Imported Chips: A Security Risk?

Egged on by U.S. chip makers and by fears of import dependence, the Pentagon is reconsidering how it should buy the brains for smart weapons

LIKE spring crocuses, expert committees are popping up all over Washington to consider the health of the domestic semiconductor industry and the risks for the Pentagon if it goes into decline.

The frenzy of report-writing is inspired by several concerns. The first is that, as a result of outdated purchasing standards, the Pentagon may not be getting the best and cheapest parts for its "smart" weapons. The military, under pressure to improve efficiency, is being told to do away with rules that require physical testing of chips and instead to adopt new methods of sampling and "statistical quality control."

Second, some worry that if the Pentagon does begin shopping aggressively for the lowest cost silicon chips, it might become dependent on foreign manufacturers. This is because Japanese producers have begun to outdo Americans in the key area of memory chips.

Third, some security experts are nervous because even U.S. companies assemble their chips overseas. It is possible that critical electronic parts could be vulnerable to foreign highjacking or blockade.

These issues have come to the fore because policy-makers are now taking note of some dramatic changes in the semiconductor industry. Last year, for example, Japanese manufacturers led the world in the production and marketing of the latest models of devices known as dynamic RAM (random access memory) chips. The Japanese were so successful in selling state-of-the-art dynamic RAM's that several U.S. companies quit the field in 1985. Some U.S. manufacturers are predicting that they will never regain the lost ground. Thus, military purchase officers may confront a dilemma: they may have to choose between buying from the most efficient RAM chip makers, or buying from American companies.

The same issue may arise in the future in another area, the production of gallium arsenide chips. They may be important for new high-speed computers and particularly for optically based data-processing, critical for the Strategic Defense Initiative. While U.S. companies are doing research in this area, the Japanese effort is said to be more coherent. It could well pay off with salable devices before U.S. research does.

Meanwhile, the Pentagon has been told that it should rely more heavily on commercial markets for its electronic supplies, and not so much on special, narrowly defined military sources. The Semiconductor Industry Association, based in San Jose, California, gave this specific advice in a briefing to military officials last November. The SIA argues that the Pentagon would get higher quality chips at a lower price by setting standards as everyone else in the commercial market does. This would encourage many small companies that view military work as unprofitable to compete for contracts, according to the SIA.

The main arena for discussing these questions is the Pentagon's Defense Science Board. A DSB "Task Force on Semiconductor Dependence" was impaneled last year under the chairmanship of Norman Augustine, president of the military contracting firm, Martin Marietta. Among the notable electronics chieftans in the group are Solomon Buchsbaum of ATT Bell Laboratories, Bobby Inman, president of the industry's Microelectonics and Computer Technology Corporation (MCC) in Texas, Jack Kilby of Texas Instruments, Robert Noyce of Intel, and Erich Bloch, head of the National Science Foundation and formerly IBM's top executive for semiconductor R&D. The task force has held three meetings since its launching in January. It plans to have a final report out this fall.

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Panel members were unwilling to discuss their work in detail. It is clear, however, that they are focusing on the economic troubles of the semiconductor industry in 1985. The U.S. companies have argued that, for reasons of national security, the government should support a strong domestic industry. The DSB task force is examining this argument and the linked plea for trade protection. In addition it is trying to learn just how much the military depends already on imported chips and whether there are any big risks in this dependence.

Some technical information for the DSB study will be provided by another expert group based at the National Academy of Sciences' Research Council. The chairman of this "Committee on Electronic Components" is William Hittinger, formerly of RCA, and the staff director is Dennis Miller. According to Miller, there is a "total void" of information on the national origin of silicon chips used in weapons. The Pentagon does have some official rules requiring the use of domestic chips. But they apply only to about one-third of the military's weapons purchases, according to one Air Force estimate. The NRC report will be published in April.

Another report will be written by the staff of the National Security Council. This rushed effort began in January. The Commerce Department is preparing a section on the economic health of the U.S. semiconductor makers. The White House Office of Science and Technology Policy is examining the claim that the domestic chip industry is the "technology driver" that promotes innovation throughout the electronics industry. And the NSC staff itself will examine the risks of depending on chips that must be shipped across the Pacific Ocean.

