

Didattica Aperta

Making libero nella didattica

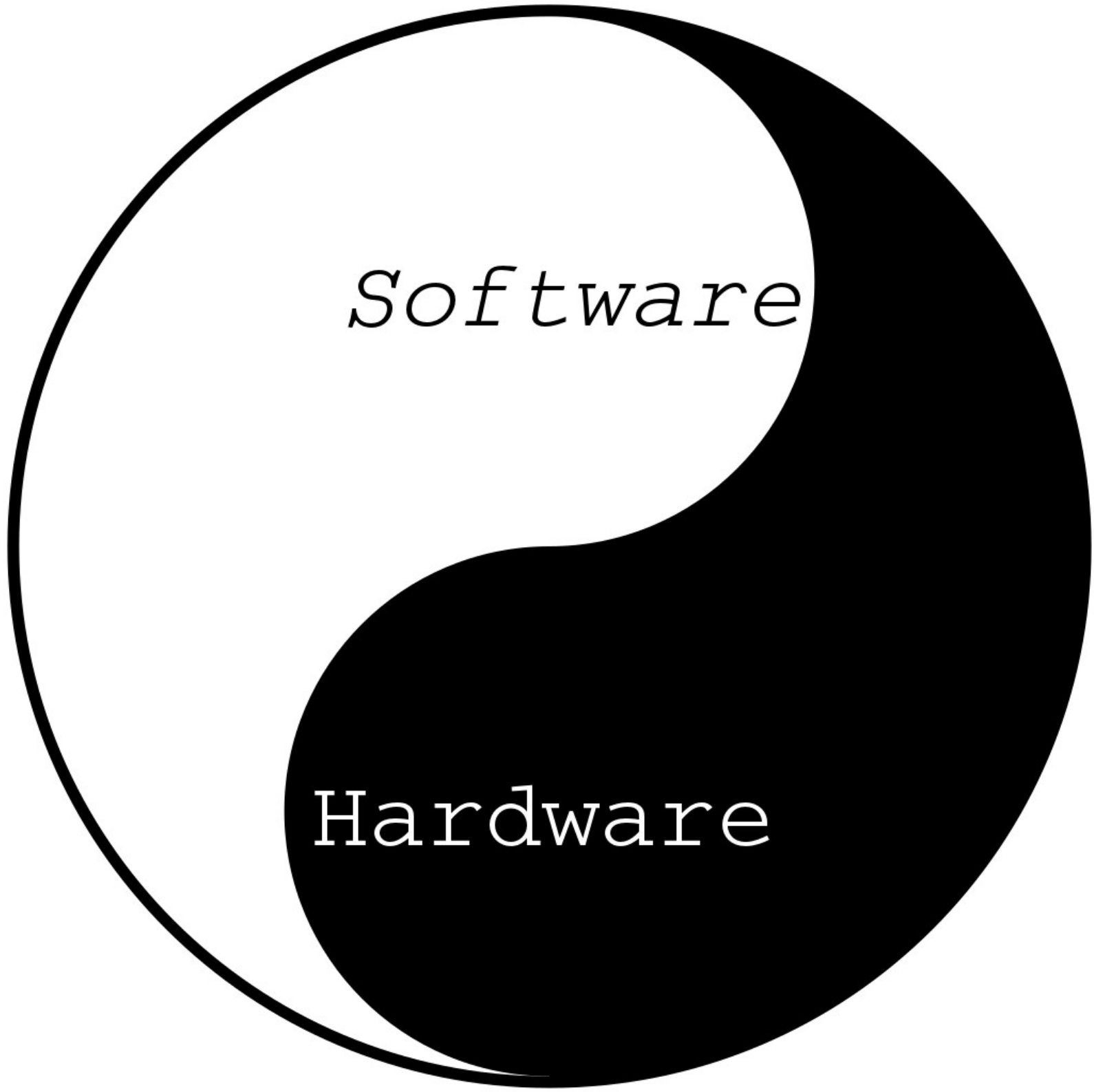
Renzo Davoli

November 29, 2014

- I READ \Rightarrow I FORGET
- I SEE \Rightarrow I REMEMBER
- I DO \Rightarrow I UNDERSTAND

- I READ \Rightarrow I FORGET
- I SEE \Rightarrow I REMEMBER
- ~~I DO~~ \Rightarrow I UNDERSTAND

I MAKE \Rightarrow I UNDERSTAND



HARDWARE = ATOMS

SOFTWARE = KNOWLEDGE

H
A
C
MAKER
E
R

. . . of the SW of things

XX century:

Post-modern(?) era = Modern Middle-Age

Age of Hardware
to have, to own

XXI century - 3rd millennium

Second Renaissance

Age of Software

To be, to know

Modern middle age: PUSH market
\$\$\$ -> knowledge generation ->
creation of needs -> fabrication ->
advertising -> selling -> planned
obsolescence -> market control and
limitations (patents, secrets,
prohibitions, pay per copy)

Second Renaissance: PULL market
Needs + Professional Capabilities ->
crowdfunding -> \$\$\$ -> knowledge
generation -> fabrication
No secrets - No limits

Modern middle age: PUSH school
Knowledge as a product -> *injections*
of literacy -> certifications
-> **NO JOY**

Second Renaissance: PULL school
Curiosity -> Discovery -> problem
solving -> Real *operational* knowledge
-> **JOY**

Creative Learning

Projects



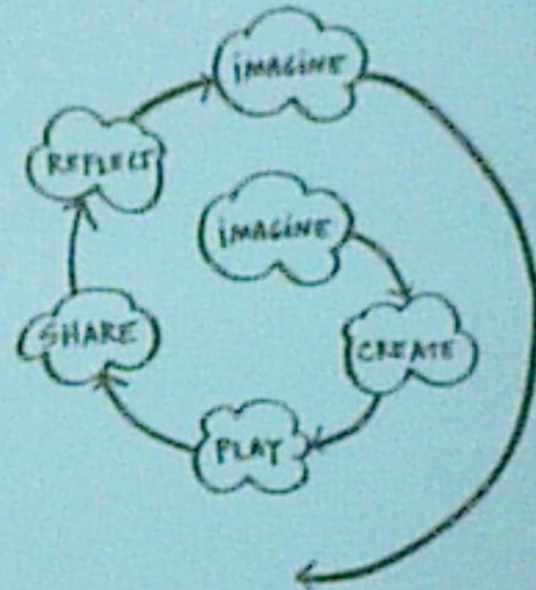
Peers



Passion



Play



CROWDEATIVITY

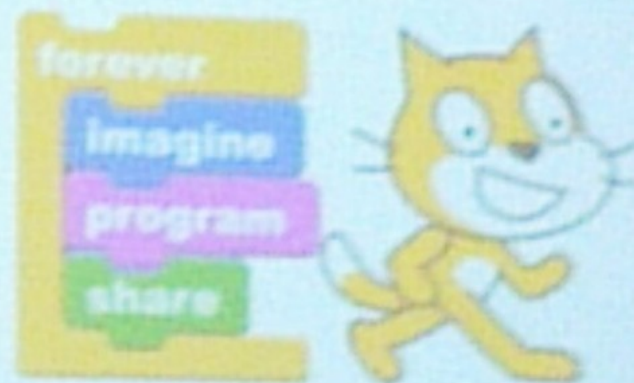
. . . because it's in the Air

Learn to Code - Code to Learn

“Young people today have
lots of experience
interacting with new technologies,
but a lot less so of
expressing themselves
with new technologies.

**It's almost as if they
can read but not write”**
(Mitchel Resnick)

SCRATCH



Actions:

- Technology is a means for education not an end.
- The meaning of education comes first
 - Studying *is* a tiring activity (tiring does not mean boring!)
 - It is a form of *cultural training*. We train cultural athletes of the future.
- Definition of heroes and rewards
- Passion, enthusiasm, interest, joy can be only taught by osmosys.
- Teacher Pride

PAPERCLIP

BEGINNER

OF

“Everybody is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.”

from *The Rhythm of Life: Living Every Day with Passion and Purpose* (2004) by Matthew Kelly
Probably misattributed to Albert Einstein.



TEACH STUDENTS TO BE HUMAN!

