By another measure, the Soviet 16,000-bit chip lags several years behind U.S. off-the-shelf products. It has 17,000 "gates" or switches, according to the CDC report. Current U.S. devices on the market have 64,000 gates. The DARPA program aims at making a single chip even more intelligent, so to speak, by placing 500,000 gates on it, and, one day, perhaps even 25 million gates.

Gallup was also handed a 4-bit microprocessor, shorter than, but capable of some of the same functions as the AVM-2901 marketed by Advanced Micro Devices Inc. in the United States in 1975. Two other devices, meant to be used with the microprocessor, were supplied: a control memory circuit and a peripheral controller. The latter two are of less interest to government officials, as they appear to be somewhat older. The Soviets provided duplicates of two devices so that one could be broken down for testing.

While CDC's report has stressed how advanced these individual devices are, government experts caution that the test of a nation's semiconductor prowess is not the ability to produce a few working devices but the ability to produce a sufficient number of reliable devices, so when built into a computer, or the guidance system of a missile, they will work. "Sure, at their laboratory in Novosibirsk they could produce a few of anything," says one official formerly concerned with the status of Soviet electronics. "But semiconductor production is a black art. The Soviets have a tremendous ability to do individual pieces of science; but they have never been good at translating that into production."

U.S. companies, such as Texas Instruments (TI), try to achieve very high yields—so that, for instance, every single hand-held calculator that is sold can actually be counted on to work. "You should see the Texas Instruments production line," says another official. "They spend millions of dollars and years refining and cleaning it to get perfect yields. But the Soviets are strangled by their own system. The plant manager wants to meet his production quota and produce 100,000 devices. He doesn't care if they work or not."

Even CDC's analysis indicates that the show-off samples it obtained are less than perfect. An enlarged photo of the 16,000-bit RAM shows that the contact points for some of the gates are not in perfect alignment. The alignment of the "mask" or template from which the circuits are printed is slightly askew, according to the CDC analysis. Such a defect in production can make it difficult to print large numbers of chips accurately or to print more complex circuit designs.

A more skeptical assessment of the Soviet chips' significance would place that country 6 or even 9 years behind the United States, rather than the 2 years that CDC claims. If, as seems likely, the 16,000-bit chip is a prototype and not a production line sample, it would be comparable not to the 4116 Revision E that Mostek marketed in the mid-1970's, but to the prototype chips that the company developed in small quantities in 1970 and 1971. Experts suggest that if it took Mostek—then a leader in the state of the art—5 years or more to develop reliable production of this chip, it should surely take the Soviets as long or longer.

J. Fred Bucy, president of TI, estimates that Soviet production of advanced chips gets "less than 1 per cent" yields, whereas TI must get "20 to 70 percent" yields for production to be meaningful. Bucy estimates the Soviets to be 5 to 7 years behind.

Given the Soviets' track record, the devices may never even be seen again. One Army electronics expert says, "It is not unusual for all of a sudden some [Soviet advanced technology] parts to appear, and for us to . . . obtain no additional parts or obtain no additional evidence that they are being used and produced."

Another defense official recounts that American industrialists have come to him with glowing reports of, for instance, a "new" Soviet machine tool seen at a trade fair in Eastern Europe, such as the annual one in Leipzig, East Germany, where the Soviets traditionally exhibit their latest wares. "I'll ask them whether they went to the fair in Brno [Czechoslovakia] and they'll say 'no.' I'll check with my staff and it will turn out the Soviets exhibited the same machine tool in Brno a few months before. They've only got one of them and they cart it around!"

So far, government officials have found little support for CDC's conclusion that the Soviets are showing the technical virtuosity of the Japanese in this field, or that they may soon "branch off into a leading position in certain specific areas" of semiconductor technology. They are awaiting the results of the tests of CDC's Soviet jewels, and what the latest trade fairs in Eastern Europe turn up. Meanwhile, CDC's Gallup could not be reached for comment. He is in China, a CDC official explained, where the company has a $69 million contract for computer sales—yet to be approved by the U.S. government.

—DEBORAH SHAPLEY

Carter Privacy Bills Cover Research, Medicine

The Carter Administration has proposed sweeping privacy legislation that will have important consequences for medical and scientific researchers, as well as academic faculty in general.

Personal records compiled for research, medical treatment, commercial transactions, and communication would get enhanced protection under the legislation, which was proposed on 2 April. A major bill in each area was devised to meet two objectives: to increase awareness of invasions of privacy, and to limit official access to personal records. "Privacy is a permanent public issue," said Carter when the four bills were announced. "Its preservation requires constant attention to social and technological changes, and those changes demand action now."

In the bill relating to medical treatment, the Administration proposes a general rule that individuals have a right to see their own medical records, but that others cannot see the records without permission first. Alas, there are also 22 exceptions to this rule, and one of them provides that epidemiologists need not ask permission if (i) the importance of their research outweighs any risks from disclosure; (ii) copies of the records in researchers' hands are destroyed when no longer needed; and (iii) further disclosure by the researcher is avoided. The bill also prevents the use of blanket disclosure authorizations, and provides a penalty for obtaining medical records under false pretenses.

