

Gene W. Ray

*Interview conducted by
Caroline Simard, PhD, and Joel West, PhD
January 28, 2004*

SAN DIEGO TECHNOLOGY ARCHIVE



The Library
UC SAN DIEGO

Gene W. Ray



Dr. Gene Wells Ray, Ph.D. has been Managing Director of GMT Ventures, since 2005. Dr. Ray has an extensive experience in technology, defense and government relations. Prior to GMT Ventures, he founded and served as President and Chief Executive Officer of L-3 Services, Inc. (formerly L-3 Communications Titan Corporation, The Titan Corporation) since February 28, 2003 and from 1985 to July 2005 respectively. Dr. Ray co-founded Titan Systems, Inc., in 1985. He served as the Chief Executive Officer and President of Titan Systems from 1981 to 1985. He served as an Executive Vice President, General Manager and a Director of Science Applications International Corporation, Inc. for 12 years. He was employed at SureBeam Corp. He served for two years as Chief, Strategic Division, US Air Force and as a Defense Industry Analyst. Dr. Ray held the position of Senior Appointee (Public Law 313) on the staff of the Chief of Staff of the US Air Force, where he led a team of military and civilian analysts and scientists. Prior to that, Dr. Ray was with the Aerospace Corporation where he contributed to weapon system analysis programs and specialized in the area of nuclear survivability. He serves as the Chairman of the Board at Decision Sciences International Corporation and Decision Sciences Corporation. He has been Chairman of Global Secure Corp. since August 2005 and Cayenta Inc. since September 1997. He has been Chairman of L-3 Communications Titan Group since May 1999. Dr. Ray served as Chairman of L-3 Communications Titan Corporation from April 1999 to July 2005 and its Director since 1981. He serves as Director of CaseRev, Inc., Decision Sciences Medical Co LLC and Decision Sciences Corporation. He has been Director of L-3 Communications Titan Group since 1981. He serves as Member of Advisory Council of Proximity, Inc. He has been a Member of Advisory Board at Patriot Data Solutions Group Inc. since October 26, 2006. He served as a Director of AverStar, Inc. He also served as Director of Titan Systems from 1981 to 1985. Dr. Ray received a Ph.D. degree in Theoretical Physics from the University of Tennessee in 1965, a Master of Science in Physics from the University of Tennessee, and a Bachelor of Science in Mathematics, Physics and Chemistry from Murray State University in 1960.

Source: Bloomberg Businessweek



THE SAN DIEGO TECHNOLOGY ARCHIVE

INTERVIEWEE: **Gene Ray**

INTERVIEWER: **Caroline Simard and Joel West**

DATE: **January 28, 2004**

LOCATION: **San Diego, California**

1 **WEST:** One of the things that we're puzzled about this is, why San Diego? Other than
2 Irwin decided that the winters were warmer here than in Boston, and he came out. A
3 bunch of peoples' little stories, they just happen to fall into San Diego. But, you came
4 to San Diego because of some guy named Beyster.

5 **RAY:** Yeah. That's right.

6 **SIMARD:** It seems like there's a lot of military communications and electronics
7 contracting here in the San Diego area. If you had to characterize it after GE or
8 Convair went away and the aerospace left, it seems that if there's any theme to the
9 military consulting here in San Diego, it is some sort of electronics or communication
10 thing. But, we haven't come across anyone who could explain why that is the case,
11 other than that Irwin and Viterbi were kind of dabbling in their spare time and they
12 started Linkabit. Despite a lot of little individual happenstance stories, we haven't
13 really seen anything else. So, is it just that there were a few seeds that were planted
14 here, or is there a more rational or a consistent pattern to it?

15 **RAY:** No. I think you probably hit it pretty well on the head. I think it really goes
16 back to two independent seeds being planted. One, I think, was Bob Beyster. More
17 importantly than Beyster for the telecom industry was, was Irwin Jacobs. I can't tell
18 you all the reasons why he came to San Diego. I never talked with him about that.
19 But, I think that has a whole lot to do with why there's a telecom industry here today.
20 There are a lot of other things that compliment and supplement that. One is that
21 UCSD is an excellent school. But, that compliments it. That's not the driving thing. In
22 fact, if I'm not mistaken, in the early days of Linkabit, the predominant recruiting
23 came from MIT and Stanford.

24 **SIMARD:** Yeah. We've had actually . . .

25 **RAY:** Even when we bought Linkabit in 1990, that still was where most of the
26 recruiting came from. There's nothing that explains who's the chicken and which one
27 is the egg. Irwin Jacobs was the one who created the business. Then he found the very
28 best people that he could find, wherever they were. Of course MIT and Stanford have
29 a lot of very good people. Not that he didn't recruit from other places. It's just that
30 that seemed to be the predominant recruiting grounds for them.

31 **SIMARD:** When I talked to Martha Dennis, she said, "I can't tell you how many
32 recruiting trips I took to MIT." [Laugh]

33 **RAY:** There were quite a few for Stanford as well.

