
VIRTUAL BOY
SELECT START
B A
VIRTUAL BOY

Nintendo Virtual Boy

- Released in 1995 (Japan and North America)
- First (and only?) table-top 3D video game console
- NEC V810 (32-bit RISC)
- 224-pixel linear arrays (one per eye) w/ oscillating mirrors create monochromatic (red) images that no one else can see
- Controller provides power via 6 AA (in series) or wall adapter
- Known to cause dizziness and seizures (!)

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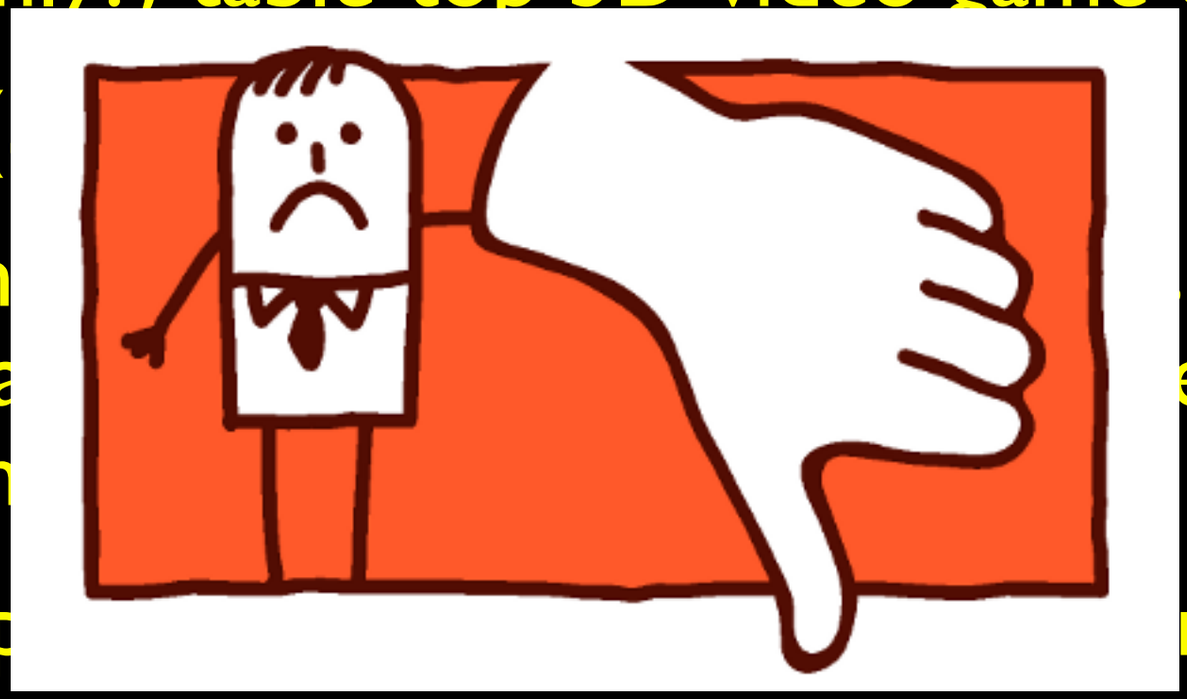


