

Date	October 9,	1997	
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TO: Jason Anderson 595-5305	FROM: Lisa Reynolds UCSD CONNECT Mail Code 0176 La Jolla, CA 92093
	Phone 619/534-6114 Fax Phone 619/552-0649
REMARKS: Urgent \to For your re	view
Jason - Attached is the letter from Bill I referenced in my v October, and has asked if you would please respond "ottersonb@aol.com."	oice mail. He is out of the country for the month of to him via email. His account is
Thanks much, and I look forward to talking with yo	u again soon.
	M



October 1, 1997

Jason M. Anderson Associate Research Analyst SANDAG 401 B Street, Suite 800 San Diego, CA 92101-4231

Subject: Engineering Recruiting

Dear Jason:

Thank you for your letter of August 12 with your response to my queries on the economic impact of additional engineering jobs in San Diego. With attribution, I have used them widely.

Now, I would like to do two things:

1. Give you updated numbers from our survey:

Attached is our latest summary, showing over 2600 engineering jobs.

- 2. Ask you to help me understand the figures, based upon the following assumptions:
 - 1. Our 1997 survey covers only two quarters. Our 1995 survey covered eight quarters. The 1997 survey showed that the need is a continuing one, not just a one-time blip.
 - 2. Our survey showed engineering jobs plus other senior jobs that are not strictly engineering jobs. We did not ask for jobs that would support the engineering jobs. The "others" are just that, "What other job openings do you have at this time?" I don't know if they include production jobs, for example.
 - 3. The American Electronic Association produces an "Operating Ratios Survey" study each year. This is a study of their membership, which is largely made up of high-tech, electronics companies. In last years, according to Erik Bruvold, Executive Director, AEA San Diego Council, engineers make up, on average, 20.3% of total employment of high-tech companies. This would mean that non-engineers make up the other 79.7%. These other jobs are in Sales and Marketing, Administration, Accounting and Manufacturing.
 - 4. Engineers are only hired if the company believes that market conditions require more new products or expanded support of existing products. They are not hired to see if they can come up with a product that someone might buy. When you hire an engineer, you must also hire a technician, purchasing, fabrication person, etc., etc., to support the product the engineer designs.

- 5. The "time-to-market" today of high-tech products (like the "Q" phone) is very short. It is NOT like biotech products that require FDA approval. Manufacturing follows engineering design in a year not 8-10 years.
- 6. The same AEA Benchmark study quotes average revenue per person in a high-tech company as \$168,500. This is per "employee", NOT per engineer. This number will yield the company's total sales expectations, if you convert engineers to total employees. You can do that by dividing the number of engineers by .203, the percentage of total employees that are engineers. If you take our 2600 engineers and divide by .206, you get total employment of 12,621 (note the one-year trailing because of "tie to market" you don't need the production workers until the product is ready to ship, a year later. If you multiply the total number of employees by \$168,500, you get the expected total sales revenues to be produced by the added engineers. This is 12,621 X \$168,500 or \$2.1 billion.
- 7. Ergo, we could be bringing in the equivalent of two billion dollar companies every six months!

Is that logic sound? I used Overland Data Products, a San Diego company in which I am a major investor and on whose Board I sit, as a comparison. ODI currently employees about 200 people and has about 40 (Mas or menos - I need to re-confirm) engineers. Their revenues are about \$60 million per annum. Their revenue per employee is \$60 million divided by 200 employees, or \$300,000 per employee - twice the AEA average. If ODI were a million in revenues and maintained the same productivity, they would have 16.6 times as many employees, or 3,3000. If all San Diego high-tech companies are as productive as ODI, 12,621 employees would yield a \$3 billion company - close enough for government work.

Did I use two short a "time-to-market" delay factor? Our survey covers 50+ companies. Do 50+ companies, with a combined employment of 12,621, act the same as two billion dollar companies? Do they need the same space? Buy the same new houses, Create the same taxes? Support the symphony the same way? Do their employees buy the same products and create the same sales taxes, and pay the same income taxes, etc.

By including SPAWAR and UCSD n our survey, we are causing a bit of a distortion, because they do not manufacture much themselves in the same manner as does a Qualcomm. Additionally, some of the companies may design products here and manufacture them in Southeast Asia. But that could also be true of our hypothetical "billion dollar company".

All of this says, San Diego has one helluva opportunity! But, I'm looking for a "one liner" that will explain our opportunity to the community. San Diego has been seeking "Fortune 500 companies", because people think they bring magical

financial support to the community. Wouldn't we rather have 50 companies that do the same thing, but spread the risk? HELP!

