

Programming the c64 from scratch

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Who am I ?

- Marc Dendooven (EL Dendo)
- Retired Offr Belgian Army
- Civil Engineer (RMA – Polytechnic)
- Master after Master in Applied Computer Science (VUB)
- Instructor Computer science

Commodore History

- C64 since 1983
 - No tools, just BASIC and MC translated by hand
 - Went to Military Academy → no time for c64
 - Lots of idea's but only a few projects
 - Sold c64 for an Amiga... but regretted it. Got it back.
 - Build an emulator (<https://github.com/eldendo/ED64>)
- Retired
 - Building an environment on the c64 without existing tools and make an educational text or course.
 - Just BASIC, MC and tools made in them

Programming the c64 from scratch

- First step: Building a compiler
 - 25 years ago: Compiler Construction (Niklaus Wirth)
 - Extended pl/0 compiler in PASCAL (PC)
 - <https://github.com/eldendo/pl-0>
 - Very small PASCAL compiler in PASCAL (PC)
 - <https://github.com/eldendo/edPas>
 - Problem in c64 Basic:
 - Not structured...
 - Not verbose...
 - Variable Names, no names for subroutines
 - Recursion and local variables
 - Other solutions
 - LISP alike language, FORTH alike language

Programming the c64 from scratch

- Back to pl/0
 - Structure → discipline
 - Verbose → commenting
 - Variable names → make a list
 - Subroutine linenumbers → make a list and comment
 - Recursion: gosub can handle 20 levels
 - Local variables: Put them on a stack.

Programming the c64 from scratch

- No File IO
- No Editor
 - Basic and PL/0 in one basic file
 - Fast tryout and debugging
 - HOW ?
 - Start line with double quote → no tokens
 - Start reading code after first double quote with peek
 - Add 5 to address on EOL

The Future

- Cleaning up the code and write an educational text or course.
- Extend PL/0 to write PL/0 in itself. (BASIC)
- Write PL/0 in itself → bootstrapping
- Make it faster
 - VM in MC
 - Or codegenerator to MC
 - Or (JIT ?) compiler from p-code to MC
- Further extend PL/0 and write other tools

WHY

- Because it is fun
- It is something I always wanted to do
- Combine hobby and my former job
- Learn and hopefully teach

The END

- Intelligence is the faculty of making artificial objects, especially tools to make tools.
 - Henri Bergson

DEMO

<https://github.com/eldendo/pl-0-compiler-for-c64>