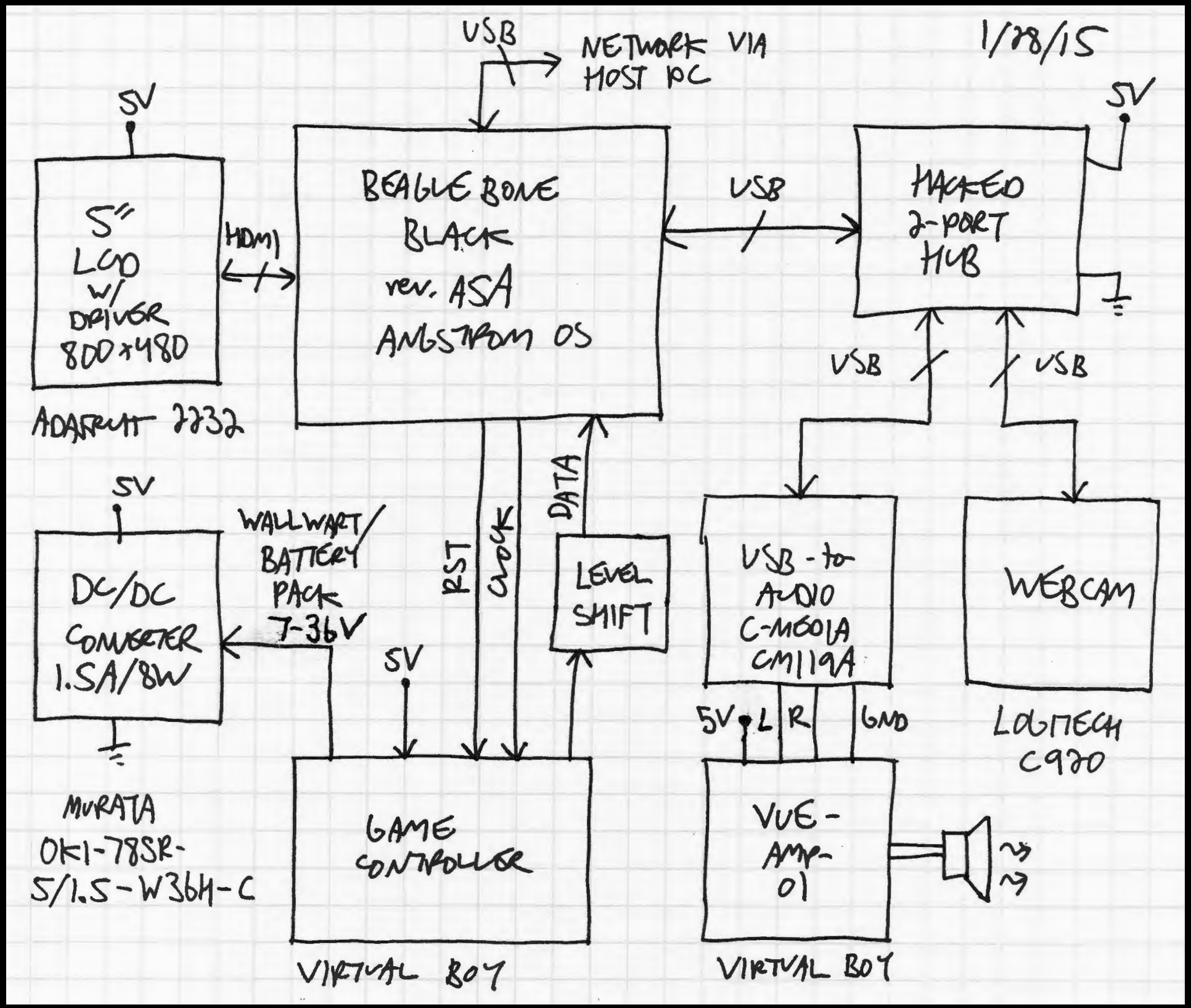
Inspiration

- Re-purpose a Virtual Boy
- Experiment w/ BeagleBone Black
- Get better (?) at using Linux
- Learn OpenCV basics
- Drew Fustini's BoothStache (element14)