34 **WEST:** You emphasized hiring the best people. Did the Linkabit hiring pattern,
35 which I guess you inherited when you acquired Linkabit, did that seem to be different
36 than that of the other electronics companies here in the area? Other than the fact
37 that it was so weighted to a couple of universities, were there other places that didn't
38 try so hard to find the best people on a national search, or weren't as successful, or
39 anything like that?

40 **RAY:** I don't think many people were as successful as Irwin was. I don't think there's
41 anyone that has had the same business model. It's been an engineering, technology-
42 driven business model, in my opinion. Irwin could tell you much better than I can. It
43 is one where you bring in the smartest and the best. You give them a lot of freedom.
44 You give them the resources they need. Then you provide a focus and direction for
45 where they do their work, and then you look out, because good things come out of
46 that. Now that's easy to say but it's difficult to do that. Not everybody uses it. It is
47 difficult to turn that into a good business. He was able to do that. I'm not sure there's
48 anyone else in the world that could have ever built a business that was anywhere near
49 as successful, or even just successful, as Irwin's using that model. He was able to do it
50 uniquely well, in my opinion.

51 **WEST:** Can you think of any other San Diego companies that tried that and were
52 even moderately successful? Of those that were technology driven. Maxwell Labs,
53 maybe?

54 **RAY:** No.

55 **WEST:** No, that was all contract, I guess.

56 **RAY:** No. I don't think I've seen a company that was as engineering and technology
57 driven as Linkabit was. I saw a little bit of Linkabit, because we acquired it. I don't
58 know Qualcomm. But my perception is, the same thing is true in Qualcomm.

59 **SIMARD:** Yeah. Qualcomm really became an intellectual property company.

60 **RAY:** Yeah, and incredibly rich in technology. I bet anyone would be surprised at all
61 of the things that are going on within Qualcomm today that one doesn't know about.

62 **WEST:** It seems kind of odd that he was able to pull it off in Linkabit. At least from
63 my experience as a government contractor many, many years ago, it's very rare that
64 A, you're thinking very far ahead. You're thinking about getting the next contract,
65 and how you are going to deliver that. And B, it is rare to be able to have in-house
66 technology as opposed to stuff that you're transferring to the government as part of
67 your contracted research.

68 **RAY:** No. You can definitely do that. You're right. That's not the norm. That's not the
69 normal government contract way. But, we have certainly done that all the way along.
70 Irwin did it in spades. As you may or may not know, when he started Qualcomm, he
71 started out with some government contracts. I remember talking with him about it
72 just as he was starting Qualcomm, his plans were to bring in government contracts,
73 but use those as the foundation for building a commercial business.

74 **SIMARD:** Which is what he had done at Linkabit with the VSAT terminal?

75 **RAY:** He did that in Linkabit. That's correct.

76 **SIMARD:** How about Titan? How did you found your organization?

77 **RAY:** I came at it from a very different perspective. I came at it from SAIC. I was
78 working for the U.S. government and Bob Beyster recruited me to come out here. I
79 became the thirty-second employee of SAIC. SAIC was strictly a government
80 contractor and the objective there was to bring in the next couple of contracts, and
81 later try to diversify very unsuccessfully into a commercial business. At least it was
82 unsuccessful while I was there. Then, I got into an argument with my boss and I lost.
83 [Laugh]

84 **SIMARD:** You didn't lose too badly, obviously. [Laugh]

85 **WEST:** What is the difference between the business models of Titan and SAIC? Are
86 they both strictly contract work for government or is there, like for Irwin and
87 Linkabit, more of an attempt to retain IP or to build competencies that are...

88 **RAY:** As was the case of SAIC and Linkabit and Qualcomm, the initial foundation of
89 Titan was government contracts. We started out, in Titan, with the philosophy that
90 we were going to have people working very closely together as teams to build a
91 business. It was a different business model than SAIC's.

92 **WEST:** Whereas at SAIC, you'd shift people around as needed for contracts?

93 **RAY:** No. It was, "You go build yours. You go build yours. You go build yours." That
94 may not sound like a very good business model, but it built a \$6 billion corporation.
95 We did damn well with it. But, Titan was different. We also set out, at the beginning,
96 to have a public company, which was very different than SAIC. To raise the capital we
97 needed to expand and grow the business. We decided to diversify into commercial
98 business for a very different reason than Qualcomm. We decided to do it because we
99 thought we had to in order to survive. Back in the late '80s, the defense budgets were
100 in freefall. When peace broke out worldwide, defense spending plummeted.

101 **WEST:** I remember real estate prices in San Diego plummeting. [Laughter] When all
102 those General Dynamics engineers got laid off.

103 **RAY:** That's right. General Dynamics went from 32,000 employees here to none. They
104 did sell off a piece of that business, but they had 32,000 at one time here in San
105 Diego.

106 **SIMARD:** What commercial business did you get into at the time?

