RASPBERRY PI

NICO MAAS

PI AND MORE 10 1/2

WER BIN ICH?

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- Master of Science
- IT Systemelektroniker
- mail@nico-maas.de
- www.nico-maas.de
- @nmaas87

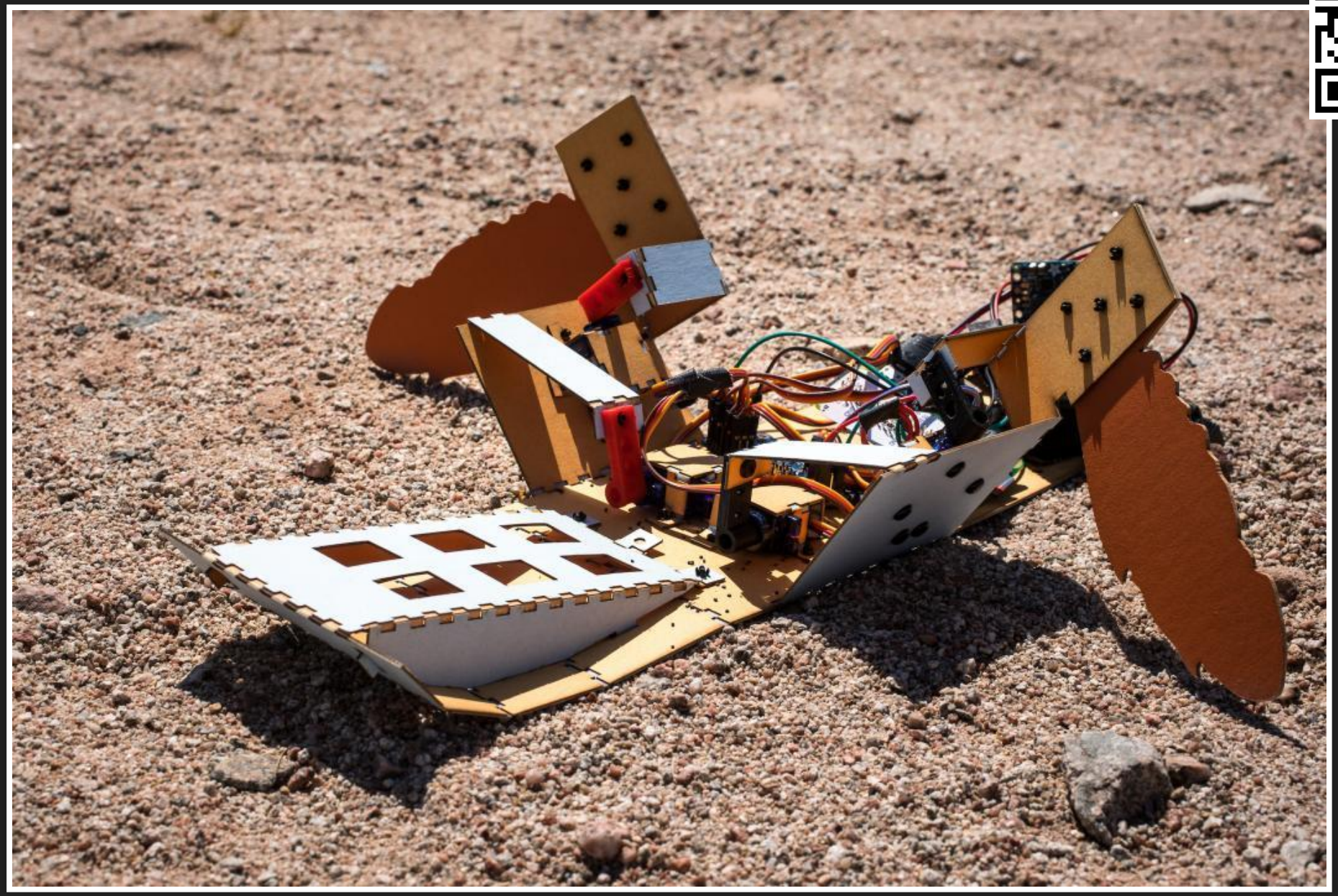
AGENDA

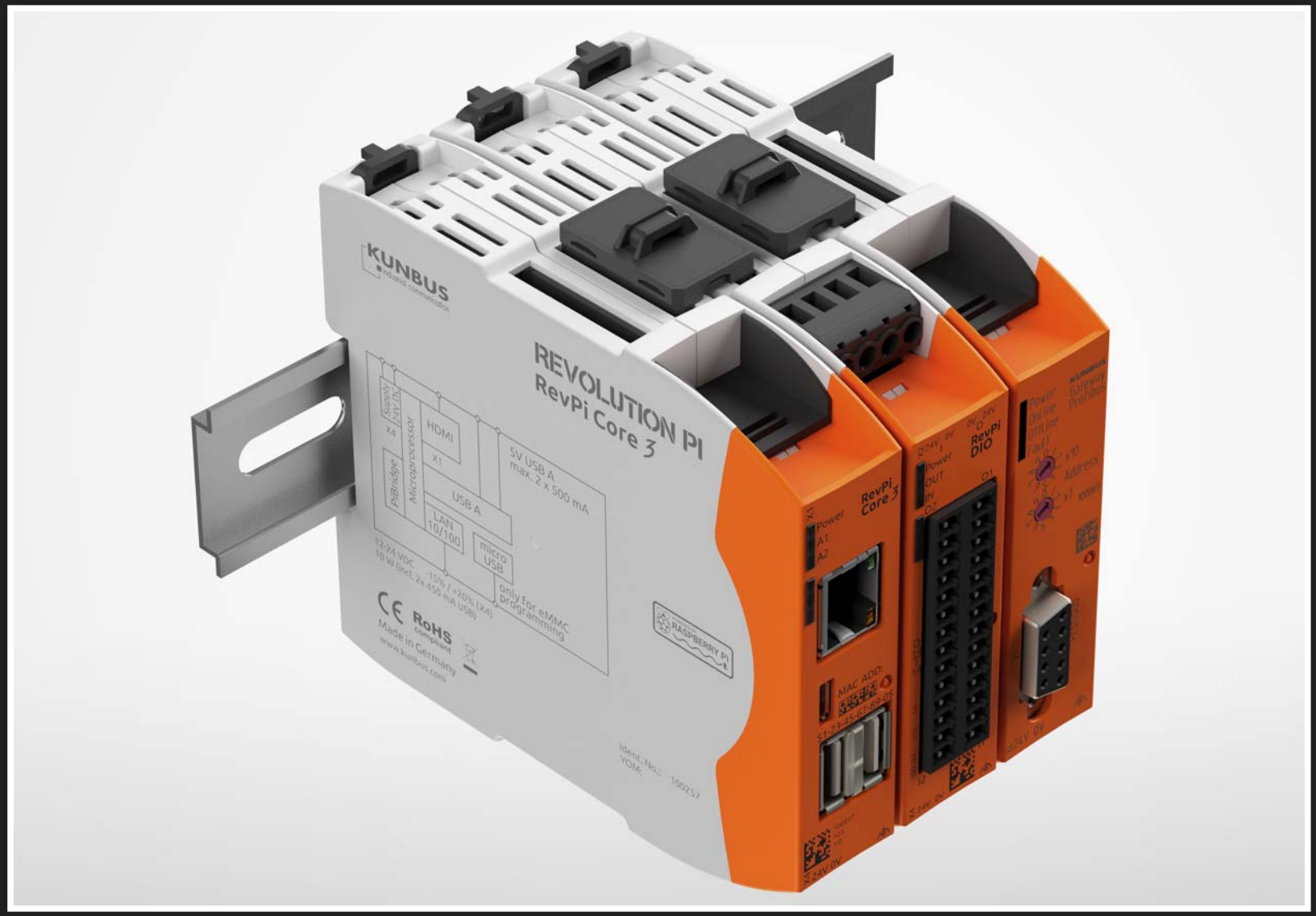
- Einführung
  - Geschichte
  - Woher der Erfolg?
  - Beispielprojekte
  - Nur der RPi?
- Erste Schritte
- Mehr Raspberry Pi
- Ende

EINFÜHRUNG

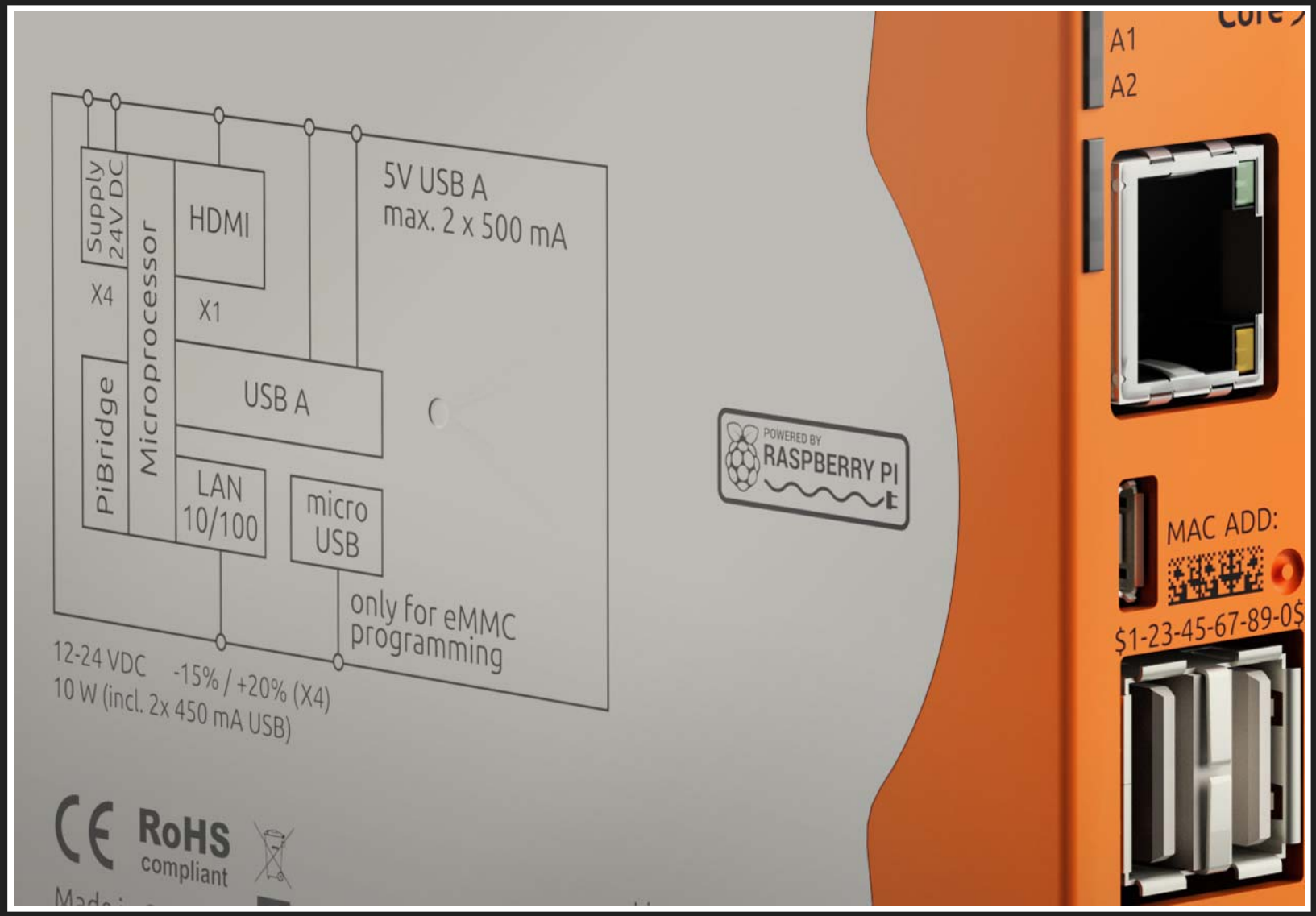

BUBBLE BOBBLE
TAITO


MAME PROJECT




KUNBUS
REVOLUTION PI
RevPi Core 3
HDMI
X1
USB A
LAN 10/100
micro USB
5V USB A
max. 2 x 500 mA
only for eMMC programming
RoHS
Made in Germany
RASPBERRY PI
RevPi Core 3
RevPi DIO

?


Supply 24V DC
X4
Microprocessor
HDMI
X1
USB A
PiBridge
LAN 10/100
micro USB
5V USB A
max. 2 x 500 mA
only for eMMC programming
12-24 VDC -15% / +20% (X4)
10 W (incl. 2x 450 mA USB)
CE
RoHS compliant
POWERED BY RASPBERRY PI
A1
A2
MAC ADD:
$1-23-45-67-89-0$


POWERED BY
Raspberry Pi

29.02.2012 - LAUNCH

10.000 Einheiten.

> 100.000 Vorbestellungen.

