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INTEL

Intel president Andrew Grove's new book, **High Output Management**, is designed as a guide for managers. However, it does divulge some interesting information about his company's activities. In 1975, Intel was looking for a new offshore production site. Grove liked El Salvador, but his site selection specialist said that the Central American country, where Texas Instruments still assembles chips, was too unstable politically. Instead, Intel built an assembly plant in the Caribbean island country of Barbados. (**San Jose Mercury**, September 12, 1983)

Meanwhile, the company is financing the expansion of its Las Piedras, Puerto Rico complex with government help. Intel just announced (**San Jose Mercury News**, September 12, 1983) that it would be selling \$80 million in tax-exempt Puerto Rican bonds. As a U.S. territory, Puerto Rico can sell bonds that are exempt from U.S. income taxes, an investment incentive unavailable in most offshore locations.

Though Intel always joins the chorus of U.S. chipmakers warning of the Japanese threat, Intel is actually doing quite well in Japan. **Business Week** (September 19, 1983) reports, Intel's Japanese sales "soared to \$90 million in 1982, up 80%, and this year they

could top \$100 million, one-tenth of Intel's worldwide sales." The company owes its strength to its dominance in two product lines, microprocessors and EPROM's (erasable programmable read-only memories). Intel's 8086 microprocessor is particularly popular in the Japanese market, because IBM uses it in its PC personal computer, which is selling well in Japan (utilizing the Japanese language) as well in the U.S.

The 8086 should do even better, through direct sales and licensing agreements, since software-weak Japanese computer manufacturers are gearing up the production of IBM-compatible personal computers. In the mainframe market, the only way that Japanese computer makers could penetrate the U.S. market was to produce equipment compatible with IBM's larger machines.

PHILIPPINES

The Manila-based Center for Research and Communications predicts that "Exports of semiconductors from the Philippines will hit a record of \$1.3 billion for 1983, making these products the country's top export." (**Electronics**, September 8, 1983)

COMPUTER TRADE STATS

The U.S. International Trade Commission reports ("Computers, Calculators, and Data Processing Machines," USITC Publication 841, Control No. 6-4-13 [Supp.], August, 1983) that U.S. computer imports have tripled over the last five years, while exports have only doubled. However, exports still remain nearly four times as high as imports, and imports make up only 8.5% of U.S. apparent consumption. U.S. imports of computers and data processing machines (including peripherals and parts but excluding calculators) grew from US\$755,353,000 in 1978 to \$2,296,618,000 in 1982. Exports rose from \$4,138,913,000 to \$8,968,923,000 during the same period. Meanwhile, U.S. apparent consumption rose from \$11,728,200,000 to \$27,103,500,000, and U.S. producers' shipments jumped from \$15,111,700,000 to \$33,775,800,000.

Japan accounts for more than a third of U.S. computer imports, but in 1982 in ranked fourth among importers of data processing equipment from the U.S. In 1982, for the first time, Japan ran a data processing equipment trade surplus with the U.S., exporting \$822,210,000 to the U.S. while importing \$774,606,000. (Please note: U.S. trade agencies do not consider third-country shipments (U.S.-origin goods processed in third countries before shipment to Japan) to be U.S. exports to Japan.)

The Commission reports that U.S.-based producers of computers have been shifting labor-intensive manufacturing processes to offshore, low-wage areas, and that major firms were also establishing offshore joint ventures and subcontracting relationships. Re-imports of computers, plus calculators, under the special re-import provisions of the U.S. Tariff Schedule (items 806.30 and 807.00) totalled 32.3% of all computing equipment imports in 1980 and 1981, but the share fell to 25.8% in 1982.

Automation of domestic production continues. Shipments per employee in the U.S. computer/calculator industry rose from

\$87,300 in 1980 to \$115,000 in 1982. Despite the trend toward offshore production and the growing capital intensity of the industry, employment in this sector rose from 284,600 in 1980 to nearly 300,000 in 1982.

In 1982, imports (\$462.6 million) accounted for slightly over half of the 1982 U.S. calculator market (\$900.4 million), and exports (\$193.5 million) were comparatively low. Of course, the calculator market represents a fraction of the overall data processing industry.