INTELLIGENT BEHAVIOR =

The ability to {create, build, make}
their {tools, solutions}

They are Actors, Citizens
(no more just viewers or consumers)

**DANGER:
DOING WITHOUT UNDERSTANDING**

**Solution:
Be a {Maker/Hacker}**

ECOLOGY

FIX-REUSE-RECYCLE

Transfer/Store {data, software}
instead of {atoms, hardware}

The experience of RaspIBO an example of very “informal” education

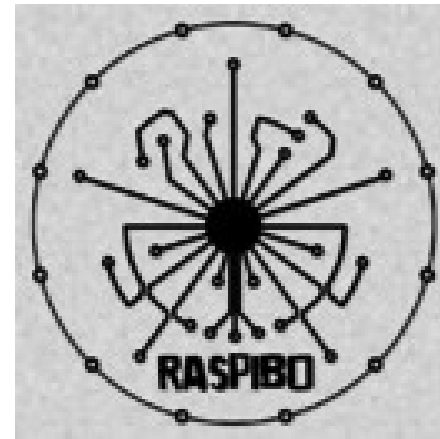
Non-lectures open to the public

Graduated professionals, university and high-school students, artisans, retirees. (age range: 15 to more than 70)

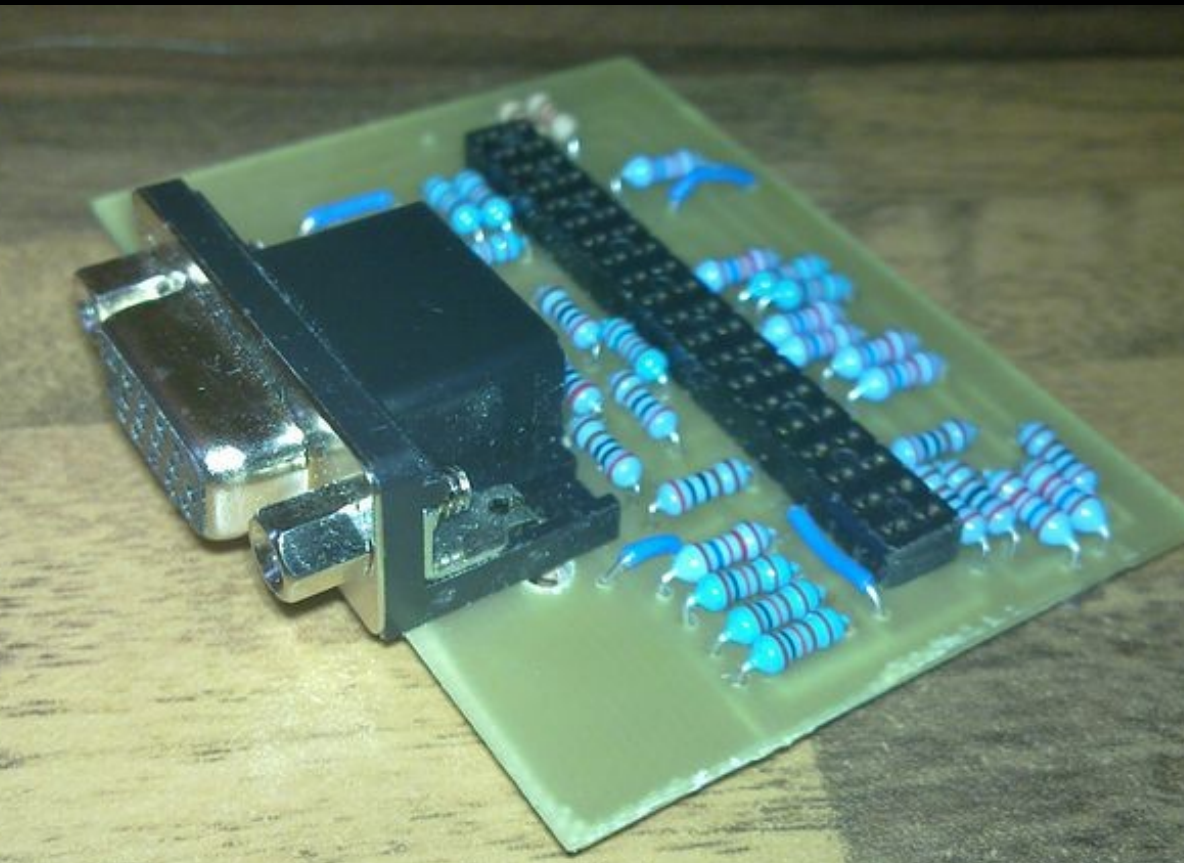
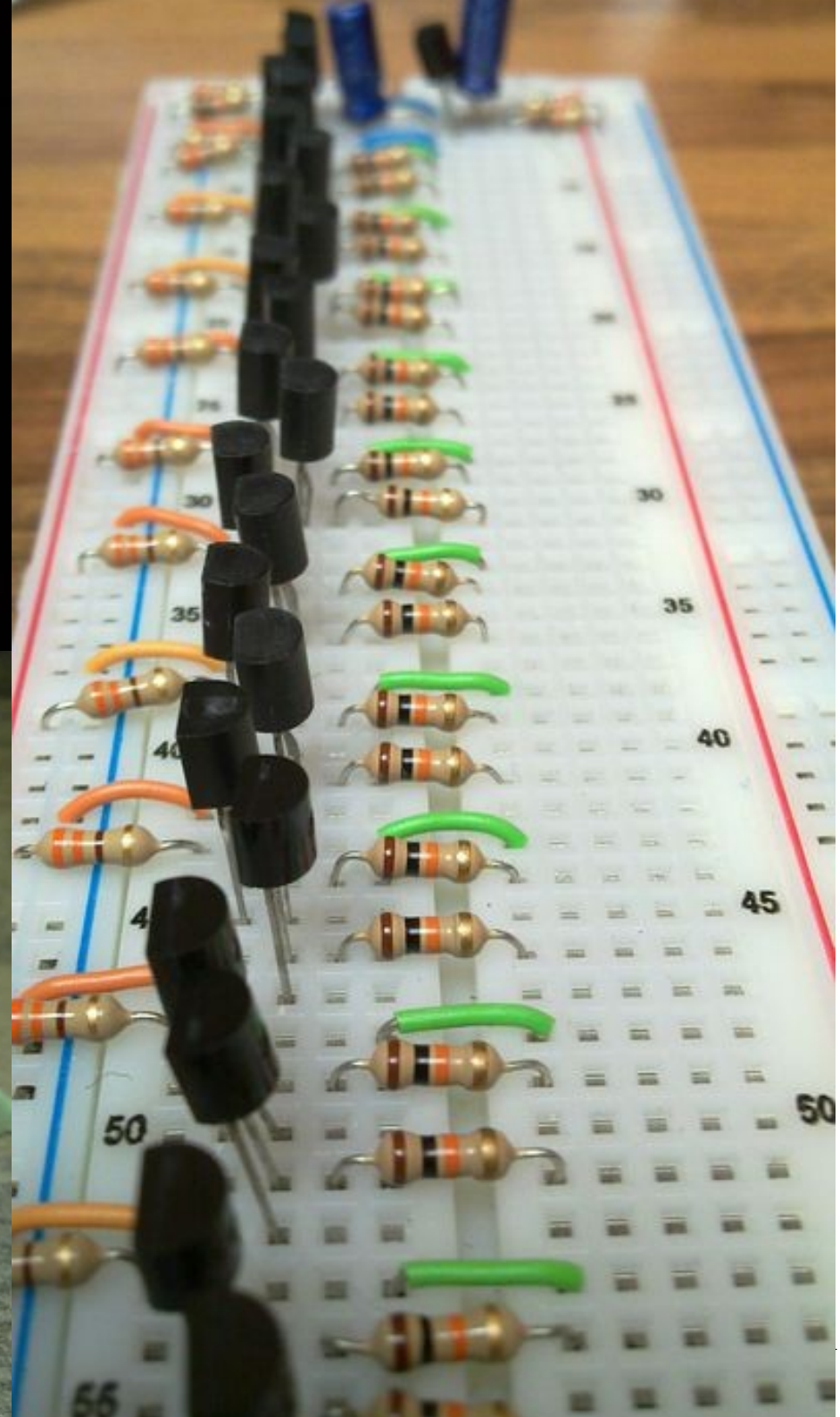
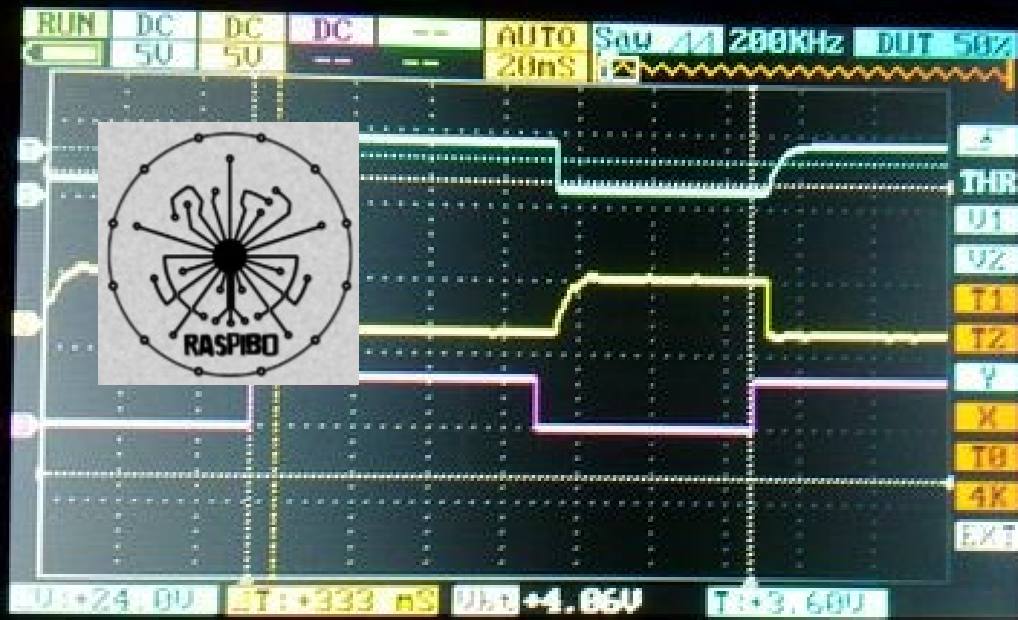
It is not an association, it is just a flash mob of friends sharing the love for experimenting and problem solving.