08.09.2016 - ESTABLISHMENT

~~> 100.000 Vorbestellungen.~~

10 Millionen verkauft.

19.07.2017 - CURRENT STATE

~~10 Millionen verkauft.~~

BBC Micro: 1.5 Millionen

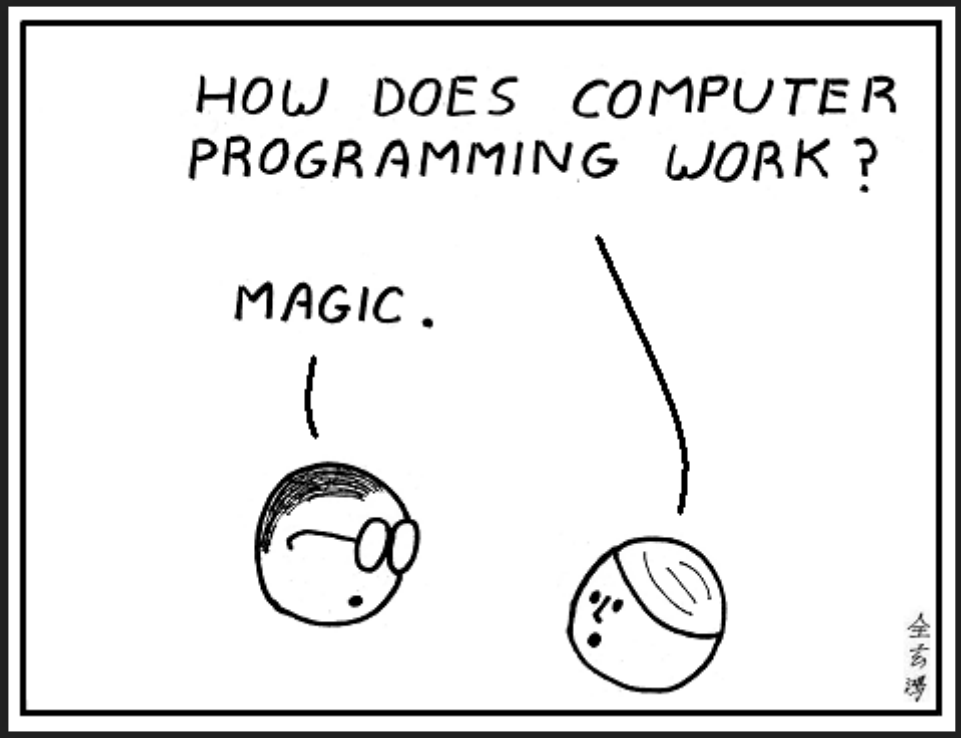
Sinclair ZX Spectrum: 5 Millionen

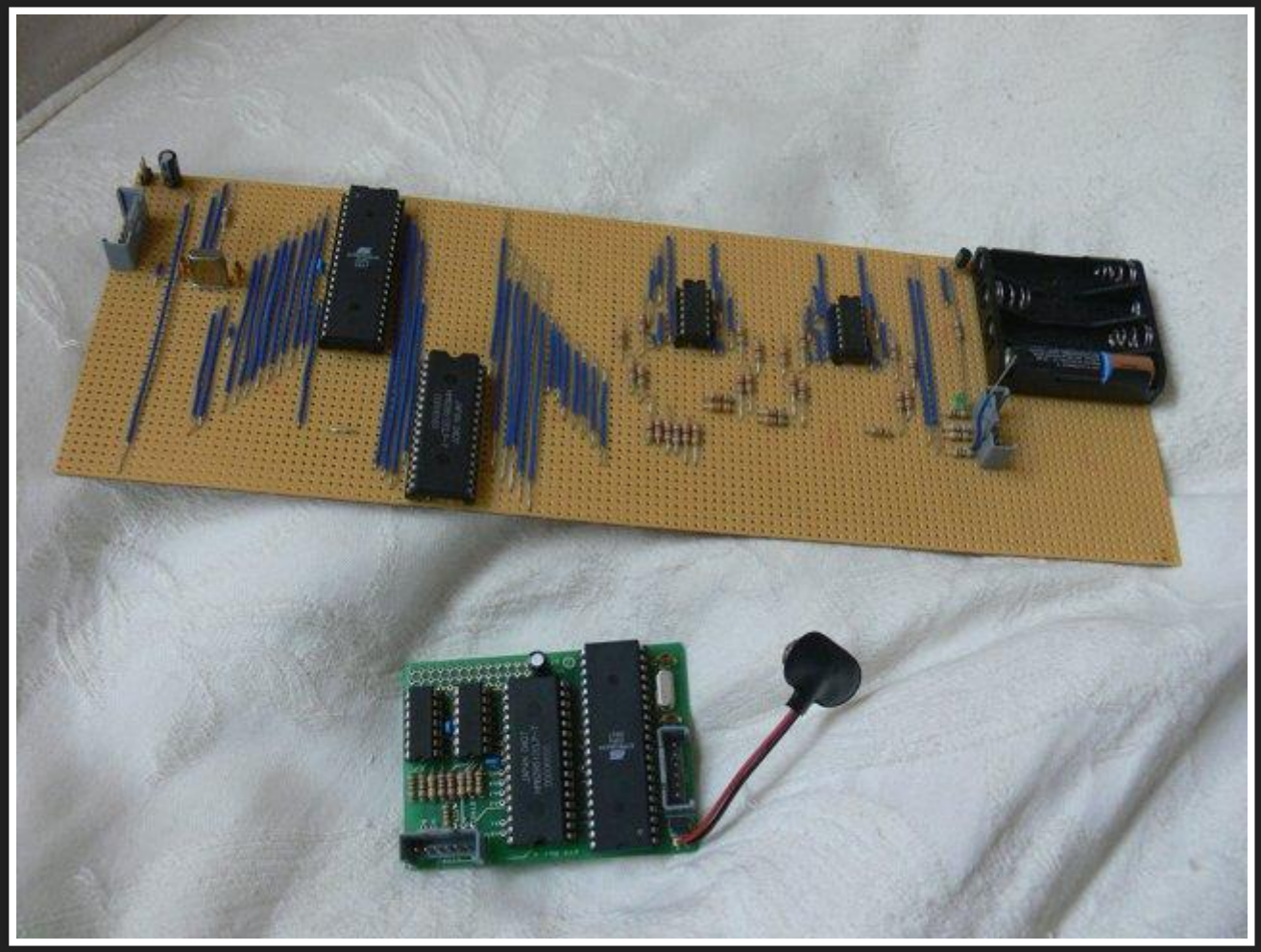
Raspberry Pi Family: > 14 Millionen

?

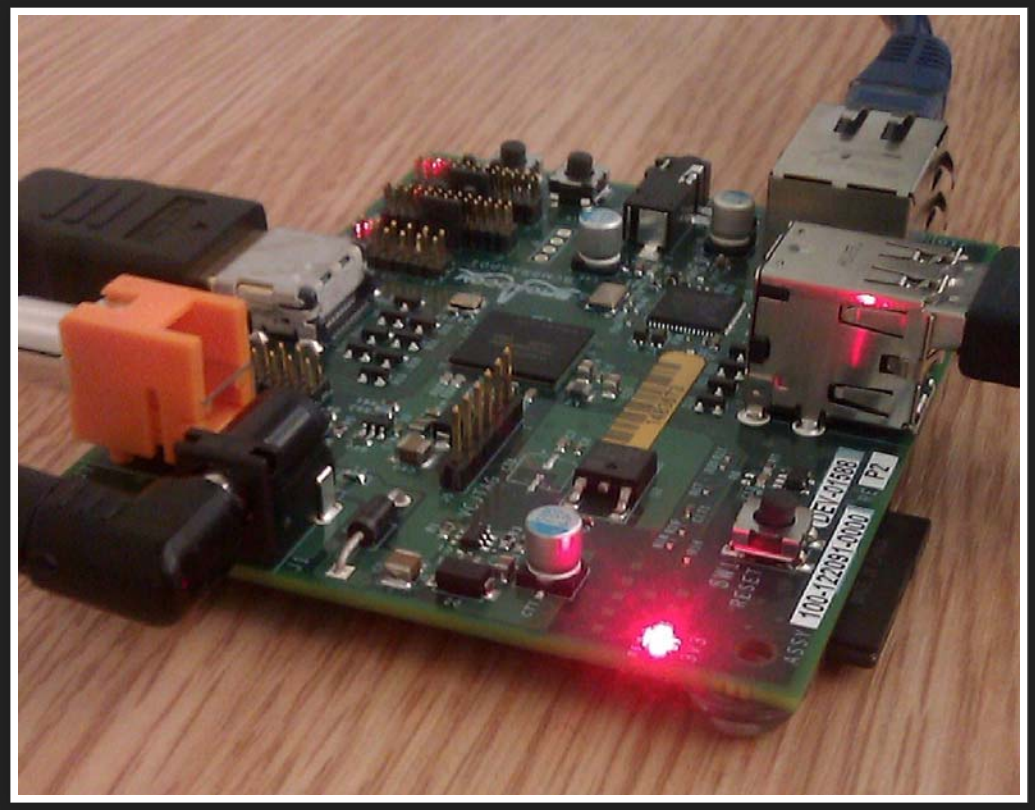
EINFÜHRUNG

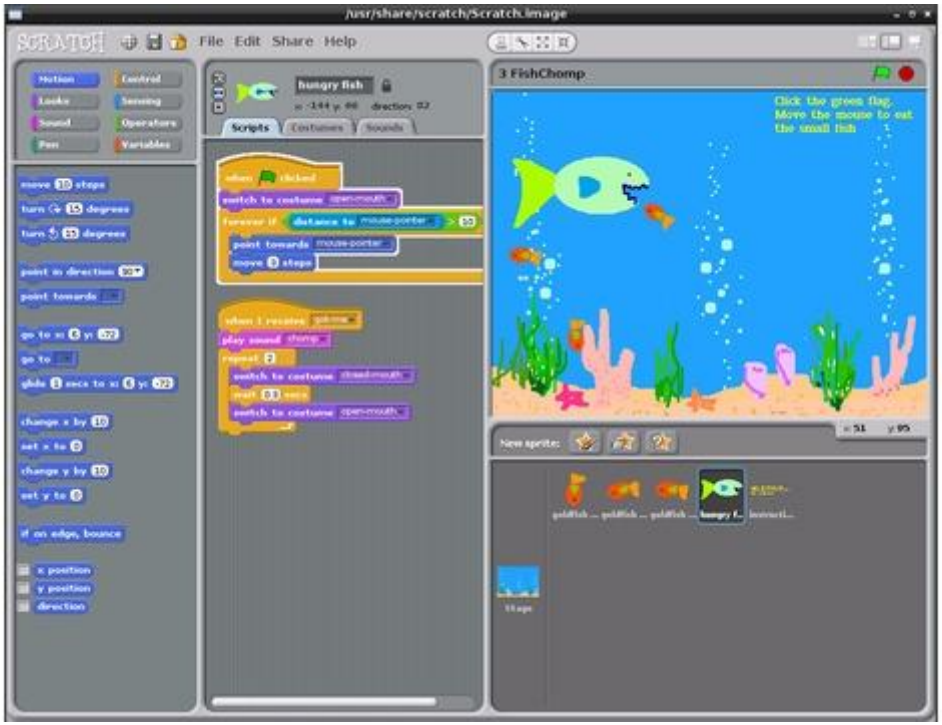
GESCHICHTE


HOW DOES COMPUTER PROGRAMMING WORK?
MAGIC.




Welcome to ROBCO Industries (TM) Termlink
Password Required
Attempts Remaining:
0x3700 :<;]*#=+[:# 0x37C0 }+SIZE*='^#<
0x370C /-^)%]@!(,?! 0x37CC #|%%HUNT#]")
0x3718 >]]:=#).=/?< 0x37D8 ./_)(]|PART
0x3724 /-](#")!#$+) 0x37E4 ':>ROLL!:|;'
0x3730]|])^%-%$-=S 0x37F0 @BORN*@|'|\|
0x373C ORT#-@^<#%/) 0x37FC ;*^,$|[$@<%.
0x3748 |*)"%_/SOME* 0x3808 <!(+-#>)(='
0x3754 \\"\]>+(!"#$ 0x3814 =]BURN+>/'[;
0x3760 |/'+TIME.--} 0x3820 ,<(.\+;]$>;/
0x376C -=CORE]'^!>$ 0x382C SETS-,==]GUR
0x3778 *|<,)[[[`-\@ 0x3838 U?=+[$,(#,^<
0x3784 >(["]=.#/*{: 0x3844 %"?)'?'?$$'$
0x3790 `-->^NONE#+} 0x3850 ]#:/`+,+|(_'
0x379C ?!-!?_{})?\] 0x385C =WIRE?",'{$'
0x37A8 %_-_-!\\:=%, 0x3868)'_\"+)^"}^,
0x37B4 :]<=<):;\$%% 0x3874 =`%)_/:;*),@ >(+-#>)




/usr/share/scratch/Scratch.image
SCRATCH
File Edit Share Help
Motion
Control
Looks
Sensing
Sound
Operators
Pen
Variables
hungry fish
Scripts
Costumes
Sounds
when clicked
switch to costume open-mouth
forever if distance to mouse-pointer > 50
point towards mouse-pointer
move 8 steps
when I receive go now
play sound chomp
repeat 2
switch to costume closed-mouth
wait 0.1 secs
switch to costume open-mouth
move 10 steps
turn 15 degrees
turn 15 degrees
point in direction 90
point towards
go to x: 0 y: 0
go to
glide 1 secs to x: 0 y: 0
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
x position
y position
direction
3 FishChomp
Click the green flag.
Move the mouse to eat
the small fish
New sprite:
Stage


xbmc
2:05 PM
American Dad! - s08e10
Wheels & the Legman and
NOVA - s00e00
Ultimate Mars Challenge...
Raising Hope - s03e06
What Up, Bro?
Recorded 2012-11-12@...
MOVIES
TV SHOWS
MUSIC
Recently Added
Title
Genres
Years
Actors
Panasonic

RELEASE: RASPBERRY PI MODEL B, 201

EINFÜHRUNG

WOHER DER ERFOLG?

