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Soviet Digital Computers: Status and Forecast

Presidential Briefing

Information on Soviet military computers is fragmentary. Available information indicates that Soviet computers in military systems have exhibited a conservative approach. The Soviets favor specialized designs which utilize proven components rather than sophisticated or even state-of-the-art features. Available information also indicates that the technology of deployed military computers does not exceed known civil technology.

In the civil sector, Soviet general-purpose and scientific computers generally compare with US-produced machines of the late 1960s, but they are much fewer in number. Production schedules for general-purpose computers have lagged plans by 2 or more years because of management, component, and design problems. Present Soviet supplies of large-scale computers are insufficient, and the Soviets have only recently attempted to make and use minicomputers in quantity.

While the Soviets have demonstrated an understanding of advanced concepts for central processors and peripheral devices equal to those of the West, the lack of a well-developed technical and managerial infrastructure prevents the realization of these ideas in practice. In developing and producing computers in quantity for general users, the Soviets are likely to continue their past practice of following proven US examples.

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I. Information on Soviet military computers is fragmentary. Available information indicates that in computers for military systems the Soviets have employed and will continue to employ conservative approaches and to favor specialized designs utilizing proven components--neither sophisticated nor even the state-of-the-art. Available information also indicates that the technology of deployed military computers does not exceed known civil technology.

A. Specific system design approaches employ analog components and simple special-purpose digital computers having programs which cannot be altered electrically and which have been thoroughly tested.

B. At present, the inadequacies of hardware and software hinder use of networks of computers in systems such as those for aerospace defense, ASW, tactical command and control, digital communications switching, and logistic support.

C. Only since the early 1970s have the Soviets emphasized computers for data processing (important in above applications) and not just for scientific and engineering computations. They are in the early stages of providing sizable quantities of reliable computers for general users.

II. In the civil sector, Soviet general-purpose and scientific computers generally compare with US produced machines of the late 1960s, but in much fewer numbers (1/8 to 1/10 of total number of US computers in 1975).

A. The Soviets have publicized the Ryad series of general-purpose computers, patterned after, and compatible with, the IBM 360 computers. Production schedules have lagged plans by 2 or more years because of management problems and component and design problems. A second generation of Ryad machines is scheduled for production in 1978; these are intended to correspond to the IBM 370 series (circa 1971 in US).

B. The last large-scale scientific computer announced and displayed by the Soviets was in 1965. This machine has been the workhorse for the Soviet scientific community until the present, but even in 1965 the machine was outdated by US standards. Since 1965, the Soviets have developed other large-scale scientific machines in secret. The Soviets have and continue to experiment with various prototypes of computers using sophisticated concepts and architecture. The inability of the Soviets to produce adequate quantities of advanced computers, particularly large-scale types, is evident from

their desire to import large Western systems such as the CYBER 76 for the Hydrometeorological Service.

C. Belatedly, the USSR has recognized the value of minicomputers (important in military and civil applications). A serious Soviet commitment to build significant quantities of minicomputers was not evident before 1974. Current Soviet design and performance are comparable with those which existed in the US at least six years ago.

III. While the Soviets have demonstrated an understanding of advanced concepts for central processors and peripheral devices equal to that of the West, the lack of a well-developed technical and managerial infrastructure prevents the realization of these ideas in practice.

A. Specifically, the best Soviet auxiliary memory storage and peripheral units are comparable with US models of the mid-1960s. The Soviets have received some help from their East European partners, particularly from Bulgaria (magnetic disc auxiliary memories) but, at best, the East European equipment corresponds to US models of the late 1960s. The Soviets are seeking to overcome their deficiencies in auxiliary mass storage, input/output units, and other peripheral equipment through imports and by obtaining licenses for Western technology.

B. In the past, the Soviets have provided little or no software support to users. With their new models such as Ryad, they are beginning to provide operating and applications software packages based on Western developments.

C. The Soviet computer effort has been fragmented among competing ministries.

D. Security restrictions concerning advanced computer developments have led to poor information flow and inefficiencies in utilization of people and other resources.

E. In developing and producing computers in quantity for general users, the Soviets are likely to continue their past practice of following proven US examples. Thus they are not likely to realize announced goals of equalling or surpassing the United States in the overall production of computers in the foreseeable future.

The sources used in preparation of this briefing are:

1. Exploitation of captured Soviet military equipment [redacted]

2. [redacted]

3. [redacted]

4. Open literature such as Soviet State Standards, Soviet Patent Licenses, equipment brochures, books and newspapers.

5. [redacted]

6. Export license applications.

7. [redacted]