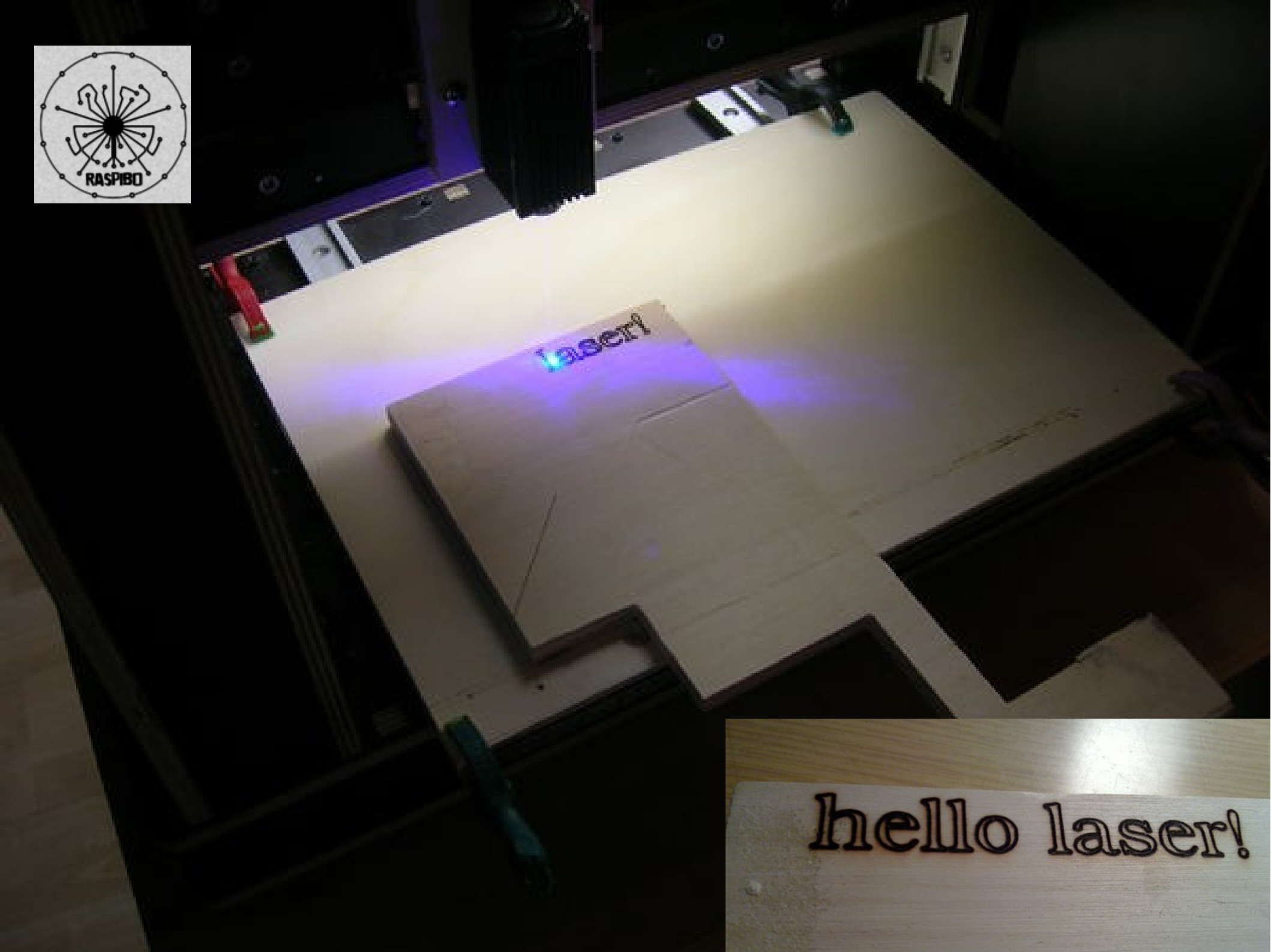
It is a “joyful creative anarchy”.

