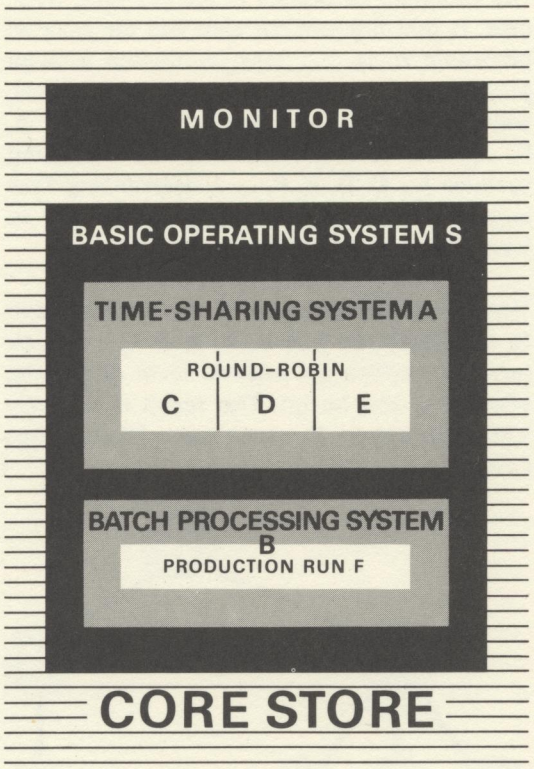
RC 4000 COMPUTER®

SPECIFICATION

RC 4000'S DYNAMIC OPERATING SYSTEM CONCEPT



- **New operating systems can be introduced – just as any other program – without modification of the monitor.**
- **Several operating systems can be in operation at the same time.**
- **Operating systems can be programmed in any of the available languages (Slang, Algol, Fortran).**

An operating system is a program that controls the running of other programs. The batch processing system for running programs in sequence is one example. Another is the time-sharing system that allows simultaneous programming in conversational form from a number of consoles. A third example is the real-time system, which initiates a series of process control programs that run in parallel at regular intervals. Most operating systems today, like those just mentioned, are designed for one, and only one, mode of operation. As a consequence of this, a desired modification of the original operating strategy requires in practice a complete redesigning of the operating system. In contrast to this, the time-sharing monitor of the RC 4000 has no built-in assumptions about program scheduling and resource allocation; it allows any program to initiate other programs in a hierarchical manner and to execute them according to any strategy desired.

This new operating system concept is based on very elementary and general functions as implemented in the RC 4000 monitor:

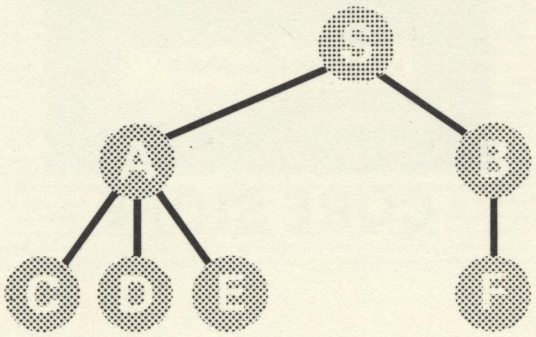
- control of the allocation of computing time among parallel programs by means of a digital clock
- initiation and termination of new programs at the request of existing programs
- transfer of messages between programs
- initiation of data transfers to and from external devices.

The core store initially contains the monitor and a basic operating system, S. S lets the

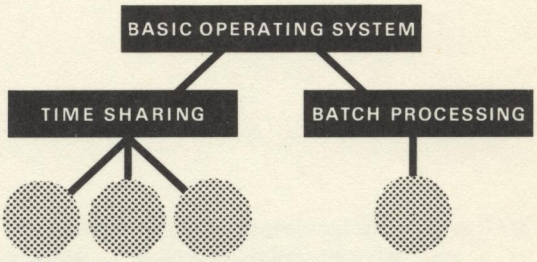
operator from an arbitrary console reserve a storage area of a given size and start a program in it. This program will thereafter run in parallel with S. Thus S functions as an extremely primitive and rigid operating system for the parallel programs A, B, ... it has started itself.

The essential difference in the RC 4000, however, is that the monitor also lets the parallel programs A, B, ... start additional parallel programs, C, D, E, F, ... In other words, while S acts as an operating system for A, B, ..., A, B, ... in turn act as operating systems for C, D, E, F, ..., determining how large a storage area these programs are to have and how long they are to run.

This hierarchy of programs can be extended to any depth, so that C, D, E, F, ... in their turn can initiate yet another level of parallel programs, and so on. The result is a family tree of programs in which each "father" has complete jurisdiction over his "sons".



In the RC 4000, then, the concept operating system becomes varied and dynamic, as the following occurs: the basic operating system S is used to start two new operating systems, A and B, which are far more subtle in strategy. A, for example, is a time-sharing system that allows conversational programming from three consoles; A therefore starts three parallel programs, C, D, and E. B, on the other hand, is a traditional batch processing system, which runs one production program, F, at a time.



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