RELEASE: RASPBERRY PI MODEL B, 201

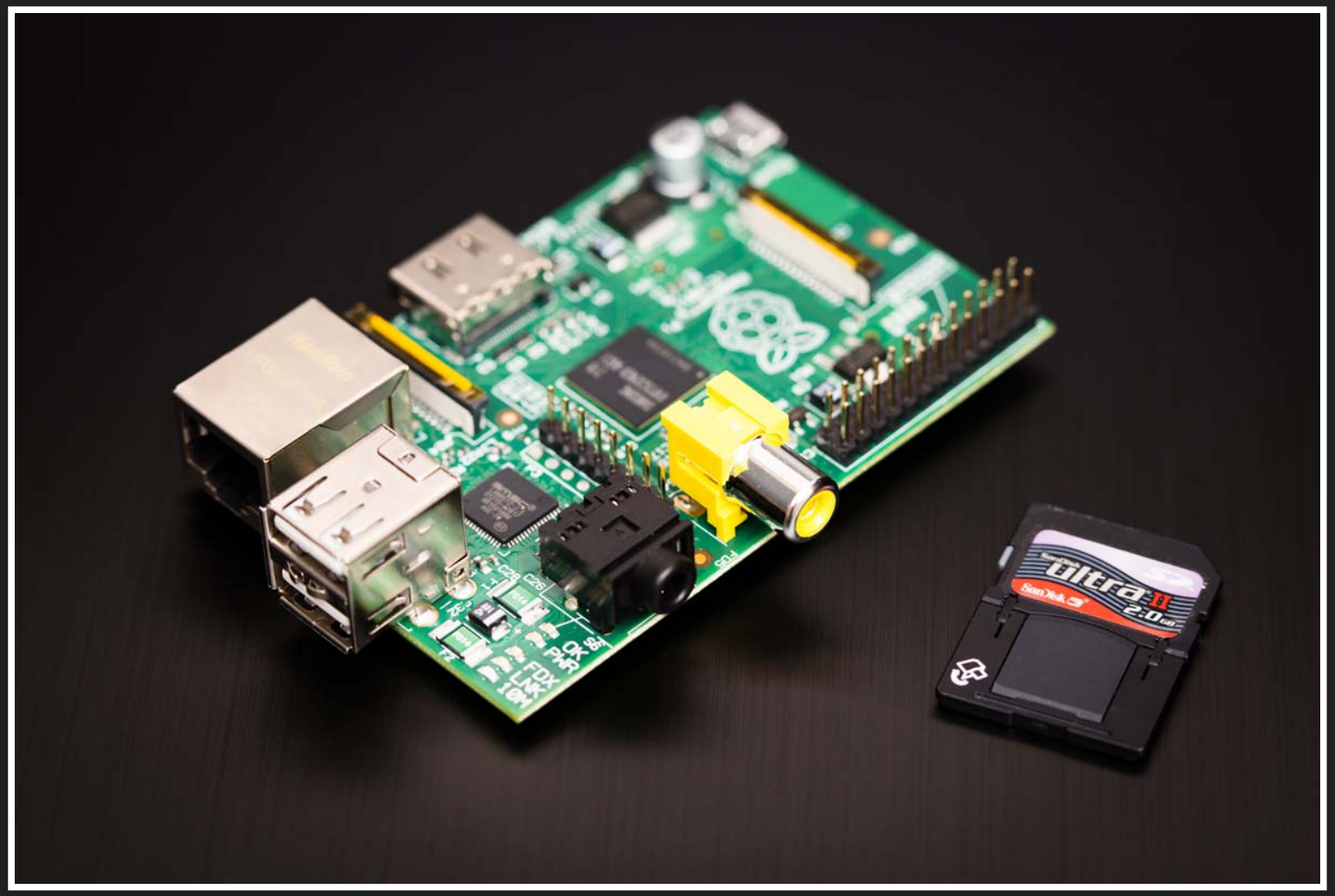
35 USD

1.) PREIS

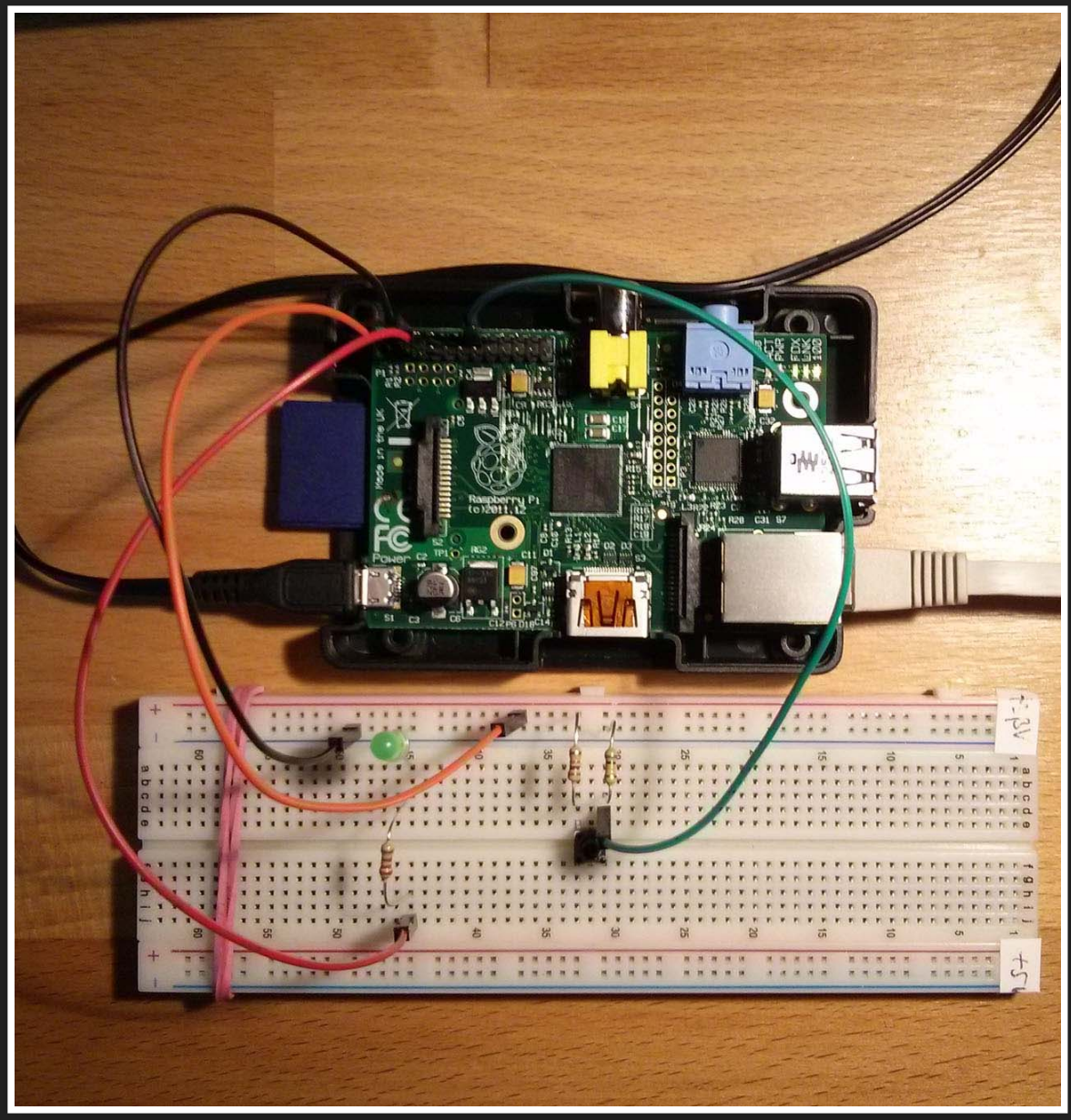
Für 35 USD - ein "vollwertiger Rechner"*?

* Zubehör erforderlich...

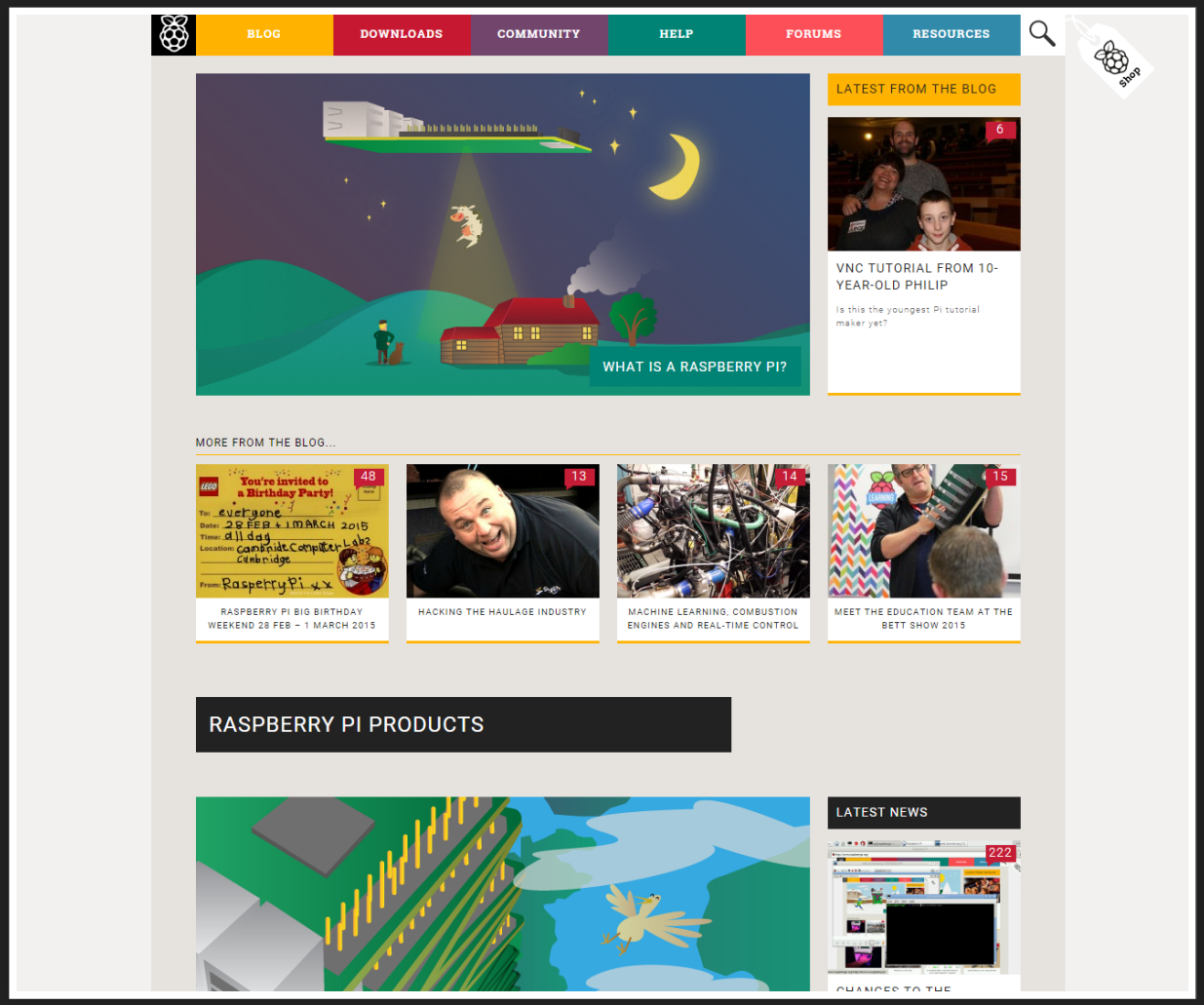
2.) GPIO



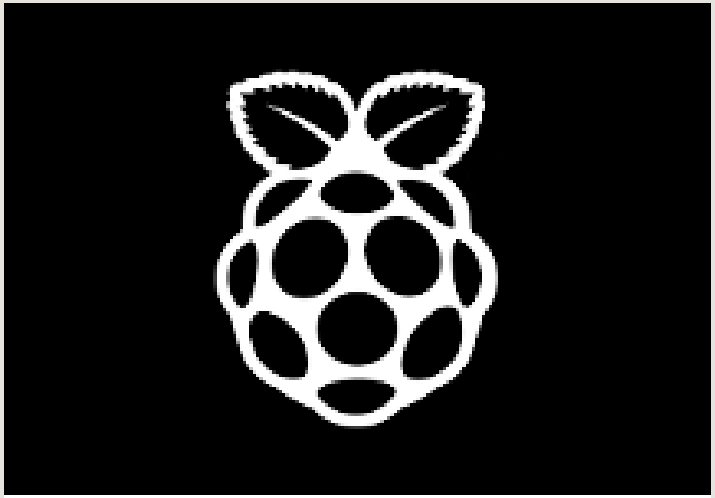

Raspberry Pi GPIO connector (P1) pinout
+5V
+5V
GND
GPIO14(TXD)
GPIO15(RXD)
GPIO18(PCM_CLK)
GND
GPIO23
GPIO24
GND
GPIO25
GPIO08(CE0)
GPIO07(CE1)
+3.3V
GPIO00(SDA1)
GPIO01(SCL1)
GPIO04(GPCLK0)
GND
GPIO17
GPIO27
GPIO22
+3.3V
GPIO10(MOSI)
GPIO09(MISO)
GPIO11(SCLK)
GND
● = changed since board revision 2