107 **RAY:** We were very fortunate when we started the company. Technology was
108 communications technology, defense communications, and then building a
109 technology business. What do we mean by "government technology business"? It's
110 where the government gives you a R&D contract to do research and development.
111 You can take the technology that comes out of that to do whatever you like. We had
112 been getting R&D contracts for quite some time and had a very good technology
113 base.

114 **WEST:** When you say a "technology base," are you talking about intellectual property,
115 which you own, or are you talking about intellectual property which has been
116 disclosed to the government, but that you understand better than anybody? Are you
117 talking about people? What do you mean by "technology base"?

118 **RAY:** The contract from the government is to develop technology to build, build,
119 build. The government owns that technology. They paid for it. However, if you will
120 put some of your own money in, then you can take that technology and obtain a
121 patent for it. In fact, you don't even have to put your own money in. You can go get a
122 patent. If it is strictly where the government funded it, not where you funded it, then
123 the patent will be such that you will have to give the government use of that
124 technology free, forever. But, you can take that technology that's patented and go out
125 commercially. The government encourages you to do that and sell it to anyone you
126 can, and you have a patent. So, the only thing you lose is that you can't use your
127 intellectual property that the government paid you to develop against the
128 government. The government has a right to that. But it really is not an impediment at
129 all.

130 **WEST:** No. Here we're talking about communications when we're talking about the
131 spinoff?

132 **RAY:** Yeah.

133 **WEST:** Or, the commercial?

134 **RAY:** No. It included communications.

135 **WEST:** What other technologies had commercial

136 **RAY:** We got involved in SPAWARs, as an example, and developed some ways of
137 using electricity to generate power that you could use to sterilize medical products, to
138 kill bacteria in food, or to kill bacteria that might be in the mail, like anthrax.

139 **SIMARD:** That's the SureBeam technology?

140 **RAY:** Yeah. SureBeam is one of those. We use it for other applications as well. That is
141 one. But, most of the technology was in the information technology area. Also
142 artificial intelligence was another technology area that we were on the forefront of.

143 **WEST:** IT is not known for the efficacy of its patents. Were there a lot of patents in
144 the IT stuff or was it more that people . . .

145 **RAY:** No. It was more the technology in the IT.

146 **WEST:** Like software or chip designs or what?

147 **RAY:** It was software and products. For example, we had a very, very early technology
148 and product for providing a system at very low cost to, for example, truckers. If you
149 remember one of Qualcomm's products was OmniTrack, and we debated on whether
150 to compete with Irwin. I remember us talking about it.

151 **WEST:** You and Irwin?

152 **RAY:** Yeah. Our technology was very different. It was called – god, what was it called?
153 You're probably aware that there are literally millions of particles that come into our
154 atmosphere and burn up daily, and as they burn up they leave a track of radiation
155 coming into the atmosphere. You can bounce radio signals off of those. It means that
156 you can have low data rate communications without having a satellite. Just use that
157 as your satellite.

158 **SIMARD:** Wow. That's very creative.

159 **RAY:** It works, but it doesn't work continuously. You might go two, or three, or even
160 five minutes without communications. It is for an application that doesn't require
161 continuous communication. They like to provide information for truckers, and for
162 information that can wait five minutes, you can use this. We actually put in a few
163 hundred devices around the country to measure the depth of snow up in the
164 mountains to see if there's going to be too much runoff. You put in sensors to
165 measure the depth of the snow, and then you use our system to transmit that back
166 once a day to someplace where they kept up with the snow depth. Then they could
167 calculate what the likely the runoff would be, and if there would be problems from
168 the runoff in the spring.

169 **WEST:** It seems like that technology would be very useful in northern latitudes where
170 you don't have good satellite coverage?

171 **RAY:** But again, it's only limited. Today with satellites you wouldn't want to go back
172 and use that technology. But, that's the place where we did have intellectual property,
173 we did have patents. We decided not to pursue them. We sold it.

174 **WEST:** When did you sell it off?

175 **RAY:** We sold it to the people who created it, to the employees in house.

176 **WEST:** Did they do anything with it?

177 **RAY:** The last time I heard just a couple of years ago they were doing a small
178 business. It was up in the Seattle area.

179 **WEST:** That kind of brought us to one of our main questions. It seems as though
180 Titan, much more than most companies, has a formal—I don't know if "policy" is the
181 right word—but it has a habit or a process of spinning companies out. A lot of
182 organizations say, "No, you can't leave," but like you said to Meister, you say, "Bye-
183 bye." Was it intentional or you just kind of happened upon that?

184 **RAY:** No. It was intentional, and again I think it's from necessity. Defense companies
185 around the country have been uniformly unsuccessful in building commercial
186 businesses. The principal reason is that people managing those businesses don't
187 really understand the industry into which they're trying to get. You don't have people
188 selling that product or service that really understand the industry. They understand
189 the defense industry or the government industry. The way I put it to my people was,
190 "How long would it take Microsoft's best salesperson to come into Titan and make a
191 sale to the CIA?" They said, "Forever." I said, "That's about how long it'll take you to
192 go into this commercial industry and make a sale. About the same length of time."

