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## FLEXTRONICS

Printed-circuit-board assembly subcontractors make up a little known but integral part of Silicon Valley. There are about 150 firms in the area, but only three actually test their boards and carry their own components inventory. One of those three is Flextronics, based in Southern Alameda County (on the fringe of Silicon Valley). Flextronics' revenues reached \$10 million in fiscal 1983, double its 1982 sales.

The company carries out assembly for well known computer companies such as Apple, Convergent, and Victor. Financed primarily from internal funds, Flextronics raised \$2 million last March from two venture capital firms.

Flextronics employs 350 people at two plants in the Bay Area, and 250 at its Singapore facility. A Flextronics executive told the *San Jose Mercury* (July 25, 1983) that the company expects to continue its Silicon Valley operations despite the fact that production costs are much lower overseas. He said, "In the early stages of any project, we live with our customers and they live with us. Excellent communication is needed between design engineers, marketing people and the production people, which is actually Flextronics. We work a project here until all the bugs are ironed out."

## VERBATIM BRAZIL

Computer-disk manufacturer Verbatim, through a 49% joint-venture in the old rubber capital of Manaus, has a lock on the Brazilian floppy disk market. Verbatim, teamed up with Brazil's MAC Industrial, has exclusive rights to make disks in Manaus, which is an free manufacturing zone with an exemption from import duties. Product costs are half of what they would be in other Brazilian cities. Fifteen employees process, finish, test, certify and package disks and jackets made elsewhere by Verbatim. (*San Jose Mercury*, June 5, 1983)

## TEXET

French investors are backing a group of Texas-based entrepreneurs to form a bi-national company to produce power semiconductors. A group of French banks and insurance companies have put \$12 to \$14 million into Texet, which is led by a former Texas Instruments vice-president. Texet is building a plant in Allen, Texas, where it plans to hire 150 workers, and another at Ste. Michele-sur-Meurthe, near the French-German border, which will employ about 300. (*Electronics*, June 30, 1983)

## ENGINEERS

Not surprisingly, the American Electronics Association and the Engineering Manpower Commission of the Association for Engineering Societies have recently offered appreciably different projections on the need for additional engineers. The two surveys relied on different methodologies, but equally important, the AEA represents employers who have an economic interest in flooding the engineering employment market while the Manpower Commission represents working engineers who would benefit from a shortage.

The AEA, relying on projections from 815 companies which presently employ 370,881 technical workers, concluded that the country will need 197,662 additional electrical engineers and computer scientists by 1987. Since colleges are expected to produce only 84,256 additional engineers by 1987, the AEA found a shortfall of 113,406. Compensating for employers' hopes of landing new military contracts, the AEA projects a shortfall of 81,780 in its "highly conservative scenario."

The Manpower Commission, which surveyed 333 employers, found "both practicing engineers and their employers predominantly foresee steadier employment levels, rather than a period of strong growth or decline." A larger portion of the Commission's respondents are in the central and eastern states, than the AEA's respondents, half of which were from California. *Electronics* (July 28, 1983) cites MIT's John Hansen, who argues, "I don't believe there are any credible forecasts focusing on EE's." Hansen says the AEA survey doesn't take into account possible adjustments in salaries, and that there is a delay between increased demand and student response to it.

In addition, none of the surveys take into account changing job definitions. Many tasks formerly conducted by professionals are now done by machines or "technicians." Cost-conscious companies are likely to continue this shift, but few have the ability to quantify it ahead of time.

## IBM BUYS

IBM, the world's largest high-tech firm, continues to buy stock in smaller innovative companies. This June it reached an agreement with Rolm, a Silicon Valley producer of electronic switchboards and military computers, to buy new shares of Rolm stock valued at \$228 million in cash, giving it a 15% slice of Rolm. IBM has agreed not to boost its holdings above 30% of Rolm stock, and it has been promised two new seats on the seven-member Rolm board of directors.

Equally significant, the two firms announced plans to undertake joint product development. The firms hope that IBM's resources and Rolm's communications technology will give them the strength to compete head-on with AT&T in the newly competitive U.S. telecommunications market.

Meanwhile, IBM has purchased an additional 1.8 million shares of Intel on the open market, raising its share from 12% to 13.7%. (*San Jose Mercury*, August 17, 1983). IBM and Intel reached a similar agreement last December. (See issue no. 27)

## TRILOGY

While IBM buys into high-tech firms, its smaller competitors are investing in one promising venture, Trilogy Systems. (See issue no. 32.) Digital Equipment Corp., the world's second largest computer manufacturer, has joined Sperry and CII Honeywell Bull as Trilogy sponsors. For \$26 million, DEC will get 9% of Trilogy's equity plus an option to license Trilogy's wafer-scale-integration technology.