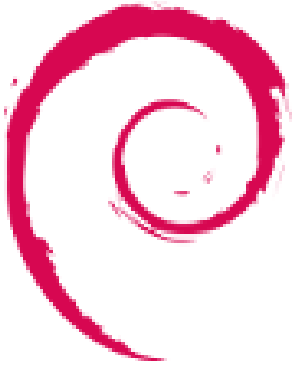
3.) COMMUNITY


BLOG
DOWNLOADS
COMMUNITY
HELP
FORUMS
RESOURCES
Shop
WHAT IS A RASPBERRY PI?
LATEST FROM THE BLOG
6
VNC TUTORIAL FROM 10-YEAR-OLD PHILIP
Is this the youngest Pi tutorial maker yet?
MORE FROM THE BLOG...
48
You're invited to a Birthday Party!
RASPBERRY PI BIG BIRTHDAY WEEKEND 28 FEB – 1 MARCH 2015
13
HACKING THE HAULAGE INDUSTRY
14
MACHINE LEARNING, COMBUSTION ENGINES AND REAL-TIME CONTROL
15
MEET THE EDUCATION TEAM AT THE BETT SHOW 2015
RASPBERRY PI PRODUCTS
LATEST NEWS
222

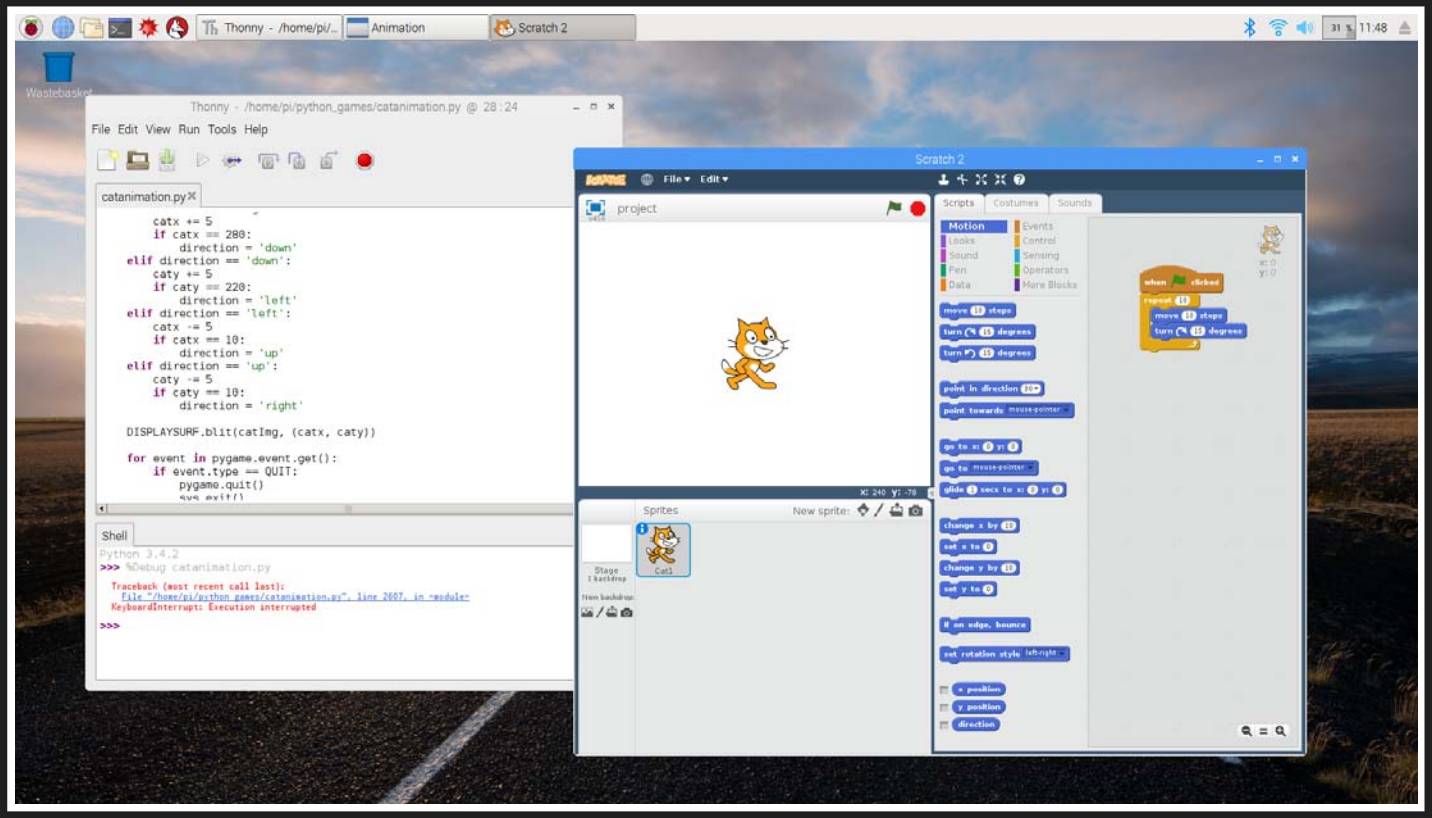
4.) BETRIEBSSYSTEM



NOOBS



RASPBIAN


Thonny - /home/pi/...
Animation
Scratch 2
11:48
Wastebasket
Thonny - /home/pi/python_games/catanimation.py @ 28 : 24
File Edit View Run Tools Help
catanimation.py
catx += 5
if catx == 280:
direction = 'down'
elif direction == 'down':
caty += 5
if caty == 220:
direction = 'left'
elif direction == 'left':
catx -= 5
if catx == 10:
direction = 'up'
elif direction == 'up':
caty -= 5
if caty == 10:
direction = 'right'
DISPLAYSURF.blit(catImg, (catx, caty))
for event in pygame.event.get():
if event.type == QUIT:
pygame.quit()
Shell
Python 3.4.2
>>> %Debug catanimation.py
Traceback (most recent call last):
File "/home/pi/python_games/catanimation.py", line 2607, in <module>
KeyboardInterrupt: Execution interrupted
>>>
Scratch 2
File Edit
project
Scripts
Costumes
Sounds
Motion
Looks
Sound
Pen
Data
Events
Control
Sensing
Operators
More Blocks
when clicked
repeat 10
move 10 steps
turn 15 degrees
move 10 steps
turn 15 degrees
point in direction 90
point towards mouse-pointer
go to x: 0 y: 0
go to mouse-pointer
glide 1 secs to x: 0 y: 0
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
set rotation style left-right
x position
y position
direction
Sprites
New sprite:
Stage
1 backdrop
Cat1

Third Party Operating System Images

Third party operating system images for Raspberry Pi are also available:

UBUNTU MATE

SNAPPY UBUNTU CORE

WINDOWS 10 IOT CORE

OSMC

LIBREELEC

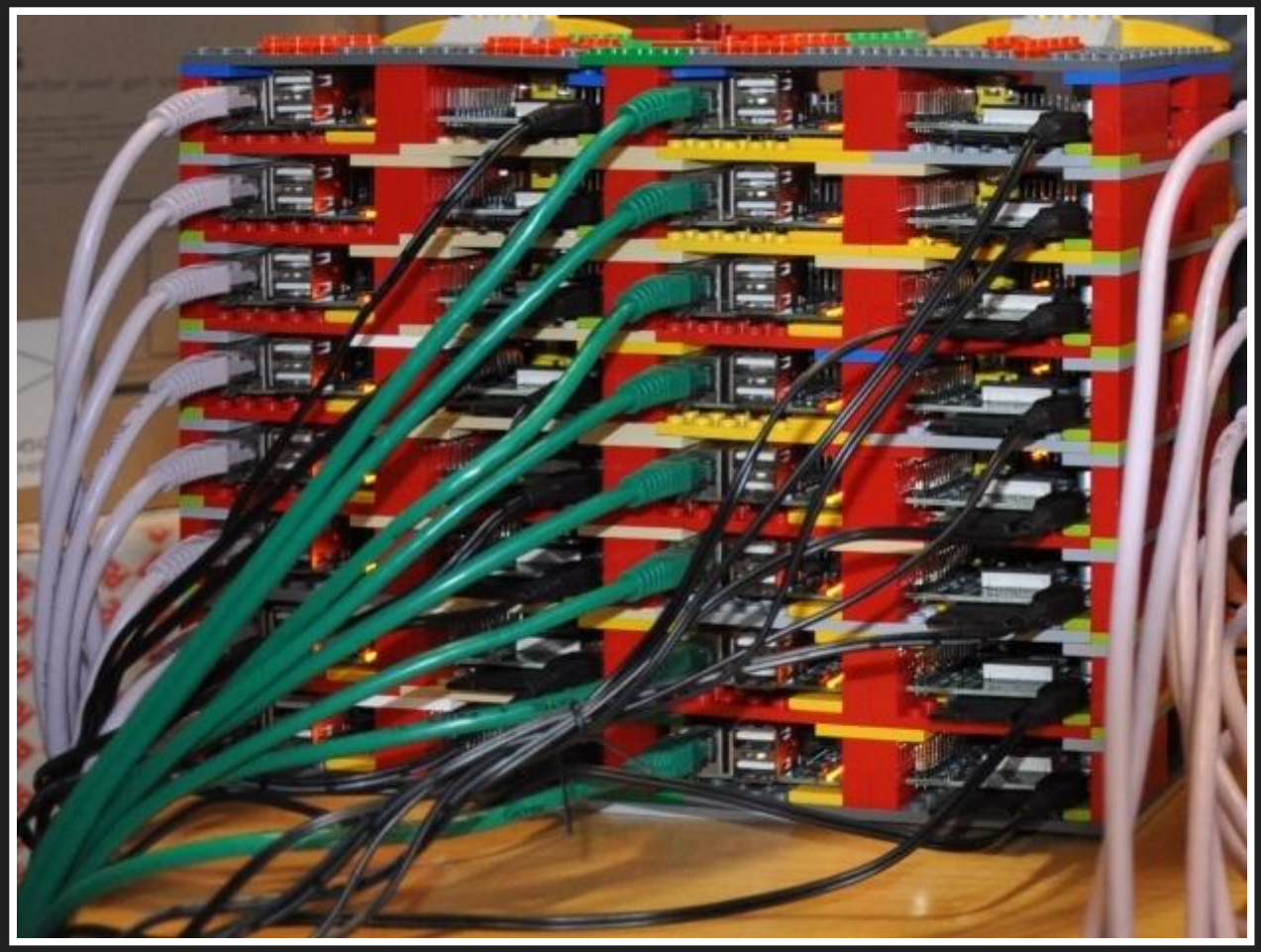
PINET

RISC OS

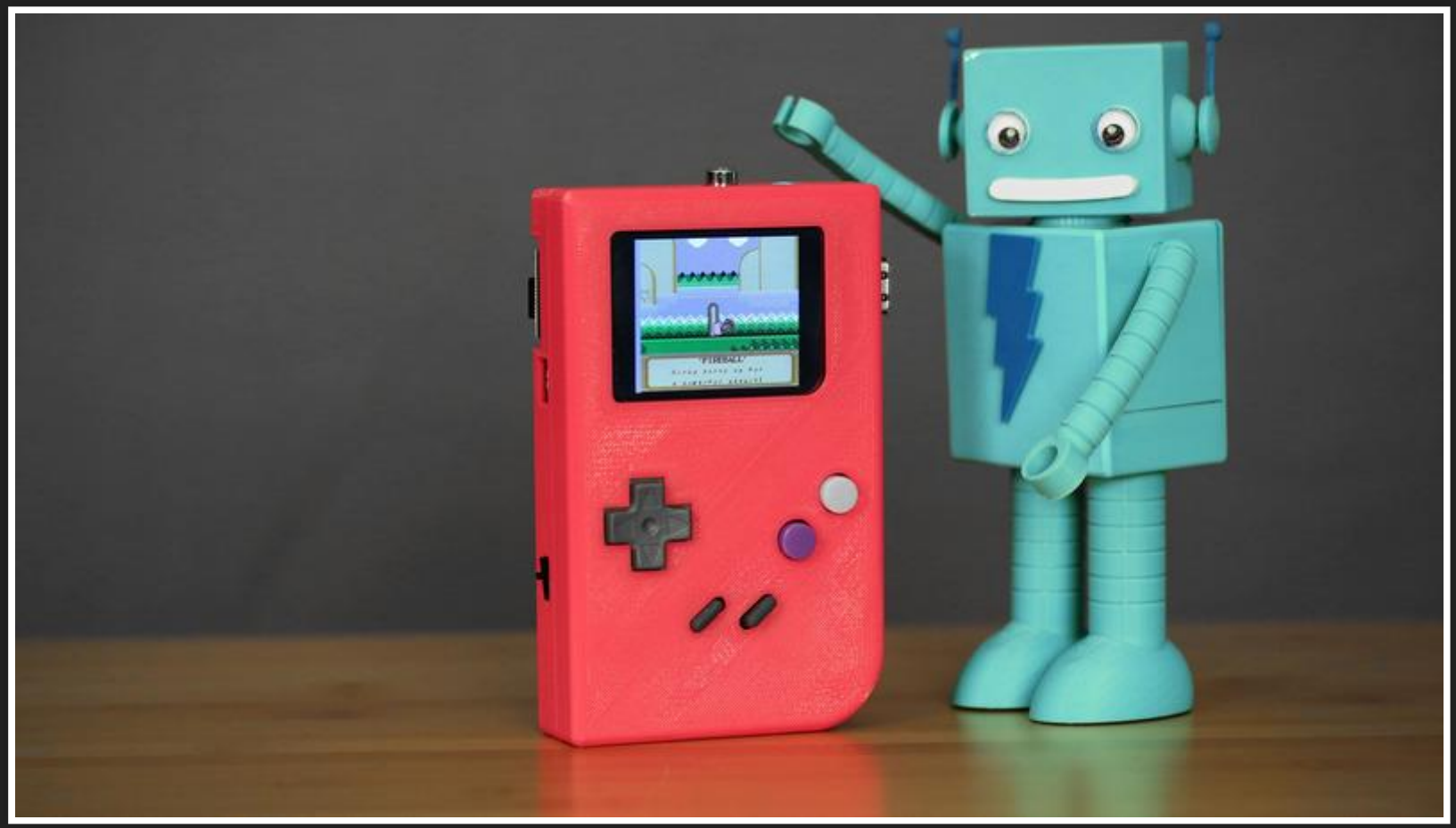
WEATHER STATION

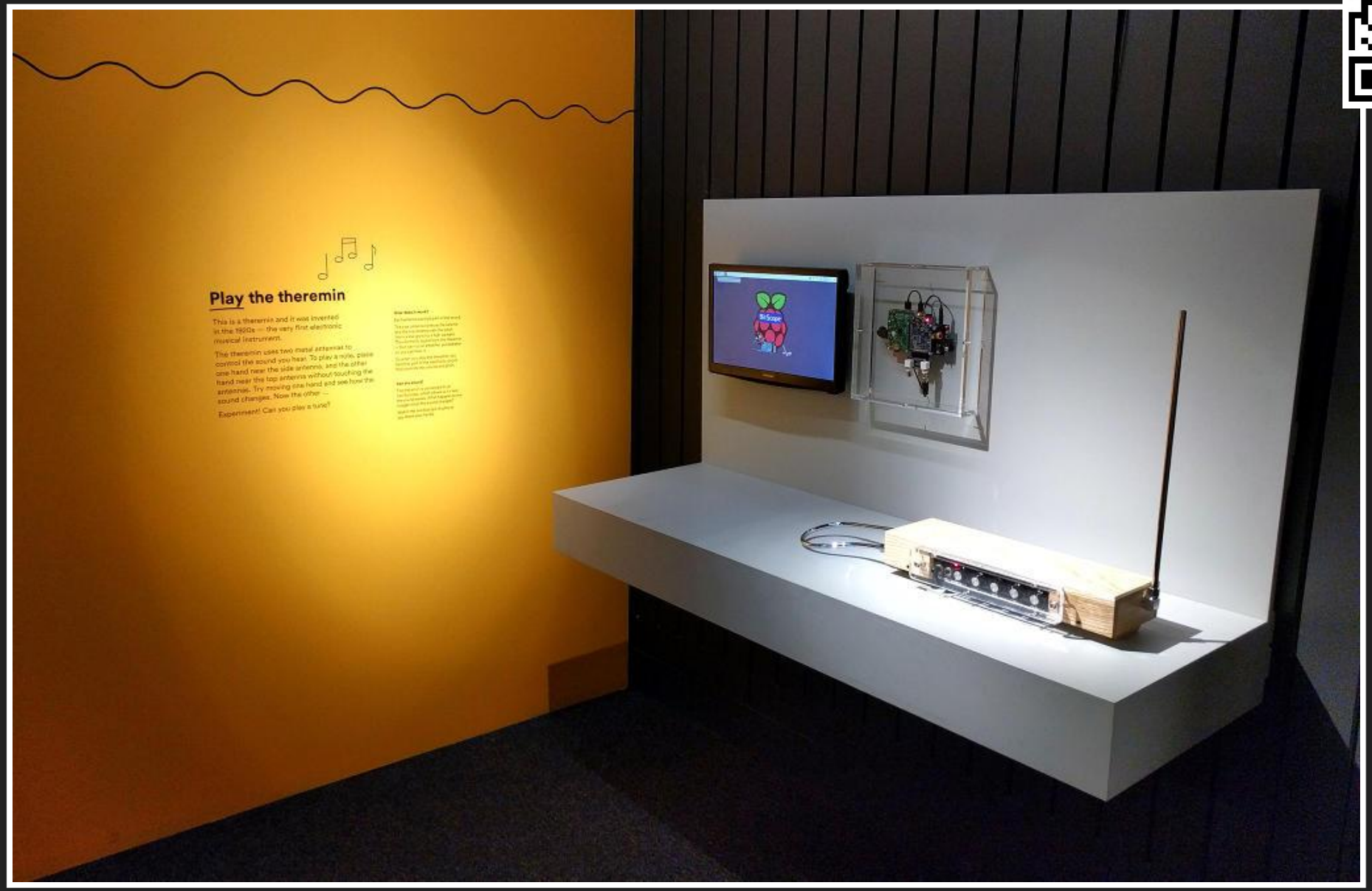
EINFÜHRUNG

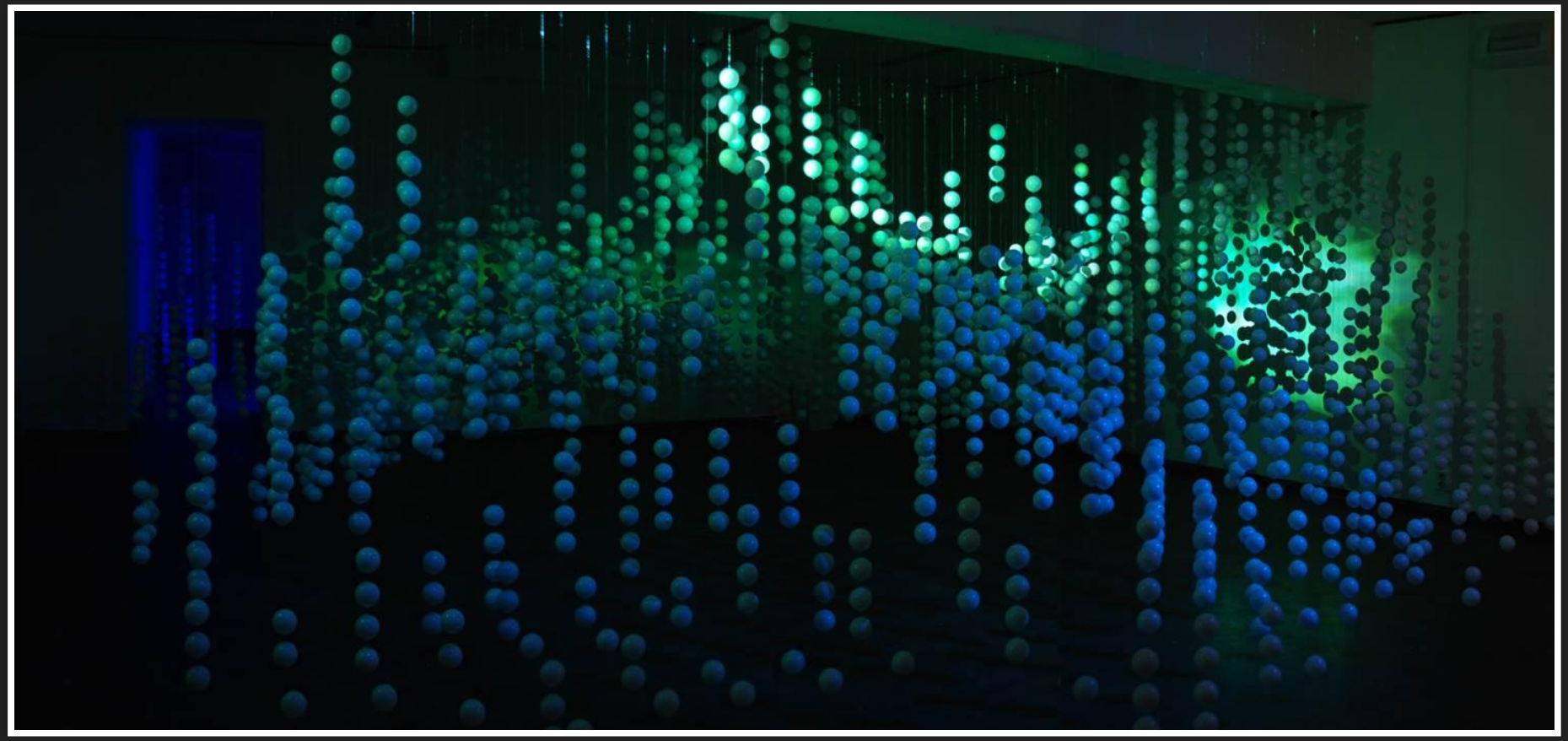
BEISPIELPROJEKTE



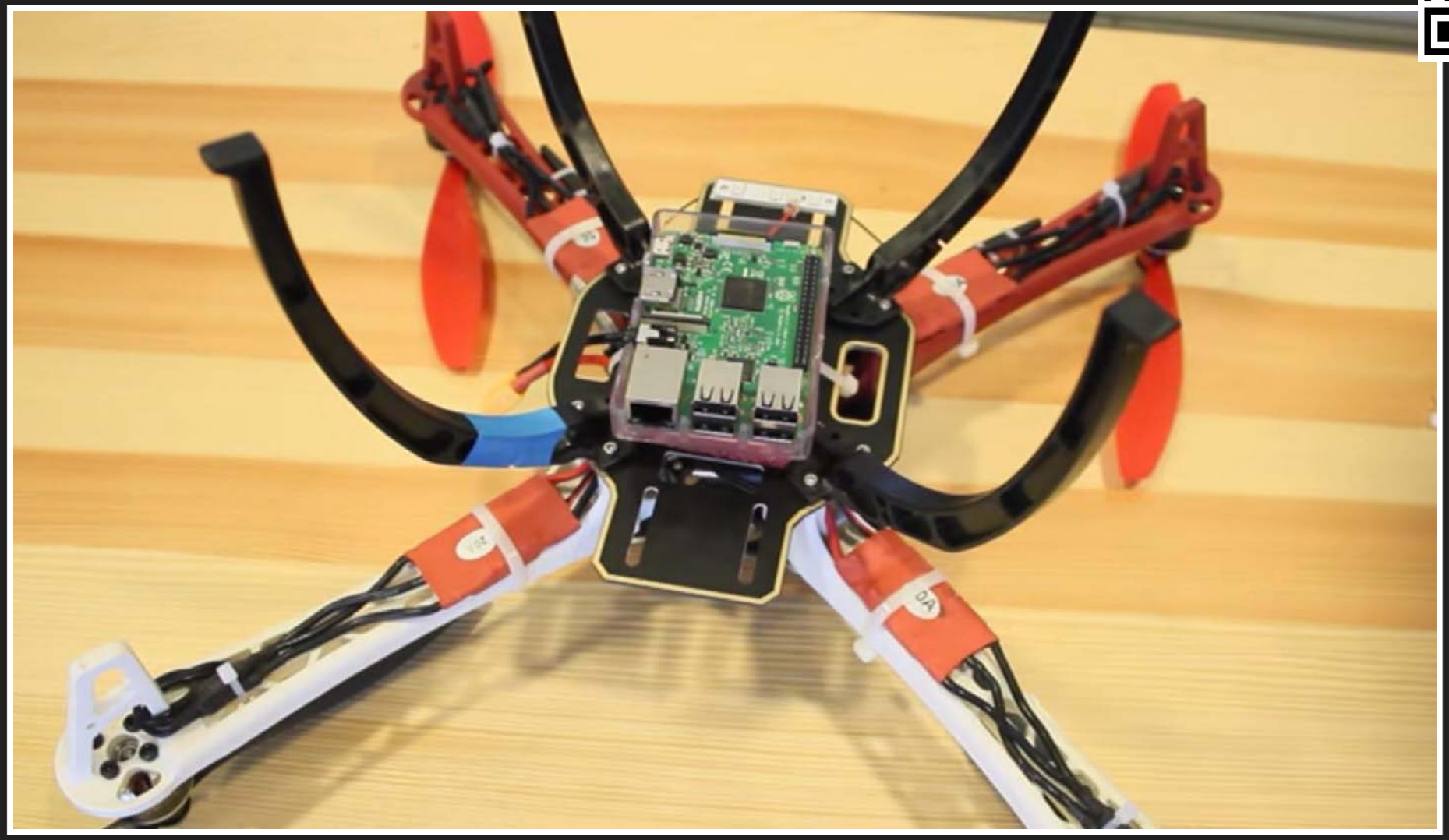

Arduino
Punch card
(protects wires)
Dart Board

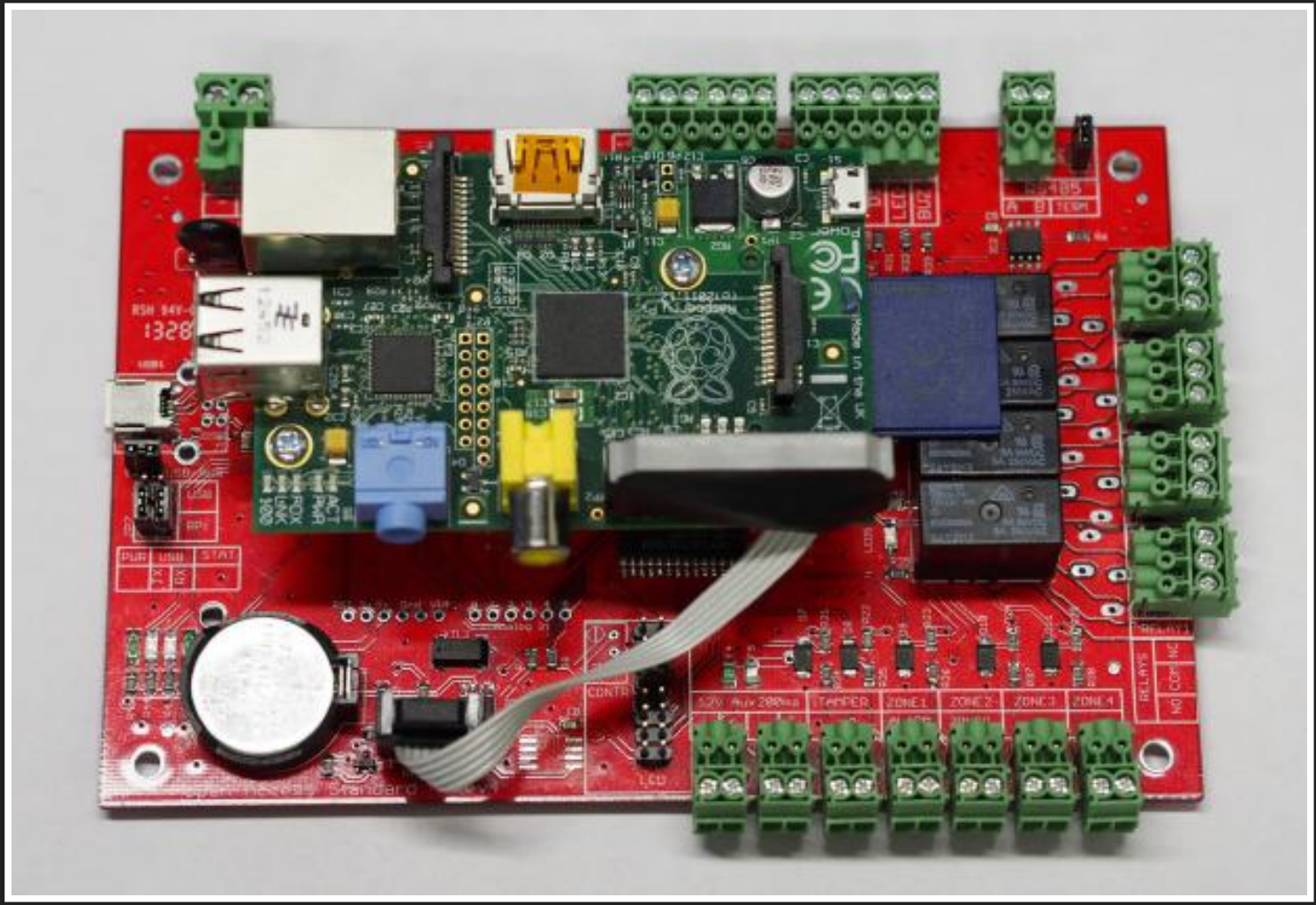



Play the theremin
This is a theremin and it was invented in the 1920s — the very first electronic musical instrument.
The theremin uses two metal antennas to control the sound you hear. To play a note, place one hand near the side antenna, and the other hand near the top antenna without touching the antennas. Try moving one hand and see how the sound changes. Now the other —
