Douglas A. Palmer

Interview conducted by

Caroline Simard, PhD, and Joel West, PhD

January 29, 2004

SAN DIEGO TECHNOLOGY ARCHIVE

The Library
UC SAN DIEGO

Douglas A. Palmer

Dr. Palmer specializes in unconventional signal processing. He holds over a dozen U.S. patents and has founded or participated in the startup of many companies. He spent 8 years at the Stanford Linear Accelerator and then went on at Linkabit Corp, Western Research Corporation, became head of R&D Director at HNC Software, and then moved on to ThermoTrex, a subsidiary of ThermoElectron. In 1998 Dr. Palmer cofounded Path1 Network Technologies where he developed the world's first video over IP systems. In 2002 he joined the California Institute of Telecommunications and Information Technology at UCSD. He has been working with Intellisis since 2006. Dr. Palmer received his MPhil and Ph.D. in High Energy Physics from Yale University after earning his B.A. in physics from UCSD Revelle College.

Source: Intellisis Corporation

THE SAN DIEGO TECHNOLOGY ARCHIVE

INTERVIEWEE: **Doug Palmer**

INTERVIEWER: **Caroline Simard and Joel West**

DATE: **January 29, 2004**

LOCATION: **San Diego, California**

1   **WEST:** One of our standard questions is, what made you come to San Diego? But, I
2   think we've probably resolved that question.

3   **SIMARD:** Your mother and father.

4   **PALMER:** When you're born here, you're stuck here.

5   **WEST:** Well, what about the decision to go to UCSD?

6   **PALMER:** We couldn't afford [Laugh] to send me someplace fancy, because my sister
7   was going to Stanford at the time. UCSD was small and marvelous, and had a great
8   reputation. Revelle was just a superior place. I think there were all of 250 students in
9   my class, you know. It was a big campus. It was Revelle when I joined.

10 **WEST:** Oh, Mira[Muir?] wasn't even opened then?

11 **PALMER:** No. So, it was Revelle and you had a block of . . .

12 **SIMARD:** That was the engineering school?

13 **WEST:** No. No.

14 **PALMER:** It was science.

15 **WEST:** It was the entire . . .

16 **SIMARD:** The entire school? Wow.

17 **PALMER:** The whole school at the time. But there was just a little Revelle quad, and

18 you parked near it. You had classes in the Quonset huts. But . . .

19 **WEST:** And you could drive through campus, because the old 101 still went through

20 campus. [Laugh]

21 **PALMER:** Well, not by that time. They were starting to pinch it all off. It was

22 interesting, though – they had this bridge over here and they went east on it and into

23 dirt fields. There was nothing out east of Five. You would go all the way to the

24 Miramar lakes or that little weird community of Mira Mesa, but the rest was just dirt.

25 **SIMARD:** Now it's prime real estate. [Laughter]

26 **PALMER:** Yeah. The Golden Triangle.

27 **WEST:** Okay. What did you major in at UCSD?

28 **PALMER:** Physics. Base physics.

29 **WEST:** Can you expand on that?

30 **PALMER:** Yeah. AP&M was there. It was cool. I took my math courses in applied

31 physics and with really smart guys.

32 **WEST:** Why did you major in physics? What do you do with an undergraduate

33 physics degree? Go to grad school?

34 **PALMER:** Yeah. I went to grad school. But, physics is fabulous stuff. I just love... it

35 started with the Science Fair.

36 **WEST:** Okay. It wasn't any particular goal, career goal ambition, whatever? It's

37 just . . .

38 **PALMER:** Just to make contributions in physics, study and learn physics. I still do it.

39 I'm still working. It's a hobby of mine now.

40 **SIMARD:** Did you go straight to grad school, or did you . . .

41 **PALMER:** Yeah. Straight.

42 **SIMARD:** Where did you go to grad school?

43   **PALMER:** I went to Yale University. Then after three years there, I ended up going to

44   the Stanford Linear Accelerator Center for my thesis research. I was up there for eight

45   years. I did my thesis in three years, then I postdoc'ed for a while, and then I joined

46   what was called IIRPA. It was Institute for Intercampus Research of Particle

47   Accelerators of the University of California. [Laugh] Back to the University of

48   California again. The ties go deep. My sister spent her first two years at UCSD too.

49   Then I came down here to teach.

50   **SIMARD:** You were a professor at UCSD?

51   **PALMER:** I don't know what all the titles were–tenure track, lecturer. I don't

52   remember the things since that . . .

53   **SIMARD:** But, you came back and taught in physics?

54   **PALMER:** Yeah. Yeah. So, I was teaching undergraduate physics here, and then . . .

55   **SIMARD:** How, why did you decide to come back?

56   **PALMER:** Well, my dad died at that time. And I loved San Diego. It was still a . . .

57   **SIMARD:** It was in your mind?

58   **PALMER:** Yeah. Although, the Bay Area's a nice place. When I first started up there,

59   it was '75. I was sharing a house in Menlo Park with some guys. They were grad

60   students. My dad came up and he looked at the house across the street. He walked in

61   there, looked around, came back and said, "It's $25,000. Why don't I buy you the

62   house? Then you fix it up," because I was a good carpenter, "and it'll save on the

63   rent?" I said, "No. No. No. I'm not going to be here that long." [Laughter] When I left

64   after eight years, those same houses were going for $250,000, and today they're going

65   for millions.

66   **WEST:** So, you came back to San Diego because you liked it?

67   **PALMER:** Yeah.

68   **WEST:** Was it the career opportunity or you just basically said, "I'm going to find

69   something to do in San Diego?"

70   **PALMER:** It was a lot of things. I wanted to teach some. Also, George Mesick and
71   Wayne Vernon were in the Physics Department here and I just thought the world of
72   them. I think Wayne Vernon is one of the smartest people in the world. So, it was
73   people, people again. When I was teaching here I got introduced to Irwin Jacobs,
74   and . . .

75   **SIMARD:** He was teaching at the time? Was he?

76   **PALMER:** No. Not really. He was right over here at Linkabit in Torrey Pines.

77   **SIMARD:** Oh, he was already at Linkabit?

78   **PALMER:** Right. And then it turns out that a couple of people, one of them Jay
79   Kaufman, had been doing radio astronomy here and he went over to Linkabit. I went
80   and interviewed with him. That convinced me it was full of smart people, and it was.
81   It was an amazing organization.

82   **SIMARD:** So was the attraction of Linkabit that it provided a way to have an
83   academic mindset but in industry?

84   **PALMER:** Yes. I interviewed in several other places in town, and they didn't have the
85   same academic mindset. At Linkabit they just let me come back here and teach. So, I
86   continued to teach here and work on the programs there. It didn't take long before I
87   realized that he had collected a lot of brilliant people. Amazing. Just . . .

88   **WEST:** And, how did he do it?

89   **PALMER:** How did he do it? I'm still asking people this to this day. [Laugh] I've been
90   part of probably twenty startups in twenty years, and it's people, people, people. If
91   you build your first core team properly, it acts like glue. There's an interesting thing
92   in startups. If you get a really good core team and you move at high speed, you can't
93   help but to bring on dead wood, so to speak. There are people that just don't fit the
94   culture or the lifestyle of the company. If you've got a really good core team, those
95   people eventually leave. They don't feel a part of it, they don't feel they're keeping up.
96   It's too much work, etcetera, etcetera, etcetera. It's kind of a streamlining. I've seen
97   this again, and again, and again. So he must have gotten a really good core team. He
98   did keep it like a campus. It always felt like a campus. At first maybe some people like
99   it. I don't know. But, there seemed to be a lot of freedom. I've learned this about him.
100 It's kind of interesting. If you have a company with a lot of smart people in it, you

101 have entrepreneurs. You can't help it. You've got people who are entrepreneurial
102 spirited. What Irwin Jacobs did is he had an entrepreneurial mindset. You could
103 come to him at any time with your ideas and he never said, "No." What I learned was,
104 and he could clarify this more than anyone, and maybe he's not even aware that he's
105 as good as he is, but what he does is he says, "Well, continue with the job you're
106 doing now, because that's important. We'll see. Maybe we'll fund your idea and keep
107 working on it in house." You accomplish two things. Or maybe three things. If you
108 say, "Nah. We don't have any interest," or something like that, you're going to lose
109 some good people and replacing them is very hard. It's very hard to get good people.
110 Number two, if they are good and it's something that maybe turns out okay, you can
111 make a mint off of it. Number three, if you keep them around at a cost of like $50,000
112 on an IRAD or something like that, they are still doing their jobs in the company, it
113 can pay off, and they're not out competing with you.

114 **SIMARD:** Right. In a way, if he hadn't sold Linkabit to M/A-COM, maybe he
115 wouldn't have all these startups. It all came unglued when he and Andy left. It was
116 always Irwin and Andy. That was the . . .

117 **WEST:** Were you at Linkabit when they left?

118 **PALMER:** Yeah. There's an interesting story there. There was kind of a shock in the
119 company for a while. But, M/A-COM sent some guys out to appease all the engineers
120 and the staff.

121 **WEST:** After they left?

