CLAMS-Forth for Forth Nerds

M. Edward (Ed) Borasky

The Prime Directives

Forth 2012 compatibility?

- Extended subject of Forth 2012 (Forth 200x Committee 2012) standard
- Not all CORE words implemented
- Some non-standard word sets implemented
- But ...
  - CLAMS-Forth words ***in*** Forth 2012 work the same way.

Run on a Raspberry Pi Pico WH

- Documentation: (Raspberry Pi Ltd Accessed 2023-11-18)
- RP2040 CPU: Dual-core Arm Cortex M0+ with 264 KiB of SRAM
- Co-processors for division and digital signal processing
- I/O state machine (PIO) and ***oodles*** of real-world connectivity
- 2 MiB of flash
- 2.4 GHz WiFi / Bluetooth
- $7US with debug connector / headers for breadboarding
- Dozens of compatible devices!

Initial target device: Pimoroni PicoVision

- Documentation: (Pimoroni Ltd Accessed 2023-11-18)
- Raspberry Pi Pico W
- “GPU” - an overclocked RP2040
- I2S audio output
- HDMI output
- MicroSD card
- USB
- ~ $37US

Premature optimizations

- Dictionary split between RAM and flash
- Subroutine threading
- Inline coding / assembly
- Top of stack / stack pointer in register
- Engine in assembly

Build with Raspberry Pi Pico C/C++ SDK

- Documentation: (Raspberry Pi Ltd Accessed 2023-10-22)
- Reference: (Smith 2021)
- Why this requirement?
- Coding libraries / drivers ***each*** multi-month projects in ASM / Forth!
  - USB
  - WiFi / Bluetooth
  - I2S audio / HDMI
  - SD card

References

Forth 200x Committee. 2012. "Forth 2012 Standard." Forth 200x Committee. http://www.forth200x.org/documents/forth-2012.pdf.

Pimoroni Ltd. Accessed 2023-11-18. "PicoVision on GitHub." https://github.com/pimoroni/picovision/; Pimoroni Ltd.

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Smith, S. 2021. *RP2040 Assembly Language Programming: ARM Cortex-M0+ on the Raspberry Pi Pico*. Apress.