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JAPANESE CHIP TRADE

The competitive strength of Japanese-based electronics companies in the world semiconductor market has unleashed a rash of responses in the United States. Several hundred electronics workers joined a "Buy American" rally at distributor Wyle Labs, in Silicon Valley, in late July. U.S.-based electronics have filed a variety of formal complaints with U.S. government agencies charging their Japanese competitors with unfair trade practices.

The Semiconductor Industry Association (SIA) laid out the essence of the industry argument in "The Impact of Japanese Market Barriers in Microelectronics," prepared for the Congressional Joint Economic Committee. The SIA suggests, in the wake of the removal of duties on semiconductors by both the U.S. and Japan, that Japanese companies still discriminate informally against U.S. suppliers.

The SIA reports that U.S.-based semiconductor firms hold a mere 11% of the Japanese market, much lower than their 83% share in the U.S., 55% share in Europe, and 47% elsewhere. It argues, "These figures, by themselves, suggest that barriers to U.S. sales exist in Japan which prevent them from achieving a share more comparable to that which they have attained elsewhere in the world." The SIA claims that U.S. firms would sell much more in Japan if the Japanese traded fairly.

The logic of the SIA argument is unconvincing, but the Electronics Industry Association of Japan (EIAJ) challenges the SIA's figures as well. The EIAJ says the U.S. share of the Japanese market, including semiconductors produced by U.S. subsidiaries in Japan and other Far Eastern countries, was about 20% in 1984, nearly double the SIA figure (*Japan Semiconductor Quarterly*, June, 1985).

Of course, both trade associations use the domicile of the headquarters to define the nationality of companies surveyed. That is a poor guide for national policy, since governments are (or should be) more concerned about the impact of trade upon employment than investor profit. Products from Texas Instruments' Japanese plants boost the EIAJ's version of U.S. sales in Japan, but they do nothing for American workers. Similarly, a large portion - perhaps a majority - of the new jobs that would result if the Japanese ordered more "American" chips would be in the Far East, at assembly plants operated by U.S.-based firms.

In fact, numerous factors hold down "American" semiconductor sales in Japan. A "Buy Japanese" un-

dercurrent may play only a small part. For example, the *San Jose Mercury News* (July 29, 1985) claims, "About 47 percent of Japan's \$8.7 billion chip market is for chips used in making consumer electronics products, such as video cassette recorders, color televisions and stereo equipment." Few American companies serve this portion of the market.

In addition, U.S. firms have put relatively little effort into learning about doing business in Japan. In fact, few American high-tech professionals and executives have ever studied Japanese, while proficiency in English is common among Japanese managers and engineers. The American Electronics Association has initiated a program to sponsor the Japanese language training of seven U.S. graduate students. (*Bay City News Service*, printed in *Peninsula Times Tribune*, June 2, 1985.) While laudable, the program is laughingly small.

Not all American electronics companies support the SIA's combative stance toward the Japanese. The Semiconductor Equipment and Materials Institute (SEMI), which represents companies that sell the machines used in semiconductor production, opposes policies that might limit Japanese investments in high-tech production and test equipment. A SEMI spokesman told the *Times Tribune* (July 25, 1985) that association members make about half their sales to Japanese firms.

Meanwhile, American and Japanese firms frequently team up. LSI Logic, a Silicon Valley-based manufacturer specializing in application-specific integrated circuits, is planning to build a \$100 million chip plant in Japan in partnership with Kawasaki Steel. Earlier this year LSI startled observers on both sides of the Pacific by hiring Keiske Yawata, an executive at NEC (Nippon Electronic), to head its Japanese affiliate.

Finally, IBM has negotiated a five-year agreement with the Japanese government to win access to technology developed from government-sponsored electronics and computer research (*Business Week*, August 19, 1985).

GAME TO BE PUBLISHED

In the last issue, we reported that Chris Crawford had been unable to find a publisher for his game simulating negotiations between the superpowers. Since then, Chicago-based Mindscape has agreed to publish the game as "Balance of Power."

TOXICS CONTROVERSIES

The Silicon Valley semiconductor industry has been on the defensive on at least two environmental fronts lately. In the last issue we reported how the Semiconductor Industry Association (SIA) had criticized news stories, on workplace hazards, broadcast by KRON-TV in San Francisco. Since then, KRON sent a letter to **San Jose Metro**, a small, young Silicon Valley weekly, demanding that **Metro** retract a quote it printed from Advanced Micro Devices' spokesman John Greenagel, challenging the facts in the TV story. It appears that **Metro** is a pawn in legal skirmishing by AMD and KRON in preparation for libel suits by both against the other.