193 **WEST:** It's funny you should mention that, because I left my company over a dispute
194 with my boss. It was a little company called CACI. I don't know if you've heard of
195 them?

196 **SIMARD:** I've heard of it.

197 **RAY:** It's not that little.

198 **WEST:** Yeah. My company never made it above fifteen employees. But I had a dispute
199 with my boss and I left. [Laugh] Of course, I didn't have a half a billion dollars in

revenue when I left. [Laugh] We actually made a commercial software company. I hear everything you're saying. The biggest problem for us was the business models. We never actually escaped from the government contracting business model. We went to a commercial contracting business model. But the entrepreneurial business model is to take a venture capitalist's money, or angels' money, or whatever, and to bet it, invest in a product, take the risk, put them all on double zero and see what happens. The government contracting model is to make ten percent here, ten percent there, ten percent over there.

RAY: That's one thing about management. You can't have the same manager doing both. The mentality is, just as you said, totally different. If you're going to have a successful commercial business, you have to bring in someone who has exactly that same mentality that you just described. The entrepreneurial mentality. You put it all on goal and you go for it. That is a much more expensive way to go than if you're using government funding to help to get it started, which you could do. What we decided to do was to go out and find the very best person. Just like a VC would do. Bring them in to run that business, then build a management team, and create a culture that was appropriate for that industry, not the defense industry. But how does a small defense company go out and find the best person to run this new business who would work for a defense company? If that's all you are promising, you won't. You'll never recruit that person. How do you recruit that person? The same way you do if you're starting up a company from scratch. You set it up as a subsidiary with its own stock. You give that person a pocketful of stock options, the same thing that that person will do to bring in people to work for him or her. You build that up separately. It doesn't do any good to build that up unless there's a way to get them acquitted. How do you get them acquitted? That's what brings you to have to spin it off. It seemed to me that all of those things were necessary in order to get to our goals.

WEST: Essentially what you're saying is that the expectations and the demands of the executive labor market for these sorts of entrepreneurial companies dictated your strategy for what you did with these technologies?

RAY: Yes. You just go through what it takes to be successful. It really dictates things. Following that route doesn't mean you're a successful company. But it's certain that if you use the same people, no matter how bright or how smart they are in the defense area, to go over and build a commercial business, it is very unlikely to happen,

233 because they don't have the right mindset. They don't understand the little ins and
234 outs of the industry.

235 **SIMARD:** These came out from your efforts in the commercial realm, when you
236 decided, "We need to spin it off, because that's the best strategy"?

237 **RAY:** We really have to make that commitment very early on if we are to recruit
238 those people. Once you head down that path you can't...

239 **SIMARD:** Was that a strategy to make up for the lost revenue in defense? Do you still
240 do that? If you see some interesting company from somebody's organization?

241 **RAY:** No. We did that up until the technology bubble burst.

242 **WEST:** When did you start this?

243 **RAY:** We started it in the early '90s.

244 **WEST:** And stopped it when?

245 **RAY:** Two years ago. In early 2002. We probably should have stopped it in March of
246 2000. [Laughter]

247 **WEST:** Yeah. Well, many people should have stopped.

248 **RAY:** We didn't quite have that good of an insight. [Laughter] The thing that really
249 did help the company is that we got recognized as a technology company in '98, '99.
250 In '99 our stock was the largest gainer on the New York Stock Exchange, and
251 Qualcomm's was the largest gainer on the NASDAQ that same year. We used the
252 currency that we had through the price of our stock to make a number of defense
253 acquisitions. While our stock price was high, we bought a lot of defense companies.
254 After 9/11, when the defense budgets went up, we had the company sitting in exactly
255 the right position. We were just extremely lucky in how this company was positioned,
256 and the markets that it was positioned in. It allowed us to go after and win much
257 larger contracts very quickly and rapidly. During 2003, our core, internal growth was
258 a little over twenty-nine percent, over \$400 million in revenues. All internal growth.
259 That strategy was paying off. We would have never had the mass if we hadn't been
260 recognized as a technology company and used that to acquire other defense

261 companies. We would have still been a \$150 million defense company. We would
262 have been going after \$10 million contracts instead of half a billion dollar contracts.

263 **WEST:** Yeah. So using your currency?

264 **RAY:** Was fortunate.

265 **SIMARD:** You were reinvesting it in your core company?

266 **RAY:** Yes.

267 **WEST:** We were talking about the difficulty in transferring skills between the
268 commercial side and the business side for managers, but what about for engineers? Is
269 it the same issue?

270 **RAY:** No. If you have a very good engineer, that good engineer can work just as easily
271 on one side as another. We transferred engineers all the time.

272 **WEST:** In both directions or just in one direction?

273 **RAY:** They go one direction at a time. Back in the late '90s, they were all going
274 commercial. Now, they're all coming back. [Laughter] They only go one way. They go
275 both ways, but only one way at a time. [Laugh]

276 **SIMARD:** Yeah. I've been looking at a lot of press releases from companies over time.
277 A lot of companies that were defense companies started claiming after the late '80s
278 that, "We are a communications company." Now, after September 11, they are back to,
279 "We're a defense company." It's the same.