U.S. 1982 COMPUTER IMPORTS

(US\$ thousands)

Japan	822,210
Canada	424,479
Hong Kong	167,224
Mexico	120,873
Taiwan	102,047
Singapore	93,860
United Kingdom	85,909
West Germany	77,746
all other	402,269
total	2,296,618

U.S. 1982 COMPUTER EXPORTS

(US\$ thousands)

United Kingdom	1,267,017
Canada	1,074,897
West Germany	947,158
Japan	774,606
France	769,843
Netherlands	387,604
Australia	344,572
Ireland	296,375
all other	3,106,851
total	8,968,923

SILICON VALLEY TO GROW

The Santa Clara County Manufacturing Group, the locally oriented trade association of Silicon Valley manufacturers, projects that manufacturing employment in the Valley will grow dramatically over the next few years. It just released a survey, conducted this March, of seventy-nine firms which employ 148,073 people (as of January 1), reportedly 59% of the County's manufacturing workforce. Assuming a "moderate economic recovery during the second half of 1983 and a sustained healthy national and local economy" throughout the survey period, respondents were asked to project expansion which "had at least a 50-50 chance of occurring."

The manufacturers predict that their local payrolls will expand by 42,435 jobs by 1985, an increase of 29%. That figure takes into account plans by five companies to shift 560 jobs to other sites in Northern and Central California and the expectation of eight firms to relocate 1,390 positions to sites outside California, primarily in the Southwest and Rocky Mountain states. Overall, responding manufacturers expect to add 23,632 employees outside California by 1985, as well as 5,352 positions within the state, primarily in the northern half.

Despite predictions that the Valley will become another Manhattan, the manufacturers project that production employment (as defined by participating companies) will increase from 44,920 in 1983 to 56,194 in 1985. Production will decline in relative importance, however, from 30.34% to 25.10% of total local employment.

The Manufacturing Group reports that much of the expansion will take place in existing facilities, which means two things: First, Silicon Valley will have a lot of surplus ping-pong tables in the next few years. And second, that the job growth at major companies will be in the existing centers of employment, notably Sunnyvale and Santa Clara.

Most commentary on the survey, from Peter Giles, head of the Manufacturing Group,

as well as public planners, has suggested that the survey projections may be optimistic. Yet, while it is true that individual companies may be counting their chips before they hatch, there will likely be enormous growth at companies which are not yet in business or which are presently too small to be included in the survey. Relatively new high-fliers such as Tandem and Convergent were not among the 79 firms, while a number of slow-growing or declining non-high-tech companies, such as Ford Motor, Gilroy Foods, Kaiser Cement, and San Jose Steel, were on the list.

The rapid growth of large firms in existing industrial areas bodes ill for the County's quality of life. The infrastructure and housing supply in northern Santa Clara County are already taxed to the limit. The boom in new firms in the newer areas of Milpitas and north San Jose has helped balance commute patterns and placed job-sites nearer the East Bay housing supply, but industrial in-fill will only aggravate congestion and boost housing prices unless local communities take action to ease those problems. Thus far, despite years of studies and warnings, little has been done.

Finally, it is interesting to note that three high-tech firms in the area, which have been in the news recently for their financial difficulties and lay-offs, were not included in the survey. Atari did not participate, and Victor and Osborne are both located a short distance outside the county.

GAS DANGERS

While the modernization of chip production usually reduces worker exposure to hazardous materials, the switch from chemical vapor deposition in wafer fabrication to plasma deposition could expose workers to highly toxic phosphine gas. According to Marjorie Balazs, head of Silicon Valley's Balazs Analytical Laboratory, the problem arises when wafers are dunked in vats of hydrofluoric acid, following deposition. Balazs says the problem can be avoided by altering the mix of phosphine and

oxygen or eliminating the acid baths, and she suggests the installation of "phosphine sniffers." (San Jose Mercury News, September 14, 1983)

N.E.C. AND NECK

Integrate Circuit Engineering, a semiconductor consulting and market research outfit, predicts that NEC (Nippon Electric) will move past Texas Instruments this year to become the world's second largest vendor of semiconductors, behind Motorola. ICE projects that TI will sell \$1.31 billion this year, up 7% from last year, while NEC's semiconductor sales will grow 20% to \$1.32 billion. Hitachi will stay in fourth place, with sales at \$980 million, up 22% from last year, while Toshiba will jump 15% to \$780 million, rising to fifth place ahead of National Semiconductor. (Electronics, September 8, 1983)

While such figures show the growing competitive strength of Japanese manufacturers, they are misleading in two ways. First, they do not include U.S. captive production. IBM, the world's largest producer of semiconductors, does not sell chips on the open market. However, if ICE's report follows the firms standard reporting practices, the Japanese totals include large volumes of intra-company sales. Secondly, they include transistors and other discrete components, product lines where Motorola and the Japanese electronics firms are particularly strong. Texas Instruments is still the world's largest marketer of integrated circuits.

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