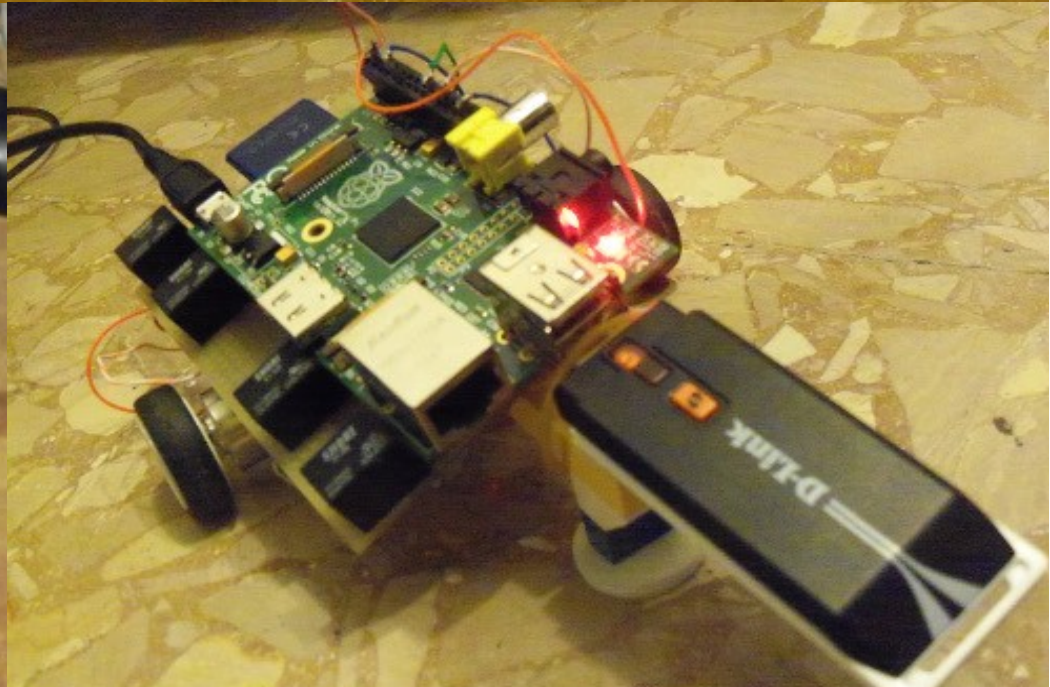
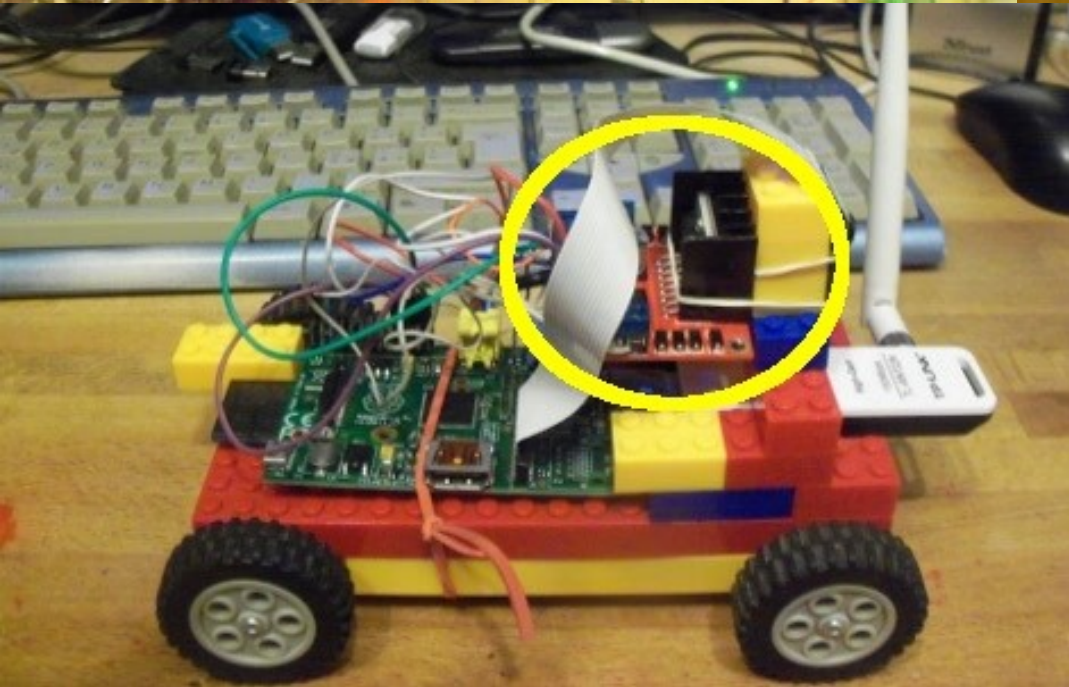
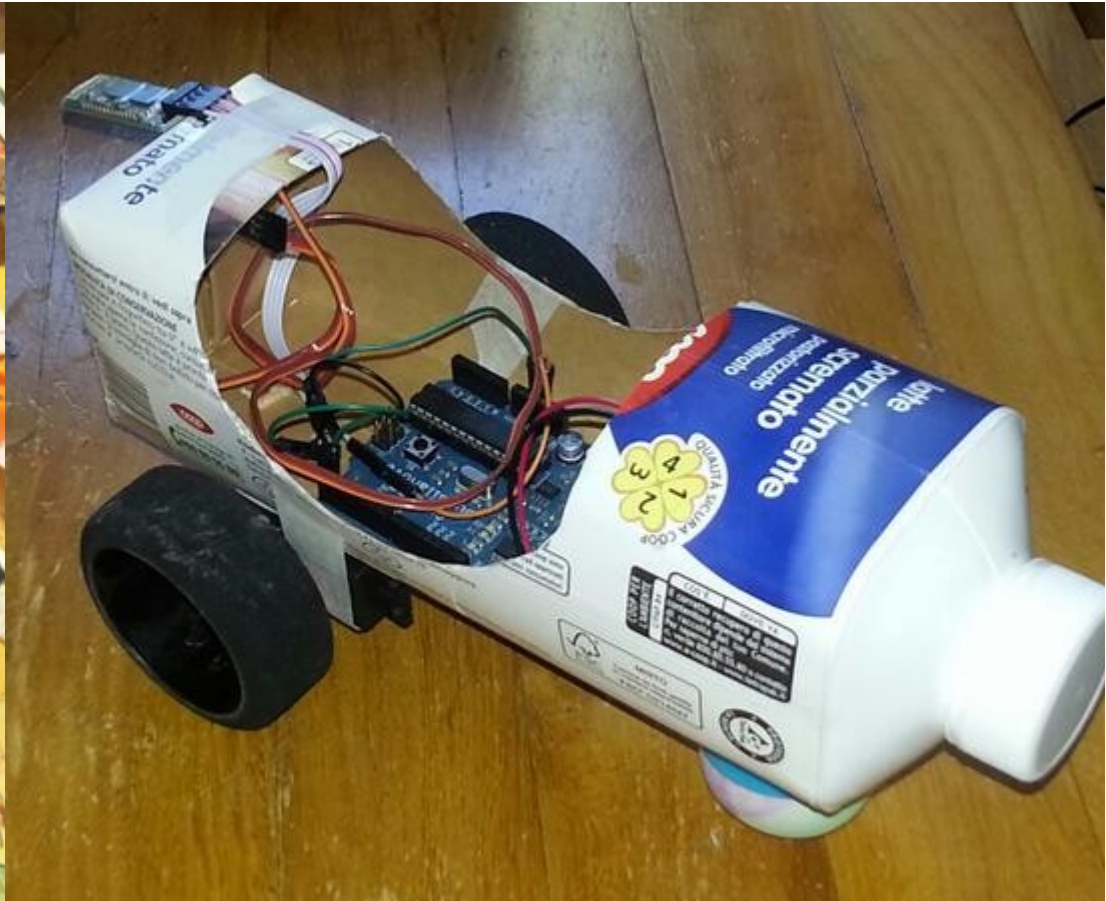
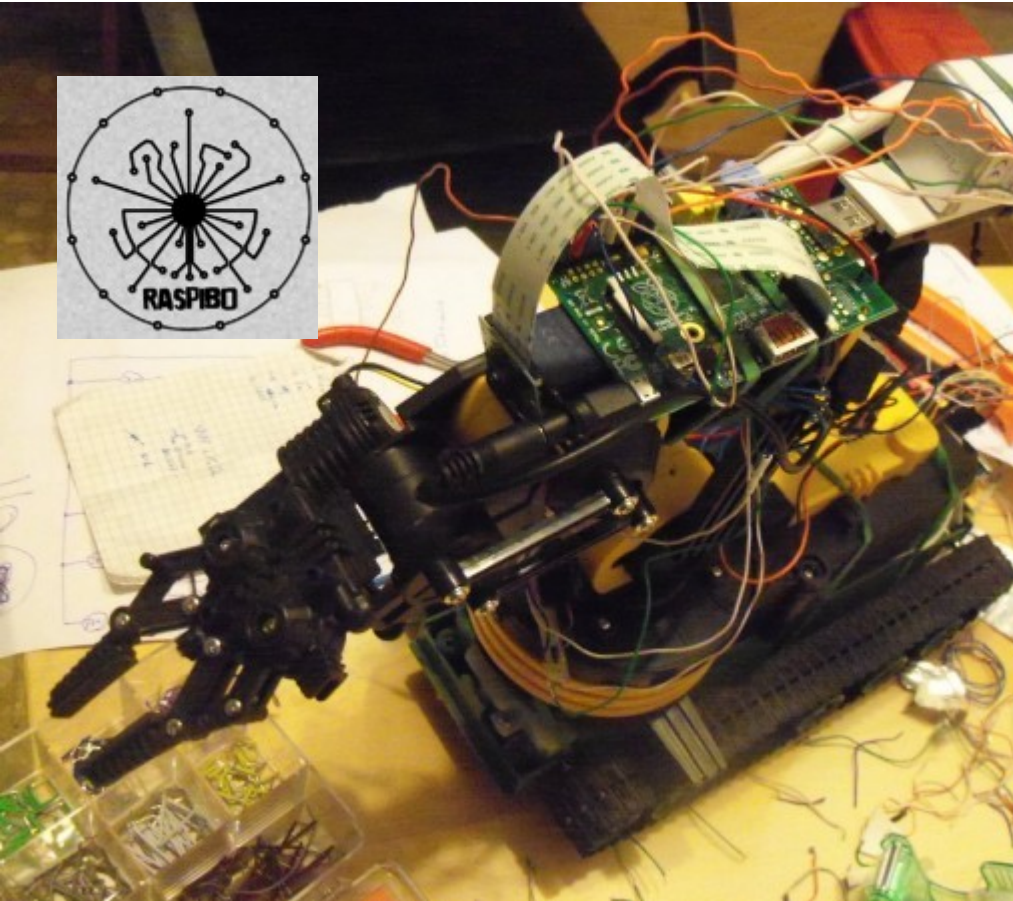
See: www.raspibo.org



