

The Data Channel is a high-speed I-O device used for transfers to and from bulk storage. Once it has been activated by an I-O command from the central processor, this device has the ability to make direct memory references for data transfers or for additional I-O commands. This latter capability allows the Data Channel to perform logically-complex I-O operations under program control without interrupting the CPU. Attached to the Data Channel is a Fastrand bulk-storage drum which provides approximately 60-million 6-bit characters of storage for random-access file-handling (and overflow from the swapping drum) at a 1.1-megacycle-per-second bit-transfer rate. In addition, two magnetic-tape units are attached to the Data Channel; they provide long-term bulk storage and a certain amount of system backup. The bulk drum, the tape units, and the controllers for these devices were acquired from the Univac Division of Sperry Rand Corporation; they also designed and built the Data Channel to BBN specifications.

As previously described, the PDP-1 computer is supplied with 12-bit addressing and a 4K memory module. A standard option allows special "extended addressing" (utilizing indirect addressing) to obtain 16-bit addresses; thus, the computer can address a maximum of 64K. Normally, all memory references are made through one memory buffer register and one memory address register. The swapping drum, because of its high transfer rate, requires exclusive use of these registers during its read/write time of 35 milliseconds, making multiprocessing impossible during each program swap. This situation is intolerable not only because of decreased system capacity but also because of the possible loss of incoming information owing to the inability of the memory to receive it.