GLOBAL ELECTRONICS

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LAY-OFFS

During the current high-tech economic slump, announcements of lay-offs in the U.S. electronics industry come almost daily. Lay-offs are considered a normal part of doing business in the U.S., and they occur even during boom times. When companies – such as Warner/Atari or Litton/Applied Technology are criticized – it is usually because of the manner in which workers are informed. A handful of firms, like IBM, Hewlett-Packard, and Advanced Micro Devices have no lay-off policies, but they all have loopholes, notably the reliance upon subcontractors that must send workers home when contracts are in short supply.

In many other countries, however, lay-offs are not so acceptable. The **San Jose Mercury News** (October 29, 1985) cited Gerlof Homan, of Golden Gate University: "Companies often carry huge financial reserves on the books of their European subsidiaries to tide them over a recession and avoid layoffs." Hewlett-Packard, which has cut hours and reduced pay at its U.S. offices and plants, hasn't imposed any pay cuts at its Latin American subsidiaries. In much of Asia, it is apparently more acceptable for employers to pressure employees– using both the carrot and the stick – to resign voluntarily, rather then to lay them off.

In Hong Kong, generally considered *laissez-faire* in its attitude toward employee rights, State Fair Electronics announced earlier this year that it planned to close its plant without providing severance pay. The owners planned to emigrate to Canada. Following a worker-management confrontation, the High Court ordered State Fair to provide several days pay to 68 workers. (**Asia Labour Monitor**, August, 1985)

Large Japanese firms are known for their permanent employment policies, but that practice does not generally extend to their overseas subsidiaries. For example, Shin-Etsu Handotai (SEH) and Toshiba each recently let go more than 100 workers at their plants in Vancouver, Washington and Silicon Valley. At times, Japanese employers offer workers the chance of moving or being laid off. In Japan, most workers reportedly accept, but NEC found few Silicon Valley workers willing to work in Roseville, a three-hour drive away.

More important, Japanese employers even lay off large numbers of "contract" production workers, primarily women, at their home plants. In most companies, temporary employees make up 10% or 20% of the workforce, but at Mitsubishi Electric, over half the workers are normally hired on contract. (**Electronics**, November 18, 1985)

In September, U.S.-based Mostek retrenched (the term used in Southeast Asia) 1,200 workers from its Penang, Malaysia assembly plant. The former employees protested, picketing the company and filing complaints with the Labour Court and the Ministry of Labour. Among their demands for better severance pay, the workers are demanding 3 months *ex gratia* pay, as opposed to the one-half month offered by Mostek.

To strengthen their claims, the workers are asking international supporters to send protest letters to Mostek's U.S. headquarters; to Mike Sharp, Mostek's managing director in the Bayan Lepas Free Trade Zone in Penang, and to the Honourable Datuk Seri Dr. Mahathir Mohamad, the Prime Minister of Malaysia, in Kuala Lumpur.

WORKERS ACTIVE

Though high-tech employers maintain instant contact, via satellite data communications links, with their far-flung subsidiaries, information about labor activities at high-tech companies travels slowly. Reports are usually fragmentary. Despite the lack of a clear picture, it is clear that worker militancy is alive and well in many parts of the high-tech world.

For example, workers at Philippine chip-assembly subcontractor Stanford Microsystems went on strike when management moved to lay off as many as half of the firm's 7,000 employees, due to a shortage of orders. In April, workers at Silicon Technology, another subcotractor in the Philippines, struck against lay-offs of nearly a quarter of its workforce. The union won the reinstatement of some of the retrenched workers, but one strike leader, Jemoshick Paul, was reportedly shot dead by a company security officer. (**Asia Labour Monitor**, August, 1985)

Meanwhile, **Computing, the Newspaper** (August 22, 1985) reports that the Electrical, Electronic, Telecommunication and Plumbing Union is organizing secret cells, with four or five members each, at National Semiconductor's plant at Greenock, in Scotland's Silicon Glen.

And in Bombay, India this Spring, 900 women employed by Tandon Magnetics – a subsidiary of U.S.-based Tandon, which is run by an Indian emigre – struck for better pay and conditions. The plant, located in the Santa Cruz Electronics Export Processing Zone, is not subject to Indian minimum wage laws, and the workers complained that they were receiving pay even lower than other Tandon affiliates in the Zone. Working mothers also objected to rotating shifts, and some employees accused male supervisors of sexual harassment. (**The Indian Express**, May 23, 1985, cited in **Asian Women Workers Newsletter**, October, 1985)

MILITARY CHIPS

The Pentagon and the semiconductor industry are still at odds as to how to ensure that the chips purchased by weapons contractors work properly. The Department of Defense charges that 3% to 12% of military chips are defective. Presently the Navy requires that arms-makers rescreen integrated circuits; the Army insists on re-testing for many wepaons; and the Air Force-run Defense Electronics Supply Center is considering such an approach.

