LaosLaser.org

LAOSLASER.ORG

Open Up Your Laser!

Peter Brier

Jaap Vermaas

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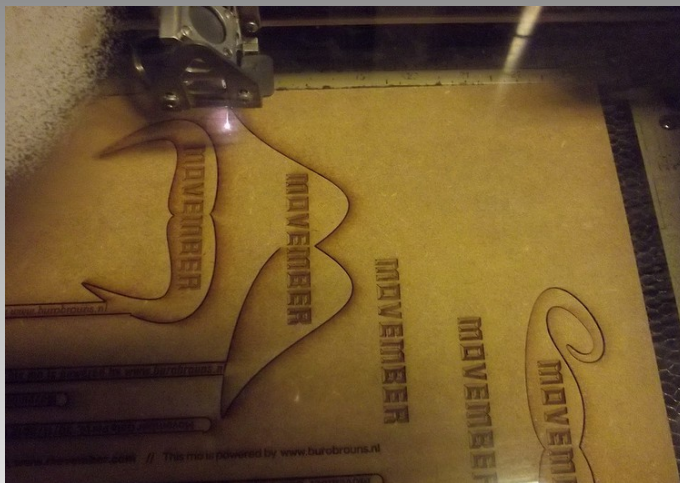THINKING
A CONFERENCE ON OPEN STRATEGIES
15.–16. NOVEMBER 2012

The Project: why?

- Lasercutters: The workhorse of any fablab

The Project: why?

Almost all fablabs use closed (hardware & source) lasercutters

- Cannot repair yourself

- Cannot modify hardware

- Cannot modify software

- Expensive!

The Project: why?

- Some lasers come with REALLY BAD SOFTWARE

- Some lasers have GOOD software but it's very EXPENSIVE (1.000+ euro for software only!)

- Most (all?) software is WINDOWS ONLY and there might be people using Linux (me) and MacOS that also want to use a laser

- OPEN SOURCE enables you to BUILD NEW APPLICATIONS or your own laser
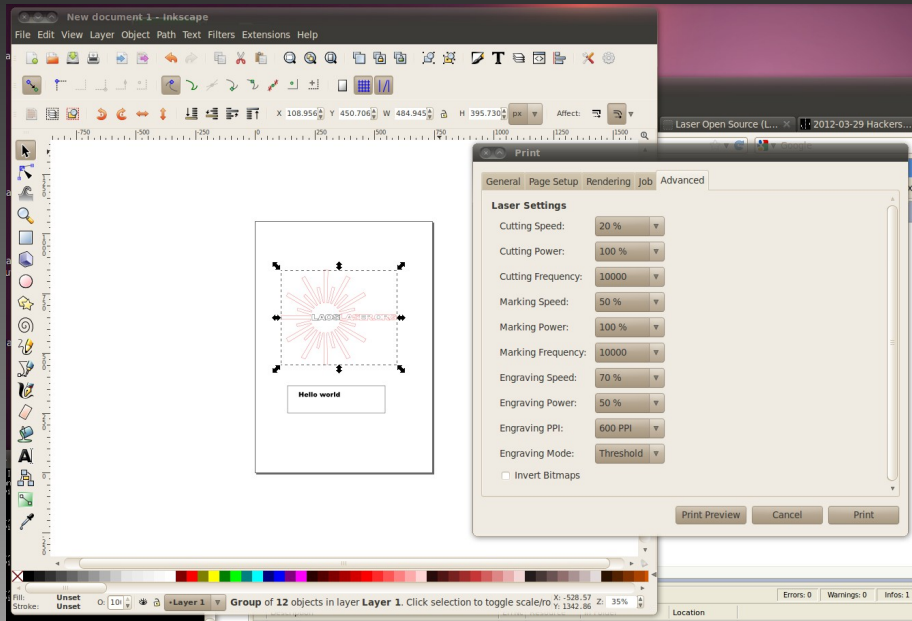
The People