280 **RAY:** I plead guilty. We worked incredibly hard in the late '90s to become known as a
281 technology company. We changed our logo. We said, "Our mission is to create, build,
282 and launch technology based businesses." Finally in '99 we became recognized as a
283 technology company. That's why our stock price went up so much. Then we went
284 back. "We didn't mean that. We're really a defense company." [Laughter]

285 **SIMARD:** You can be defense and still have very good technology and innovation?
286 Yeah.

287 **RAY:** That's really true.

288 **SIMARD:** You can still hire the top engineers that really want to come back and want
289 to still be with a technology company? Right.

290 **RAY:** That is true. I was positioning us with respect to the markets.

291 **WEST:** All kidding aside, when we go back to look at what you said, I would hate to
292 misrepresent. It wasn't like you said, "We willed ourselves to be a technology
293 company and then when it goes soft, we'll run back"?

294 **RAY:** No. That wasn't it. That was not it at all. I was talking with tongue in cheek.

295 **WEST:** Yeah. I just wanted to make sure that we . . .

296 **RAY:** Yeah. Thank you, for that.

297 **WEST:** So, when you're transferring engineers back and forth, are you in fact
298 acquiring engineering talent in the local labor pool? Are you hiring them out of
299 colleges or are you're hiring them from elsewhere in the country?

300 **RAY:** Yes. Yes. Yes. All of those. After the first three quarters of 2003, we hired 3,200
301 new employees. I don't know how many we hired the last quarter. I haven't heard
302 that. But probably, in all likelihood, we exceeded the 4,000 employees that we hired
303 last year. We hired them from everywhere. Everywhere you could get them.

304 **WEST:** How many of those were hired in San Diego?

305 **RAY:** I don't know that number.

306 **WEST:** How many people are here locally?

307 **RAY:** Twenty-five hundred or so? I don't know.

308 **WEST:** Is there any particular competence or expertise here in the San Diego
309 operation?

310 **RAY:** Yes, there is. Let's get around to the real question that you asked before. Going
311 back to talking about why San Diego is so strong in telecommunications, I really do
312 believe that the principal reason for that is that Irwin Jacobs chose San Diego.
313 Another thing that has helped compliment it, as you were talking about it before, is
314 UCSD. Although, most of Linkabit's early recruits out of college didn't come from

315 UCSD, many of them have come from there since then. I'm sure Qualcomm has
316 hired many. We've hired many. UCSD has been a very good asset, and a very helpful
317 asset. Another very helpful asset has been another thing you suggested earlier, the
318 military here. Since I first came here in 1970, the Navy has had a very strong presence
319 here in San Diego. They called it many different names.

320 **WEST:** NEL and NOSC?

321 **RAY:** You got it.

322 **WEST:** I won fifty bucks or a hundred bucks from NOSC in 1975 for their physics
323 contest for high school students. [Laugh] They had just renamed it from NEL.
324 Because NEL was the people on the top of the hill and NOSC was the people on the
325 top of the hill, plus the people down on the side of the hill. [Laugh]

326 **RAY:** You really do know this.

327 **WEST:** What I remember most is in '81 I went into a C-3 vault on the sea side, and it
328 had to be radiation tempest protected, because if there was a Soviet trawler offshore,
329 they didn't want them shooting microwaves at it to eavesdrop on their research. This
330 computer that we were using was inside this tempest-tested vault. I gathered from
331 this visit that they were doing some sort of C-3 research for the Navy right in that part
332 below the pill boxes for the Ft. Rosecrans bunkers. We could talk... My dad worked
333 for Convair during the war, but that would be maybe too far afield. [Laugh]

334 **RAY:** No. That's right on. We have a facility just like that on the first floor of this
335 building that you can't listen into.

336 **SIMARD:** How much research does the Navy do here?

337 **RAY:** That has been here all along and it's been a very good source.

338 **SIMARD:** So, it's not just an outpost for sailors, like the image that . . .

339 **RAY:** No, it's not. About four years ago, I can't remember when, SPAWAR
340 headquarters was moved here.

341 **SIMARD:** Why did they move here?

342 **RAY:** I don't know. It was during the reorganizing of one of the base closures. It was
343 part of the consolidation. They actually moved here from Washington D.C.

344 **SIMARD:** Yeah. So, that was a big deal.

345 **WEST:** I interrupted you. You were starting to say, "Since 1970 there's been fairly
346 active Navy research here?"

347 **RAY:** There has been active Navy research.

348 **WEST:** Is there a theme or a pattern to it?

349 **RAY:** It's all been in the communications. Yeah. It's been Navy electronics, but it's
350 really been communications-driven technology that's been here.

351 **WEST:** If Titan is doing a defense contract, or SAIC, or one of the other contractors
352 for Navy communications, and they have an office here, then would the people who
353 are doing the contract work be also here generally?