Though re-screening may increase the cost of military semiconductors by 30% to 40%, "the Pentagon argues the extra step will pay for itself because the cost of fixing defects grows by a factor of more than 10,000 when a system gets into the field." (**Electronics**, November 4, 1985)

Critics within the semiconductor industry, however, suggest that re-screening procedures damage good chips, and they argue that the military should allow suppliers to follow the practices which have boosted reliability in the commercial sector.

In particular, the Semiconductor Industry Association is proposing that the military switch from source-control drawings to a simple, standardized two-page procurement specification – that is, reduce the number of designs. **Electronics** (November 25, 1985) reports, "*One reason, the SIA argues, is that the government specification system makes it difficult for chip makers to achieve the production volumes necessary to use statistical controls and minimize costs.*"

Meanwhile, the Department of Defense is concerned about the large number of chips and other components discontinued by semiconductor firms. The Defense Electronics Supply Center has determined that manufacturers plan to stop making about 9,000 separate components, up from 5,000 in 1984. Most chipmakers plan their product lines around civilian demand, and according to **Electronics** (November 11, 1985), "The commercial life cycle of a semiconductor type is about seven years, but weapons systems normally have an operating life of about 20 years."

There are presently four strategies for supplying discontinued chips. First, specialized manufacturers like Lansdale Transistor and Electronics, of Phoenix, can buy discontinued product lines, but they may need subsidies to acquire major technologies. Second, the Defense Electronics Supply Center can increase its stocks of discontinued parts. To make this work, however, the Pentagon would need earlier notice of discontinuation. Furthermore, this approach does nothing for foreign purchasers of U.S.-made military equipment, since they do not have access to DESC. Third, newer chips can be programmed to emulate discontinued parts. And fourth, the military is willing, in rare cases, to produce old chips on its own.

While old chips are being phased out, advanced circuits produced through the Pentagon's Very High Speed Integrated Circuit (VHSIC) are just entering the market. Honeywell is selling its sample VHSIC components for $6,000 each; TRW is charging $5,000. When production volumes increase, prices should go down soon, but they are unlikely to become competitive with commercial chips.

VHSIC contractors would like to offer their Pentagon-subsidized chips commercially, since that would increase their income, and some Defense Department insiders support such a move, since it would increase volumes and drive down prices. However, VHSIC chips are controlled under the International Traffic in Arms Regulations, and prevailing sentiment in Washington is to tighten controls on the spread of military technology, not to encourage non-military sales and exports. (**Electronics**, November 4, 1985)

SOVIET TECHNOLOGY

Andrei Ershov, designer of the U.S.S.R.'s computer literacy program – which was introduced into that nation's 60,000 high schools this September – gave **Business Week** (November 11, 1985) a remarkably frank picture of the Soviet Union's high-tech strengths and weaknesses. Ershov reported, "We can make the electronic circuitry, but we can't seem to make the printers and floppy-disk drives." The Agat, the U.S.S.R.'s first personal computer, was "premature" because it depended upon disk drives from East Germany and Bulgaria. Now Soviet designers are working on a 16-bit microcomputer with a cassette tape memory.

Ershov blamed production problems on the fact that there are too many ministries trying to develop machines. He denied that Soviet leaders are afraid that Soviet citizens will use computers to independently disseminate information. He said that the U.S.S.R. has its own hackers, called "computer fanatics," but he described young-

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sters working late at computer centers, not in the privacy of their own homes.

The Reagan administration, of course, contends that the Soviet Union has stolen most of its advanced technology from the U.S. and its allies. In "Soviet Acquisition of Militarily Significant Western Technology: An Update," a September, 1985 report bearing no agency identification, U.S. intelligence officials detail a version of a comprehensive Soviet program to collect, legally and illegally, Western technology and high-tech equipment. Press reports say that the Technology Transfer Intelligence Committee, a CIA-led group of 22 separate Federal agencies, compiled the document, which is available from members of Congress.

For example, the report alleges, "In the late 1970's alone, the Soviets acquired about 700 embargoed one-of-a-kind dual-use products each year principally in the area of manufacturing, inspection, instrumentation and test equipment, including key microelectronics production and test equipment. These products were used for making Soviet counterparts of possible for use as key manufacturing or test equipment that completed process lines." The Committee says Soviet technology diversion efforts have closed the U.S. lead in microelectronics from 10 to 12 years in the mid-1970's to four to six years today.

The Soviets obtain sample semiconductor devices, which they duplicate through reverse engineering, but this practice should become more difficult as circuits become more complex. They also buy circuits in bulk – as many as 100 million circuits each year.

The purpose of the "Update" is to convince Congress to tighten controls on the dissemination of research results and the export of high-tech goods and knowledge, but the real lesson of the CIA study may be quite the opposite. The Soviets may indeed be willing to expend substantial resources to obtain ideas and hardware from the West, and they have demonstrated that U.S. efforts to control a wide range of technologies are likely to be ineffective. If the U.S. were to ease controls on most items, focusing instead on the protection of vital military secrets, leakage could be reduced drastically. Furthermore, money spent to build up Soviet production lines could boost the income of the U.S. firms that produce the equipment, rather than spies and smugglers.

