State Sequence Handlers

Edward B. Rawson
Rawson Engineering
Lincoln, MA

ABSTRACT

We describe a new type of sequence control structure which allows an ordinary : word to behave as a small state machine. The control structures may be freely mixed with BEGIN, UNTIL, etc., and with IF, ELSE, and THEN, with conventional nesting restrictions. The new structures include analogs of BEGIN, UNTIL, etc., as well as several other words which support terse, readable, state machine code.

The normal state variable is replaced by an entry pointer, but its handling is largely hidden in the source code, and application code never need supply a pointer value. Definitions may be understood as standard FORTH procedures, with the understanding that execution may "hang up" in one of the internal loops or called procedures until it is proper to proceed. Repeated calls to the main procedure result in repeated execution of the loop code or the called procedure until continuation is appropriate.

The sequence control structures encourage structured code, make state entry and exit natural, and produce fast, compact, object code. They eliminate the need to assign and manage state numbers. The structures and several applications are described.

*This paper has been submitted for publication in the **Journal of Forth Application and Research.**