The risks do not involve only foreign production. U.S. companies commonly send circuit-bearing chips abroad to low-wage Asian countries for partial assembly. One security expert explained the concern as follows: "Suppose you make some chips with the latest missile guidance circuits and send them to Singapore [for assemby]. They come back, and one chip is missing. What do you do then?" The prospect of losing a military chip in Singapore apparently is more alarming than losing one in Texas. In any case, the major concern is that most chips used in the United States—regardless of the nationality of the parent company—

must be shipped in from overseas factories. In theory, this makes them vulnerable to unpredictable events abroad, including terrorist actions.

Yet another report will be issued in April by the White House task force on military efficiency chaired by David Packard, chairman of the Hewlett-Packard electronics company. According to a staffer, the report will not deal with national security per se, but with the need for greater efficiency in the military's use of electronic parts. For this reason, the Packard report may run against the grain, in that there appears to be a clash between the desire for high efficiency and for 100 percent domestic manufacture.

The Semiconductor Industry Association, of course, has had a hand in promoting these issues. The SIA is now engaged in a multiple-front campaign against Japanese manufacturers and is looking for support wherever it can be found. Until now the chip makers have not been able to coax defense officials into declaring that the domestic chip makers should be protected for national security reasons. Now this may change. If not, says one SIA official, "We will have to do something on the Hill. No one has written the legislation yet, but we're talking about it." ■ ELIOT MARSHALL

Gene-Splicing Debate Heats Up in Germany

The Greens want a halt to all industrial biotechnology; the government plans to extend the scope of safety guidelines

Bonn

GROWING public pressure has persuaded the German government to take a firmer stand than it had previously intended on the regulation of genetic engineering research. In particular, it has proposed that new regulations should be legally binding on all industrial experiments, rather than remain voluntary as they are at present.

The deputy minister for research and technology, Hans-Hilger Haunschild, announced during a debate in the German federal parliament, the Bundestag, on 12 March that a revised version of current safety guidelines will be introduced within a few weeks. Although more liberal than the current guidelines, Haunschild said their application would no longer be formally restricted to publicly funded research. The current guidelines are closely modeled on those developed by the U.S. National Institutes of Health and have remained essentially unchanged since they were introduced in 1978.

The Federal Ministry of Research and Technology had been suggesting that it intended to keep industrial compliance voluntary, following a commitment from German chemical and pharmaceutical companies engaged in the research that, even without legislation, they would follow the approved safety guidelines.

The government's change of heart has been partially prompted by the news that a small Heidelberg-based firm, Gen-Bio-Tec, had been carrying out experiments on the use of bacteria to produce blood-clotting factor without formally notifying the ministry's Committee for Biological Safety. The Gen-Bio-Tec incident was the principal trigger of a sharp attack on the government's handling of genetic engineering research during the debate in the Bundestag. The government was accused of promoting the rapid development of a new technology before adequate control procedures had been put in place. (Federal Research Minister Heinz Riesenhuber announced last June that he will provide $480 million over the next 4 years to support a wide range of research and development activities.)

Heinz Riesenhuber

Developing new safety guidelines.

Criticism came from members of the two principal opposition parties, the Social Democratic Party and the environmentalist party, the Greens. Both seem confident that rising public concern about genetic engineering will give the issue a high profile in the campaign for the federal elections at the beginning of next year.

Until recently, public debate on genetic engineering has been relatively muted in West Germany compared to the United States. The government has had little difficulty in meeting concerns about safety by adopting guidelines closely modeled on those developed by the National Institutes of Health.

According to observers here, however, three issues have now significantly increased the intensity of the discussion:

- the possible application of genetic engineering to humans, which has triggered deep-seated memories of eugenics experiments conducted by the Nazis;
- the implications for academic freedom of the growing links between German universities and large chemical companies;
- criticism from the environmentalist movement of the possible effects of the release of genetically engineered organisms into the environment.

The result has been a political debate that has focused not just on safety questions but also on wider philosophical issues. "Many people feel that they were bypassed in the early stages of the debate over nuclear energy," says Gunter Altner of the Institute for Applied Ecology in Heidelberg, which has been actively engaged in recent controversies. "Industry must come to recognize that it is legitimate to question new technological programs from both a social and an ethical point of view; otherwise the citizen only feels it possible to say no, and this can be very dangerous."

Members of Germany's scientific community have accepted the need for a debate. "The decision about how these new techniques should be applied will not be taken