Although the Reagan Administration is trying to clamp tight controls on the export of U.S. technology, it has authorized the use of computer network technology to facilitate communications between American and Soviet computer scientists. At first the Department of Commerce blocked the link, but it later assented, requiring that U.S. users be warned not to transmit information that would be illegal to send in other ways. At this point, the hook-up is likely to be used by idealists, not spies. One can be sure that the National Security Agency is constantly monitoring all such contacts.

Participants hope that the East-West computer conferencing system will lead to broader East-West high-tech communications links, but it is unlikely that there will be generalized access – in the forseseeable future – to terminals or personal computers on the Soviet side.

A.T.&T. TO CUSTOMIZE

The entry of the divested, deregulated AT&T into the merchant semiconductor industry has kept everyone guessing. The telecommunications giant first moved into commodity memory chips, selling 256K dynamic random access memory chips (DRAM's) and sending out samples of the upcoming DRAM generation, the megabit (1024K) chip. However, Donald Liedberg, AT&T Technology Systems Group national sales amanger, told **Electronics** (November 18, 1985) that the company plans to hold such chips to a 5% to 30% of its semiconductor business. He said, "Our strategy has been to lead the process development with memory and use the process developed there for other products." That is, like many other chipmakers, AT&T plans to use high-volume, low-profit chips to refine its wafer fabrication skills and increase yield (the percentage of goods chips on each wafer).

To apply that production technology to more profitable components, AT&T has opened design centers in Silicon Valley and Munich, West Germany. At these and future centers, AT&T will help its customers design standard-cell chips for specific applications. Then the company will fabricate the devices at one of four existing wafer fab plants or the old Synertek factory in Santa Cruz, near Silicon Valley, that AT&T recently acquired.

U.K. POLLUTION THREAT

The Winchester City Council, in Hampshire, in southern England, overrode local objections to approve a "technology park" at King's Worthy. Members of the King's Worthy council and the local Liberal/Social Democrat Alliance warned that a chemical spill could endanger the local water supply. The area is built upon chalk, which means that surface contamination could easily seep into the local aquifers. Though it looks like development will occur, the episode shows that the news of Silicon Valley's environmental problems is beginning to leak out. (**Computing, The Newspaper,** August 29, 1985)

WEST GERMAN DATA COMMUNICATIONS

U.S.-based multinational corporations such as the Bank of America and National Semiconductor are dissatisfied with West Germany's data telecommunications policy. Citibank, in fact, has decided against building a planned communications center in that country. **Business Week** (November 18, 1985) reports, "if a corporation wants to install new communications equipment, the Bundespost [post and telecommunications ministry] paperwork can drag on for a year."

Even personal computer operators are restricted. Plugging one's modem into a phone line requires rented equipment and a special permit, which may take months to obtain.

ADOLESCENT ATTITUDES

Citing a wealth of anecdotal evidence, most U.S. observers have suggested that youngsters, particularly teen-age boys, are fascinated with, excited by, or at least interested in computers. However, a recent study by Steven Pulos and Sarah Fisher, of the University of California's Graduate Group in Science and Math Education, challenges that assertion. ("Adolescents' Interests in Computers: The Role of Self-Concept, Attitude, and Socio-economic Status," April, 1985)

In the study, Fisher and Pulos interviewed 185 7th grade students, selected from a poor, minority-dominated urban school and a suburban, academically successful school in the same metropolitan area. About half the randomly selected students from each school were girls.

Their first, most startling discovery, reinforcing an earlier study by the same researchers, was that computer "whiz kids" were far from the norm. " . . . most adolescents do not appear to be very interested in computers, and their attitudes about computers probably do *not* differ from those of adults. Furthermore, it appears that adolescents generally respond to computers as they do other intellectual/academic activities. Computers do not appear to be a novel or particularly important part of their lives."

Fisher and Pulos found that students with an interest in video games were more likely to be interested in computers, but that those with traditional adolescent interests – such as dates, movies, and music – were less interested. Boys and girls responded with equal interest, and none of the students suggested that computers were for whites (or any other ethnic group) only.

Ironically, the researchers found that students at the wealthier suburban school, where computer training is built into the curriculum, were less favorable to computers than their central city counterparts. Pulos and Fisher suggest that their computer coursework, though highly regarded, is boring. They say, "The computer is not used as a creative tool, but is treated as a new form of obligatory 'busy work.' Students usually do not have an opportunity to use the computer in an open way, and in a way they would like." They conclude, "If we want our students to learn to take advantage of this new technology, they need to be introduced to more interesting applications than they have been so far. Currently, students' attitudes primarily reflect those of their teachers and parents, because their experiences with computers, to this point, have not given them reason to change this point of view."