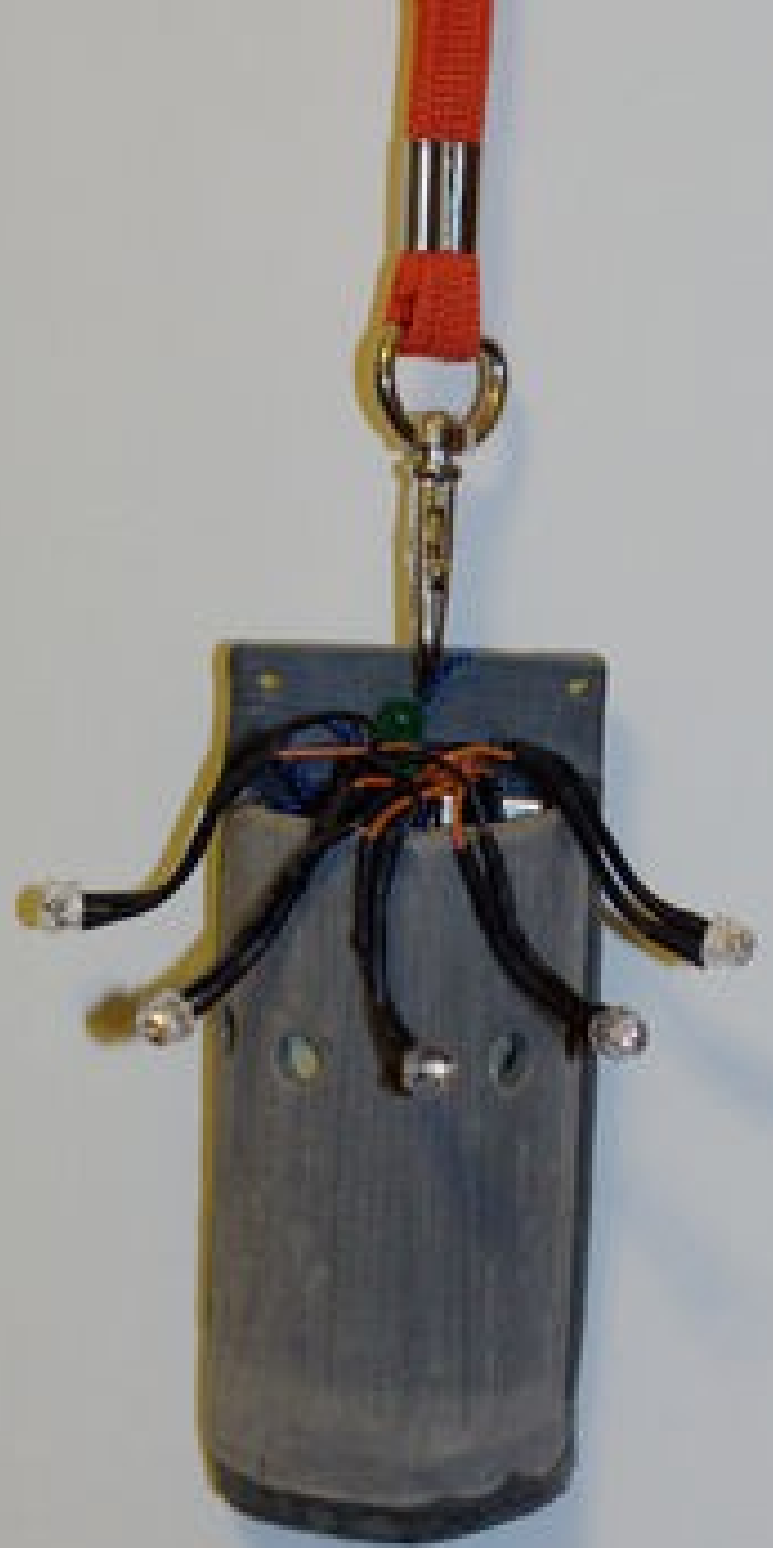
PRACTICAL EXAMPLES



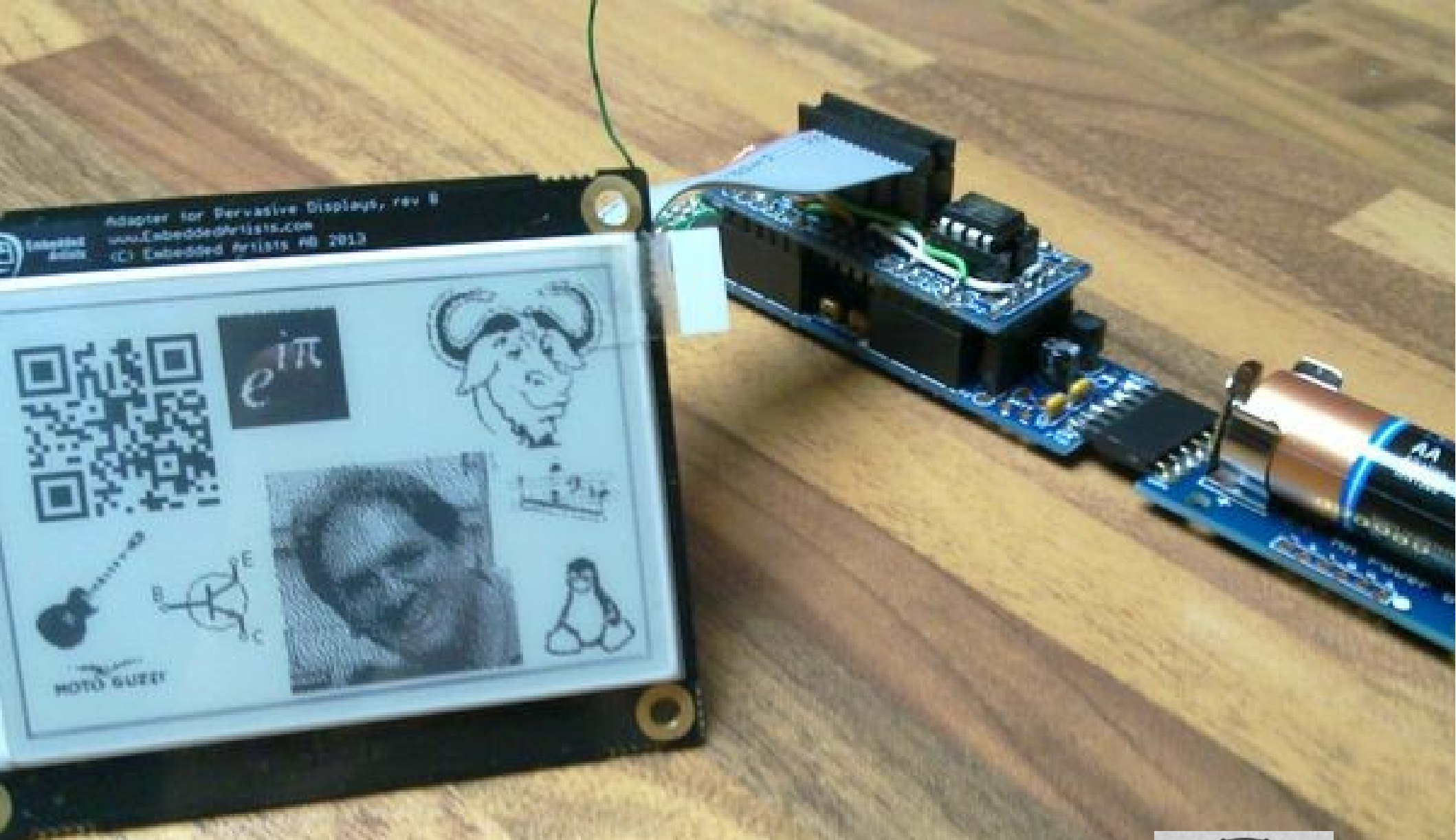












Adapter for Pervasive Displays, rev B
www.Embedded Artists.com
(C) Embedded Artists AB 2013