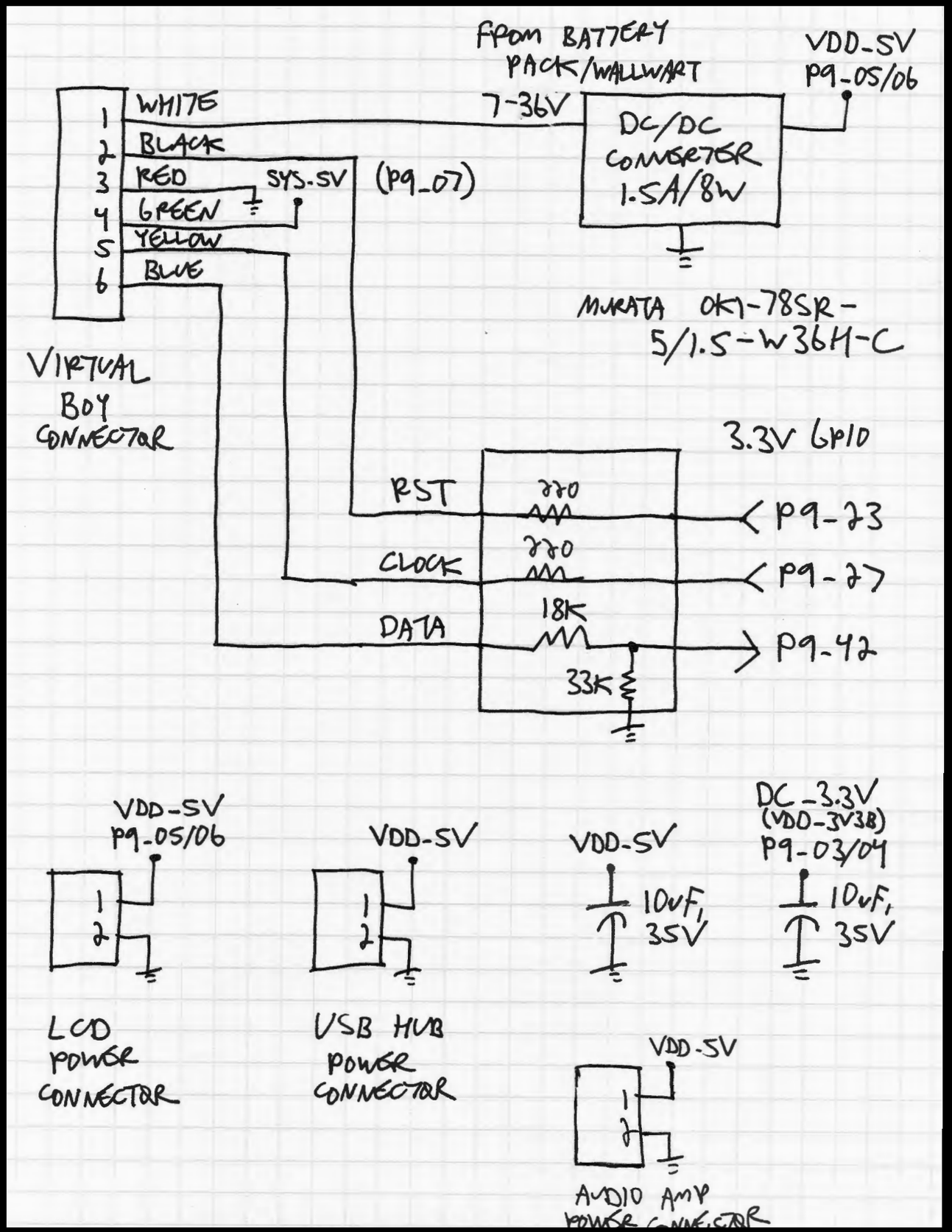
PLACE MUSTACHES ON FACES FOR POINTS

1. PICK UP GAME
2. AIM AT FACE(S)
3. PRESS "A" WHEN MUSTACHE(S) APPEAR
4. MORE MUSTACHES AT A TIME = MORE POINTS

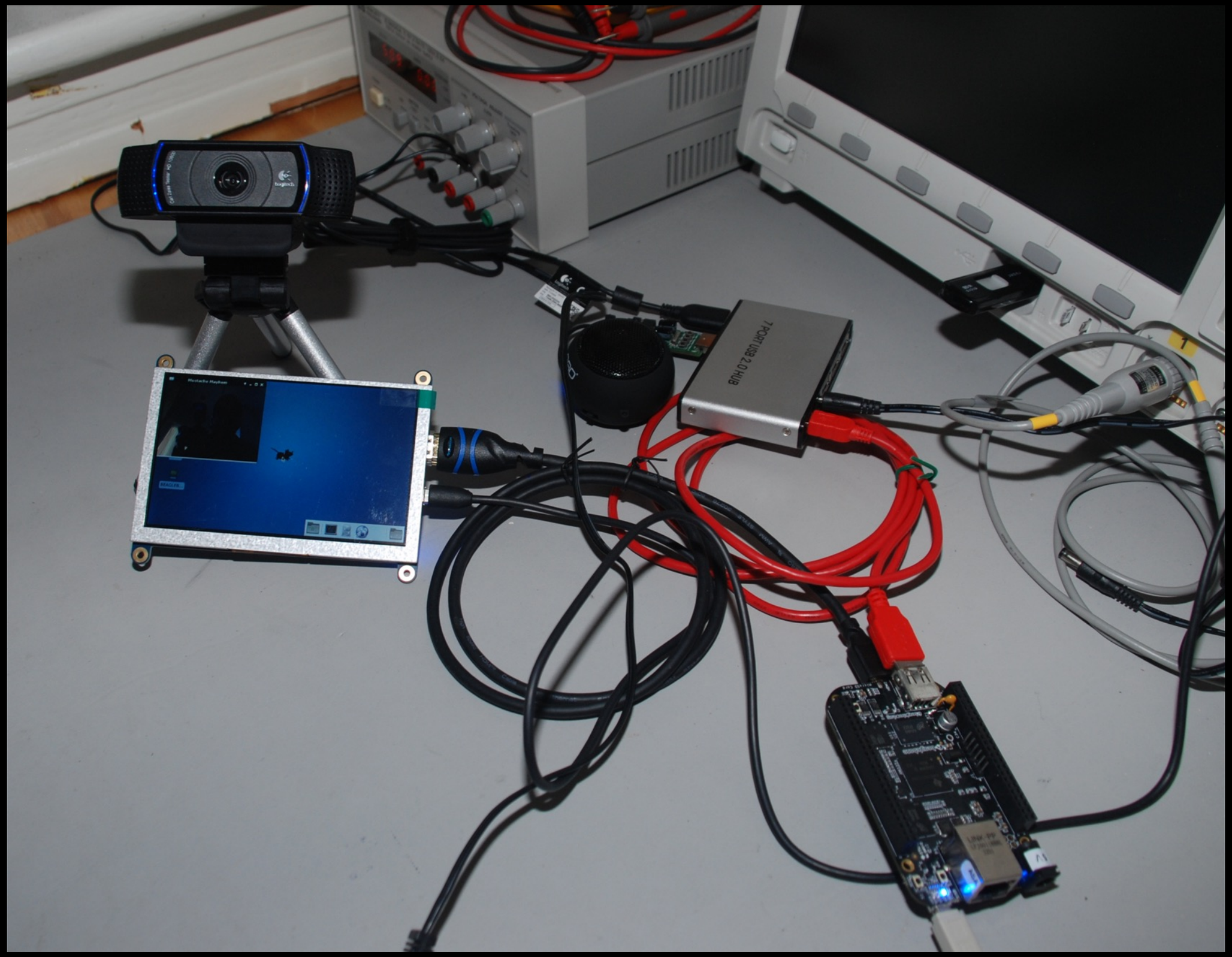