Meanwhile, the SIA - probably the least sympathetic of Valley trade associations toward environmental regulation - has overstepped normal channels to attempt to influence the outcome of a major Environmental Protection Agency study of Silicon Valley. Dissatisfied with the contents of a not yet released report of the Integrated Environmental Management Project, the SIA asked a litigation law firm, Hogan & Hartson, to arrange a meeting with top EPA officials. The law partner who contacted the EPA turned out to be Frank J. Fahrenkopf, Jr., chairman of the Republican National Committee. The **San Jose Mercury News** reacted editorially (August 19, 1985), saying it couldn't evaluate the merit of the SIA's critique of the report. "But it's clear," it opined, "that the SIA undermined its own credibility last week by applying political pressure on the federal agency to change its report before its release for public discussion."

This is not the first time that SIA has attempted to suppress or alter a report critical of the industry's environmental record. In fact, the KRON broadcast covered exactly such an instance.

ASSEMBLY AUTOMATION

Steadily, both the offshore subsidiaries of American semiconductor manufacturers and domestically run Asian subcontractors are automating the process of integrated circuit assembly. Kulicke and Soffa, the leading supplier of assembly equipment, reports that it has 20,000 manual systems and 5,000 automated systems in place in Asia.

Comprehensive assembly automation is unlikely to come soon, however. **Semiconductor International** (June, 1985) reports, "The real logjam appears to be molding and trim and form operations - and particularly device transport between them." Even the most automated assembly plant operated by a U.S. firm, Fairchild's South Portland, Maine, facility, requires human handling. And assembly specialists consider the Fairchild operation inflexible. In assembly operations - particularly those that handle many product lines - flexible automation has become critical, since time saved through speedy assembly is en lost due to long down times between runs.

SILICON VALLEY GRIDLOCK

In the past few years, developers and high-tech companies have filled up, with factories, labs, and offices, most of the remaining industrial land in the original Silicon Valley cities of northern Santa Clara County. Consequently, the "Golden Triangle" area of San Jose, officially known as the Rincon de los Esteros Redevelopment Project, is currently the site of rapid industrial growth. Even with no further construction, planners anticipate that firms in the 7.3-acre area will employ 84,000 by the year 2000. If the Triangle is built out according to its current plan, there will be as many as 129,000 jobs.

The problem, according to a recent environmental impact draft report, is that the roads in the area cannot handle that many workers. Even if planned highway and transit improvements take place, the section faces gridlock. Planners believe it will be difficult to solve the problem, since it will require the cooperation of two adjacent cities, Milpitas and Santa Clara, experiencing comparable industrial expansion. Halting construction won't work, for planned transportation facilities are scheduled to be financed by taxes generated by additional industrial construction. (**San Jose Mercury News**, July 3, 1985)

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BRAZIL'S TELECOMMUNICATIONS

Brazil's policy of nurturing its domestic high-tech industry has moved slowly in computers, but in telecommunications it has been relatively effective. Although Brazil is hardly a world leader in electronics, "Since 1974 the Brazilian Telecomms industry has progressed from a situation of deep technological dependency to one of substantial and dynamic progress in modern digital telecommunications." For every dollar of telecommunications equipment now imported into Brazil, factories in Brazil produce ten dollars worth. Since it was formed in 1972, the state-owned telecommunications monopoly, Telebras, has expanded both services and employment while holding down rates.

Telebras revenue, generated primarily through long-distance and international phone services, has not only financed its own growth but has also supported other government projects. However, since investments have been targeted to generate income, "the rate of growth of rural telecommunications proceeded at an extremely low level in relation to the major cities and urban areas."

The seven largest suppliers of telephone and related equipment, holding 83% of the market, are firms of foreign origin. In 1981, the four largest vendors of telecommunications equipment in Brazil were the local affiliates of Ericsson (Sweden), NEC (Japan), ITT, and GTE. However, Telebras has forced the foreign companies to transfer majority ownership to Brazilian interests, and it has mandated that equipment be produced in Brazil and that it incorporate Brazilian technology.

To create that technology, Telebras formed its own research and development center, "CPqD," at Campinas. The center, which exercises control over both university and industrial labs, employs more than 700 research personnel. It is active in several fields, including digital exchange design, the development of integrated circuits, and a satellite communications program including a Brazilian satellite and low-cost ground stations. (Mike Hobday, "The Brazilian Telecommunications Industry: Accumulation of Micro-electronic Technology in the Manufacturing and Service Sectors," United Nations Industrial Development Organization [UNIDO/IS.511], January 25, 1985)

FOOTLOOSE

AT&T's new telephone assembly shop in Singapore, mentioned in last month's **Global Electronics**, is a runaway. The phone company has shut down a comparable production area in Louisiana. ITT-Qume, a Silicon Valley peripherals manufacturer, has laid off 170 employees at its headquarters. Their jobs duplicated work now done in Puerto Rico and Taiwan by the company. Gould, which recently gave notice to 500 workers at its American Microsystems (AMI) chip-making subsidiary in Silicon Valley, is hiring about one hundred production workers at AMI's Pocatello, Idaho plant.