- Jaap Vermaas (fablabtruck.nl)

- Peter Brier (pbrier.nl)

- Jerry Jacobs (xor-gate.org, electronics pcb design)

- Bart Bakker (mini fablab: offered his system)

- Protospace.nl: (various people): provide laser system and coffee

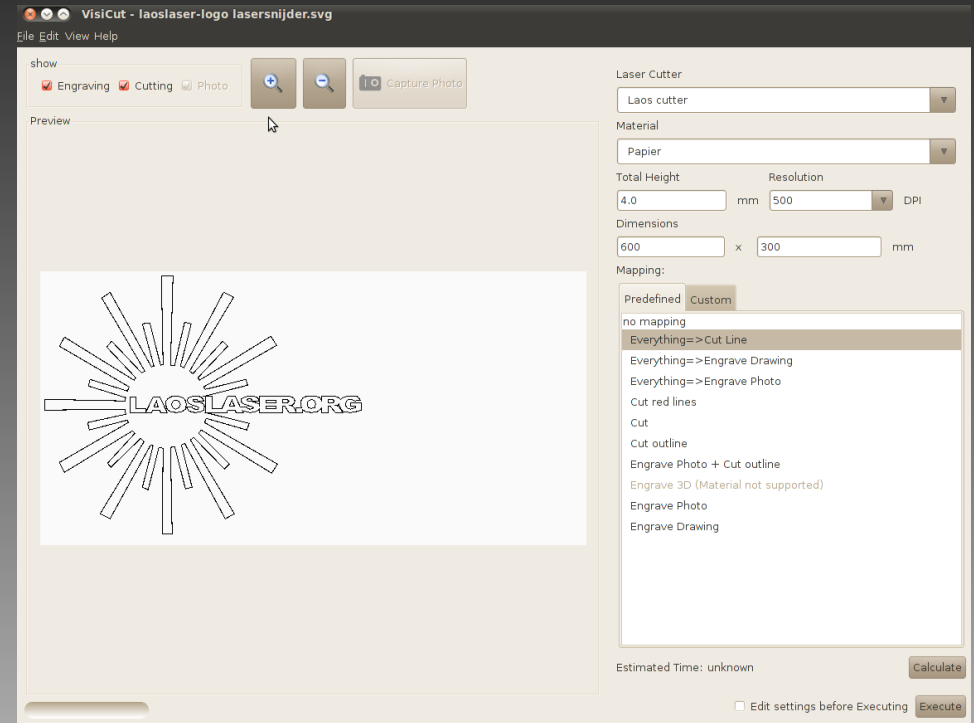- Thomas Oster (fab Lab Aachen): Visicut

The Technology

- Software:

    - Postscript based CUPS printer driver using PSTOEDIT for conversion to gcode-like file

    - VisiCUT, stand alone JAVA program for cutting

    - Embedded firmware inside the laser with TCP/IP, SD-card, I2C display and stepper motor drivers

- Hardware:

    - MBED: LPC1678 cortex M3 ARM

    - Pololu steppers or exernal driver
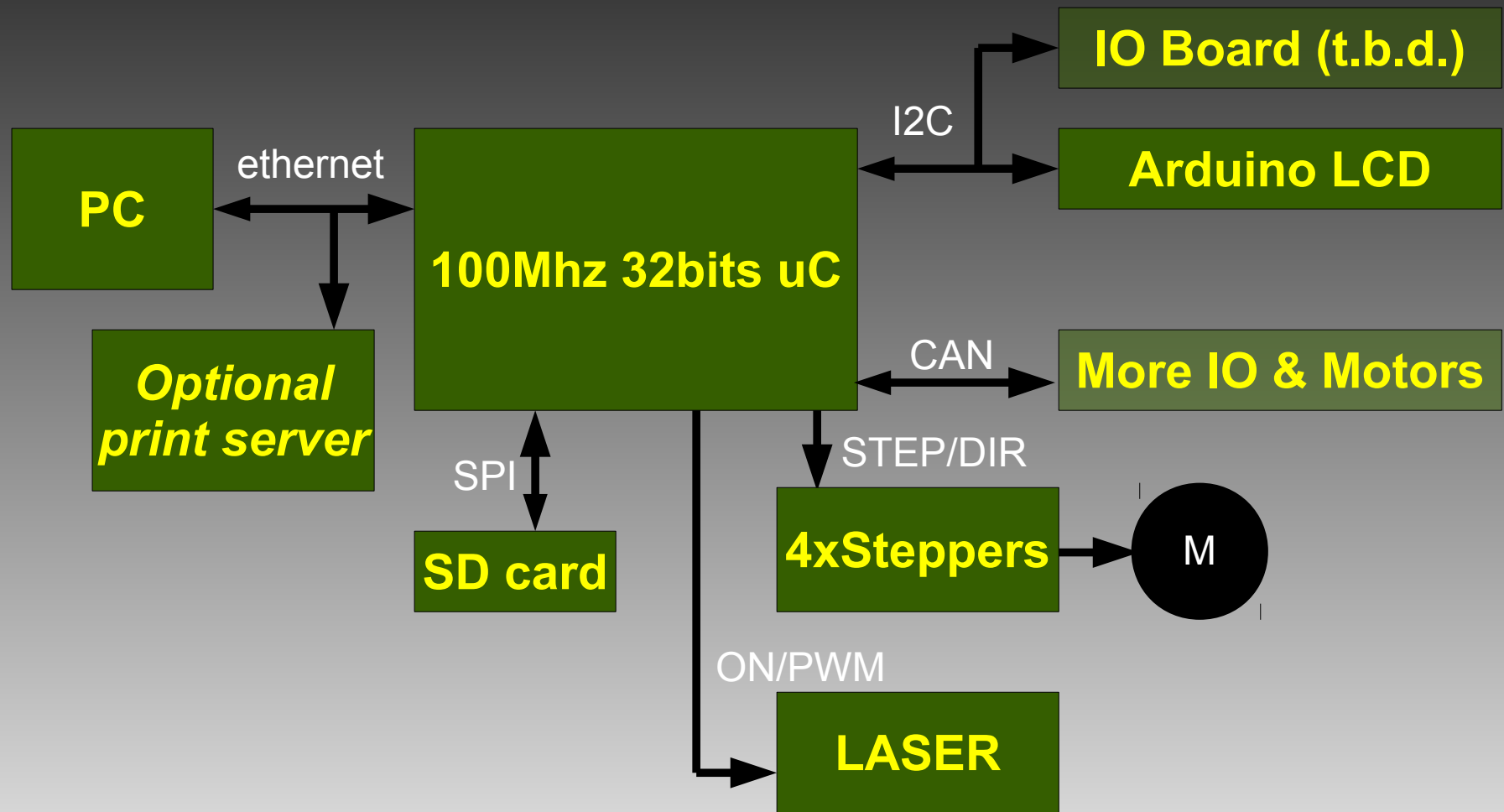
The Technology - Software
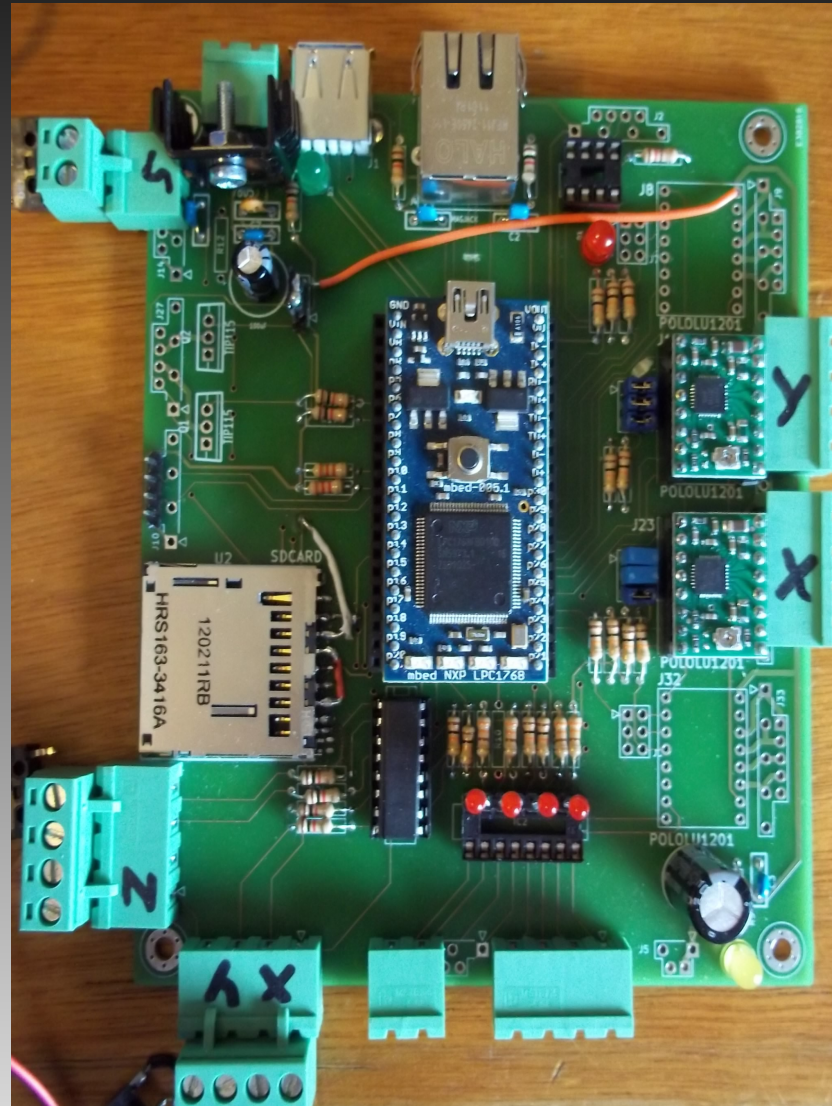