Block Diagram



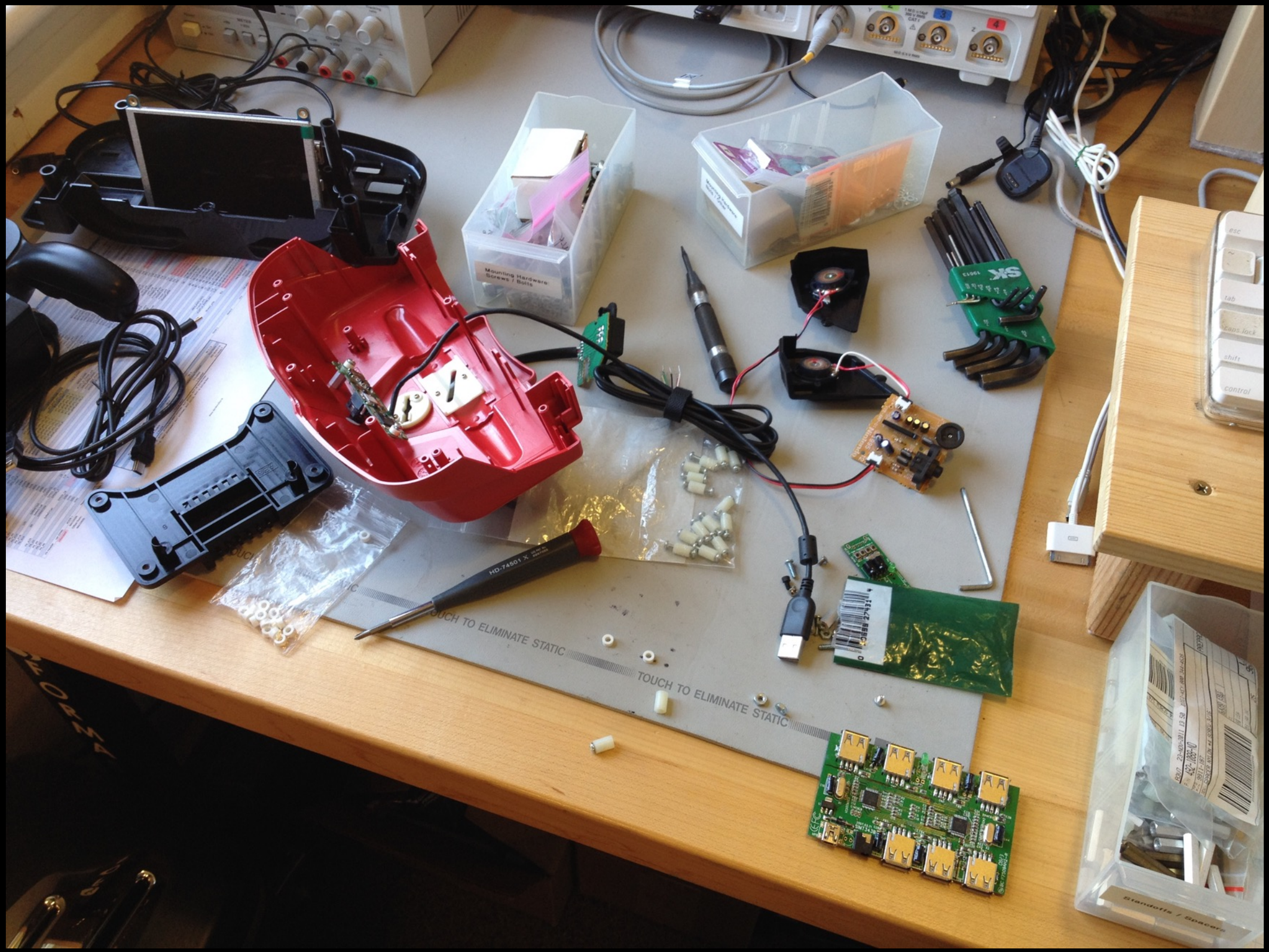
Schematic


FROM BATTERY PACK/WALLWART
7-36V
VDD-5V
P9-05/06
DC/DC CONVERTER 1.5A/8W
MURATA OKI-78SR-5/1.5-W36H-C
1 WHITE
2 BLACK
3 RED
4 GREEN
5 YELLOW
6 BLUE
SYS.5V
(P9_07)
VIRTUAL BOY CONNECTOR
3.3V GPIO
RST
220
P9-23
CLOCK
220
P9-27
DATA
18K
P9-42
33K
VDD-5V
P9-05/06
LCD POWER CONNECTOR
VDD-5V
USB HUB POWER CONNECTOR
VDD-5V
10uF, 35V
DC-3.3V
(VDD-3V3B)
P9-03/04
10uF, 35V
VDD-5V
AUDIO AMP