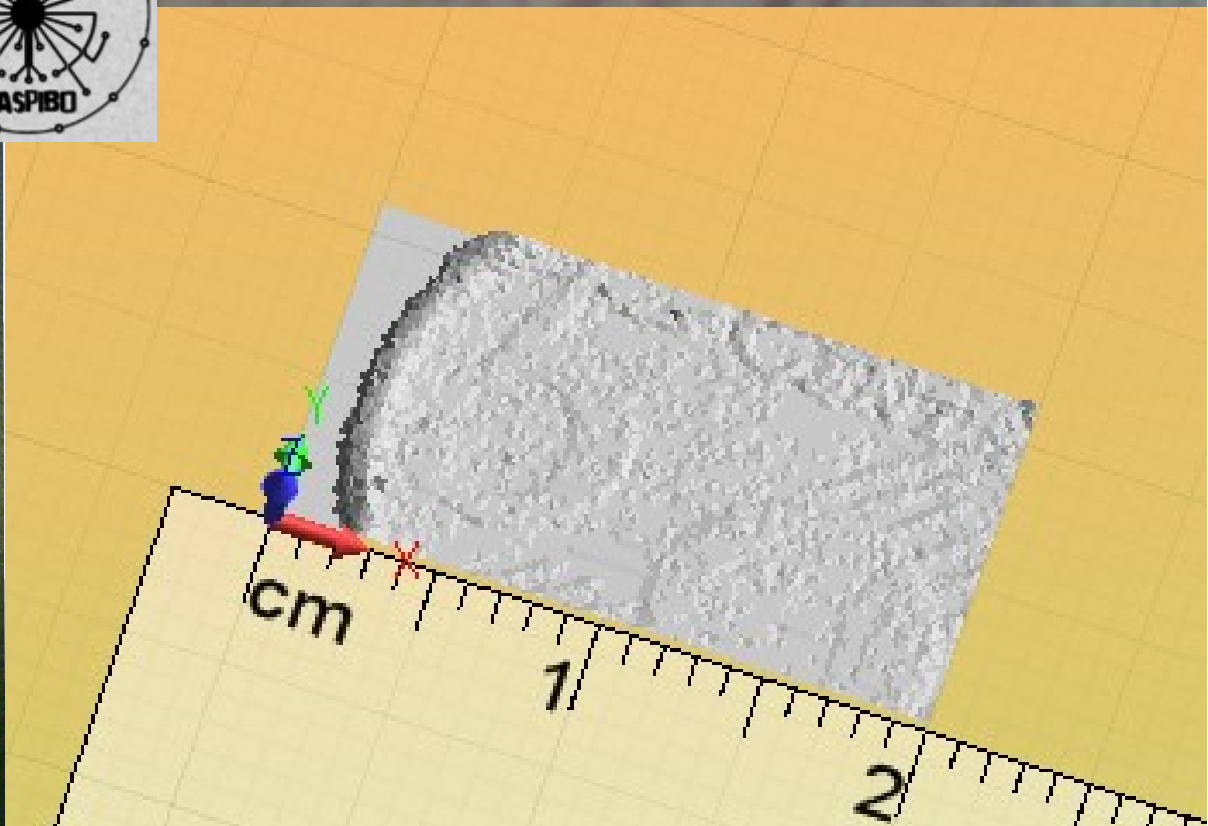
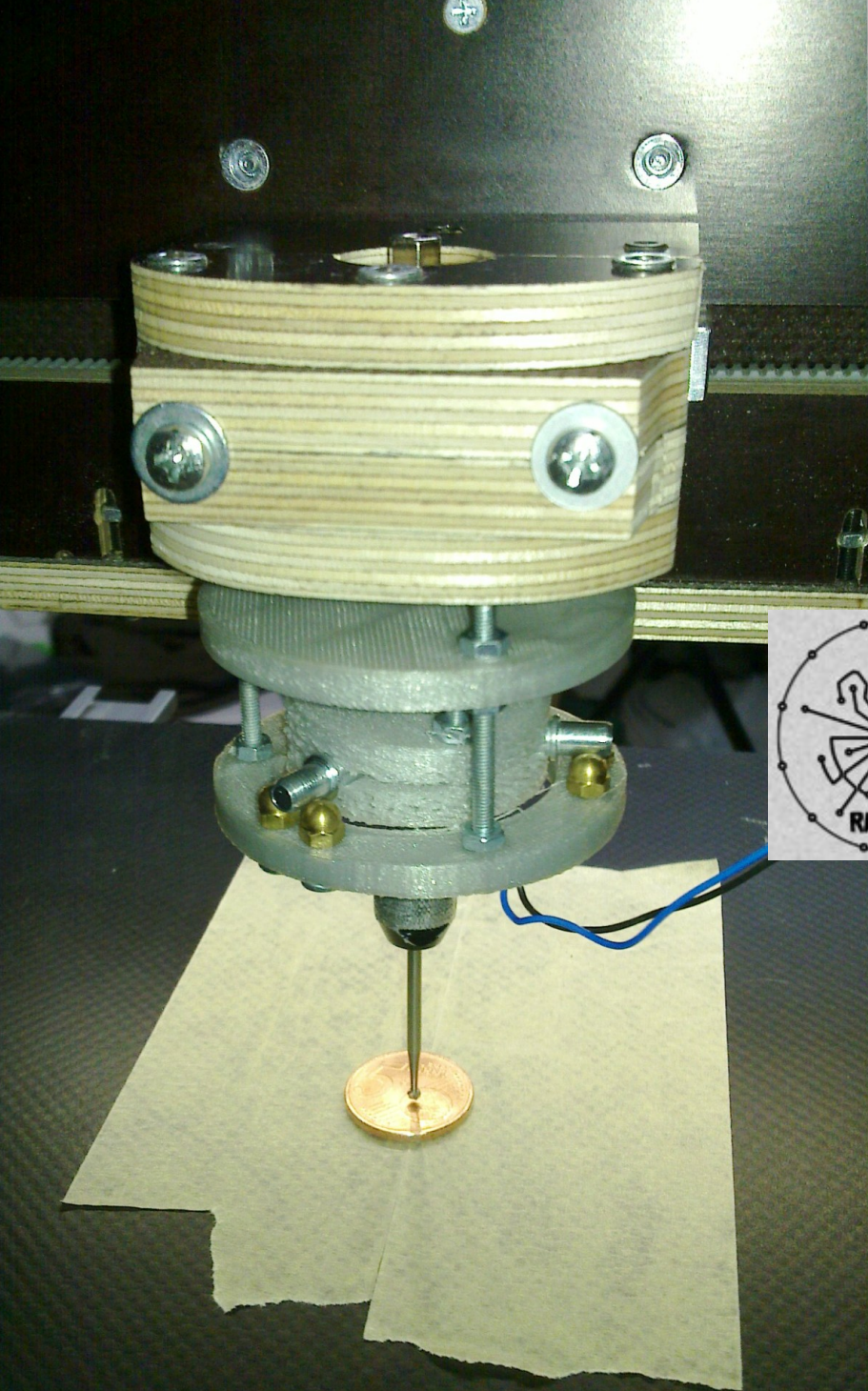
$e^{i\pi}$