## SINGAPORE

Singapore is rapidly becoming the disk-drive headquarters of Asia. Two more California manufacturers, Maxtor and Computer Memories, have announced that they will open Singapore plants to supplement domestic production. (**Business Journal**, July 4, 1983; **Electronics News**, August 6, 1983). The **Far Eastern Economic Review** (July 21, 1983) explains, "According to industry analysts, Singapore has an edge on Taiwan, Hong Kong, and South Korea in disk drives because the latter three, while strong in electronic components, are relatively weak in precision metal and mechanical parts and the machining industry."

"Tandon Singapore's managing director, Hari Apte, calls disk drives a 'materials intensive' product, with direct labor accounting for a mere 3-4% of production costs. The [Singapore Economic Development Board] claims a 30-50% cost saving for many disk-drive parts compared to the U.S. Singapore's budding aerospace industry has given a boost to its precision parts capability."

## TAIWAN

While Singapore dominates the offshore disk-drive sector, Taiwan joins South Korea as a major producer of computer terminals and monitors. In its favor, Taiwan hosts two foreign-invested makers of high resolution cathode ray tubes, Philips and Clinton. Since CRT's are costly to ship, major terminal-makers have established plants there. (**Far Eastern Economic Review**, July 21, 1983)

The **Review** also reports that Taiwan has a strong base of printed circuit board subcontractors, many of which descend from Ampex. A number of Ampex-Taiwan's managers and engineers left the firm to set up their own small PCB firms, and now many of those plants are upgrading to do computer-grade production.

## SOUTH KOREA

When Fairchild Semiconductor announced plans to close its optoelectronics division earlier this year, it arranged to sell its assembly equipment to General Instruments. The machinery is being shipped from Fairchild's Seoul, South Korea facility to GI's plant in Kuala Lumpur, Malaysia.

Canadian telecommunications manufacturer Northern Telecom will work with the Daewoo Group to set up semiconductor manufacturing facilities in Korea. The announcement (**Electronics News**, July 11, 1983) said that the facility will serve the Korean market, which probably means that it will supply linear integrated circuits to manufacturers of consumer electronics equipment for export.

Timex, which has diversified in recent years from watches to home computers, has announced plans to assemble computers near Seoul. (**Electronics News**, May 23, 1983)

"With the lure of \$3 billion in orders for new equipment, Korea is enticing foreign manufacturers into sharing some of their most advanced telecommunications technology," reports **Business Week** (September 5, 1983). Among the foreign companies which have set up joint ventures with Korean industrial groups are ITT, AT&T, Northern Telecom, and L.M. Ericsson. These ventures are being organized to serve the entire Asian market, not just South Korea.

## DEMETRON

West German electronics materials supplier, Demetron, has acquired its second Silicon Valley subsidiary. In July Technology Glass, based in Sunnyvale, announced that it had agreed to be acquired. Technology Glass employs 90 workers in Sunnyvale and 210 elsewhere in the U.S. It supplies packing materials to the semiconductor industry. Demetron already operates a plant in Morgan Hill, on the southern fringe of Silicon Valley.

## A.M.I.-ASAHI

American Microsystems, Inc., the Silicon Valley custom chip specialist now owned by Gould, has announced a joint venture in Japan with Asahi Chemical Industry. AMI sold Asahi a 49.95% share of its Tokyo-based marketing subsidiary, and the two firms have agreed to fund the establishment of a design and manufacturing facility. The Japanese deal is similar to a project that AMI arranged earlier in Austria, with Voest-Alpine. The shipment of \$60 million in chip-making equipment to the Austrian venture was delayed for eight months by U.S. government concerns that technology might be diverted to the Soviet Bloc. (Electronics News, July 4, 1983)

## MEXICAN APPLES

Apple Computer plans to produce computers in Mexico to serve the country's closed personal computer market. It is reportedly awaiting a government decision, in which the Silicon Valley firm will be told whether it can license production to its Mexican partner, Computadoras Personales, or will be required to invest in a joint venture with it.

Apple still dominates the Latin American personal computer market, but Computadoras Personales has exhausted its import quota. The Mexican Apple IIe will have special bi-lingual features, and the company plans to export nearly 40% of its Mexican output to other Latin American nations. (Business Week, June 13, 1983)

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