H/W Development



H/W Development



H/W Development

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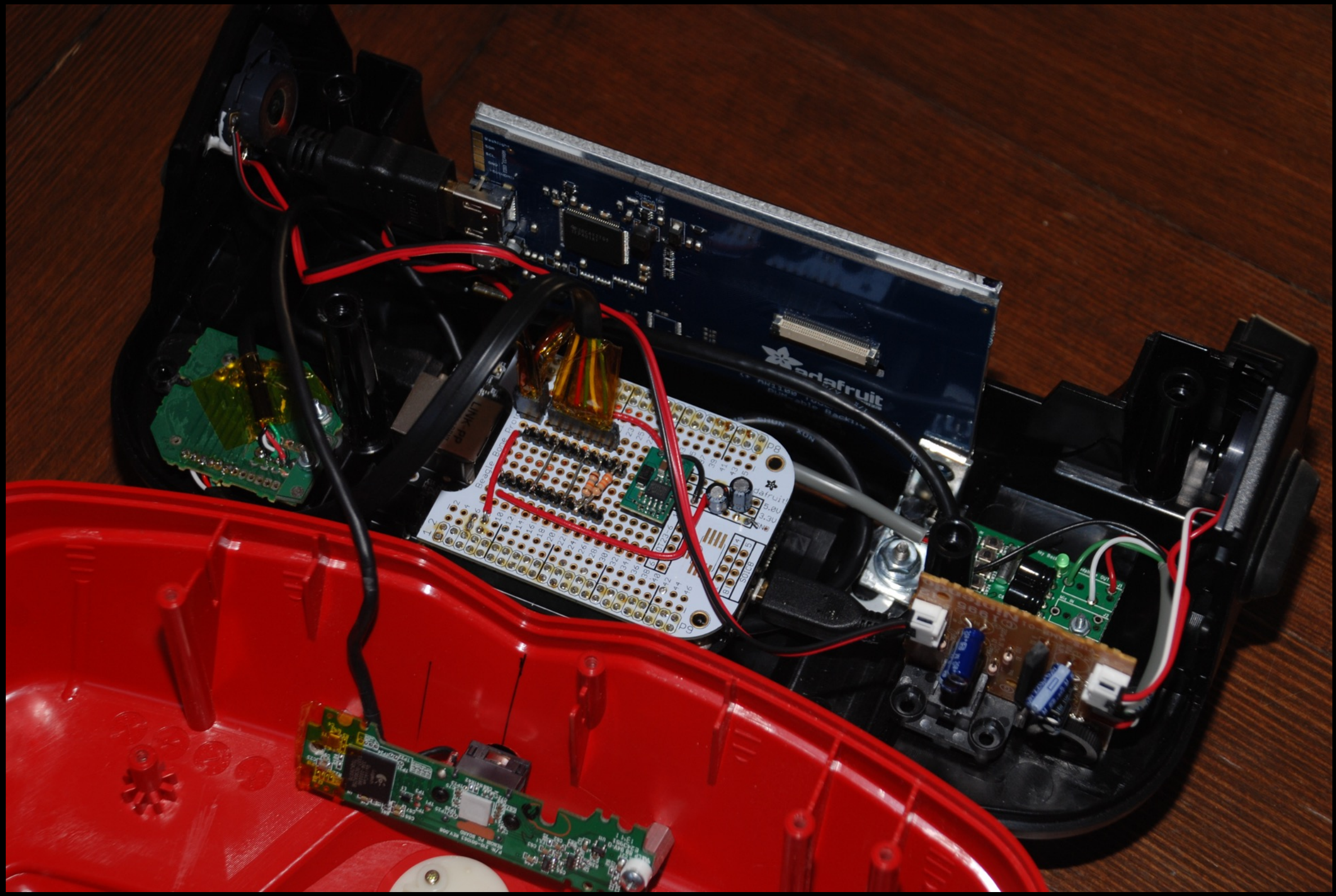