Experiment! Can you play a tune?



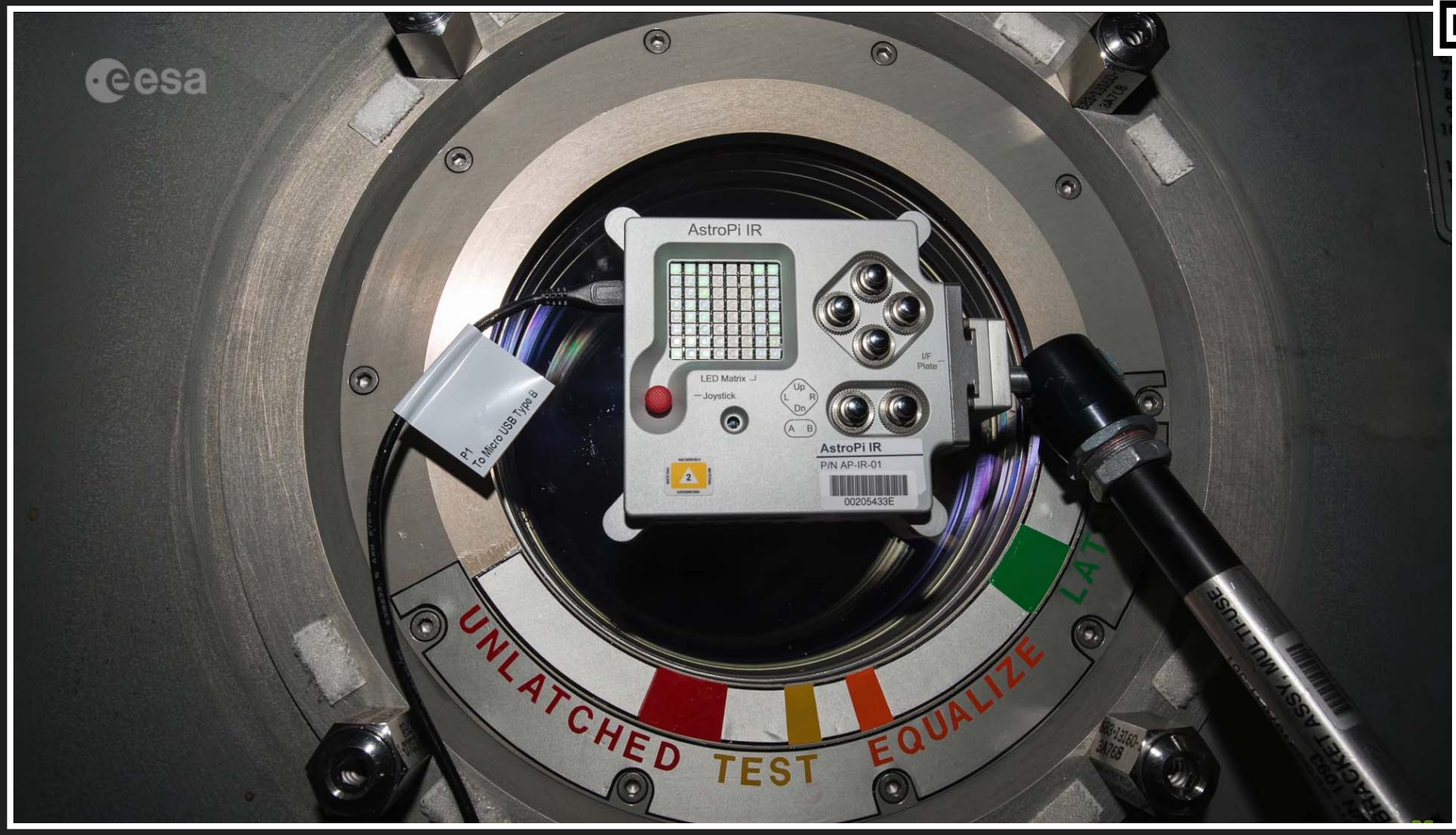

12/10/16
QPADEV0017
121 Packer Productivity
10:33:10
BT2250/S1
Clock Number: _____
F3=Exit
F3=Exit
F3=Exit
F3
F10
Enter
Error Reset




PWR
USB
STAT
TAMPER
ZONE1
ZONE2
ZONE3
ZONE4
RELAYS
NC
COM
NO


8:12
66%
TYFONE


ZELDA
HOME AUTOMATION


esa
AstroPi IR
LED Matrix
Joystick
I/F Plate
Up
L
R
Dn
A
B
AstroPi IR
P/N AP-IR-01
00205433E
P1
To Micro USB Type B
UNLATCHED TEST EQUALIZE

EINFÜHRUNG

NUR DER RPI?

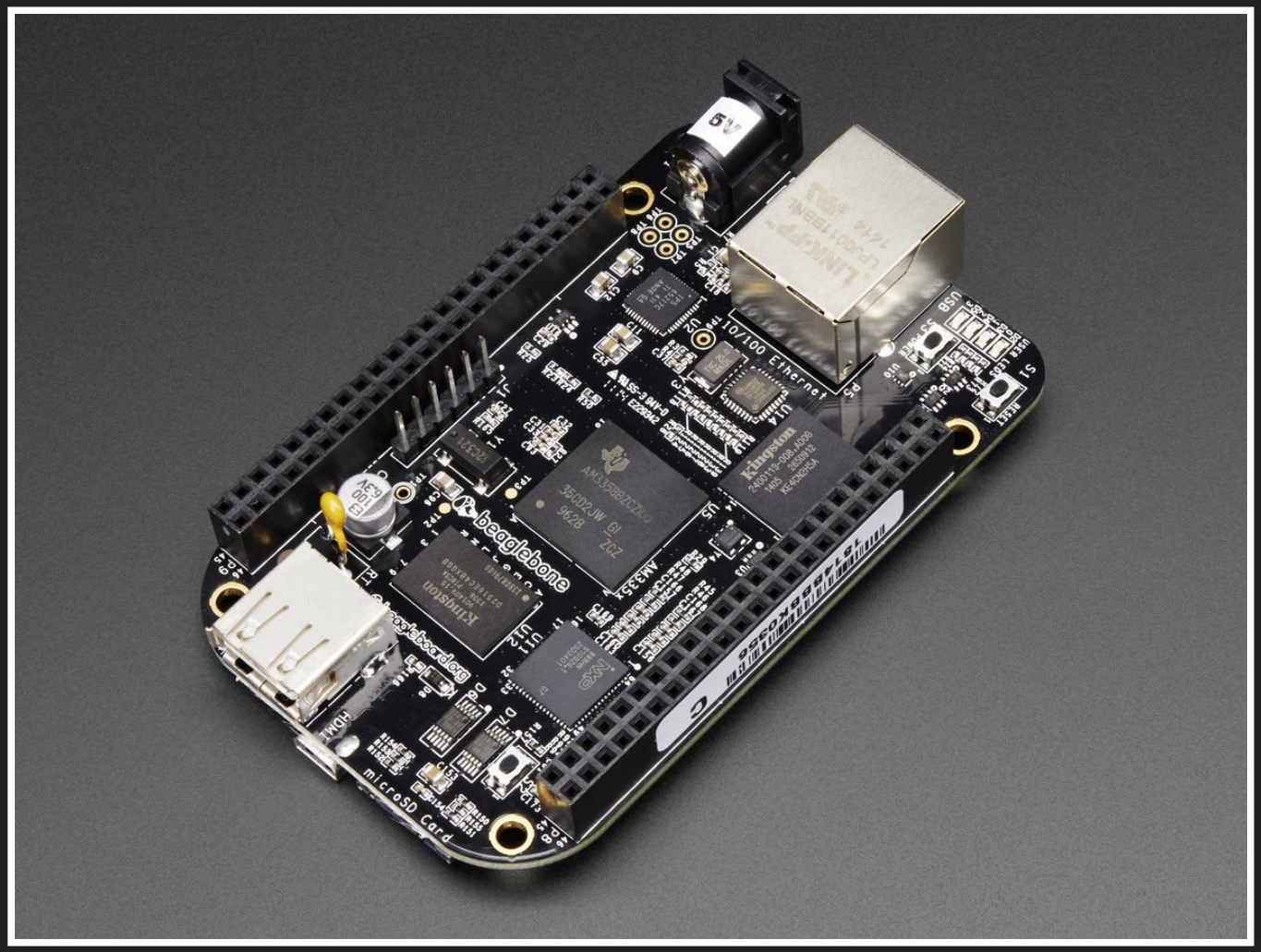
RASPBERRY PI 1 MODELL B V2

- 700 MHz ARM
- 512 MB RAM
- Full HDMI
- Cinch Video
- Stereo Audio
- USB 2.0
- 100 Mbit Ethernet

WARS DAS SCHON ;)?

NEIN :)!

