The Forth Way of Multitasking

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Abstract

The common approach to multitasking is the "time-slice" approach where a 'supervisor' is overseeing the processes that run on one processor in a pseudo-parallel fashion. This philosophy was developed in the 1950's and 1960's which were characterized by big, expensive mainframes shared among diverse users who didn't know about each others programs.
If one faces the fact that Forth is most often used on microprocessor systems dedicated to one application and programmed by one programmer or a team of programmers that cooperate closely, the need for "forced withdrawal of control" disappears. Instead, every process itself can take on the responsibility of giving up control when it is ready to. Hence the mechanism for multitasking can be much simpler and faster, enhancing interrupt response.

The following article explains the workings of the Forth multitasker and shows its implementation and usage. It was developed while designing a peripheral modem device ("TELEMIDI"), connecting a FI on one side with bitrates of up to 7800 baud to a modem with a bitrate of 1200 baud on the network side, running up to 5 tasks at a time insuring error-free transmission.