A COMPUTER LAG BY RUSSIA FOUND

But U.S. Expert Discerns Potetnial for Parity

By JOHN NOBLE WILFORD

The Soviet Union still lags behind the United States in the production and use of computers but has "the raw technical potential to achieve something near parity" within 10 years, an American expert said after a recent tour of Soviet computer centers.

Dr. Barry W. Bohem of the Rand Corporation said that one of the main problems hindering the development of computers in the Soviet Union was—ironically, for a Communist state— the lack of centralized planning.

Dr. Boehm's analysis of Soviet computing in general was that it suffered from a "serious lack" of equipment, a "very ragged situation" in programming and "virtually nonexistent" support services.

But he reported that, in certain high-priority areas, such as military and space activities, the Russians were "less far behind" than they used to be and had demonstrated their "impressive technical potential."

Guest of Soviet Academy

Dr. Boehm made a two-week tour of computer centers in Moscow, Kiev and Tbilisi last October as the guest of the Soviet Academy of Sciences. He is head of the computer systems analysis group at Rand, which is a nonprofit organization in Santa Monica, Calif., for research on military, scientific and public policy problems.

His reports was published in the current issue of Rand's Soviet Cybernetics Review, a bimonthly publication of reports and translations on Soviet computer technology. Dr. Boehm elaborated on his observations in an interview by telephone.

In an opportunity rare for a Western computer expert, Dr. Boehm visited the Soviet Institute of Space Research in Moscow, which oversees scientific aspects of the Russian space program. He was also allowed to conduct some experiments with Soviet computers.

Solar Probe Planned

At the space center, Dr. Boehm said, he learned that the Russians were "apparently not going for the grand tour of Jupiter, Saturn and Uranus." Such an unmanned mission, which is being planned by the United States for late in this decade, would involve a flight of more than nine years and a considerable advance in computer technology.

But Dr. Boehm learn of Soviet plans for a three-year solar probe using an unmanned spacecraft to fly by Jupiter and into a path perpendicular to the sun-earth plane. It is not known when the mission will be launched.

The space institute consists of about 500 people and expects to expand to 3,000, Dr. Boehm learned. The expansion is partly attributable to new programs, but also apparently to some centralization of mission planning and spacecraft design work.

Computers Are Slower

Dr. Boehm said that the Russians "have a fairly compact standard spaceborne computer" with a 4,000-word core memory, 256 words of erasable memory and a speed of about 100,000 operations a second. Computers on American spacecraft have the capability of performing 500,- 000 to a million operations a second.

Discussing the poor coordination among Soviet computer experts, Dr. Boehm said:

"Typically, the academically oriented institutes of the Academy of Science develop the hardware [equipment] designs and basic operating system software [programing]; the electronics industry produces the machines, often after long wrangles with the institutes and production delays — and neither is particularly responsible to the user to provide maintenance or assistance in extending or debugging the software."

As long as there is a lack of coordinated, centralized Soviet effort, Dr. Boehm said he thought the United States "will stay comfortably ahead in computer technology and usage."

But he added, "Our lead in space and military applications will probably be less than our lead in general-purpose computing."

What the Russians need, Dr. Boehm said, is a centralized computer development program headed by a "tough-minded, pragmatic technical man" like those who headed development of the Russian rocket and space program. He said that Academician Viktor Glushkov, head of the Institute of Cybernetics at Kiev, "is probably the major candidate" for such a post.

At present, Dr. Boehm said, the best Soviet computer in fairly general use is the BESM-6, which has a capacity for 32,- 000 words in its memory core and 500,000 operations a second. This is roughly comparable with the IBZM 7094.

A larger and more efficient computer, called RYAD, is planned to go into production late next year, Dr. Boehm reported. Meanwhile, the Russians are buying some British computers as a "stopgap" measure.

It is estimated that there are 5,500 to 6,000 computers in the Soviet Union, against 24,000 in Western Europe and 63,000 in the United States.