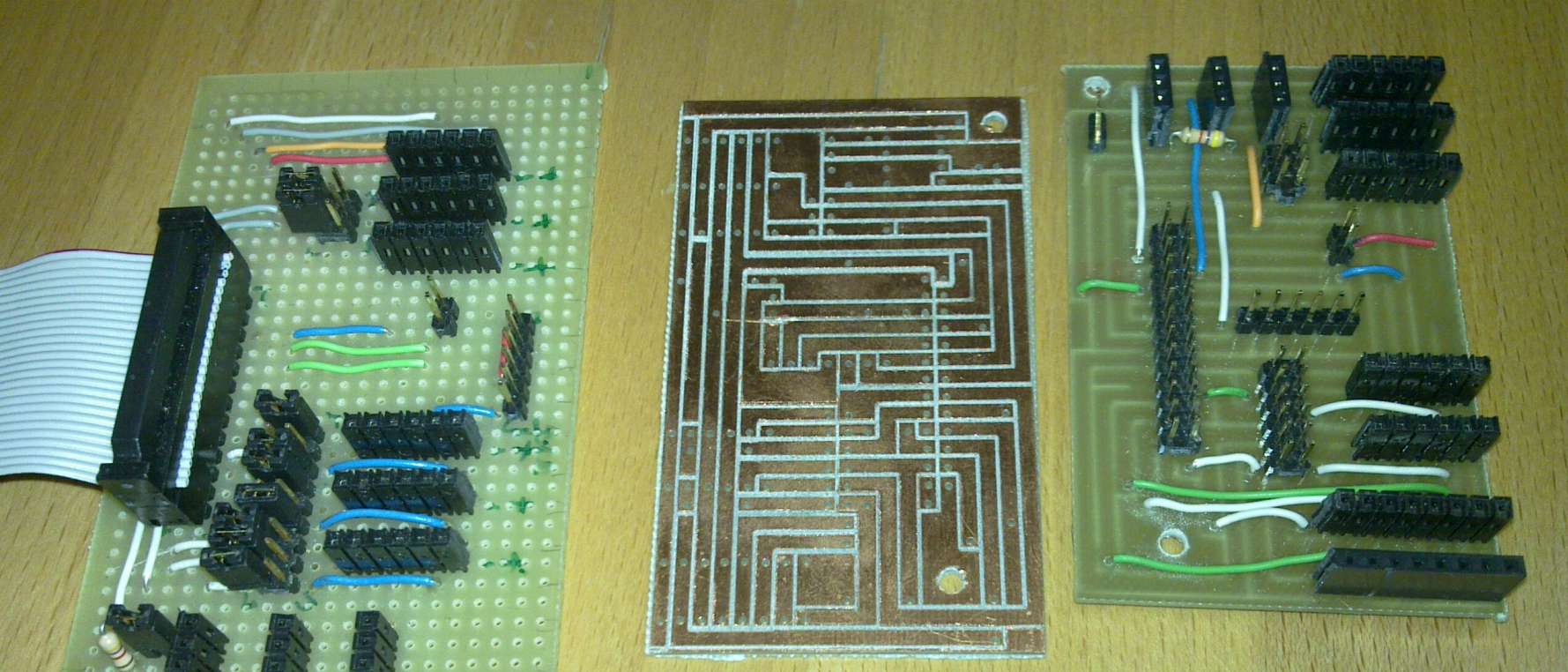


MOTO GUITAR



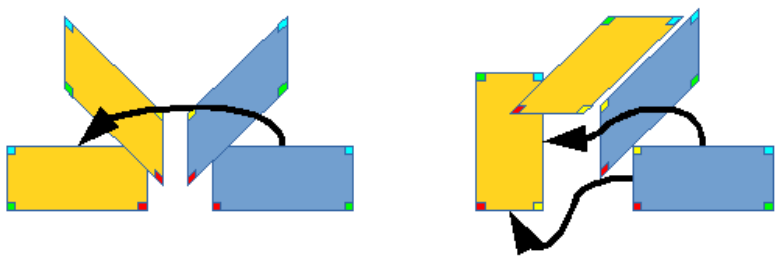
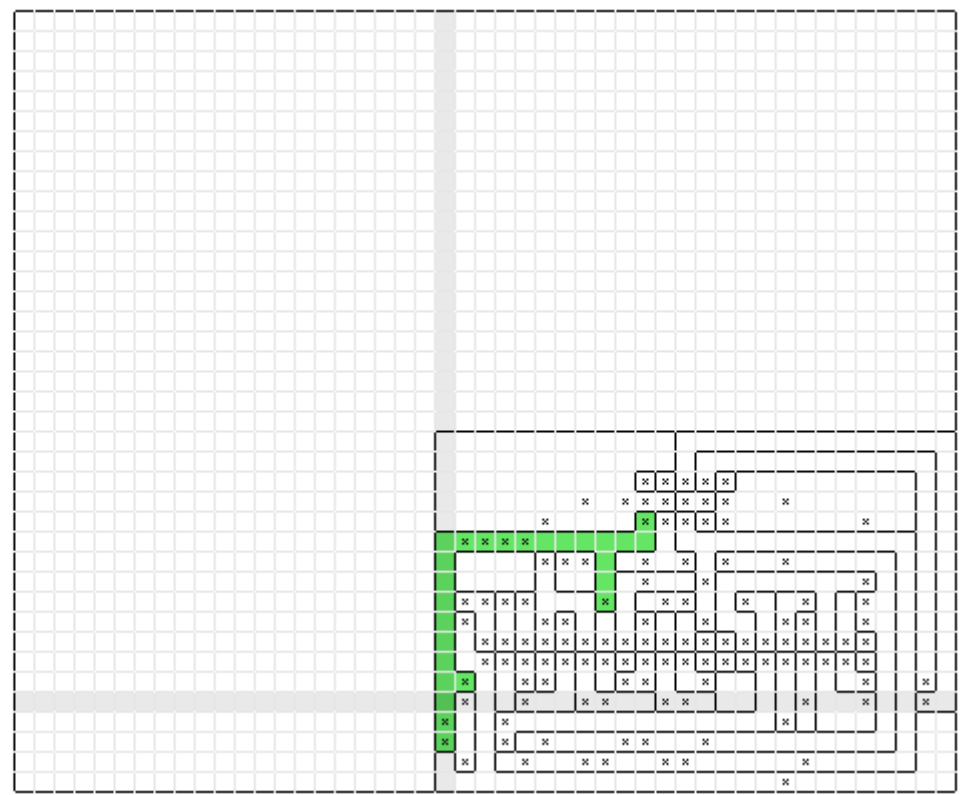


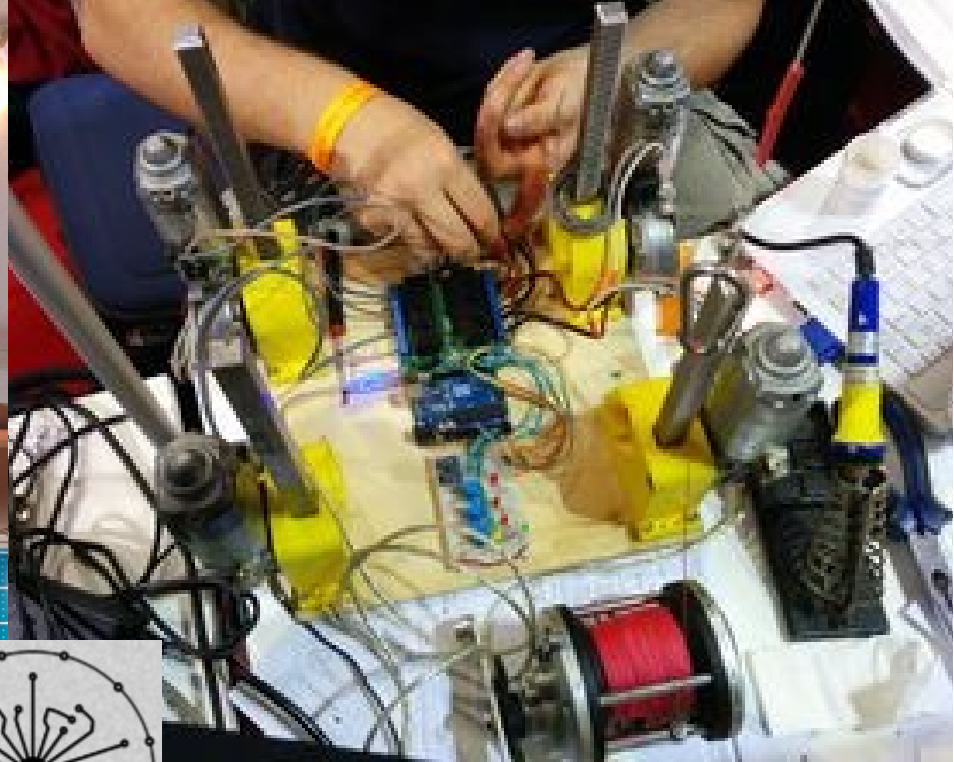


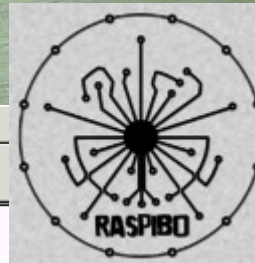


- edit
- select
- undo
- save
- quit

click/drag:
 ⇨extend
 +shift=new track
 +ctrl=add/del hole
 ctrl+z=undo







File Edit View Run Tools Help



Options
 ID: top_block
 Generate Options: WX GUI

Variable
 ID: decima
 Value: 128

UDP Source
 IP Address: 0.0.0.0
 Port: 1.234k
 Payload Size: 1.472k
 Null Pkt is EOF: False

IShort To Complex
 Vector Input: No

Frequency Xlating FIR Filter
 Decimation: 30
 Taps: 1
 Center Frequency: 0
 Sample Rate: 1.95312M

WX GUI FFT Sink
 Title: FFT Plot
 Sample Rate: 65.104k
 Baseband Freq: 0
 Y per Div: 10 dB
 Y Divs: 10
 Ref Level (dB): 0
 Ref Scale (p2p): 2
 FFT Size: 1.024k
 Refresh Rate: 15
 Freq Set Varname: None