122 **PALMER:** Yeah. It was three days later. This is kind of funny. We go in the
123 auditorium and we listen to the guys from M/A-COM say, "We're brilliant. We'll take
124 care of you. You just do your jobs and be good boys". I went back to my office and got
125 on the computer and updated my resume. [Laugh] No questions asked. It was just
126 quiet in the auditorium, which is contrary to normal Linkabit operation. I submitted
127 it to the print queue. It went off and the print queue backed up. I wanted to know
128 when to go in and pick it up, so I did a search on the print queue and it gives the
129 names of the files being submitted. It was "resume, resume, resume, resume, resume."
130 [Laughter] There must have been twenty resumes popping out of it. I went there and
131 looked and it was every good person I knew – it was sad. It was . . .

132 **WEST:** And, this is in an hour after the talk?

133 **PALMER:** Yeah.

134 **SIMARD:** Wow.

135 **PALMER:** But, I fell in with Hussein El-Ghoroury, who was the best systems engineer
136 I've ever met. Hussein was trying to keep the company together and he brought a
137 group of the good people together in the system engineering team. He called it his
138 "tiger team" or something. He kept a lot of good people together there.

139 **WEST:** When you were in his group, did you notice the culture shift that was going
140 on?

141 **PALMER:** Oh yeah. Yeah.

142 **WEST:** So, what was the difference between the old culture and the new culture?
143 Were people just reacting to, "Oh gosh, the brilliant founders are leaving. We better
144 jump"? Or were there more tangible things?

145 **PALMER:** Oh, it was tangible in the following sense. It went from a campus
146 atmosphere of academic equals to a paternalistic corporate atmosphere. Management
147 was up in the clouds and they cast down tidbits to the peons – that's an exaggeration.

148 **SIMARD:** The headquarters were now on the East Coast, so you were not aware of
149 the decisions they made?

150 **PALMER:** Right. They put in big conference rooms too. There's a real difference. I've
151 lived on the East Coast in that atmosphere. Massachusetts is an arrogant part of the
152 community. You look at MIT, Harvard, BU, Scientific American, you look at the
153 peoples, the Kurzweils, the Wolfram, they're the center of the intellectual universe.
154 There were things happening with MIT, Lincoln Labs. The arrogance out of there was
155 filtering down and it doesn't fit with California. I'm not saying it's worse, or delivers
156 less. They've done good work out there, but it's a different mindset. You can't have
157 any further mindset than between Boston and California.

158 **SIMARD:** That's interesting, because there's actually been a book about the
159 difference in culture between Massachusetts and Silicon Valley, asking, "Why has
160 Silicon Valley took off and Route 128 didn't?" The book talks a lot about this kind of
161 corporate culture.

162   **PALMER:** Even now I'm helping out on several mergers and acquisitions. Mergers
163   and acquisitions are all about culture, you know. It's just like a marriage, you know.
164   You get a husband and wife who come from totally different cultures, and you've got
165   things to overcome, let alone all the rest of the problems [Laugh] you have left.
166   Mergers, M&As fail on culture, mostly. A lot of it you can't put your finger on, but
167   something's different.

168   **WEST:** So you ran Hussein's team while the rest of the company was really shifting.
169   What was it like in Hussein's team? You said he had good people there, so at least
170   you were keeping good people. Was there anything else about the team that was
171   different, other than the quality?

172   **PALMER:** The team was excellent. Some of the programs were shifting to less... As a
173   company you can stay high margin, cutting-edge. You're doing things right at the
174   limit of what technology can produce. That's one corporate culture. The next one is
175   to fall back into low margin, cut pennies, and lock up the file cabinets. Memos started
176   pouring out right and left. "The supply cabinet will be . . ." We never got memos
177   before, but all at once memos were pouring out everywhere. Controllers were coming
178   in. "Too many pencils are being used. Too many book binders." From now on you had
179   to sign out for all bookbinders. "The stockroom will be under lock and key." It's just a
180   culture shift to . . .

181   **WEST:** You're from San Diego. Were there other people that were equally offended?
182   San Diego culture, particularly in the '70s and '80s, wasn't particularly hierarchical
183   and centralized. But, for the people that would come from... Irwin hired a lot of
184   people from MIT.

185   **PALMER:** From all over. And . . .

186   **WEST:** The East Coast people also kind of noticed the shift, or did you particularly?

187   **PALMER:** Everyone, I think. A lot of people stuck it out. A lot of good people even
188   stuck it out as long as they could. I went early because a recruiter I know called me
189   and said, "There's a bunch of loonies over here on Miramar Road that are doing just
190   bizarre things. You really ought to be part of it." [Laugh] I went over there and it was
191   a bizarre company full of brilliant . . .

192   **SIMARD:** What company was that?

PALMER: It was called Western Research. It was run by Bob Hunter. His brother is Duncan Hunter, the congressman. It's a great family. I still stay close to them. They're very wonderful people. Bob Hunter is the rebel. A real rebel. He was going to knock sense into the Department of Defense, the Department of Energy, you name it. We were going to build the world's largest laser. We were going to build everything. More technology came out of that company in a few years than you can even believe. It was an amazing place.

SIMARD: Was that company doing a lot of military type work?

PALMER: All. A hundred percent.

SIMARD: So you had worked on some military technologies?

PALMER: Yeah. Yeah. At MILSATCOM.

WEST: MILSATCOM at Western Research or at Linkabit?

PALMER: At Linkabit. I think Steve Hart left before me. His office was next to mine at Linkabit. He's VIASAT. And then there was another one. I think there's someone else that left before me too, but then I, bingo, was gone. It was hard to leave, because I had so many friends there. It was a great social atmosphere.

SIMARD: What year did you leave, in 1990?

PALMER: Eighty-five, I think.

WEST: Do you remember when in '85?

PALMER: No. May or something like that.

WEST: Well, I understand the announcement was in April.

PALMER: Was it that soon? [Laugh] Maybe it was later. Maybe it was September or something.

WEST: Irwin Jacobs left in April.

PALMER: Okay. So, it might have been like September or something. Hussein was a great guy. A lot of guys stayed and really fought the battle to try and keep it together. They really gave it their all. Slowly they . . .

220   **SIMARD:** Eventually they left and formed PCSI.

221   **PALMER:** Dave Lyon was – yeah.

222   **SIMARD:** Lyon? Yeah.

223   **PALMER:** Western Research is interesting. I can't even tell you what they were doing
224   because it was all Star Wars, but it was just mind-blowing. They did the first adaptive
225   optics in the world, beyond even the systems they're building now. It was quite a
226   place. They actually tried to hire Hussein to come in and manage a program and they
227   couldn't tell him what it was. [Laugh] It was strange stuff. But, that was a brilliant
228   company. And then Bob Hunter was appointed to the Department of Energy.

229   **SIMARD:** So, the rebel? [Laugh]

230   **PALMER:** Yeah.

231   **WEST:** What did he do in DOE?

232   **PALMER:** He was Assistant Secretary. He tried to reorganize it and kick out the
233   boondoggles, and he ended up being kicked out. [Laugh] He was tramping on the
234   sacred cows. He was doing what should have been done.

235   **WEST:** Oh yeah.

236   **SIMARD:** That was probably why they hired him.

237   **PALMER:** The sad part is, when he left, he had to eliminate his commercial interests.
238   He sold Western Research to Thermo Electron. Another merger and acquisition-
239   gone-crazy company out of Waltham, Massachusetts. When that happened . . .
240   [Laugh]

241   **SIMARD:** Someone told me in one of the interviews that Irwin Jacobs will never sell
242   Qualcomm. [Laughter]

243   **PALMER:** No.

244   **SIMARD:** He's had his experience with that, you know.

245 **PALMER:** Yeah. Especially to a company out of Massachusetts. So anyway, I got it
246 again. [Laugh] I bailed and went with Hecht-Nielsen, who is a professor here, to
247 Hecht-Nielsen Neural Computers. We did neural networks. More ties to UCSD again.

248 **SIMARD:** Hecht Computers?

249 **PALMER:** Hecht-Nielsen Neural Computers. It's called HNC. HNC Software.

250 **SIMARD:** I know it by HNC.

251 **PALMER:** Okay.

252 **WEST:** When was that?

253 **PALMER:** That was '87 or so.

254 **WEST:** When you were at Linkabit, were you a communications guy or a laser guy?
255 Or . . .

256 **PALMER:** Communications. Or whatever. At Linkabit, Irwin always said, "Hire a
257 smart guy. He'll figure out what to do in the company." That was his hiring
258 philosophy. Hire just smart people. As soon as they come in, they are immediately
259 blazing a path somewhere.

260 **WEST:** And at Western Research you were also in communications?

261 **PALMER:** Laser stuff. [Laugh]

262 **WEST:** So, optics?

263 **PALMER:** Lasers and optics. Right. We worked with Clark Guest, who's a professor
264 here at UCSD. And Sung Lee.

265 **WEST:** You were at Western Research when you worked with him?

266 **PALMER:** When I was at Western, right. When I went to HNC, likewise, I worked
267 with Clark Guest again, because he's a brilliant guy. One of the smartest guys I know.
268 I'm still working with him. He's a brilliant guy. At HNC we worked with a lot of
269 groups around town.

270 **SIMARD:** Still military oriented?

271   **PALMER:** No. They didn't know where they were oriented. They had neural
272   networks and they were Chase money. They were funded by Battery Ventures out of
273   Boston. [Laugh]

274   **WEST:** One case where the Boston money didn't screw them up, right?

275   **PALMER:** Right. [Laugh] Then it gets kind of funny. I worked with a lot of other
276   companies and professors in town, Dr. Ty Smith at the VA Hospital, and Albert
277   White in the Economics Department here. A really brilliant mathematician, in
278   applied economics – well, that's probably why he's in economics. But, then just as an
279   aside, I did a hobby thing with some guys out of Linkabit. We formed a company
280   called DR3 Datadesign, and we pioneered just kind of off-the-wall things.

