

## I. THE HARDWARE ENVIRONMENT

The computer chosen as the basis for the Hospital Computer System was a PDP-1, manufactured by the Digital Equipment Corporation. The PDP-1 is a 5-microsecond, 18-bit computer. Each instruction occupies one word, allowing 12 bits of address information. The basic memory module consists of 4096 (4K) words. In order to meet the demands of time-sharing, this computer has been extensively modified. The cost of the modifications can reasonably be used as a measure of their scope; central-processor modifications alone cost as much as the purchase price of the unmodified PDP-1. The total cost of the system hardware is about one million dollars.

In addition to the central processor unit (CPU), the system includes two other processorlike devices, the program-swapping drum and the Data Channel. Both of these devices have the ability to make direct memory accesses without the use of CPU circuitry. Thus, three independent processes may be occurring simultaneously; this multiprocessing capability greatly increases the efficiency of the time-sharing system.

The program-swapping drum is divided into thirty-two 4K-word fields. The drum is capable of exchanging 4K of core storage for 4K of drum storage in 35 milliseconds. That is, during one revolution of the drum, a 4K core-memory module can be written onto one drum field and another drum field can simultaneously be written into the same memory module. This type of swapping technique has been more or less central to most time-sharing systems which permit a variety of tasks with limited memory.