
GLOBAL ELECTRONICS

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watchdogging "High Tech"

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DELAY

In case you didn't notice, PSC did not publish *Global Electronics* in October. My wife and I had our second child on October 19. The baby, a healthy, 7 lb. 6 oz. boy named Abram Quinn Siegel-Rivers, is growing rapidly. However, just like four years ago, when our daughter Misha was born, paternal responsibilities kept me away from the newsletter for a while.

We now resume *Global Electronics*' monthly schedule, and all subscriptions will be extended one month.—*Lenny Siegel*

PSC FINANCIAL CRISIS

Unless the Pacific Studies Center can raise \$20,000 in cash or pledges by February 15, PSC's board of directors plans to close the center's doors permanently on April 30, 1987, when its lease expires. Though institutional support for PSC has dwindled in recent years, we are optimistic that individual donors can help us meet our goal.

Please consider making a contribution or helping us raise the money. This is not a fund-raising gimmick, but a decision based upon hard facts.

ZSCHAU—NOT NOW

Congressman Ed Zschau (R-Los Altos), the leading political spokesman of Silicon Valley executives, ran surprisingly close this November in his drive to unseat veteran incumbent Alan Cranston, California's U.S. Senator. Democrat Cranston edged out Zschau 3.6 million votes to 3.5 million.

Zschau won the Republican primary in June, largely on the strength of TV ads paid for with large financial contributions from high-tech managers and investors. David Packard, founder of Hewlett-Packard, and one of the country's richest men, mobilized for the campaign even those businessmen who considered Zschau too moderate on "social issues."

The founder of Silicon Valley-based disk-drive seller System Industries, Zschau first ventured into politics as point-man in the American Electronics Association's successful 1978 lobbying drive to cut the capital gains tax, incidentally a campaign helped considerably by Cranston's support. With the blessing of Congressman Pete McCloskey, who left Congress to seek the Republican Senatorial nomination in 1982, Zschau was

elected to the House in 1982 and 1984.

In his Senate campaign, Zschau relied heavily upon his image as a successful entrepreneur. He told the press, "While I have been creating jobs, Alan Cranston has been creating more government." He talked about steps to improve U.S. competitiveness, particularly against the Japanese.

But Zschau, like his fellow entrepreneurs in the semiconductor and computer industries, waved the flag only when seeking subsidies for "U.S." business. When it came to creating jobs, particularly in manufacturing, Zschau's national loyalty disappeared.

As of July 27, 1986, System Industries has 722 permanent employees, including 562 in the U.S. and Canada and 160 based in Europe. More important, the company is not really much of a manufacturer. It employs only 155 in production, divided between plants in Milpitas (Silicon Valley) and Dublin, Republic of Ireland.

System Industries markets and supports disk and tape storage systems for minicomputers. Its 10-K report explains, "Manufacturing of the Company's subsystems involves assembling and testing circuit board assemblies the power supplies for controllers, testing disk and tape drives, and final system integration and testing. Most of that work is in-house, but System Industries has always purchased its disk and tape drives from other manufacturers.

Today Fujitsu supplies 80% of the disk drives sold by System Industries. In turn, System Industries is Fujitsu's major outlet in the U.S., having bought 14,000 of the 25,000 disk drives the Japanese firm has sold in the U.S. Most of those drives were made in Japan, but in 1986 Fujitsu open a plant in Oregon where it is doing final assembly on some of its drives.

The *San Francisco Examiner* (October 31, 1986) reports, "From mid-1980 to mid-1981, when Zschau left the company and began his congressional campaign, System Industries shifted its purchases until it was buying more than 80 percent of its drives from Fujitsu."

Before then, Control Data supplied a majority of System Industries's drives, from plants in the U.S. Control Data's drive-making business has since fallen on lean times. In October, 1985, Control Data closed in Magnetic Peripherals subsidiary in Silicon Valley and laid off 1,100 employees.

System Industries may have had good business reasons to shift suppliers. Nevertheless, it can be argued, persuasively, that Ed Zschau created jobs in Japan at the expense of manufacturing jobs

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for U.S. workers.

Somehow Zschau has earned the reputation as Congressman for Silicon Valley, but his old Congressional district contains adjacent Republican strongholds in the hillside communities of the San Francisco Peninsula. Those communities are home to many high-tech professionals and managers, but the bulk of the Valley's high-tech workforce resides in Congressional districts represented by Democrats Don Edwards and Norman Mineta.

In fact, although Zschau carried his own Congressional district in the U.S. Senate results, he lost Santa Clara County—the official jurisdiction most closely identified with Silicon Valley.