281   **SIMARD:** Deer3 it was called?

282   **PALMER:** DR3. It was the initials of the founders. [Laugh] Doug. And Dave Cook was
283   in there. Dave Cook has been in every startup and you'll see his name a lot. He's at
284   Votrax now. He was at . . .

285   **SIMARD:** Wow. Okay.

286   **PALMER:** I brought him into Western and I brought him over to Sabia. It's all
287   incestuous around here. He was at PCSI. He was with Dave Lyon.

288   **SIMARD:** Uh huh. The team.

289   **WEST:** You were giving us the DR3.

290   **PALMER:** DR3, we did printed sheets . . .

291   **WEST:** With Dave?

292   **PALMER:** Oh, yeah, that was Dave Cook. We had the chairman of the UCSD Music
293   Department at the time. I think his name was Erickson, and Rob – Rob, Rob, Rob. He
294   was one of the Rs. I can't remember. It'll come to me in a bit. We made printed sheet
295   music and we were working with Bill Norgrund and Myron Eichen. Now, there's a
296   name you're going to see over, and over, and over again. I had a long relationship
297   with him. He just died about a year ago, but he founded Ivac, BrookTree. He was
298   involved with Pacific products. His son founded Proxima, which was computer
299   products or something. It turned into Proxima. Then he went off and he formed

300   Rokenbok, the toys. Myron's been an investor in dozens of companies. All over the

301   place. And Bill Norgrund.

302   **WEST:** Was he an angel or was he actually starting them himself?

303   **PALMER:** He was actively involved in it. Bill Norgrund was more of the angel. Myron

304   always was hands-on. I worked with Myron at BrookTree when there were only three

305   guys in an office. [Laugh] BrookTree was eventually sold to Rockwell and became part

306   of Conexant. There were three or four basic technology groups in San Diego early on

307   that started everything. One was NCR. That started all the semiconductor stuff down

308   here.

309   **WEST:** Why do you say that?

310   **PALMER:** Like every company, they kind of did weird things and a lot of their people

311   rolled out of there up into Newport Beach and Silicon Valley and came back into

312   town. Kumar Majeti and others.

313   **WEST:** Was NCR doing semiconductor work here in their RB plant?

314   **PALMER:** Yeah. They had a plant in Carlsbad, I believe. They were building

315   computers. They were world-class at the time. The next group of things began with

316   General Atomics. That was the birthplace of lots of other companies. That was

317   Freeman Dyson, who was called then to form a group on the Orion Project. The

318   Orion Project was going to launch rockets with exploding nuclear bombs. Freeman

319   Dyson brought in thirteen of the most brilliant minds in the United States, including

320   Myron Eichen, and Bob Beyster.

321   **WEST:** Okay. [Laugh]

322   **SIMARD:** Very interesting.

323   **PALMER:** You're starting to see the picture here? Okay. [Laughter]

324   **SIMARD:** Yeah. We talked to Gene Ray yesterday. He mentioned Bob Beyster.

325   **PALMER:** Now you're really tying the loop, because Gene tied Linkabit to the

326   remnants. The other one is Jim Palmer, the guy that was there. He went off and

327   started Horizons Technology.

328   **WEST:** Jim Palmer was at GA?

329   **PALMER:** Yeah. Remember, almost as soon as everyone was collected they started
330   doing experiments, quite successful ones actually. There's a tower down in Point
331   Loma where they were sending things out. [Laugh] I used to sneak behind the fences
332   down there and go look at that in high school, junior high level, and used to watch
333   these experiments. GA was very active in supporting the Science Fair.

334   **WEST:** Oh yeah.

335   **PALMER:** I used to go up there. You remember that?

336   **WEST:** Yeah. That was even in . . .

337   **PALMER:** Did you get the tour?

338   **WEST:** The GA tour was the highlight.

339   **PALMER:** Yeah. That was the best. TRIGA. Remember TRIGA?

340   **WEST:** Yeah. The blue water or something? "Fusion is just around the corner."

341   **PALMER:** Yeah. [Laugh] So anyway, almost as soon as Orion began it was
342   demolished. Freeman Dyson left to go back and Bob Beyster stayed here with Myron
343   Eichen and started SAIC. After eight years or something like that, Myron left SAIC.
344   He was the only outside shareholder for a long, long time, because it was an
345   employee-owned company. Then he started Pacific Hydro Products and then started
346   his chain of founder, foundryships, or whatever you call it.

347   **WEST:** Did you ever work at SAIC, or you just worked for people who had?

348   **PALMER:** No. I knew a lot of people there.

349   **SIMARD:** Just knew a lot of them?

350   **PALMER:** If you're here, you collaborate with them on lots of things.

351   **WEST:** One of the things we were trying to get at... Obviously a lot of people in town
352   have passed through SAIC. And the question is, at least when we look in the
353   commercial side, we see a lot of people who passed through Linkabit by starting
354   companies. We don't see many people, comparatively speaking, who passed through

355 SAIC. I don't know if it's the caliber of the people or the culture, or the training they
356 get.

357 **SIMARD:** Or their technology or whatever?

358 **WEST:** Yeah. Yeah.

359 **PALMER:** Right now, you're right about it. A few good guys left and did things. Jim
360 Palmer was one. But, it's the culture. SAIC has been so involved with government for
361 so long they kind of have that culture too. It doesn't reward, there's no
362 entrepreneurship. It's, "Do your job and don't make any waves." So, it wasn't
363 conducive.

364 **SIMARD:** Getting that next contract rather than thinking?

365 **PALMER:** Yeah. Fulfill the customer's requirements. Although, they've done neat
366 things but it's a different culture. It's not my culture, but it's a culture. They do have
367 some smart people. At HNC we hired some SPAWAR guys who were just fantastic,
368 but we blew it at HNC and they went back.

369 **SIMARD:** They went back to SPAWAR?

370 **PALMER:** Yeah. It's a funny thing, but like many of my buddies from Linkabit, if
371 nothing's going on where we get stressed out... We lived for stress. You had to be at
372 the edge of falling apart, running out of the last dollar, trying to do some marvels in
373 the face of insurmountable circumstances. That was Western Research. A lot of the
374 people are like that. Dave Lyon's like that. Of the whole team out of Linkabit, a lot of
375 them had that personality.

376 **SIMARD:** Very driven?

377 **PALMER:** Yeah.

378 **SIMARD:** Is there anyone in particular at SPAWAR we should try to talk to, to
379 investigate . . .

380 **WEST:** Or somebody who came through there and made out on the commercial side?

381 **PALMER:** Try Peregrine Semiconductor. Ronald Reedy and Rory Moore. Reedy took
382 the silicon-on-insulator technology to Peregrine Semiconductor. A lot of good people

383 went through there, who then branched out to other places. Jim Tiernen is another
384 one you haven't talked to.

385 **SIMARD:** James Tiernen?

386 **PALMER:** We hired all of his people. The last company I cofounded with UCSD
387 professors was Path1 Network Technology. We hired most of their people. [Laughter]

388 **SIMARD:** Oh really?

389 **PALMER:** From Joe. Yeah.

390 **SIMARD:** They sold to Radyne/ComStream, right?

391 **PALMER:** Yeah. And then did really well.

392 **SIMARD:** Yeah. Right.

393 **PALMER:** If they'd only held it a little stronger. Jim was a headstrong guy. Chris
394 Bennett, who worked with him, was a good guy too. Chris Bennett would be a good
395 guy to talk to.

396 **WEST:** Where is he now?

397 **PALMER:** Maybe he went with Radyne/ComStream.

398 **SIMARD:** Okay.

399 **PALMER:** Then, let's see, from HNC . . .

400 **WEST:** You were doing software stuff at HNC, or were you doing algorithms, or what
401 were you doing?

402 **PALMER:** Yeah, Algorithms. Algorithms and hardware. You did everything. You wore
403 a hat in three different directions all night long. Bob Hunter came in. We were trying
404 to get an experiment done. This is amazing stuff. Someday someone will write a book
405 about it.

406 **WEST:** And what year is this?

PALMER: Eighty-seven, '88. This is Bob Hunter's personality. It was 3 a.m., between Saturday and Sunday, we're trying to get an experiment going. It was all ripped apart, and he walks in. Three a.m. right? [Laughter] Paul Johnson and I are sitting there and working. He came over and said, "How are you doing?" We said, "We can't find the problem." And he said, "Okay. Give it all you got. I'll see you in the morning." It's 3 a.m., which meant he's going to be back at 7 a.m. to see that all this . . . [Laugh] That was the style of the company.

WEST: And people took it?

PALMER: It was one incredible place.

SIMARD: They liked doing it. Yeah.

PALMER: Yeah. We were going to show the world what we could do, and it was an amazing place. Paul Johnson, who was sitting next to me all bleary-eyed when Bob walked away, said, "Doug, you know, most people would find this a very stressful situation." And I said, "Paul, I think we like stress." [Laughter]

SIMARD: We find it fun rather than stressful? Yeah.

PALMER: But, one day when I was at HNC, the new management kind of took over. Robert was a fun guy, really fun guy. But new management, sent out from Boston, so to speak, took over. They were moving the company up in the credit verification and so a lot of the scientists went out to other places.

