A. The privileged instruction (IOT) in the user program is encountered by the central processor and trapped by the hardware. An interrupt is generated and the hardware registers associated with the user program, including the program counter (which specifies the next instruction to be executed in the user program), are stored in Executive memory.

B. The Dispatcher, which is started by the interrupt, reads the trap register and decodes the IOT by means of a table lookup on seven bits of the trap register. This lookup yields the address of the Executive routine required, and a branch is made to that address.

C. Each routine decodes an additional six bits of the trap register to determine which of various options may have been requested for the basic IOT. If the IOT has a high execution speed, it is executed and the routine debreaks to the user program. In cases where the IOT will be executed in user mode, the user registers stored by the interrupt are transferred from Executive memory to the user-memory area reserved for IOT's and the debreak address is changed to the address (in Executive memory) of the appropriate IOT routine. Debreaking then occurs, starting the IOT routine in user mode instead of starting the user program.

Notice that if a user program which is using a slow IOT is swapped out, the location, saved by the Swapper, at which the program will be restarted later is a location in the IOT routine in Executive memory. Also, the eventual point of return to the user program is stored in, and therefore swapped out with, the user memory block. Any other program which is swapped in between time periods allotted to this user program may use any IOT since no user-program information has been saved in the Executive memory. Finally, the slow IOT routines may themselves use fast IOT's (for example, Job Hunter uses Teletype IOT's) without any loss of information;