FAIRCHILD INDONESIA

News from Fairchild's semiconductor assembly plant in Cibubu, Jakarta, Indonesia, is slow and sparse, so it is difficult for outsiders to know exactly what is going on there. **International Labour Reports** (July-August, 1985) reports that the company was pressuring employees to quit voluntarily rather than handing out lay-off notices. Workers blamed the recent introduction of automated equipment. Now an individual operator can supervise seven machines at once, as opposed to only two before.

Earlier, the **Asia Labor Monitor** (February, 1985) carried a report that the Indonesian Manpower Ministry bowed to the demands of a delegation of 100 workers last November and ordered the factory's general manager to recognize a union. Fairchild had dismissed two union activists and suspended a third.

VOTE COMPUTER VULNERABLE

A series of lawsuits challenging the centralized tabulation of ballots highlights that it is extremely difficult to protect data processing systems against tampering. The **New York Times** (cited in **San Jose Mercury News**, July 29, 1985) pointed out, "The computer program that was used to count more than one-third of the votes cast in the presidential election last year is vulnerable to manipulation and fraud, according to expert witnesses in court actions challenging local and congressional elections in three states."

Defeated candidates in Indiana, West Virginia, Florida, and Maryland have taken local election officials and Computer Election Systems, of Berkeley, California, to court, charging fraud or error. The company and the officials have successfully defended themselves thus far, but such complaints can be expected to increase as long as there are no safeguards or oversight agencies. John Kemp, head of Computer Election Systems, said, "It is totally economically infeasible to have a fraud-proof system."

SUPERCOMPUTER SECRECY

Another skirmish is underway in the war over secrecy between the Pentagon and America's leading research universities. The Department of Defense not only restricts foreign access to computers used in research projects that it sponsors, but it is trying to keep Soviet bloc scholars away from high-speed supercomputers now being put together at four campuses with funding from the National Science Foundation. Officials at three universities - Cornell, Princeton, and the University of Illinois - have refused to endorse contract language limiting access to their work, but the University of California at San Diego has accepted it. (**New York Times**, cited in **San Jose Mercury News**, July 30, 1985)

IRELAND

The Irish Development Authority's aggressive campaign to recruit and subsidize U.S.-based high-technology firms has made Ireland a leading center of high-tech production within the European Community. In the past several months, however, some investors, such as Atari and Storage Technology, have closed their Irish facilities, triggering protests by their workers. The Atari occupation, in Limerick, was settled through negotiations that assured workers of increased severance pay, but we have not determined the precise outcome of the STC struggle. Late last year, unionized STC workers were notified that they were being transferred to work for another American firm, Dahlstrom, which did not recognize the union.

Ireland not a member of the North Atlantic Treaty Organization (NATO). In fact, it is a neutral country. But under an agreement between the U.S. Department of Defense and the Irish Institute for Industrial Research and Standards (IIRS), the IIRS is authorized to inspect and certify weapons systems components manufactured in Ireland. In Dublin (May 16, 1985) reports that more than a thousand workers - over ten percent of the Irish computer industry workforce - produce military components for the U.S.

APPLE BOYCOTTS SOUTH AFRICA

Top executives of Apple Computer have cut off all the company's sales to South Africa, while most other U.S.-based computer firms have declined to break their ties with the racist regime. Apple has no holdings in the country, and it has only sold 20,000 small machines there over the past five years, so it had little to lose by taking the symbolically strong stand. In fact some commentators have suggested that Apple took the step to garner favor in France, where it is still trying to get the government to order Apples for its schools. (Peninsula Times Tribune, August 7, 1985)

I.B.M. WINS IN MEXICO

After a protracted effort, IBM has won preferential treatment in Mexico. Unlike Apple and Hewlett-Packard, it will be allowed to establish a wholly owned subsidiary to manufacture personal computers. The company plans to invest \$6.6 million and hire 240 workers. It has pledged to sell only 8 percent of its output within Mexico, but that could still represent a major portion of the domestic market (San Jose Mercury News, July 25, 1985). The Mexican government's approval of IBM's proposal, following an earlier denial, illustrates both the economic weakness of Mexico and the economic power of IBM.

EXPATRIATES

In the overseas operations of U.S.-based high-tech firms, American managers are considered all powerful. Within their own firms, however, they are outsiders. A tour of duty at an offshore plant frequently slows career growth when the executive returns to the U.S. Overseas managers have trouble keeping up with both technical and political developments back home, and headquarters staff either forget about them, or if there is turnover, don't even know them. A veteran international executive told the San Jose Mercury News (August 12, 1985) that "nine of ten expatriates who go to the Far East from Silicon Valley end up leaving their company within a year of returning to the United States."

STANFORD MICROSYSTEMS

Workers at Stanford Microsystems, a large semiconductor assembly subcontractors located in Pasig, near Manila, in the Philippines, struck for at least two months this summer. Asian Workers Organizing (August, 1985) reports, "Their picket line has been constantly harassed by management-hired goons and security forces. Strikers have been stoned, shot at, and burned with chemicals."

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