ALAMEDA COUNTY

Driving down the Nimitz Freeway along the eastern edge of the San Francisco Bay, one sees a sign saying "Welcome to Silicon Valley." The sign is not at the boundary of Santa Clara County, known to government statisticians as the San Jose Standard Metropolitan Statistical Area (SMSA), but in Fremont, a rapidly growing "suburb" at the southern end of Alameda County.

With lower land costs and more housing available for high-tech workers than in Santa Clara County, in recent years Southern Alameda County has attracted a number of high-tech firms, such as Apple Computer, Sun Microsystems, Dest, and Xerox's Diablo Systems. When employment data on the Fremont area is combined with the San Jose SMSA, the magnitude of the current slump is diminished. Silicon Valley is indeed having problems, but part of the reported decline in Valley employment is accounted for by the slow but perceptible shift of jobs to Alameda County.

From December, 1980 to December, 1985, employment in Alameda County's electronics, electrical equipment, and instruments industry (Standard Industrial Classification or SIC Codes 36 and 38) rose from 6.0 thousand to 10.4 thousand. Jobs in SIC code 737, computer and data processing services (including software), jumped from 1.3 to 2.8 thousand in the same period. These data understate high-tech activity in the county, however, since the state Employment Development Department does not break out the computer industry (SIC 357) separately from non-electrical machinery as a whole (SIC 35).

Alameda County Electronics Employment

(December of each year, figures in thousands)

	1980	1981	1982	1983	1984	1985
Electr. (SIC 36)	4.0	4.1	4.6	5.0	5.7	6.5
Instrum. (SIC 38)	2.0	2.1	2.5	2.8	3.6	3.9

Source: Annual Planning Information: Alameda County, 1986-1987, Employment Development Department, State of California, May, 1986

It is worth noting that high-tech industry in Alameda County is concentrated in the southern portion of the county, which historically has served as a bedroom community for adjacent Silicon Valley. Though one of the world's great research universities, the University of California, is located in the northern part of the county, in Berkeley, the UC engineering and computer science departments never catalyzed the development of a high-tech center similar to the one created by crossbay rival Stanford.

Stanford had two advantages. First, as a private university, it was flexible enough to subsidize the electronics industry before it became an entrenched interest in the area. The UC system has always had close ties to California industry and agribusiness, but as a public institution it was held accountable by the powers that already were, not by the emerging electronics industry.

Second, at the time the electronics industry was just beginning to expand, Stanford was surrounded by (and actually owned) agricultural and vacant land. The Berkeley area, however, was much more developed.

Today, however, attempts to stimulate high-tech investment in central and northern Alameda County are running into a third obstacle. High-tech executives consider Oakland and Berkeley bad places to invest, not so much because of their strong left-wing political slants, but because of the large number of black people in the area. In general, high-tech companies are unwilling or afraid to hire large numbers of blacks, but if they moved much further north, they couldn't avoid it.

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FAIRCHILD-FUJITSU DEAL

In October Schlumberger, the French-owned oil services firm, announced that it was selling 80% of Fairchild Semiconductor, until then a wholly owned subsidiary, to Fujitsu of Japan. Long before it was purchased by Schlumberger, Fairchild was Silicon Valley's first commercially successful semiconductor firm, and most of the other chipmakers in the Valley were founded by former Fairchild managers and engineers. Consequently the press gave the event enormous symbolic importance.

The other major merchant semiconductor firms that helped give Silicon Valley its name—such as Intel, National Semiconductor, and Advanced Micro Devices—are also losing market share, employees, and money, while Japanese chipmakers are increasing their clout. Does the Fairchild-Fujitsu deal mark the eclipse of Silicon Valley?

Decidedly not. Although major Japanese electronics companies are today leading players in the production of integrated circuits, Silicon Valley remains by far the world's most important center of semiconductor technology.

At a time when integrated circuits were standard components that engineers designed into equipment circuitry, it may have made sense to identify Silicon Valley with its merchant producers. Today, however, anyone who designs electronic equipment—from radar warning systems to personal computers to telephone exchanges—tries to fit as much of the design as possible into the design of chips.

Thus, semiconductor technology has diffused from a handful of chipmaking outfits into the electronics industry as a whole. In the late 1970's, after computer designers figured out that they could design computer circuitry into chips, Silicon Valley became a major center for computer design and production, and outside computer manufacturers set up semiconductor subsidiaries in the Valley. Today, Valley computer employment exceeds semiconductor employment.

The semiconductor industry is therefore broadly integrated with the electronics industry as a whole. Equipment producers not only manufacture their own chips, but they employ top design talent. Oddly enough, this development has increased opportunities for a new generation of start-up firms, which now supply a wide range of chips, designs, and services to equipment producers.