In the bill relating to scientific research, the Administration proposes to formalize (read *enforce*) pledges of confidentiality commonly made to research subjects. In most cases, researchers would be expected to recite a sort of reverse *Miranda* warning: "I am prohibited by law from releasing information about you to anyone except those that I tell you about. If I should break the law, I will be subject to a $5000 fine, and you will have the right to sue me." The requirement for such a statement could be waived by an institutional review board (IRB), an authorized group that approves research proposals.

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Also, under provisions in the research bill, scientists would be barred from recontacting the subjects of earlier research without the approval of an independent body (such as an IRB). Researchers could not see individual files compiled by other researchers unless they first signed a pledge of confidentiality.

Although these two bills may make life a bit more difficult for researchers, the bill relating to communications may have the opposite effect. The Administration proposal would prohibit the search or seizure by law enforcement authorities of a "work product"—such as a manuscript—if the author is engaged in disseminating information to the public. Although intended primarily to apply to the media, the bill would also apply to academic faculty. A subpoena would be necessary if authorities wanted to seize uncompleted work, a requirement that would effectively bar them from rifling files.

The bills were developed from the recommendations in 1977 of the Privacy Protection Study Commission, a group set up in 1974 by then President Gerald Ford. Because the legislation was developed independently of Congress, and introduced during a week dominated by other news events, congressional reaction is uncertain.

State Officials Alerted to School Asbestos Hazard

Although asbestos is perhaps the best known human carcinogen, examples of its reckless use continue to emerge. Several years ago, for example, federal health authorities first became aware that between 1940 and 1973, asbestos had been sprayed in thousands of school buildings as soundproofing, fireproofing, or merely decoration. Much of the asbestos is now beginning to flake off into the air that schoolchildren breathe.

State health officials, formally alerted on 16 March by the Environmental Protection Agency, are just beginning the task of identifying the schools where asbestos was used. The most thorough search so far is that performed by the state of New Jersey, where 10 percent of the schools were found to contain sprayed asbestos. The level present in the ambient air approaches the levels present in homes of asbestos workers, but the significance of this is not immediately clear. A strong association between such exposure and a heightened risk of cancer has not been shown so far, according to a scientist at Mt. Sinai medical school in New York, but a prudent approach would be to reduce the exposure, either by stripping the asbestos or by sealing it.

There are suspicions that the problem may be quite broad. Flaking asbestos has also been found in a UCLA dormitory, the Yale School of Arts and Architecture, and most recently, the building that houses the Council on Environmental Quality in Washington. In the CEQ building, which was built as recently as 1965, the level of asbestos in the air near sprayed stairwells is reportedly 30 times the level now considered safe.

. . . and Federal Officials Learn of Hazard in Homes

Recently, a new and potentially more serious health hazard from asbestos emerged. According to the tests of a scientific consulting firm located in Rockville, Maryland, common hand-held hair dryers often contain asbestos linings that flake into tiny fibers that are expelled as the dryers are used. Federal authorities estimate that as many as 13 million such dryers are presently in use (roughly half of the total in use), meaning that nearly one out of every six households has its own little asbestos spray gun. There are suspicions that the same linings may be present in the hood-type hair dryers commonly used in beauty shops.

The situation is of concern because dryers are used so close to the face, and because bathrooms are often compact and poorly ventilated. Tests completed thus far prove that asbestos is a common insulator, and that it is discharged, particularly by well-worn dryers; they do not conclusively prove that the fibers are small enough to be inhaled or that the total amount expelled poses a risk of increased cancers. Studies of the homes of asbestos workers show, however, that once in the home, asbestos is virtually a permanent contaminant: It cannot be collected by a vacuum or otherwise removed. The longer it hangs around, the smaller and more breathable the fibers become.

The agency with the power to address the problem is the Consumer Product Safety Commission (CPSC). Its officials have decided not to act on a petition by the Environmental Defense Fund to recall the dryers until further tests have been performed by the National Bureau of Standards and the National Institute of Environmental Health Sciences. The tests may not be completed until June.

The CPSC, which has a reputation for bureaucratic torpidity that is unmatched in Washington, became involved in the issue with typical alacrity. A local television station, WRC-TV, tried to interest it in the story 9 months ago, and CPSC officials steadfastly insisted the problem was not serious enough to merit their attention. The officials based their decision on a $20,000 study by management consultants that led them to believe falsely that asbestos was no longer used in hair dryers. The CPSC chairwoman, Susan King, now blames the study; the study's authors now blame the CPSC. In any event, they finally became interested when the television station paid for the scientific work themselves and broadcast the results on 29 March.

Harvard Misspending Alleged

The inspector general of the Department of Health, Education, and Welfare (HEW) has concluded that Harvard University's School of Public Health misspent $2.5 million of the federal grants it received between 1975 and 1977.

The HEW audit represents only the opening salvo in what the agency has described as its war on poor accountability for research monies at university campuses. The report says that Harvard inappropriately charged overhead and other costs to the grants.

Harvard financial officials believe that the amount in contention will be substantially reduced after they have an opportunity to plead their case.

R. Jeffrey Smith