Inkscape with CUPS
LAOS driver

Visicut (stand alone)

The Technology - Design

IO Board (t.b.d.)

Arduino LCD

I2C

PC

ethernet

100Mhz 32bits uC

Optional print server

CAN

More IO & Motors

SPI

STEP/DIR

SD card

4xSteppers

M

ON/PWM

LASER

The Technology - Electronics

The Technology - Hardware

- KiCAD used for PCB design (open source schematic, board layout package)

- PCB's 3rd revision: small things always pop up:

  - Text

  - Pinning

  - Footprint problems

- Overall: a happy experience
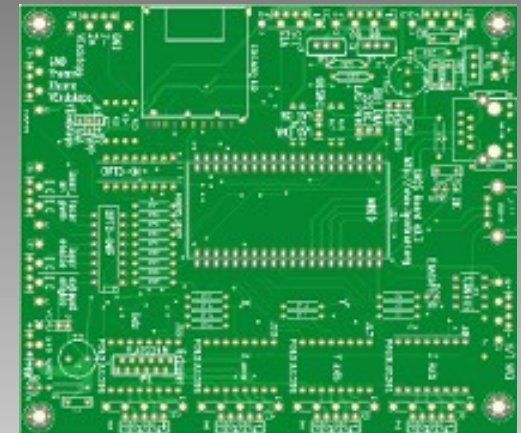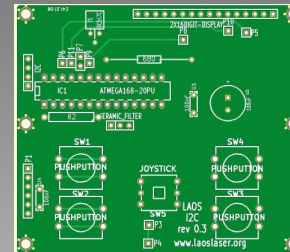
The Status

- Website and wiki, all info and source code online

- Over 75 kits shipped

- 20+ systems running LAOS already!