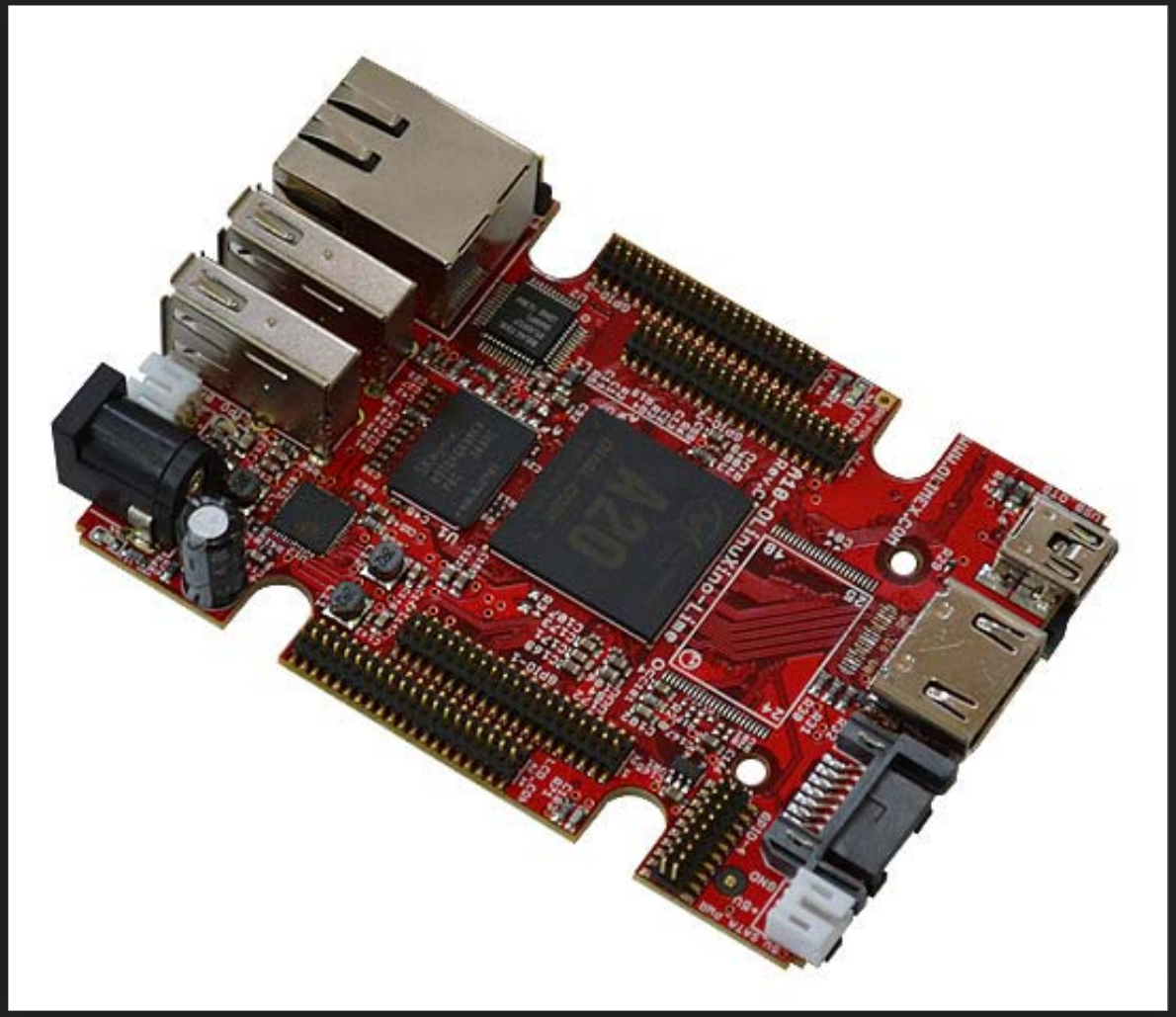
BEAGLEBONE BLACK



BEAGLEBONE BLACK

- 1 GHz ARM
- 512 MB RAM
- 2 x PRUs
- Full HDMI
- USB 2.0
- 100 Mbit Ethernet

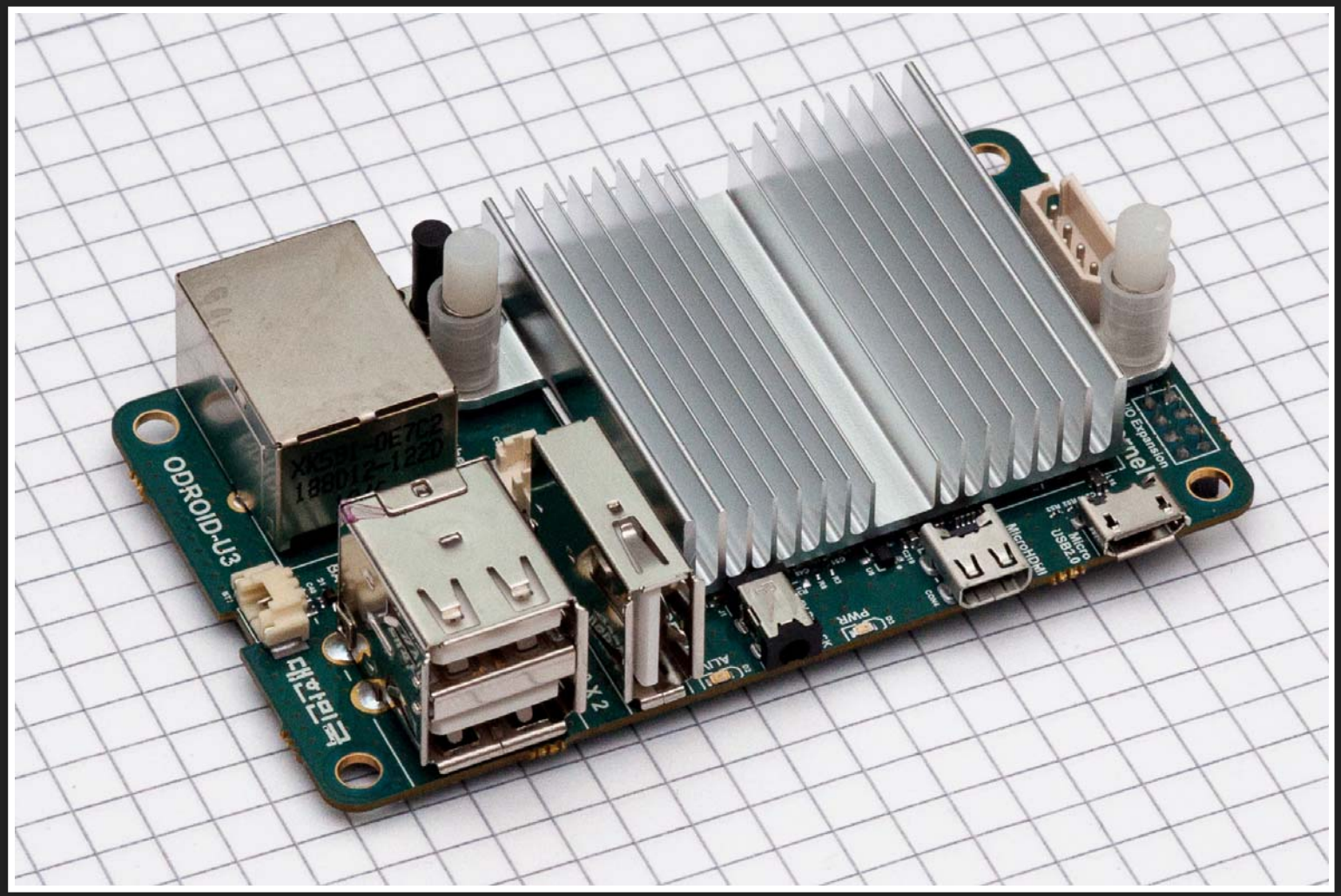
OLIMEX (Z.B. A20 OLINUXINO-LIME)



OLIMEX (Z.B. A20 OLINUXINO-LIME)

- 1 GHz ARM Dualcore(!)
- 512 MB RAM
- Full HDMI
- USB 2.0
- 100 Mbit Ethernet
- LiPo Charger
- SATA Connector
- 160 GPIOs(!)

HARDKERNEL ODROID (Z.B. U3)



HARDKERNEL ODROID (Z.B. U3)

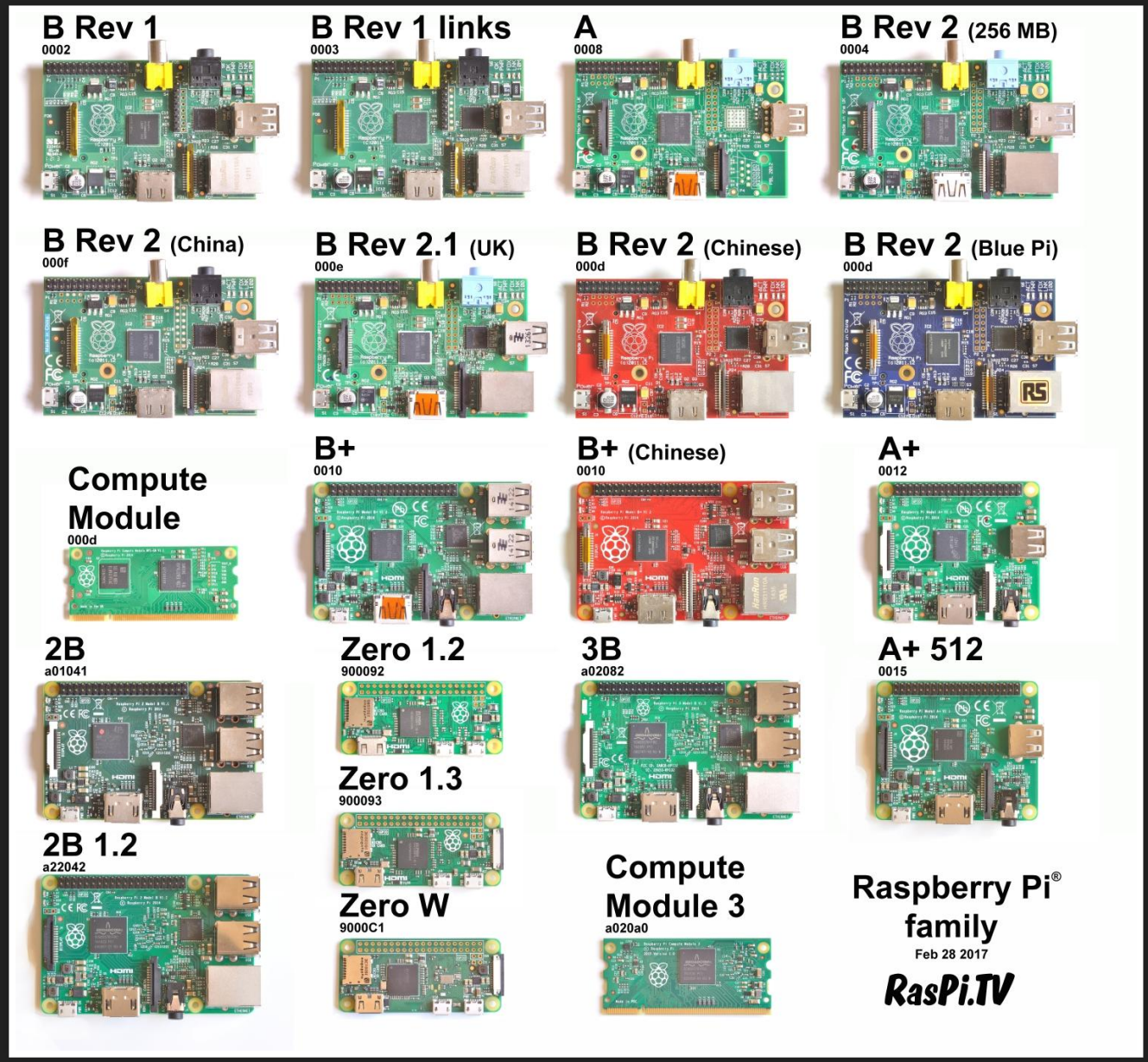
- 1.7 GHz ARM Quadcore(!)
- 2 GB RAM(!)
- Full HDMI
- Stereo Audio
- USB 2.0
- 100 Mbit Ethernet
- eMMC