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UCSD CONNECT 1997 Engineering Recruiting Survey

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1997 Engineering Recruiting Survey

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No. of Employees 1,050 53 30 64 233 282 450 30 40 22 260 250 53 190 87 98 150 370 15 155 15 3,800 78 0 25 26 26 5 18 3 148 300 149 150	be in San Diego:																			_				_				_					
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	Current openings/all fields	30	17	24	12	26	15	15	0	4	5	5	8	6	10	11	7	13	12	5	5	3	6	2	0	1	3	2	0	0	0	10	2

Source: UCSD CONNECT 0176F, La Jolia, CA 92037



Needs for Technical People in the Second Half of 1997

10/9/97

Requirements	Q3	Q4	Total
Software Engineers	600	615	1215
Hardware Engineers	290	364	654
Other types of Engineers	421	392	813
Enginineering Management	129	120	249
Total Engineering Positions	1440	1491	2931
Marketing and Sales	203	190	393
Finance and Accounting	140	141	281
General Admin. and Support	523	443	966
Manufacturing Positions	526	854	1380
Total Other Positions	1392	1628	3020
Total Positions	2832	3119	5951

SOURCE: UCSD CONNECT 0176F, La Jolla, CA 92037

10/9/97

UCSD CONNECT 1997 Engineering Recruiting Survey

Issues in the area of recruitment: *

Ranking Code: 5 = big issue - 1 = not an issue

Average Meeting the financial expectations 5 5 1 4 3 3 5 5 4 4 5 5 5 5 5 5 5 5 1 5 3 4 5 3 4 5 5 4 4 4 3 5 5 5 4.1 43512242141 2.9 Helping adjust to the cost of living in the state of CA 3 1 4 1 3 2 3 1 1 3 2 2.5 Helping the recruits to find affordable housing 5 5 1 1 3 5 5 1 4 1 1 3 2 1 3 5 4 3 3 1 2.9 homes to purchase 3 2 4 3 1 3 2 1 4 2 2.7 appartments to rent Helping their spouse/partner find employment 5 4 1 1 3 3 4 2 1 3 3 2 1 2 1 1 1 1 3 3 3 1 5 4 3 2.3 worries about commuting - too much traffic. 2.2 2.2 Does relocation package meet their needs? 1.9 Helping their children with educational needs 3 3 1 1 4 3 4 1.8 Perceived lack of sufficient opportunities in the high tech field 1.7 Concerns about the natural disasters in the area (earthquakes... 1311212 1.4 Illegal immigrant issues and concerns 1 1 2 1 2 1 1 1 1 1 4 1 1 2 1 1 Perception that crime is too high/being on the border 2311314 1 1111 1 1 1 2 2 1 1 1 1 1 1 1.4 Concerns over illegal drug use 2 1 1 1 3 2 4 1.3

SOURCE: UCSD CONNECT 0176F, La Jolla, CA 92037

^{*}In the general comments section of the survey many companies mentioned the concern of engineers that San Diego could be a "dead-end" city, with no other opportunities for employment if their first job didn't work out



Issues in the Area of Recruitment

Top 5 Issues:

Ranking Code: 5 = big issue - 1 = not an issue

Meeting the financial expectations	4.1
Helping adjust to the cost of living in the state of CA	2.7
Helping the recruits to find affordable housing	2.4
Helping their spouse/partner find employment	2.3
Does relocation package meet their needs?	2.2

San Diego could be a "dead-end" city - was mentioned by many companies

SOURCE: UCSD CONNECT 0176F, La Jolla, CA 92037

Companies Included in Survey
Agouron Pharmaceuticals
Akos Biomedical
Alaris Medical Systems, Inc.
Allied Signal Inc./Electron Vision Gr.
AMCC
Booz-Allen & Hamilton, Inc.
Cafesoft
Chemtronics, Inc.
Clinicomp International, Inc.
Columbus Research, Inc.
ComStream
Cubic Corporation
Cymer
Denso Wireless
DepoTech Disired
Digirad
Doctor Design Corp. ENCAD
Expertsoft_
GDE Systems, Inc.
General Atomics
General Instruments
Genset
GreyStone Technology
GTE Mobilnet
GTE Wireless
Hewlett-Packard
HNC Software
I-Bus
Jabra Corp.
Kaiser Electro Optics
Kokusai Communications
Kyocera America, Inc
Leading Edge Eng. (HireTech)
Lightspan Partnership
LG InfoComm, Inc.
Predicate Logic, Inc.
PRISA Networks
Pulse Engineering
Qualcomm
REMEC, Inc.
Reticular Systems Inc.
Rockwell Semiconductor Systems
SAIC*
San Diego Data Processing
San Diego Gas and Electric
SCS Corp.
Sierracin/Magnedyne
Solar Turbines
Sony Technology Center-San Diego
Sony Wireless Telecommunications
Space Electronics Inc.
Spawar
Stac, Inc.
Symitar Systems
Torrey Science Corp.
TRW
UCSD
Uniden
UNISYS
ONIO 10
Total included in the survey: 60
1



Memo:

10/9/97

Phone

619-534-2776

534-7609 SOE

To:

Joseph E. Bear

UCSD, School of Engineering

Fax

534-4771

From: Lisa Reynolds

Assistant to Bill Otterson

619-534-4750 619-552-0649 (fax)

10/9/97

Joe -

Enclosed is the latest update to the CONNECT 1997 Engineering Recruiting Survey. As Bill mentioned in his email, we have promised to keep the information confidential, and the confidential pages are noted as such. I'll follow up with some information in the mail and hand outs for your October 16 meeting.

Thanks, Lisa Reynolds Assistant to Bill Otterson 534-4750