SIMARD: It seems to be a time following the arrival of new management. My husband works in Silicon Valley and he says, "Managing engineers is like herding cats." [Laughter] When the wrong person tries, especially someone who doesn't have the technical abilities, then they . . .

PALMER: Yeah. Sure. When I was at HNC two weeks, I was trying to work with Dave Lyon of PCSI. They had a neat startup. They had Martha over there and it was cool. They got Dave Cook in there. He came out of Western and went over to PCSI. PCSI was really cool. You'll see why in a second. [Laugh] What goes around comes around. When I got a call back from what was left of Western, it was under Thermo Electron, and they said, "We're being very entrepreneurial." It turns out that George Hatsopoulos, who was running Thermo Electron, was a very interesting guy. He was chairman of the Federal Reserve. He built instruments. They talked me into coming

438   back to finish a program and they said, "We're going to do a lot of startups and
439   things. We know you've been through two or three of them now, so help us out." So, I
440   went back and spent six, eight years there.

441   **SIMARD:** Did they want to spinoff startups?

442   **PALMER:** Yeah. Their vision was you could raise capital on the venture markets
443   cheaper than any other way. It was the best way. And then you got the
444   entrepreneurship of the people you spinout to do it. So, they were going to create an
445   empire of fifty-one percent ownership. And then people felt, "Gee, by buying some
446   stock in this company I don't have just a flaky startup. I'm actually a part of an empire
447   that knows how to manage and look over its assets."

448   **WEST:** Sort of like a more decentralized version of the GE model? You're buying a
449   portfolio of lots of businesses and you assume they know how to run it?

450   **PALMER:** Yeah. So, it was a lot of fun. I was commuting out to Boston again.
451   Somehow, at HNC I was doing that every other week. I was doing it again. [Laugh]
452   We went through probably forty startups and spinoffs and acquisitions there.

453   **SIMARD:** Forty spinoffs?

454   **PALMER:** There were more than that. But, I mean the ones that I was doing due
455   diligence on. We bought Gamma-Metrix here in town. I tried to buy PCSI. There was
456   a problem though. There was some spin going on. George Hatsopoulos was leaving it
457   to his brother. His brother moved to Wall Street and found there's more money to be
458   made on Wall Street and hype than from sound business principles. You can go look
459   up the history of Thermo Electron. A lot of people came to this conclusion. I was
460   trying to start another communications company called Trex Communications. The
461   company started treating people badly. Eric Korevaar left and formed Astroterra.

462   **SIMARD:** Uh huh. Right. He was at Trex Communications wasn't he?

463   **PALMER:** Yeah. Scott Blum left to form AirFiber. I stuck it out with Trex as long as I
464   could. We bought a few companies. We were all into the free-space optical
465   communications. I joined the Center for Wireless Communications. That was Larry
466   [Larson], and Tony Acampora, and good guys over here. The . . .

467   **WEST:** When you say "joined," you became an investor?

468 **PALMER:** Yeah. It was a real good deal. In fact, it quickly convinced us that free-
469 space optical is a bad deal. [Laugh] It paid off in spades. CWC was a very valuable
470 investment.

471 **WEST:** So, what happened then to Trex?

472 **PALMER:** I was raising capital. I spent a lot of time in Midtown Manhattan. It's a
473 great place to raise capital. New York beats anywhere in the world. What you learn in
474 Silicon Valley and everywhere else is that VCs can't say "no." It's not in their
475 vocabulary. They never say no. "Well, yeah. This is interesting. Maybe if you had a
476 better management team." That's their way of saying "no." It's almost like dealing
477 with Japan. There's never a "no." They're getting a little better now. [Laugh]

478 **SIMARD:** Right. They had to learn.

479 **PALMER:** But, in New York City, you would walk in with your PowerPoint. They
480 would give you five minutes. You would put out your business plan. They would have
481 a financial guy, a technical guy and a partner. In ten minutes you got your answer.
482 "No. No interest." And often no explanation. But, it was a great place and New York's
483 a wonderful place to hang out. But I was getting bad vibes. At some of the companies
484 I was going into, I was getting yelled out for the financial practices of Thermo, and
485 I'm a techie. By the time I had raised enough money, $17 million on this one, I'm also
486 getting bad feedback from Gamma-Metrix. A lot of the good people were leaving
487 there. I watched Eric and Scott go from my group, and I felt like, "Hmm." Rick
488 Kramer left. He's doing well now. So, what happened is I hired Ron Fellman, who was
489 an ex-professor from UCSD out in the entrepreneurial world. He was doing
490 consulting work on our free-space laser. He was working so well. It was, "Wow."
491 Anyway, I got back from a trip and called him in the office one day. I closed the door
492 and said, "Ron, you and I have got to go out and start a company. [Laughter] This
493 place is doomed." We went out and raised money and about three months later we
494 were out. I sold my stock at $49, and about three months later it was about $13.

495 **SIMARD:** The right vision at the right time?

496 **WEST:** Yeah.

497 **PALMER:** So, I shed of all of those... There was a term that was used in Thermo
498 Electron, it was called "murders and inquisitions." [Laughter] So, Ron and I did Path1

499   Network Technologies. We started out doing voice over IP, then switched to video
500   over IP.

501   **WEST:** Why?

502   **PALMER:** Because I love video. In voice over IP there are too many weird big guys
503   out there, the big Telcos. They're very strange companies. We know now why they
504   were so strange. They all had [Laugh] bad things going on inside. By exposure to first
505   M/A-COM and then to Thermo, I spot it very quickly and know where to short stock,
506   and stay away from it.

507   **SIMARD:** Did you do any wireless at all at Path1?

508   **PALMER:** Our patents were covering wireless. We were seeing 80211 start to rise and
509   thought it was interesting. So we extended our patents to that domain. They'll
510   become very valuable someday.

511   **SIMARD:** I did think you were doing those both.

512   **PALMER:** Yeah. We did some interesting work. We were basically the pioneers of
513   video over IP. Myron Eichen had introduced us to Marco Thompson originally. I
514   started a company, Video Freedom, in the meantime that, unfortunately, the federal
515   government clobbered with the V-chip. We had a competing technology and they
516   wouldn't allow us to show it to the government. They were bought off by the MPAA.
517   So we were out of business. You have to have clout. That's one thing that Irwin
518   recognized quickly: to grow you have to get into Washington D.C. You have to play
519   with the big boys. He's very good about that. Anyway, at Path1, it was kind of
520   interesting, our big success came with the box I built at Dr. Design with Marcos' guys.
521   He gave me a discount. He always did. Marco's a terrific guy. Marco's team built the
522   box for us, under our design, to carry commercial quality video over IP. We hired
523   Tiernen people to help us in the program. We were trying to sell this thing, and
524   networks are very, very cautious people. They don't . . .

525   **WEST:** "Networks" being in this case telephone operators?

526   **PALMER:** No. In this case, it's real television networks.

527   **SIMARD:** Yeah. Right. Right. [Laughter]

528 **PALMER:** The CNNs. [Laugh] They don't risk anything.

529 **SIMARD:** They protect their turf.

530 **PALMER:** We had Williams, and Enron, and everyone trying to deal with us, and I
531 was getting funny vibes out of these guys. [Laugh] I can't quite describe it, but odd
532 things out of Enron and Williams and Nortel. They all had an interest in us, but Sysco
533 seemed to be a straight shooter. No interest, but they were straight shooters. We sold
534 about half of the company to a Canadian company called Leach. It turned out the
535 CTO of the Canadian Telephone Company was running that one. He went over to run
536 it and then he bought into us. But, we were trying to sell to CNN and they said, "Well,
537 we don't trust your equipment." We had this beautiful little 1U box that was light
538 years ahead of all the competition. Sysco was selling something this big that was
539 inferior. Every one of six companies was inferior to our little itty bitty module.
540 Thanks to Intel, they gave us an IXP-1200 upfront. More connections in San Diego
541 again. Intel came through for us, and we came through for them too, with our first
542 commercial product for their network processing. Intel's been very good to me. I've
543 got a development system on my desk here. Intel gave it to us. They've been
544 wonderful guys. With this box, we finally talked CNN into covering a Redskins game,
545 out of Washington D.C. to Atlanta. So, we went out on September 5th and installed
546 it.

547 **WEST:** This would be like 2001?

548 **PALMER:** Yeah. [Laugh] Yeah. We installed it in Washington D.C., set it up, and they
549 went via traditional landlines, via satellite, and used ours as number three backup.
550 They told us that it performed flawlessly the entire game. It was comparable to the
551 other stuff. "Well, will you buy it?" "Nah. No interest. We don't like that." "Well, we'll
552 have to go out and remove it." Bam. September 11th happened. The federal
553 government took all the satellite channels. They took everything. They took
554 everything.

555 **SIMARD:** I had no idea.

556 **PALMER:** Yes. DoD walks in and every channel anywhere going anyplace is theirs
557 now. CNN . . .

558 **SIMARD:** For how long?

PALMER: A week or two. CNN has no way of getting broadcast video out of Washington. We got a call. "Can we use your box? We need it now." [Laughter] The internet, remember, is independent of all that. It just runs, you know. All of the coverage that came out of Washington D.C. for two weeks was coming through our little box. All the interviews down at the Pentagon, the President, everything was flooding out, and CNN distributed to the whole rest of the world. We were going, "Yeah." [Laugh] It never crashed, never had to be rebooted, never anything. Just performed flawlessly.

WEST: When you say your "box," you actually had one back in CNN's center too, right?