Meanwhile, the merchant producers fight to develop strategies to remain profitable in difficult times. Some will succeed, but others may be victims of the industry's technological success. It's difficult to make money as the value of a single circuit feature (a gate) approaches zero. In fact, it isn't clear that the Japanese companies that won the battle for market share in the selling of random access memory chips were making any money at it. (Of course, the U.S.-Japan agreement on semiconductor trade may raise prices to the point where the business is profitable.)

Moreover, if the processing or storage capacity of a standard chip doubles every year or two, that means that the firms that buy circuits must design doubly powerful equipment in the same time period, just to keep their chip purchases level. Individual equipment companies may keep up with that pace, but in the long run, the chip's capabilities will outrun the market.

Even if the electronics industry lifts itself from its slump in the near future, worldwide employment at merchant semiconductor firms is likely to grow slowly. However, within both existing and new segments of the electronics industry, integrated circuit technology will continue to increase in importance.

SILICON CONTROL

Though Silicon is one of the most common elements on the surface of the planet, it takes a great deal of equipment, power, and technology to convert it into industrial grade ingots and wafers. Five companies, three of which are based in Japan, currently supply three quarters of the world market.

Silicon and Epitaxial Wafer Market (1985)

<u>Company (home country)</u>	<u>Sales</u>	<u>Market Share</u>
Shin-etsu Handotai (Japan)	\$320 million	25.5%
Wacker (W. Germany)	\$205 million	16.3%
Osaka Titanium (Japan)	\$151 million	12.0%
Monsanto (US)	\$137 million	11.1%
Japan Silicon	\$128 million	10.1%

Source: Dataquest, cited in *San Jose Business Journal*, November 24, 1986.

Following the recent purchases of two U.S. silicon producers, Siltec by Mitsubishi Metals and NBK by Kawasaki, some observers, such as *Electronics Materials Report's* Daniel Rose, have warned that the Japanese could exercise strategic leverage over U.S. chipmakers. If the Siltec-Mitsubishi deal goes through, that will leave Monsanto as the only major U.S.-based producer of Silicon. With Monsanto Electronics losing money, its parent, Monsanto Co., could sell it to a Japanese firm as well. (*San Jose Business Journal*, November 24, 1986)

The Japanese threat, however, is exaggerated, for three reasons. First, most of the foreign suppliers have plants in the U.S. Second, the technology is relatively open. And third, many major U.S. chipmakers, such as Texas Instruments, produce their own silicon. Captive silicon production apparently is left out of the Dataquest tables (above).

Meanwhile, the Pentagon has expressed concern that there is no U.S. source of super-pure polysilicon, used

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to manufacture sensors for smart weapons such as tactical missiles. The major supplier now is West Germany's Wacker, but its polysilicon plant is uncomfortably close (17 miles) to the Czechoslovakian border.

To make sure that high grade silicon is produced in the U.S. the Pentagon is using a provision of the 1950 Defense Production Act to guarantee an \$8 million market to any prospective domestic supplier. Despite the funding, U.S. companies are generally not interested in creating a plant to manufacture silicon with no serious domestic market. The Pentagon may have to invest a lot more money before enticing anyone into the business. (Business Week, October 27, 1986)

UNISYS

Burroughs and Sperry have always been two of IBM's top competitors in the mainframe computer business. They represented the "B" and the "U" (for Univac) in the BUNCH, the acronym representing the original non-IBM data processing world. Their merger in May created a large new computer firm, surpassing Digital Equipment (DEC) as number two in the world computer industry, but still a dwarf compared to IBM.

Recently the combined company announced its new name, Unisys, and it quickly hit the airwaves with impressive television commercials implying that the merger was smooth and successful.

The merger will not be smooth, however, for some 5,000 workers to be laid off to cut costs. Already, Unisys has announced plans to close manufacturing plants in Eau Claire, Wisconsin and Bristol, Tennessee (San Jose Mercury News, December 5, 1986). Either Sperry's semiconductor plant in Eagan, Minnesota or Burroughs' semiconductor plant in Rancho Bernardo, California will be shuttered next year (Business Week, October 27, 1986).

DISCLAIMER ON HANDBOOK

Tom Gassert, author of *Health Hazards in Electronics*, reviewed in the August, 1986 *Global Electronics*, has informed us that the Asia Monitor Resource Center edition of this book contains some scientific and medical errors which were not corrected before publication. He warns that if the AMRC does not supply the buyer with detailed corrections, discretion is strongly advised when using their edition.

He also suggests that the AMRC price is much higher than what he had agreed to, for the project was intended to be charitable, not profit-making. Gassert is currently at the London School of Hygiene and Tropical Medicine, and he is working on a revised edition. Helpful comments about the *Handbook* can be sent to Gassert, c/o Box 609, Red Bank NJ, 07701.

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