Variable
 ID: samp_rate
 Value: 125M

Variable
 ID: decimation
 Value: 64

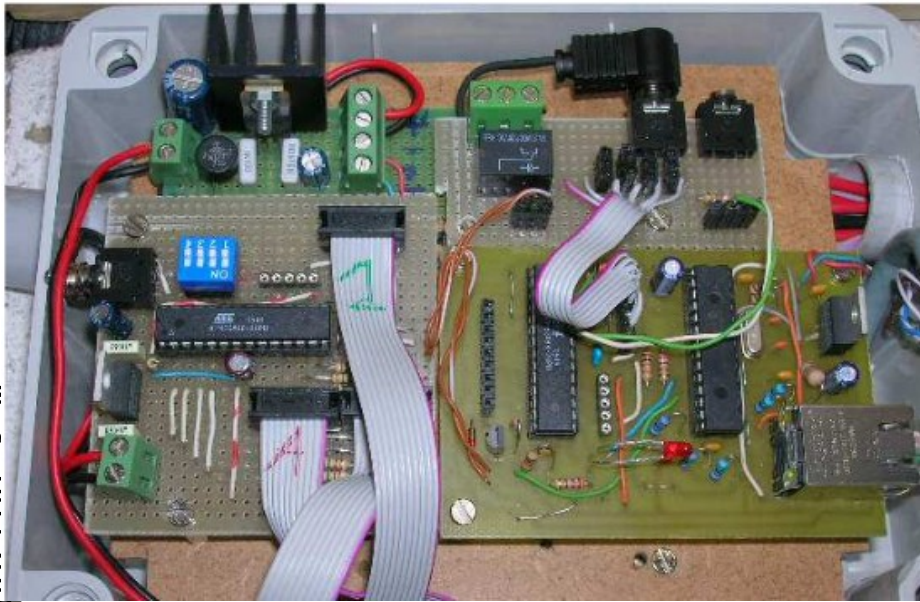
Low Pass Filter
 Decimation: 1
 Gain: 1
 Sample Rate: 65.104k
 Cutoff Freq: 5k
 Transition Width: 100
 Window: Hamming
 Beta: 6.76

AGC2
 Attack Rate: 625u
 Decay Rate: 10u
 Reference: 1
 Gain: 1
 Max Gain: 65.536k

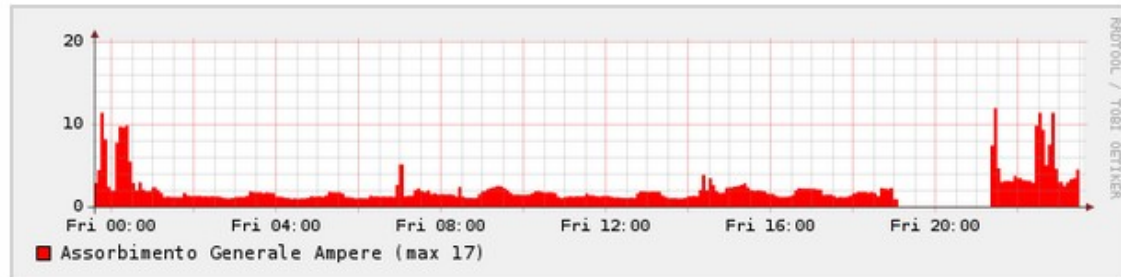
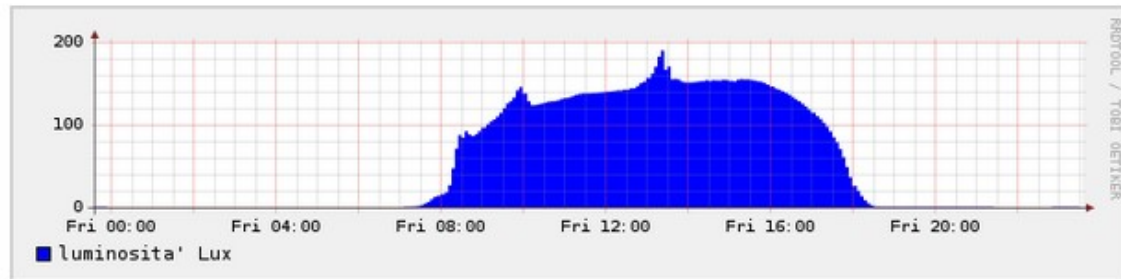
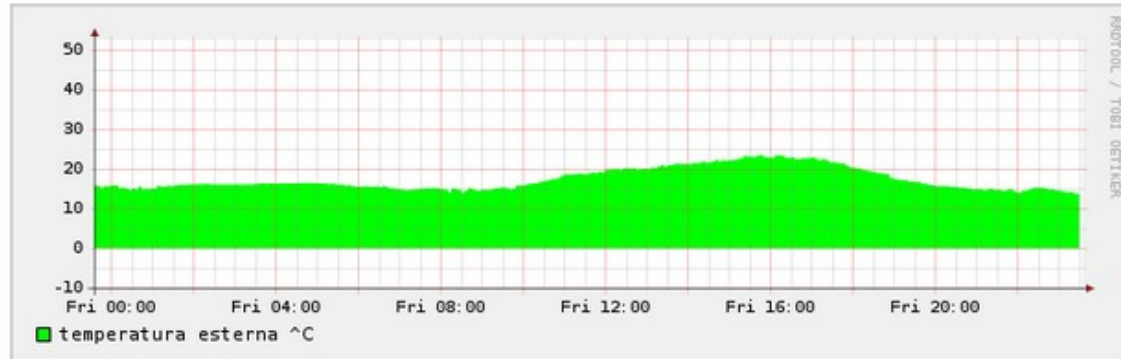
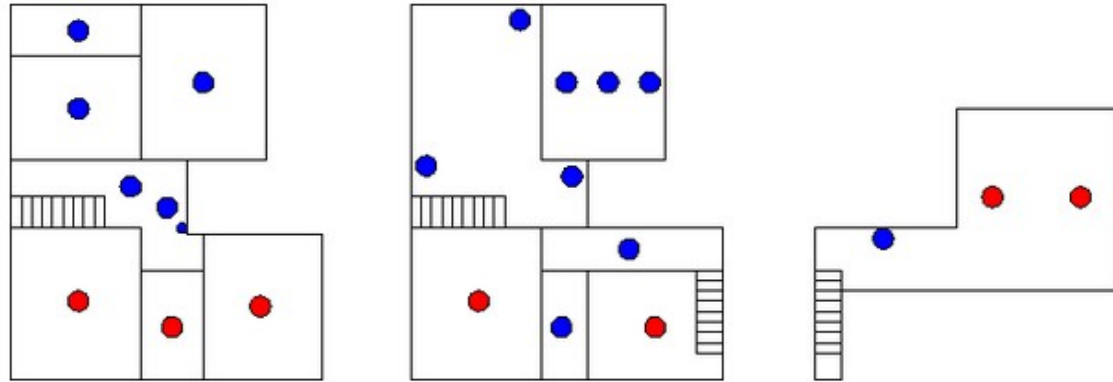
Complex to Mag

DC Blocker
 Length: 32
 Long Form: True

- ▷ [Audio]
- ▷ [Boolean Operators]
- ▷ [Byte Operators]
- ▷ [Channelizers]
- ▷ [Channel Models]
- ▷ [Coding]
- ▷ [Control Port]
- ▷ [Debug Tools]
- ▷ [Deprecated]
- ▷ [Digital Television]
- ▷ [Equalizers]
- ▷ [Error Coding]
- ▷ [FCD]
- ▷ [File Operators]
- ▷ [Filters]
- ▷ [Fourier Analysis]
- ▷ [GUI Widgets]
- ▷ [Impairment Models]
- ▷ [Instrumentation]



Domus





Set Origin Transform Window Machining

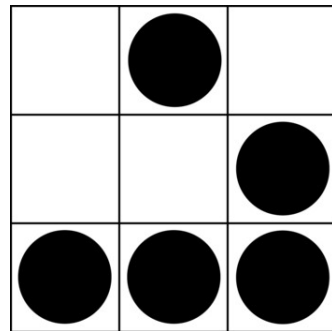
Select Mode
Left button for selecting objects
(with Ctrl key for extra objects)
(with Shift key for similar objects)
Drag with left button to window select
or to move object if on an object
Mouse wheel to zoom in and out
Middle button to rotate view
(with Ctrl key to pan view)
Right button for object menu
See options window to hide this help
(view options->screen text)

Program Output



We are still creating art and beauty on a
computer:

the art and beauty of revolutionary ideas
translated into (libre) code...



renzo, rd235, iz4dje