PALMER: Yeah. Yeah.

SIMARD: Did you have to install more? Did you put . . .

PALMER: We had four of them around the country.

SIMARD: Okay. So, you didn't all of a sudden need to scramble to produce more ...

PALMER: Right.

SIMARD: Or you were ready for that kind of . . .

PALMER: No, we weren't ready. It just did its job. The guys at CNN had no channels, no channels, and here's one. They just plug it in and adapt as fast as they can. It went in as a standard television feed, SDI, and came out as a standard television feed. That was fine for them.

SIMARD: Did they buy any?

PALMER: No. [Laughter]

SIMARD: Wow. They used it and didn't buy it?

PALMER: Yeah. Yeah. Sales are starting to really flow now, but they went right back to their old ways of doing business. [Laughter]

SIMARD: That's the biggest journalistic coverage need that they could have ever had in their whole existence.

PALMER: Yeah. It's business, and business isn't fair. I'll take luck over skill any day in business. Anyway that's kind of funny.

SIMARD: That's unbelievable.

PALMER: So anyway, we kept our ties to UCSD. We had Ramesh Rao on our Advisory Board. We've always kept ties here. I left the company. I wanted to go off and do some physics and do some stuff on my own for a while.

SIMARD: So, it's still existing, Path1?

PALMER: Yes. It's a publicly traded company. I was on so many boards and things at the same time. A group of guys wanted to start a company. It was the founders' team out of Gamma-Metrix. [Laugh] We had purchased them and then kind of destroyed them, so they wanted to start a new company to do the same thing, which is a bulk analyzer company. So, they formed a company called Sabia, Inc. I went in and was their first investor, and on the Board, and had been helping them out. What's kind of funny about this is the guy who was president of Gamma-Metrix at the time was Derek May. Derek May left also and went to become VP of manufacturing at Qualcomm. Derek left and sold stock. They sold the manufacturing to Nokia. So, Derek bought a yacht and went sailing. He lives in Sunset Cliffs, right near me. He went and became a director at Sabia. And about six months ago things weren't going well at Sabia. They didn't have the business expertise they needed or the customer relations. Derek May became the CEO of Sabia. Meanwhile, I brought David Cook over to Sabia to help out and he wrote all the software for the company, but then he got called to go to Votrax. So, he's head of technology, I think, VP of engineering or something at Votrax. From PCSI, Dave Cook went to WaveWare, which was Martha Dennis's company. Then he was a consultant for a while, and then I brought him over to Sabia. A good culture. Good culture.

SIMARD: Yeah. She was wonderful when we were . . .

PALMER: Yeah. She's great. So anyway, Ramesh called me and said, "Doug, can you do some consulting for us?" I said, "Sure. That'll be fun."

WEST: I imagine at this time it's at Sabia?

PALMER: No. He was here. He stayed a professor in UCSD. I was consulting with Marco on a project for Disney for a while. Then Ramesh called and he had some

617 projects that he wanted help with. That lasted about a week and then he said, "Oh,

618 forget it. Why don't you just join us?" And, I thought . . .

SIMARD: Calit2 was getting started up already?

PALMER: No. No. It had been . . .

SIMARD: It had been started?

PALMER: Well, there wasn't much here. There wasn't anything. There were five people. But, he told me about it and I thought, "Gosh, this is like a startup. And it's the University of California. This is cool. Okay." Calit2 is fantastic. And Larry is a university entrepreneur. I have great respect for him. He had a birthday party, and the whole team piled in the conference room over here. There were about ten people sitting around. A true entrepreneur he said, "There's only ten of us here" and he said, "I think in two years there's going to be 500 of us." All that, that kind of ambition is just [Laugh] fabulous. A great motivator. Ramesh too. I have great respect for the team here.

SIMARD: Does Calit2 have some commercialization projects? What happens to the technologies, the projects that you come up with?

PALMER: Yeah. Foremost, education. Foremost is to create the next generation of entrepreneurs. How do you create these people? Give them . . .

WEST: Yeah. How do you create the next generation of entrepreneurs?

PALMER: Create exciting things for them to do. How do you do that? You can't pull it out of thin air. You have to do something real. Real stuff is being done here. It's visionary at one end and it's applications at the other end. If commercial things happen, fine. I suspect in ten years you're going to see a hundred new companies spun out of here doing wireless, everything. It's going to be an incubator beyond belief. Guys like Don Kimble, a brilliant guy. The team being assembled is remarkable, really, really.

SIMARD: Do you patent any of the projects and then license them to companies? Or is that not. . .

645   **PALMER:** We can. That's not the overall... Education is the number one aim. Number
646   two is to create jobs in California and to boost the reputation of the university.
647   Motivate young people. In the new building, when we get living labs up there, I think
648   a lot of people are going to want to... We'll get into the high schools and try to
649   convince more people to get into the field.

650   **WEST:** Into what field?

651   **PALMER:** Engineering, wireless, information technologies. "Field" is a funny one.
652   There's engineering and there's visionary engineering, which is not "I'm going to do
653   what everyone else is doing better." It's "I'm going to the left. If everyone goes [right],
654   I'm going to the left." [Laugh] Whichever direction. I'm going to go my own way and
655   create a whole new technology, nanotechnologies, anything. You name it. Lori has a
656   fantastic way of getting people all around the school tied in. What Calit2 can do is
657   kind of interesting. For faculty members, if you're teaching full-time, it's a full-time
658   job. If you want to be really good. So, getting into research and things, writing
659   proposals and grants, it's a tough job. We kind of bridged opportunities between
660   faculty people all over the country, especially California and the government. I think
661   it's a great thing for the institution to have.

662   **SIMARD:** I had asked Stephanie, two years ago when Calit2 was one room with boxes
663   in it. It was just starting, and I had asked her, "How do you interface with the other
664   efforts at the university, like the Center for Wireless Communication, Technology
665   Transfer?"

666   **WEST:** CMRR?

667   **SIMARD:** Right. And then there is another. I spoke with Abigail Borough and there
668   was another center.

669   **PALMER:** The Von Liebig Center?

670   **SIMARD:** Yes. And so, how does Calit2 interact with the other parts?

671   **PALMER:** We're light years ahead. [Laughter] Everyone wants to be at Calit2. But
672   there's no jealousy. Everyone wants to get into the wake.

673   **SIMARD:** Okay.

674 **PALMER:** Yeah. Steaming successful entrepreneurs don't push. They don't cajole.
675 They don't force. They steam ahead full speed and suck everyone into the vacuum
676 behind them, and that's the way I see it.

677 **SIMARD:** Yeah.

678 **PALMER:** Really. It's just the energy. It's like one light in a room full of moths.

679 **SIMARD:** I was at a conference of Peter Cowhey, and Larry Smarr was showing the
680 wireless bus. Is that still working? The bus?

681 **PALMER:** The cyber channel?

682 **SIMARD:** Yeah. [Laugh] The picture, and the people on the bus checking their email.
683 That's great.

684 **PALMER:** Uh huh. It's little things like that that really roll.

685 **SIMARD:** Well, it excites students a lot.

686 **PALMER:** Yeah. Yeah.

687 **WEST:** When you say it excites students, is this undergraduates or graduates?

688 **PALMER:** Everybody. And, business and industry outside. One of the things I like
689 about this is... When you're an entrepreneur and your company is six people, "Hi. I'm
690 Okie Phenokie startup company." Click. Buzz. [Laugh] Getting recognition. Well, you
691 saw Path1 with CNN. It was impossible. The task is overwhelming. But, I call now and
692 say Calit2 and it only takes a second. If they haven't heard of it, it only takes a second
693 and then, "Oh. Okay." If they have heard of it, "We'll be right down." Just like that.
694 Larry's reputation really encourages that. Ramesh has said something that's kind of
695 interesting about why he brought me and Don Kimble and some of the other
696 supermen in here. He said, "We want to build things. We want to actually make
697 things." He said, "That's so hard in a university. They can turn out papers, and
698 research, and ideas, and thoughts, but they don't actually produce a tangible thing.
699 Calit2 can make the tangible things. When you're through, you're going to have
700 something that you can stamp your name on and say, 'That's it.'" The other one that –
701 this is off the record. Berkeley gets great PR. Their motes, you know, BSD. We know

702   about it. UC San Diego, we all want to see them – UCSD had, UCSD-Pascal came up

703   one time. I don't know if you remember that. It was . . .

704   **SIMARD:** In the rankings?

705   **PALMER:** Yeah. It was everywhere.

706   **SIMARD:** I've actually heard that some deans at Berkeley were really nervous [Laugh]

707   because UCSD was like . . .

708   **WEST:** No. UCSD-Pascal was a programming language in the '70s and the '80s. It's a

709   variant of Pascal the programming language.

710   **SIMARD:** Oh, okay.

711   **PALMER:** We've seen Linux and we've seen other things. We want to create some

712   new open things that become adopted worldwide. I'm working on two, which I'm

713   hoping will push something. And . . .

714   **SIMARD:** So, you're doing some open-source projects?

715   **PALMER:** Yeah. They'll be open to researchers. Maybe if there's a licensing

716   opportunity too we won't ignore it, but that's not our primary goal.

717   **SIMARD:** That's not a goal?

718   **PALMER:** Education first. Motivation too. As Larry puts it, it's pervasive ethernet, or

719   pervasive internet. One of the things we really like to do is make... Everyone laughed

720   about it with the crash of the dot coms and everything, but ethernet was the greatest

721   civil engineering project of all human history. Nothing ever even came close to it.