- Printerdriver for Linux and Visicut (win/mac/linux) are operational

- Basic cutting and engraving, with speed and power settings operational

Testing machine: HPC LASER

The Status: practical

- The board is now available for developers and early adopters.

- There is a cheap desktop laser system available for early adopters

- Good tools available, based on Inkscape and Visicut

- Experience with students: from idea, via inkscape to laser in a short time

The Joys of open source:

- Yesterday during a talk there was the request for a simple power/speed scan for lab use: test material settings

- 10 lines of lua code:

```lua
-- A small lua script to laser a 10x10 speed/power scan
x = 30;
y = 30;
for i=1,10 do
  for j=1,10 do
    speed(10*i);
    power(10*j);
    box(1+x + (10*i), 1+y+(10*j),8,8);
  end
end;
```
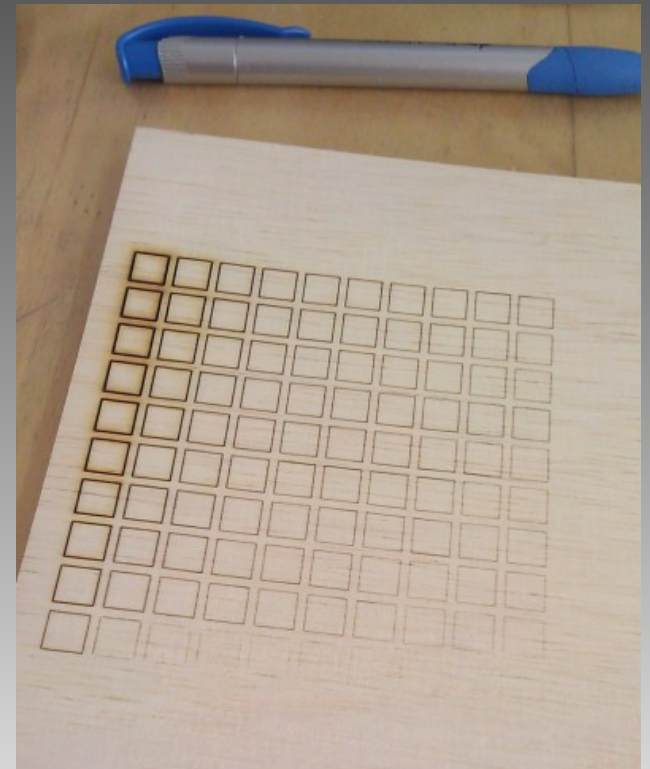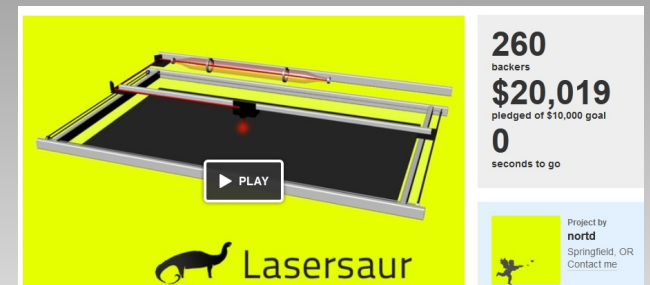
The business Model

Please copy!

- There is no need for the Chineese to ship crippled hardware and software!
  Just copy the Open Source designs (please)

- Revenues can be made by developers by assisting design-ins and special application development

- Tested Hardware + Software can be bundled and shipped as a service (charge for handling)

Other open source projects

Lasersaur (Kickstarter project)

- Focusses on DIY laser system

- Less focus on electronics and software toolchain

- Complementary (you can use Laos board and software on lasersaur laser)

260
backers

$20,019
pledged of $10,000 goal

0
seconds to go

Project by
nortd
Springfield, OR
Contact me

Lasersaur

The future?

- More systems...

- More contributors...

- More robust...

- More plug and play...

- Creative uses of the hardware!

  WORKSHOP TOMORROW! Play with the Laser

  (bring your own laptop and SVG design files!)