

Akira Engine

Version 1.0

The Akira Engine is a new co-processor chip powered by the SD-0064 sample. It uses the Akira-Sword protocluture and was first used to accelerate Star Forth 1.0 from ~115,000 words per second to over 400,000 words per second.

The Akira Engine has five major parts; the load-step operations, the D-stack operations, the Stack Frame operations, the Forth Acceleration operations, and the new non-conflicting register system.

WARNING: These operations depend on zero-point energy from the alien sample. Do NOT use these operations without consulting Dr. Korr or Dr. Halberg. There could be.. unforeseen consequences.

Load-Step operations

LD_FS, ST_FS

```
LDA [BLX, +]
```

This compact operation loads from BLX and increases BLX by the width of the destination register. It is based on the `MOVE.W (A0)+, D1` operation found on the Motorola 68000 series CPU. Alias `DPOP`.

```
STA [BLX, +]
```

Similarly, this operation stores to BLX and increases BLX by the width of the source pointer.

ST_PD

```
STA [-, BLX]
```

This operation decrements the BLX pointer and then stores A in the result. Alias `DPUSH`.

D-stack operations

- under construction



Stack Frame Operations

- not implemented yet

Forth Acceleration System

LSTEP

Increment [FLX], compare to [FLX+4], ZF=1 if done, clean up if done. Replaces forth_loop_runtime from the forth code and accelerates loop primitives from 110,000 words/sec to 1.3 million words/sec.

TTOS

Test top-of-stack. Replaces the test_top_of_stack function and accelerates branching by 2x, accelerating Fizzbench from 220,000 words/sec to over 450,000 words/sec

LIT

Literals. Replaces forth_lit and accelerates literal number pushes by 3x-4x, accelerating Mathbench from 250,000 words/sec to over 800,000 words/sec.

Non-conflicting Register System

New registers have been added to avoid register pressure against composite pointer registers. The new registers operate using quantum entanglement and liminal space addressing combined with the latest in teleportation technology. It's completely safe. At least, Dr. Isaac Korr thinks it's completely safe. If operating within normal parameters.

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