722   Counting the number of people, the money, the effort that went into it. It was like a

723   hundred times what the space program was. It dwarfed the Panama Canal or

724   anything else. It was great. Everyone pooh-poohed it and laughed about it, but they're

725   on it ten hours a day. It totally has changed life and everything we can imagine. And,

726   it hasn't stopped. There's this temporary pause but it's gathering momentum again

727   and it's going to crawl into places you can't even imagine.

728   **SIMARD:** How was it to start Calit2 among the doom and gloom of the past couple of

729   years?

730 **PALMER:** A miracle. [Laughter]

731 **SIMARD:** Because, you do have industry membership, right?

732 **PALMER:** Yup. A lot of it.

733 **SIMARD:** It stays somewhat stable?

734 **PALMER:** Some of the pledges went south and we couldn't help it. But, it's done
735 pretty well. We hope it'll weather the gloom and doom of Sacramento. Because we
736 are going to be generating the jobs of the next ten years.

737 **SIMARD:** You got some funding through Sacramento?

738 **PALMER:** Yeah.

739 **WEST:** It's a matching fund right? You get so much corporate and you get the state to
740 match it?

741 **PALMER:** Yeah. But, I just see it as – you remember Idea Lab? Do you remember that
742 at all? It started way back . . .

743 **SIMARD:** I remember Idea Lab.

744 **PALMER:** We're a big idea lab. I just see a lot of that going on. I see a lot of people,
745 students. And remember, Irwin is back piling a lot of money in here. We're working
746 with Qualcomm. There's still an academic flair to Qualcomm, and they're talking to
747 us very closely. You can see good things emerge there.

748 **WEST:** How much of Calit2 is related to Wireless Center?

749 **PALMER:** I don't know. Maybe thirty percent or something that's with the Faculty &
750 Staff Association.

751 **WEST:** When you say thirty percent, you mean thirty percent of UCSD, Calit2, or
752 both UC and UCI?

753 **PALMER:** Probably both. But, the ties go way beyond wireless. Wireless is one
754 physical layer, fiber, the computing side of it. With the Homeland Security we're
755 working on a number of issues there that are really cool. A lot of the Homeland
756 Security is moving internet information technology down to a wearable level, at a

757   sensor level, meshes of networks. The building is going to be a kind of a model of a

758   pervasive ethernet in the future. If anything goes on we'll have lies, and spies, and

759   sensors.

760   **SIMARD:** The federal government gives some funding for the Homeland Security

761   projects?

762   **PALMER:** Yeah. It's a typical grant. But, we have to deliver it.

763   **SIMARD:** Yeah. Two years ago, I talked Stephanie, who said they were looking to...

764   **PALMER:** Yeah. But, the federal government is serious about getting a return on its

765   investment. They want answers and that's their goal here. And, wizard program

766   working on that was, that's with Dr. Leslie Lenert entered at the VA hospital. He's the

767   program lead on that. So, we tie a lot of pieces together.

768   **SIMARD:** That's great.

769   **PALMER:** Irwin thought successful entrepreneurship and leadership is energy,

770   motivation, go out in front, lead, and suck everyone into your wake. And when I

771   think of others...

772   **SIMARD:** Nice analogy, actually. I've never heard that analogy before, speedboats

773   speeding away. Do you have a list of member companies with Calit2?

774   **PALMER:** I think our website carries a lot of that.

775   **WEST:** You're doing the Homeland Security. Is there much being done in Calit2 that's

776   military or is it just Homeland Security is as far as it goes?

777   **PALMER:** I don't know all the programs here. We have ties to all kinds of stuff. But,

778   the ones I'm aware of, and the ones I'm working on, are Homeland Security. But,

779   there are probably secure defense things. Last night we were until eight o'clock down

780   in the bowels of SPAWAR, talking to guys about solutions. They have bewildering

781   problems in their IT and their network infrastructure in Iraq and such. We walked

782   out of there going, "Oh man. [Laugh] This is a problem."

783   **WEST:** Can we back up to your career a little bit, because we kind of buzzed through

784   it. I know that with twenty companies in twenty years, it is kind of hard to [Laughter]

785   do any of them any justice, but just so that we understand. We had a couple of things

we're interested in. One is the crossover between military and civilian work. It sounded like you were in military quite a bit for a while. Did you cross over and never come back? Did you go back and forth? I mean, how did that . . .

PALMER: I think my secret clearance lapsed in '92 or something like that. That was kind of the end of that. [Laugh] But, even at Path1, Livermore and Los Alamos wanted to do some high-speed video and so we were talking to them. I'd hate to have a company that depended on the Department of Defense. But, at the same time there are wonderful people in there and there is a lot of cross-pollination. There's Linkabit. Even Qualcomm got started on DoD contracts. I don't know if you've heard the story. I've heard it third-hand. Qualcomm thought they were going under at one point. They're overwhelmed and they were literally working out their Chapter 11 papers, and then they got a phone call from DoD and had some money. [Laugh] Irwin worked it really well between military and... What he always did that was kind of cool is he would work on DoD programs that were cutting edge and could benefit the commercial programs. If you're making canteens or pup tents it's probably not going to help you commercially. But the types of things he always got linked to did.

WEST: Did you find that there was any issue in terms of crossing over from when you had your secret clearance and you were primarily doing military work to working in commercial work? Was there any problem in transferring your skills? Was there any problem in terms of going from a company that was military-focused to a company that was civilian-focused?

PALMER: There's less documentation [Laugh] in commercial. You sell it first and then document it. In the military, the documentation starts first. But no, there's no – the military is very easy about. It's probably easier than the university about intellectual property and rolling in and out their . . .

SIMARD: Gene Ray was talking to us yesterday and his perspective was that on the engineering side the crossing over is easy. On the managerial side it's very difficult, because the client is so different, has special requirements...

PALMER: Yeah. Yeah. The accounting.

SIMARD: And the culture. Yeah.

816   **PALMER:** Most companies just create two groups, military systems and commercial
817   systems. You make it a separate business unity or something instead of – they live in
818   different places. At Linkabit there was The Hill, [Laugh] that was mostly DoD, and
819   then commercial in the Valley. But, there are ways of getting around it. Thermo
820   Electron and Thermo Trex went back and forth. They finally just booted most of the
821   commercial. They'd spin it out. You do have to keep them separate. But, for the
822   people, engineers, sometimes the work is more exciting in DoD. It's more
823   challenging, more cutting-edge. Someone will throw $2 million to develop a chip that
824   is beyond the beyond, and you get to do it and it's fun. At Western . . .

825   **SIMARD:** Yeah. So, that's that top-secret stuff then? I know someone who works at
826   Lockheed in their most secret division, and he says, "My god, I'm working with
827   knowledge that I didn't even know existed." He's just so excited. So, from an
828   engineering point of view, it can be very attractive.

829   **PALMER:** Yeah, it can. It depends on the program, again. DoD has some exciting...
830   There was stuff I was on in Star Wars, that was just incredible. It was so fun.
831   [Laughter] That's what you dream about. SLAC was great. I love hardware. SLAC had
832   two and a half miles of the greatest hardware on the planet. That was nuts, but it was
833   fun. Maybe if I were filthy rich and could just dabble I, maybe I'd go back to SLAC
834   and work on an experiment. But, in the meantime this is the funnest place in the
835   state to work. [Laugh] It's great.

836   **SIMARD:** Do students come here and do doctoral projects, or how do students
837   interact? I know you said teaching. So, do you go into classes? Do they have . . .

838   **PALMER:** Project oriented. Our students come in and work with the projects that are
839   here. The equipment we're developing here is coming back to give something for
840   students to work on that's cutting edge. Each of us in here has a number of student
841   projects we mentor. They have university projects, really cool ones, through ECU 191
842   and 291. So students can actually work on a real, live project, not a student thing
843   that's right out of a box or something like that. We have a number of those going.
844   Students are really fun to work with.

845   **SIMARD:** Do you see some sort of interfacing with the future business school as
846   students come here and work on all those exciting technologies and learn about
847   them?

848 **PALMER:** Yeah. There's a gal here – gee, has her name changed or not? She's getting
849 married. Anna Marie Besarites. She works in the Chancellor's office, and Chancellor's
850 Associates. I've spent a lot of time with her. She knows a lot of this stuff. You might
851 talk to her. I could get you her number too. She's very knowledgeable, from the
852 chancellor's office, of ties to industry. The Chancellor's Associates is an interesting
853 group.

854 **WEST:** What are they?

855 **PALMER:** People around town who are entrepreneurial-bent and who have back ties
856 to UCSD. They can stay in close to see where things are going. You know about
857 CONNECT, right?

858 **SIMARD:** Uhm-hmm. Do you guys do some stuff with CONNECT sometimes?

859 **PALMER:** No. But, at Calit2, I'm helping some entrepreneurs. Calit2 would like to
860 keep ties with startups and help where we can. A lot of introductions. Startups need
861 introductions. It's that credibility gap.

862 **SIMARD:** For a company? Yeah.

863 **PALMER:** So, if we can route things through, it's just fine. It's great.

864 **SIMARD:** Are you going to keep track of people that came and worked on your
865 projects, and then started companies?

866 **PALMER:** Yeah. Definitely. Von Liebig is there. I'm working on two things with
867 professors to try to get spun out through Von Liebig. It should be a good deal. The
868 university – UCLA does it well. [Laughter] This is something we're all aware of. UCLA
869 does it well. Berkeley does it well. UCSD does it badly.

