drum (or "little drum"). This little drum is small and fast; it can store thirty-two 4K programs and complete either a one-direction or two-direction swap in 35 milliseconds. In order to allow for more than 32 active programs, a portion of the Fastrand (or "big drum") has been allocated to the Swapper; this portion has the capacity to store 49 additional programs. The big drum, however, is much slower. The amount of time required for a one-direction swap can be computed as follows.

45 milliseconds	— average head positioning
34 milliseconds	— average rotational latency
87 milliseconds	— data transfer
166 milliseconds	— average one-direction swap

A two-direction swap requires an average of 287 milliseconds since the heads do not need to be repositioned. Even in the rare case where latency time is zero, a one-direction big-drum swap takes almost three times as long as a little-drum swap.

Big-drum swapping is actually performed by the I-O Processor. The parameters of the I-O operation are determined by the Swapper, but the program to be swapped out must actually execute the instructions which link it to the I-O Processor. (These instructions are located in Executive core, and the instruction counter of the program is set to their location by the Swapper.) In order to allow the program to execute these instructions, its queue counter is temporarily set to the best possible value by the Swapper; the queue counter is reset to its correct value after the swap is performed.

Because of the length of time required for a big-drum swap, the