354 **RAY:** Yes. Almost exclusively. We've had contracts for the Navy here in San Diego,
355 whatever their name was at the time, since we were less than a year old. So, it's been
356 continuous for twenty-two years now.

357 **WEST:** Do you have a sense as to what percent of the 2,500 employees are actually
358 working for local clients?

359 **RAY:** By far the majority, but I don't know.

360 **WEST:** Most of the local demand from the military is still communications, or is it
361 kind of...

362 **RAY:** It still is. Yes. From the Navy. Even more so now that SPAWAR is up here.

363 **SIMARD:** Do you have a lot of defense contractors that open a branch here?

364 **RAY:** Yes. When SPAWAR moved out here a number of contractors did exactly that.
365 The one that made the biggest move out here, made the most overt efforts, and did
366 well at it was Booz Allen. But, the largest contractor here for the Navy has been for
367 the last many, many years, SAIC, and I think we're probably number two.

368 **WEST:** Is there other communications work or research centers for the Navy, besides
369 San Diego?

370 **RAY:** This is the principal place for Navy communications. SPAWAR is the
371 organization responsible in the Navy for the communications and that was here.

372 **WEST:** Before SPAWAR moved here then there was some communications with
373 NOSC?

374 **RAY:** Well, NOSC actually reported into SPAWAR. Yes, but it was still a part of
375 SPAWAR.

376 **WEST:** So, from since you were here, most of the Navy's communications research
377 has been...

378 **RAY:** No.

379 **WEST:** Was there another center besides San Diego?

380 **RAY:** It was in Washington, with SPAWAR, before SPAWAR moved out here.

381 **WEST:** So, the NEL was a branch office and there was a headquarters? Okay.

382 **RAY:** Exactly.

383 **WEST:** This is the thing that we're having trouble picking up. I made inferences. I
384 said, "NEL was here, NOSC is here, and then the Navy is here," but we haven't
385 actually run into anybody who could make the link, because most of the time we've
386 been talking to people on the commercial side. A lot of the Linkabit people we talked
387 to didn't do local Navy contracts. They did D.C. contracts, or maybe they did
388 classified stuff that they wouldn't talk about. But, nobody really had made the link
389 between... Can you think of any other companies besides you and SAIC that have
390 benefited from the Navy's communication research here?

391 **RAY:** I know a lot of them here. Booz Allen, as I mentioned. I'm not even sure they
392 were in San Diego before SPAWAR moved out.

393 **WEST:** Well maybe going back a little further, though. Maybe ten years ago. Was
394 anybody else?

395 **RAY:** A lot of them, yes. But a lot of the small companies have been acquired. There
396 are a lot of small companies that have sprung up that are doing that. I wouldn't be
397 the best person to ask that. We could get you a list of those companies if you'd like?

398 **WEST:** I'm just wondering if you would see these people in your bidding?

399 **RAY:** We do, but I'm no longer down seeing the bidding. We do see them. That's
400 what I'm saying. I could go to one of my people.

401 **WEST:** But, there's nobody of your size that's . . .

402 **RAY:** Uh, no. SAIC's the largest. I think we're probably next, but the big boys are all
403 here as well.

404 **SIMARD:** Lockheed is here.

405 **RAY:** Lockheed. And DAE. They're all here. But, I think it's mostly the little guys that
406 are here in San Diego. SAIC is huge, certainly.

407 **WEST:** They'll do anything.

408 **RAY:** Yeah.

409 **WEST:** Does the fact that their operational units may be here matter at all, or is it just
410 really the research group that the linkage comes to?

411 **RAY:** No. The headquarters being here is very important.

412 **WEST:** Is it important that the fleet or the Seals, or the carrier wings are here?

413 **RAY:** No.

414 **WEST:** So, it's just the research side?

415 **RAY:** Yeah. Just the SPAWAR side. But it's more than research. SPAWAR actually
416 produces the communication products that go out in the field. You asked how large it
417 was. Don't hold me to it, but \$5 billion or \$6 billion per year rings in my head for
418 SPAWAR.

419 **WEST:** Is there anything else we should understand about the linkages? Because
420 we're trying to understand... Irwin and Andrew do a little bit of government
421 contracting, they build it up to Linkabit, sell it off, do it again.

422 **RAY:** They do a little bit of government contracting, but then they use that
423 technology that came out of the government contracts to build all kinds of
424 commercial activities. Let me give you two wonderful examples that occurred after
425 Irwin left. Irwin started Linkabit with Viterbi as a consulting organization in '68, I
426 believe. It was small for quite a while. In 1980, they sold it to M/A-COM, and Irwin
427 continued to run that business and some additional businesses within M/A-COM,
428 until they broke off in '85 to start Qualcomm. But, during that period of time they
429 built two commercial businesses that are humongous today. One is called satellites,
430 the VSATs. They built a commercial satellite communications business. They built
431 the terminals. They built all of that technology. They got all kinds of patents.

432 **WEST:** That ended up with Hughes?