870 **SIMARD:** Doing what? Connect the . . .

871 **PALMER:** Getting professors and students connected entrepreneurially.

872 **SIMARD:** Okay.

873 **PALMER:** There's CONNECT, which doesn't help a whole lot for getting a professor
874 out and rolling.

875   **SIMARD:** Right.

876   **PALMER:** We do it badly. I knew this when I was on the outside, when people like
877   Ron Fellman had to leave. They just had to leave the university. I'm trying to work
878   with the Tech Transfer Office and I'm bringing in venture capital people I know
879   around town. Leo Spiegel is a good guy. You might even want to go talk to him. He's
880   a partner at Mission Ventures. Another Chancellor's Associate. Marco is another one
881   who... We're all UCSD grads too. You push for your alma mater. But Leo, he's from
882   the funding side. He was an entrepreneur. Grew his own company. Did really well. I
883   tried to get him into some startups but he ended up in the Sandpiper, which was
884   acquired by Digital Island, and then [sound effect]. [Laugh] But he got some money
885   out of it and he joined Mission Ventures. He too would really like to kick butt and get
886   the university to really – but the university has had some scandals in the past ...

887   **WEST:** Which one?

888   **PALMER:** [Laugh] I can't name them. But, there's something about biotech where
889   there's always some professor who leaves in biotech and he starts a little company
890   and then suddenly, "Hey he stole all the . . ."

891   **SIMARD:** All the IP?

892   **PALMER:** "The public property," and all of this.

893   **SIMARD:** Stanford has that story with Yahoo.

894   **WEST:** But they didn't steal it. They were out in the open. Everybody knew that.

895   **PALMER:** That's Stanford's model. Stanford chose not to do anything about it and
896   gave them their blessing, even though they worked on this part of it while they were
897   at Stanford. It was well known.

898   **SIMARD:** NCSA sued people and lo and behold the founder of Yahoo gave a whole
899   bunch of money back to Stanford. But, the other guy never gave anything back to
900   them.

901   **WEST:** Bill Gates did endow a building at Harvard after using the Harvard computers
902   to create Microsoft.

PALMER: Yeah. And Sun certainly hasn't hurt Stanford any. Interestingly at the birthday party I learned a lot. It was fun. God it was fun, because all the old Linkabitters came back, and we all sat in one room. And . . .

SIMARD: You really missed something.

PALMER: This is going to sound weird. I've never seen such a group of tall people in my life. It is strange.

SIMARD: You know, there's research about how tall you are and how successful you are. [Laugh]

PALMER: Well, I don't mean necessarily a success, but just Linkabitters were all over six feet. That was the biggest group of guys I've ever seen. It was weird. Just a coincidence. No one cares what you look like, and we had our little four-footers, but it was just funny. [Laugh] It was just kind of funny. But . . .

SIMARD: Was that right before Christmas? That party?

PALMER: I guess it was. It probably says here. Maybe it doesn't. October 17th. Okay.

SIMARD: Ah, it was in October.

PALMER: One of the cool guys here was... You've followed up on Torrey Science and Technology too? Dave Cook went through there too. Dave Cook's interesting because he's worked for all of these companies. [Laugh] This is kind of funny. At the birthday party they said a couple of interesting things. One is, Irwin insisted that if a professor leaves here, he can take a leave of absence to start a company and come back without penalty. So we do have that going for us. That's really good.

WEST: Irwin insisted this when he was here or when he was outside?

SIMARD: When he founded it.

PALMER: Halfway in between.

SIMARD: When he founded the Engineering School, when he came?

PALMER: Yeah. There were testimonials from all these people who worked with him. The other one is, Irwin said something I totally agree with, "When you're in

930   engineering school, learn the fundamentals." Everyone wants to jump on

931   immediately, make products and everything, but "Learn the science." That's one of

932   the interesting things about Irwin. Instead of just apps on top of other people's work,

933   he really stressed the fundamentals. You always felt that in Linkabit. One of the most

934   impressive people I ever met was Dave Lyon. He does seminars. He always did

935   seminars, weekly seminars, and they never pulled their punches. Man, they were

936   highly technical on everything. Fundamentals on everything. Of course, Andy Viterbi

937   was always right there too. It was always basics. If you really want to generate

938   intellectual property, be at the basics. I remember Dave Lyon gave a lecture when I

939   joined up there, on modems. I thought, "Oh yeah, big deal." He got through and I was

940   blown away, "Wow. What a science. It's incredible." So, that's one thing I remember

941   about Irwin, "Learn the fundamentals." I think that was a lot of the problem with the

942   dot coms: they came in at an application level and blew up because an infinite

943   number of competitors can do the same thing. The guys who went into that business

944   with the fundamentals come out of it really well, the Syscos and the Intels. They came

945   through it. They had the intellectual property base. They had something

946   fundamental. So they did pretty well.

947   **SIMARD:** But, it seems also that during the dot com bubble, the floodgates were

948   open. It was kind of a gold rush. Everybody and their uncle were programming, even

949   though there was absolutely no diagram in it. It was really kind of . . .

950   **PALMER:** And all the con men came in too. Then . . .

951   **SIMARD:** One thing that . . .

952   **PALMER:** You won't get any history of it, but con men have been rife in San Diego, I

953   think. [Laughter] Starting from, shall we say, not K-Pro. That was one of the early

954   ones. Some con man has just wiped out... Along with all of this steady, wonderful

955   work, there's this seething sea of con men running the system underneath trying to

956   collect money and capitalize. I'm sure the Bay Area has its history too.

957   **WEST:** Did you say K-Pro's rise was . . .

958   **PALMER:** No. No. It's demise was. [Laugh] You might look at Silk Road. There's

959   another one that was funny. There are a number of these banks that... Every bright

960   side has its dark side. Somewhere it has the dark side of the force, so to speak. But,

961   that might be part of the story.

962 **SIMARD:** Well, in Silicon Valley, they say "the vulture capitalists," because there are
963 some that were all about hyping something that wasn't there, and then . . .

964 **PALMER:** Generally I don't have a great regard for VCs. I have a high regard for
965 angels.

966 **SIMARD:** Yeah. Or a handful of VCs you have respect for? Right.

967 **PALMER:** Yes. For example, we have Hamilton here. It's just good. I mean . . .

968 **SIMARD:** Hamilton Atkins?

969 **PALMER:** Yeah. But, my belief is, VCs can get so tied up in palming something off
970 on... I don't know if you know some of the story of what happened in the 1990s? It
971 affected us a lot too. I got exposed to it. A lot of it was just plain corruption. The VCs
972 funded companies composed of undergrads who don't know anything. Fund them.
973 Spin stories. The spin starts around it. They go to an investment bank. They want to
974 move their investment 10X in twenty months. Why does the investment bank do
975 this? Due diligence will tell you there's nothing in there. The investment banks have
976 the two arms, with a Chinese wall in between, which doesn't exist, and I've seen it.
977 The investment bank goes to an Intel or some big company and says, "If you buy this
978 from us, we will pump your stock through our stock analysis." Meanwhile, these guys
979 personally all take stakes in the . . . I won't name the names, but I've sat in meetings
980 where I was thinking, "Is this legal? Can these guys do this?" And it was bad. It was
981 bad news. I hope it all gets weeded out. It really needs to be before everyone trusts
982 the system and that's . . .

983 **SIMARD:** In the Valley, when the bubble burst, some guy was quoted as saying,
984 "Thank goodness all the wimps are gone." [Laughter] Only the hardcore techies are
985 left behind and will...

986 **PALMER:** It's true. Two or three years ago I was talking to my unemployed buds at
987 lunch, [Laugh] and they were moaning and groaning. These are hardcore techies. I
988 said, "Why are you groaning? It's back to where it was in the '80s before all the hype."
989 It's the same hardcore guys. All the people or used car salesmen who suddenly
990 became dot com marketers [Laugh] are back selling used cars. [Laughter] Real people
991 are leaving and going into real estate. You name it. But, it's back, I think, to the
992 harder core of where it should be. Remember energy in the '70s? Maybe you don't,

993 but in the '70s everyone was suddenly in the oil business. And then probably in 1985
994 was when Texas was getting jealous of Silicon Valley. "We can do it too. We can make
995 an Enron, and a Williams, and a . . ." [Laugh] That was pretty funny.

996 **WEST:** Well, we're kind of tying this all back together. One of the closing questions
997 we're asking a lot of people is, "Where does the talent go?" Certainly, the Calit2 vision
998 is a very optimistic one, but at least in Silicon Valley, the backbone of the middle
999 class has moved to India, or the jobs at least have. Then again, we were at an
1000 electronics company today where they're going to have more tech people in China
1001 than they're going to have in San Diego. And so, what is it that this region and
1002 wireless and the sundry telecom can do to continue to be valuable in a job cluster?