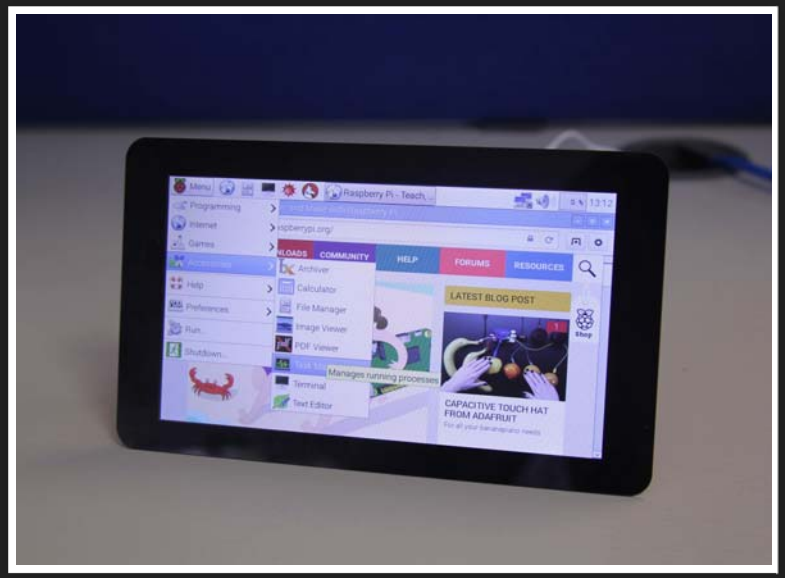
HARDKERNEL ODROID W

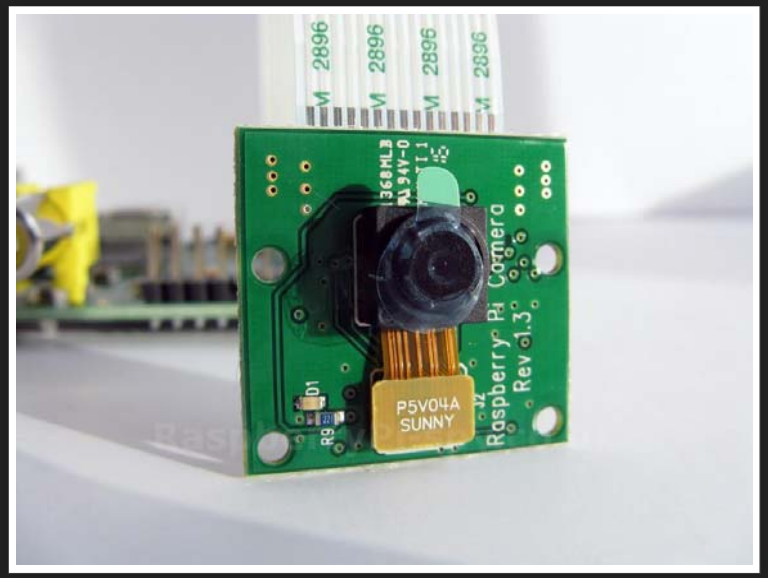
HARDKERNEL ODROID W

... das hatte Konsequenzen für Broadcom

KONKURENZ BELEBT DAS GESCHÄFT!

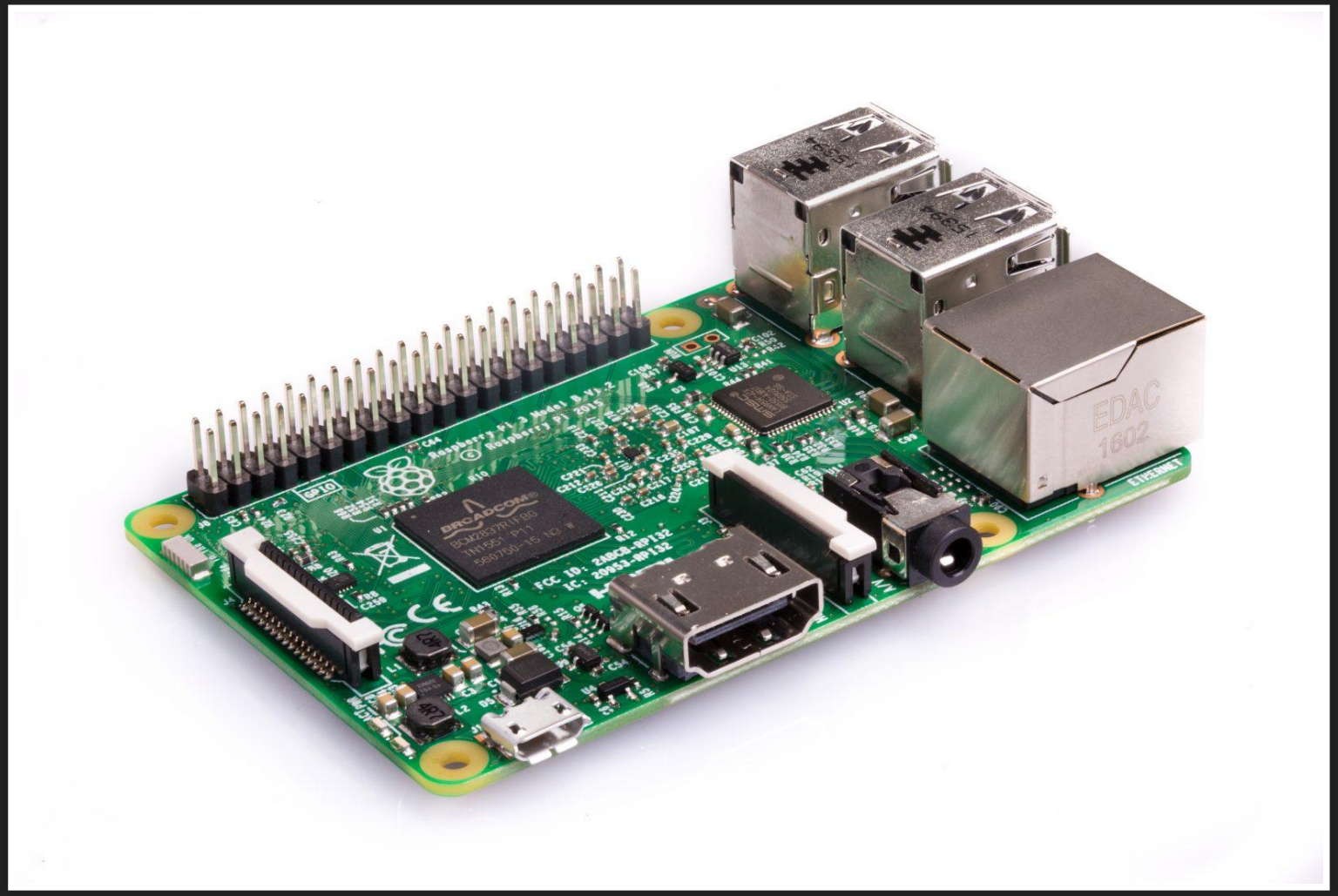

B Rev 1
0002
B Rev 1 links
0003
A
0008
B Rev 2 (256 MB)
0004
B Rev 2 (China)
000f
B Rev 2.1 (UK)
000e
B Rev 2 (Chinese)
000d
B Rev 2 (Blue Pi)
000d
Compute Module
000d
B+
0010
B+ (Chinese)
0010
A+
0012
2B
a01041
Zero 1.2
900092
3B
a02082
A+ 512
0015
Zero 1.3
900093
2B 1.2
a22042
Zero W
9000C1
Compute Module 3
a020a0
Raspberry Pi® family
Feb 28 2017
RasPi.TV


Raspberry Pi - Teach...
COMMUNITY
HELP
FORUMS
RESOURCES
LATEST BLOG POST
CAPACITIVE TOUCH HAT FROM ADAFRUIT


P5V04A
SUNNY
Raspberry Pi Camera
Rev 1.3

ERSTE SCHRITTE

RASPBERRY PI 3 MODELL B V2

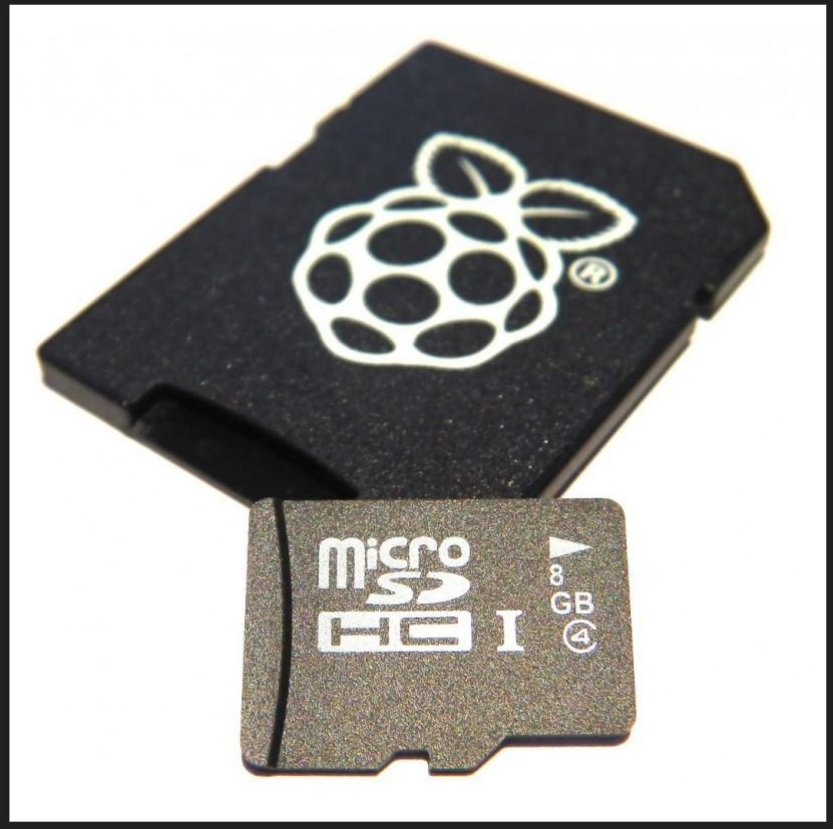


RASPBERRY PI 3 MODELL B V2

- 1.2 GHz ARM Quadcore (64 bit)
- 1 GB RAM
- Full HDMI
- 3,5mm Klinke Video / Audio
- USB 2.0
- 100 Mbit Ethernet
- Bluetooth 4.1
- WLAN
- ~ 38,90€

ZUBEHÖR: MICRO SD CARD

>= 8 GB, Markenhersteller, Class 10



ZUBEHÖR: MICRO USB NETZTEIL

>= 2.5 A, 5V

ZUBEHÖR: GEHÄUSE

ZUBEHÖR: ÜBERSICHT

INSTALLATION:

- RASPBIAN STRETCH WITH DESKTOP herunterladen: https://www.raspberrypi.org/downloads/raspbian/
- Etcher herunterladen und installieren: https://etcher.io/
- Micro SD Karte in den PC stecken & Etcher starten
- "Select image" klicken und Raspbian auswählen
- "Select drive" klicken, Micro SD ausgewählen
- "Flash!" klicken
- Sobald fertig, Micro SD entnehmen, in RPi einlegen
- Alle Stecker verbinden
- RPi mit Strom versorgen

MEHR RPI?

GUTEN QUELLEN

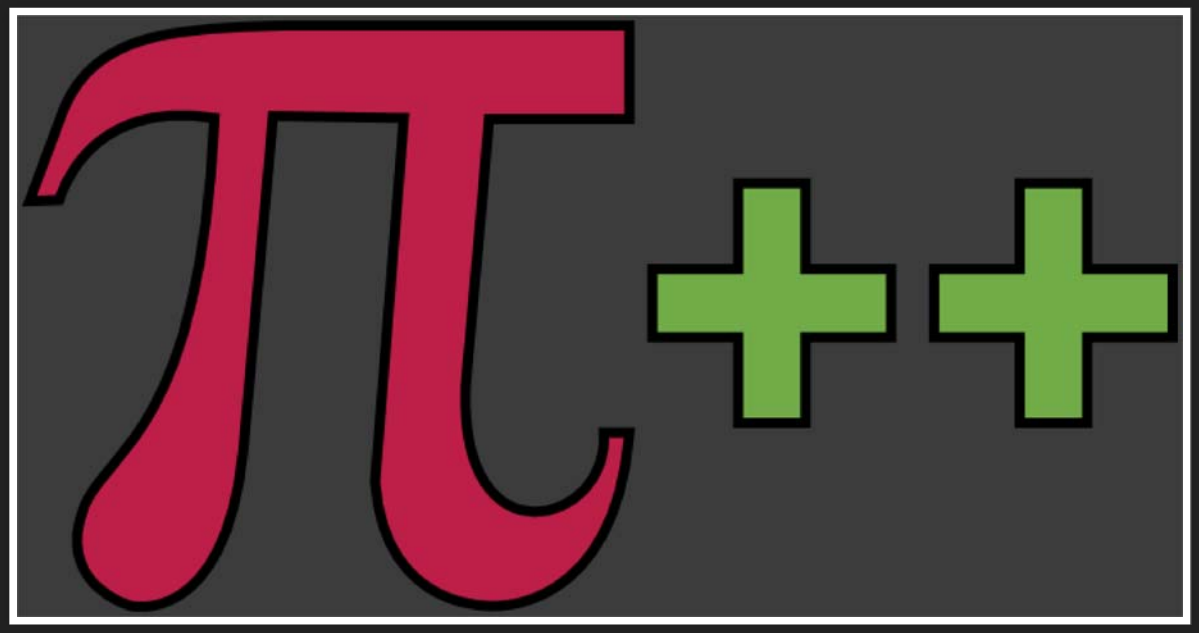
INTERNET

- Allgemein: https://www.raspberrypi.org
- Installation: https://www.raspberrypi.org/help/
- Forum: https://www.raspberrypi.org/forums/

BÜCHER & KITS

- elektor
- Rheinwerk
- Franzis
- Conrad

RASPBERRY PI JAMS



https://piandmore.de/

FRAGEN?

Danke für Ihre Aufmerksamkeit -

und viel Spaß auf der PAM 10 1/2 :)!

www.nico-maas.de