433 **RAY:** That's correct. M/A-COM, in their infinite wisdom, back in the late '80s decided
434 they were going to get out of the commercial businesses and stay in defense, [Laugh]
435 just before peace broke out. They had all the patents and they sold that business in
436 early '87, to Hughes, and that's where the VSAT business came from. But, all those
437 patents still are owned by Titan today, if they haven't expired.

438 **WEST:** M/A-COM got the patents with Linkabit?

439 **RAY:** M/A-COM sold the business to Hughes. The intellectual property they jointly
440 owned with Hughes, and had a five-year period where they couldn't get in the
441 commercial business. That was in '87. When we bought Linkabit, we got the same
442 intellectual property and we couldn't get into the business using that intellectual
443 property until 1992. Another business they built is a multi-billion-dollar commercial
444 business.

445 **WEST:** And you decided not to get into it when it expired?

446 **RAY:** No, we have gotten into it. We did. That's what led to our Titan Wireless. That
447 was the genesis for that. We used the technology that came out of that for two or
448 three commercial projects that we looked at and decided not to pursue.

449 **WEST:** So, Titan Wireless was the only thing that you commercialized from that
450 packet of technology?

451 **RAY:** Yes. That got up to \$200 or \$250 million dollars a year. Another wonderful
452 technology that Irwin built at Linkabit while it was owned by M/A-COM is
453 something I'm sure you use quite often, the ability to watch television over satellite.
454 We've all used it. But, [Laugh] long story short, the VSATs came along and they were
455 using VSAT to receive television. Anyone could go out and buy a big satellite dish and
456 get NBC, ABC, because nothing was encrypted.

457 **SIMARD:** I think Martha Dennis mentioned they were also doing a scrambling
458 technology. The scrambling was from the military?

459 **RAY:** That's exactly right. They took that and turned it into a commercial business
460 called Conditional Access. What that means is that you can receive a program on
461 condition that you pay for it. It's called Conditional Access and it used scrambling, or
462 encryption, as part of this whole system. In September of 1986, after Irwin had left,
463 M/A-COM again sold that business to General Instruments, who are now owned by
464 Motorola. Those are two very, very important and very large commercial applications
465 that Irwin built while he was doing defense business in Linkabit. We also owned part
466 of that technology.

467 **WEST:** Did you do anything with that technology?

468 **RAY:** Yes. We tried desperately, but General Instruments blocked it. As soon as the
469 five years were up, we jumped into the business and made a valiant attempt. We
470 found out that General Instruments was giving a kickback to HBO for [Laugh] every
471 piece of equipment they sold, and we could get every cable company signed up but
472 HBO. Without HBO you didn't have a business. There's more to that story, but
473 there's no reason to get into it. It's one of the painful lessons. We did try, but we were
474 not successful. So Irwin was doing the defense business, but even then he had the
475 same model that he would have in Qualcomm, of using the defense as a base to build
476 commercial.

477 **WEST:** Does anybody else come to mind as someone who made that bridge from the
478 defense side to the commercial side?

479 **RAY:** Not like he did. No. There isn't anyone.

480 **WEST:** There's nobody like him anyway.

481 **RAY:** There's no one else like him. He's an incredible guy. He's an incredible person.
482 He really is.

483 **WEST:** Any other sort of linkages or flows between defense contracts? Can you think
484 of anything else we should understand about how the military side of the San Diego
485 electronics research cluster works, or where it comes from, or how people go back
486 and forth in knowledge?

487 **RAY:** If you go back and look at all the Linkabit spinoffs, there are dozens of them. If
488 you go back and look at all the SAIC spinoffs, I would say that there are two
489 independent seeds that were sown. One was Meister and the other was Irwin. Meister
490 is the defense one. There are all kinds of companies, I have no idea how many. I'm
491 not sure there's a record of them.

492 **WEST:** The interesting thing is, though, we haven't seen a lot of impact of SAIC seeds
493 on the commercial side.

494 **RAY:** No. That's right.

495 **WEST:** Linkabit seeds seem more likely to create viable commercial companies than
496 the SAIC seeds?

497 **RAY:** Absolutely.

498 **WEST:** Any idea why?

499 **RAY:** Sure. It's the same thing that you said before, the problems you had when you
500 left CACI, when you still had the mindset of making ten percent and not taking risk.
501 That's not the way you build a commercial business. It's just not understanding that
502 business.

503 **SIMARD:** Did they try spinning it off like your strategy, to hire the right culture?

504 **RAY:** No, I don't think so.

505 **SIMARD:** They wanted to have their cake and eat it too? And that just doesn't . . .

506 **RAY:** Yeah. You don't usually have your cake and eat it too. [Laugh] That's right.

507 **WEST:** So, if we see a spinoff by Titan then it's usually the case where you knew you
508 had to commercialize it, and you used this model you described to us, where you
509 bring somebody in and you try to build up the business and spinoff.

510 **RAY:** For spinoffs that's always the case. Yeah.

511 **WEST:** Have you ever divested a company where you've said, "Eh, we can't do
512 anything with this. We'll just kind of . . ."