1003 **PALMER:** Yeah, it's a problem. But, there are always short-lived problems. In the end
1004 we'll go up in value. I saw something recently that's kind of interesting. An Indian
1005 engineer makes twenty percent of a U.S. engineer's salary. If you count all of the trips,
1006 the transportation, the communications, etcetera, it means there's probably a fifty
1007 percent savings. Then, there are a couple more issues that pop up. One is, India can
1008 change governments. China can change governments. If you go back fifty years, I've
1009 seen waves of this where, "Hey, the place to be is South America," and then there's a
1010 revolution and the company's nationalized. Then they all run to Washington saying,
1011 "We want to be paid back. We want to be reimbursed for our losses." That could
1012 happen. Theft of intellectual property is huge out of these countries. People I know
1013 who have set up manufacturing over there, they're finding bootleg parts on the
1014 market by the tons. They've tried to track them down and stamp them out and
1015 they've found out they were coming out of their own factory. They didn't shut down
1016 at five o'clock and go home. They came back at midnight and ran more parts for
1017 themselves. Things like that. They have . . .

1018 **SIMARD:** There's much less control?

1019 **PALMER:** Yeah. There are other stories I've heard from friends. One is a guy I know
1020 who had a company that was doing printed circuit boards. They were competing on
1021 contracts and losing against another company that was moving over to Malaysia, or
1022 something like that. He was trying to decide, "Should we move to Malaysia and
1023 compete on a price basis?" and he decided not to. He called all the engineers
1024 together. They decided to modernize here. What they did is they boosted the
1025 technical and customer skills of their employees, and they found that they became

1026 the FedEx of circuit boards. Companies would say to them and to their competitor,
1027 "We really, really need a whole bunch of these by Monday." The other company said,
1028 "We can't get you anything short of two months out of our factories in Malaysia. We
1029 have to retool, send some guys." While this company would say, "We'll do it." They
1030 learned to do turnarounds pronto, just like that.

1031 **WEST:** That's fairly similar to, although a week is a bit extreme, but in some ways
1032 that's sort of a more aggressive version of Marco's business model.

1033 **PALMER:** Yeah.

1034 **WEST:** You need something. You don't have any way of building a team from scratch.
1035 You've got to have it. You're hoping to ship. You want a turnkey solution.

1036 **PALMER:** Yeah. So there's a hope there, just on speed. The other one is, I think, we're
1037 still the innovators of the world. We turn out very innovative people from our
1038 schools.

1039 **SIMARD:** Yeah. Well, the human capital is still . . .

1040 **PALMER:** The human capital is good. The other thing is, I think you're going to see a
1041 lot of cross – maybe the manufacturing will go over there and the manufacturing
1042 research. There's another thing that people don't seem to understand. Writing
1043 software isn't high tech. It's the steel industry. The automobile is as high tech as
1044 anything else. Everyone's lying about Silicon Valley being high tech. Dot com wasn't
1045 high tech. To write some html, that's not high tech.

1046 **SIMARD:** Tech.com is not high tech?

1047 **PALMER:** Yeah. You need PhDs to do high tech. What people call "high tech,"
1048 turning out an old circuit board to do this with some plans, this isn't high tech. This
1049 is the steel business. All these 'high tech' jobs that talk about "data entry," that's not
1050 high tech. Circuit board manufacturing. It's not high tech. Writing website software
1051 is not high tech. Here's high tech. Genomic studies. Nanotechnology. Fiber optics.
1052 Free-space optics. You can go on, and on, and on, and on, and on, and on. Materials
1053 properties. Semiconductor properties. Getting processes and semiconductors down
1054 below twenty nanometers. That's high tech. I'll give you an example. You want a
1055 foundry? A million dollars, and you've got an old beat up foundry and you're making
1056 chips. Is that high tech? Not one person in there will have anything more than a high

1057 school education. But, wafers will go in one end and chips will come out the other
1058 end. That's not high tech. So, the definition of high tech is changing. And there's still
1059 a hardcore of hard high tech that's going to remain here. I'll tell you something else.
1060 There aren't enough high tech people in India or China to satisfy the world's needs.
1061 There aren't enough really high tech people anywhere. It's just that bell-shaped curve.
1062 There aren't that many people on the planet who can really go out in front and lead.
1063 [Laugh] I hope I haven't shocked you about this. But the definition of high tech has to
1064 change. When Coleman College gives you a high tech career, give me a break. That's
1065 not a high tech career. The other thing about high technology is that it's diversifying
1066 to an extent that's beyond belief. It used to be that there was electronics, there was
1067 biotech, [Laugh] there was computer science or something like that. That was about
1068 it. There are a thousand fields now and they practically can't even talk to each other,
1069 because they're so weird. Look at human body implants. Oh, if you want to see
1070 something amazing, [Laugh] this will blow your mind. You've got to go over and get a
1071 picture of this, just for fun. [Laugh] Over there in the Med School, next to the med
1072 library, walk down the hallway. My wife was looking for a vending machine. "I need a
1073 Coke. Lend me a dollar." She walked over, put her money in, and went, "What is this?
1074 Tea?" No. It's a vending machine [Laugh] that sells DNA. [Laugh] I don't even know
1075 what the stuff is. I can't even speak the language. [Laugh] I went over and looked at
1076 it. It's just mindboggling. You put your credit card in it and it sells you, what did I see,
1077 "calf intestine cytokines." I don't know what these things are. All these chemicals. It
1078 says, "Don't worry about having a cold pack. It comes with this built-in refrigeration
1079 thing." I'm looking at this and thinking, "Do people just walk down the hall and put
1080 their credit in" and think, "Oh good, cytokines," and go back in their labs? They do.
1081 [Laugh] This is high tech.

1082 **SIMARD:** I wonder who thought of that as a business model? [Laugh]

1083 **WEST:** Well, I don't know. We had that last interview where they talked about
1084 locking up the supply cabinet. Maybe this was their equivalent of locking up the
1085 supply cabinet? [Laughter]

1086 **PALMER:** No. This is a private vendor. This is some company.

1087 **SIMARD:** Oh, so probably a biotech company? Just decided to . . .

1088 **PALMER:** Yeah. But out of a vending machine. Yeah. It's getting . . .

1089   **SIMARD:** My advisor at Stanford studies biotech, so I will get a picture of the
1090   machine. [Laughter]

1091   **PALMER:** Yes. Do. You know the entrance to the biomed library, that hallway down
1092   to the side there. It's right halfway down the hallway. [Laugh] I mean, that should
1093   tell you something.

1094   **SIMARD:** That's great.

1095   **PALMER:** Human implants. They had an open house here when they opened the
1096   new natural sciences building, and there were twenty lectures that I sat through
1097   thinking, "God, I don't even know what language these people are speaking."
1098   [Laughter] So, there aren't enough high tech people in the world and there never will
1099   be. There's your old Bell curve out there and even if we take everyone in China and
1100   everyone in India who's up there, it's still not going to satisfy the world. As far as I'm
1101   concerned, everything that boosts China and India is going to boost us in the long
1102   run too. It's not a matter of exporting the jobs. All jobs are nebulous and moving.
1103   That's . . .

1104   **SIMARD:** Probably will become a market as well if their life standard improves and
1105   they become potential customers to all your technologies.

1106   **PALMER:** Yeah. It's unfair right now because their government is manipulating
1107   things. They want to build up dollar reserves and they won't buy our products. We
1108   have to deal with it. One way to do it is to buy all their companies while the dollar is
1109   high, and then we can retire on them someday when they're way up there. I don't
1110   know. Whatever it is, it has to be worked out at a national level. But, on a human
1111   level, there are costs and it has hurt here. There's an odd thing that's occurring in San
1112   Diego right now that someone ought to take advantage of. The people on the streets,
1113   the unemployed, are the most brilliant. The most brilliant people around were the
1114   ones who were in crazy little startups, and those are the ones that died. All the
1115   backward, low-tech companies in San Diego [Laugh] have done fine. Look at Silicon
1116   Valley: Fairchild did okay. Look at IDTI. Companies that are making really backwards
1117   chips, they just kept selling into DVD players, but those cutting-edge companies
1118   doing low process semi, they all went down the tubes.

1119   **SIMARD:** My husband's startup got bought by AOL/Time Warner and now they've
1120   just fired everybody who used to be on the Netscape campus. Again, it's this East

1121 Coast/West Coast threat happening. "We're going to make them our satellite office
1122 with a couple of hundred people to do our bidding." Now everybody is working on
1123 their resumes. So, when you were talking about that it just seemed so brilliant.

1124 **PALMER:** Don't you think AOL and Time Warner will split?

1125 **SIMARD:** I don't know. Maybe.

1126 **PALMER:** I think so. That's – I heard a funny one on the news the other day and it
1127 was on Marketplace. The guy said, "Well, here's what the financial advisors say, 'Buy
1128 that other company because that merger is a generator of synergies and you can cut
1129 the costs, eliminate redundancies, and have economies of scale. We can always
1130 sell . . . "

1131 **SIMARD:** How many can you sell?

1132 **PALMER:** Right. A year later they say, "You've got to get rid of that asset because it's
1133 worth more when it is spun out than it is as . . ." Financial people just want the churn.
1134 Churn. Churn. Churn.

1135 **WEST:** They keep churning to get you going.

1136 **PALMER:** Exactly.

END INTERVIEW

The San Diego Technology Archive (SDTA), an initiative of the UC San Diego Library, documents the history, formation, and evolution of the companies that formed the San Diego region's high-tech cluster, beginning in 1965. The SDTA captures the vision, strategic thinking, and recollections of key technology and business founders, entrepreneurs, academics, venture capitalists, early employees, and service providers, many of whom figured prominently in the development of San Diego's dynamic technology cluster. As these individuals articulate and comment on their contributions, innovations, and entrepreneurial trajectories, a rich living history emerges about the extraordinarily synergistic academic and commercial collaborations that distinguish the San Diego technology community.