513 **RAY:** Yeah. But, that's unusual. Rare. Very rare. I'm sure that it happened, but it's
514 very, very rare.

515 **WEST:** In most cases, when we see a spinoff then it would be something that was
516 deliberately intended to be built up?

517 **RAY:** Right. Let me give you another example of another area that we got into. This
518 was commercial IT. As I said, that's not intellectual property, that's really a service.
519 We had been doing IT on the defense side forever, so it just came naturally to do the
520 same thing on the commercial side.

521 **WEST:** You mentioned that Enterprise IT was one of your pillars. That's not strictly
522 speaking of a government line business?

523 **RAY:** That's right. One of the things that came out of that was we saw the need for a
524 software product that was tied right into the Internet. Again, we took the technology,
525 we hired a CEO, and then we went out and found venture capital money. I was
526 already putting more money into Titan Wireless and the SureBeam than I should
527 have been. We went out and found a VC and set it up. iPivot was the name on it. It
528 was called something else before. But, iPivot was the name. We built it up. It had
529 total revenues of \$8 million in the fall of '99, and we sold it to Intel for half a billion
530 dollars.

531 **WEST:** Wow. [Laugh]

532 **SIMARD:** That's a good outcome.

533 **WEST:** What's it called now, do you know?

534 **RAY:** Oh, it's just part of Intel. It disappeared in there.

535 **WEST:** Do they have the product line, or did they just . . .

536 **RAY:** Yeah. They made a product out of it.

537 **SIMARD:** Did they stay in San Diego?

538 **RAY:** Yes. Yeah. Intel has a pretty sizeable operation here now. That was kind of the
539 seed for getting Intel consolidated here.

540 **WEST:** Is there anything we should understand about the Titan Wireless spinoff?
541 Obviously it didn't turn out the way you hoped?

542 **RAY:** That's right. It didn't.

543 **WEST:** But since that is the strongest link between the Titan story and our wireless
544 story, I want to make sure we're clear on that.

545 **RAY:** Yeah. The genesis that got us started into it was our VSAT business, the
546 Linkabit technology. We took them out of Linkabit and set them up as a separate
547 wholly-owned subsidiary. We went out looking for that CEO. We went to the
548 commercial arm of Hughes and hired a gentleman that had been the COO of Hughes
549 Communications, which was their commercial arm at that time. Very senior guy at
550 Hughes. His name was Fred Judge, and Fred came in and ran that business for us for
551 the first few years. The first major contract we got was in Indonesia. Timing is
552 everything in this world. We got a contract. We put in a bunch of the VSATs there.
553 They looked like they were doing very well. We got a huge contract to expand it, and
554 that was just about when the economy in the Pacific Basin went into the toilet, which
555 was in '94 or so, '94-'95. So, that business and that contract didn't go for that reason.
556 We regrouped and sold a number of VSATs around the world. Then we moved from
557 that into service and got to where we would use our capability to put in VSATs as
558 leverage to get into a country to provide services. We ended up being able to get a
559 worldwide network where we could use VSATs in countries where there was no fiber.
560 You could move into that country immediately. We used fiber where it was available.
561 As a result we could get low-cost way of providing service.

562 **WEST:** To governments or to businesses?

563 **RAY:** To businesses. Not to governments, but to businesses in the developing parts of
564 the world where there was no real telecommunications capability. It was a very good

565 service. It held up much longer than the telecommunication business did in the U.S.,
566 because there was such a demand. But finally, it got caught up and went the way of...
567 We thought it could outlast the telecom depression in the U.S., but it couldn't. It
568 finally got caught up. But, it was maybe a year and a half, two years later, just because
569 there was so much demand in those countries.

570 **SIMARD:** Had you already taken out all your stock options?

571 **RAY:** No. We were still fostering it. We had an IPO ready to go to spin that off
572 when the whole Pacific Rim turned down. We were ready to do it at that time. We
573 had the prospectus prepared, investment bankers onboard, very high valuation. I
574 think it was three-quarters of a billion dollar market cap evaluation on it. The
575 technology bubble. [Laugh]

576 **SIMARD:** But, they managed to sell there, though?

577 **RAY:** Yes. By the way, one of the things I'm really proud of is that the country you
578 may never have heard of called Benin has one of the most modern
579 telecommunication infrastructures in the world. We put in a cellular telephone
580 system across the whole country. We put in half a dozen or so switches, and a fiber
581 optic link. We came out of that making a reasonable amount of money, and they
582 ended up with a very flexible system.

583 **SIMARD:** So, you can help the Third World?

584 **RAY:** It really did. It really did.

585 **SIMARD:** Thank you very much.

586 **RAY:** Enjoyed it. Best of luck to you. Pleasure being here. It's nice seeing somebody
587 that has so much history on San Diego.

END INTERVIEW

Recommended Citation:

Ray, Gene W. Interview conducted by Joel West and Caroline Simard, January 28, 2004. The San Diego Technology Archive (SDTA), UC San Diego Library, La Jolla, CA.



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.