H/W Development

H/W Development

S/W Development

- Xcode 6.1.1 targeted for OS X or BBB
- Angstrom Linux 2012.12/3.8.13
- Xfce: Graphical desktop environment
- OpenCV: Face detection and image manipulation
- SDL (Simple DirectMedia Layer): Audio playback
- Cairo and Freetype: Font rendering
- libsoc: Low-level I/O interfacing for Virtual Boy controller

Controller

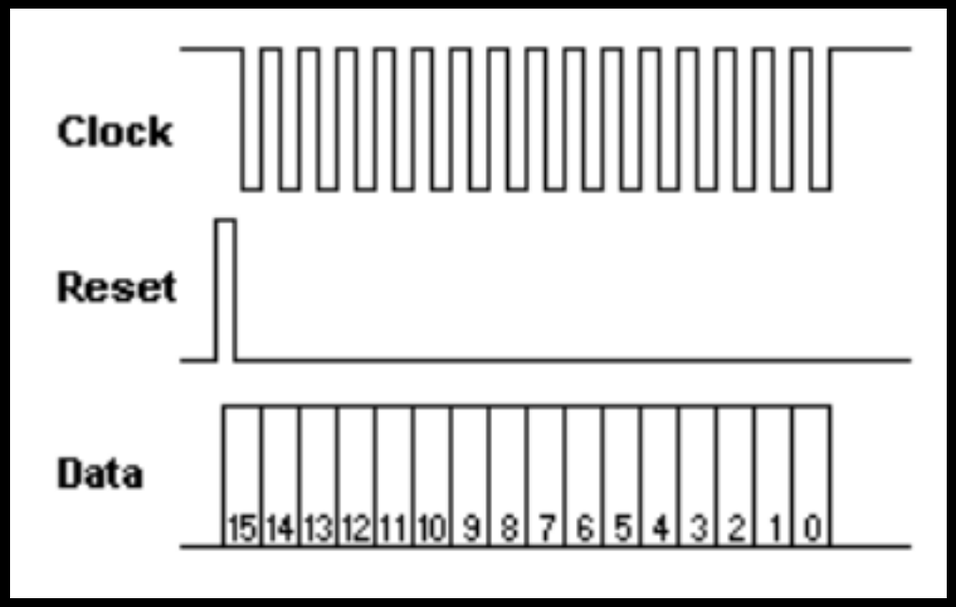
- Provides gameplay control and power for system
- Synchronous serial interface
- Each bit corresponds to an individual button

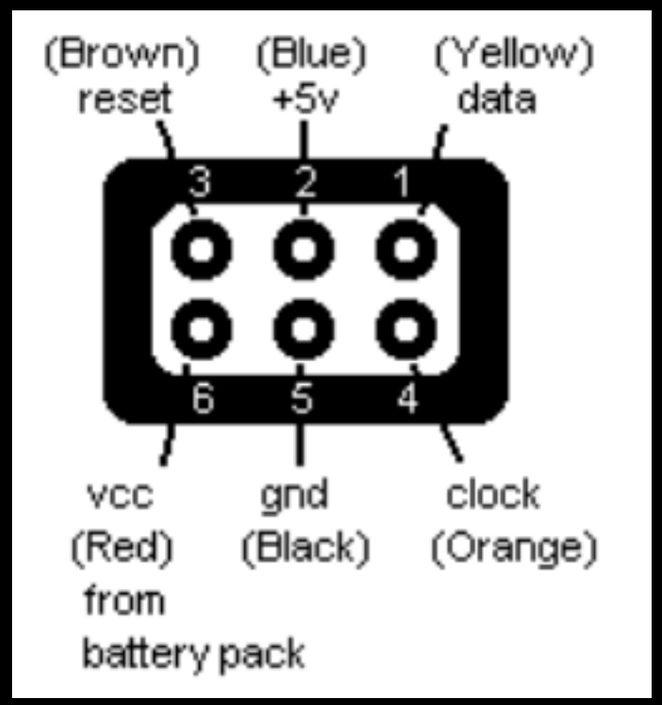
15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
rdd	rdl	sel	str	ldu	ldd	ldl	ldr	rdr	rdu	lbb	rbb	b	a	1	bat

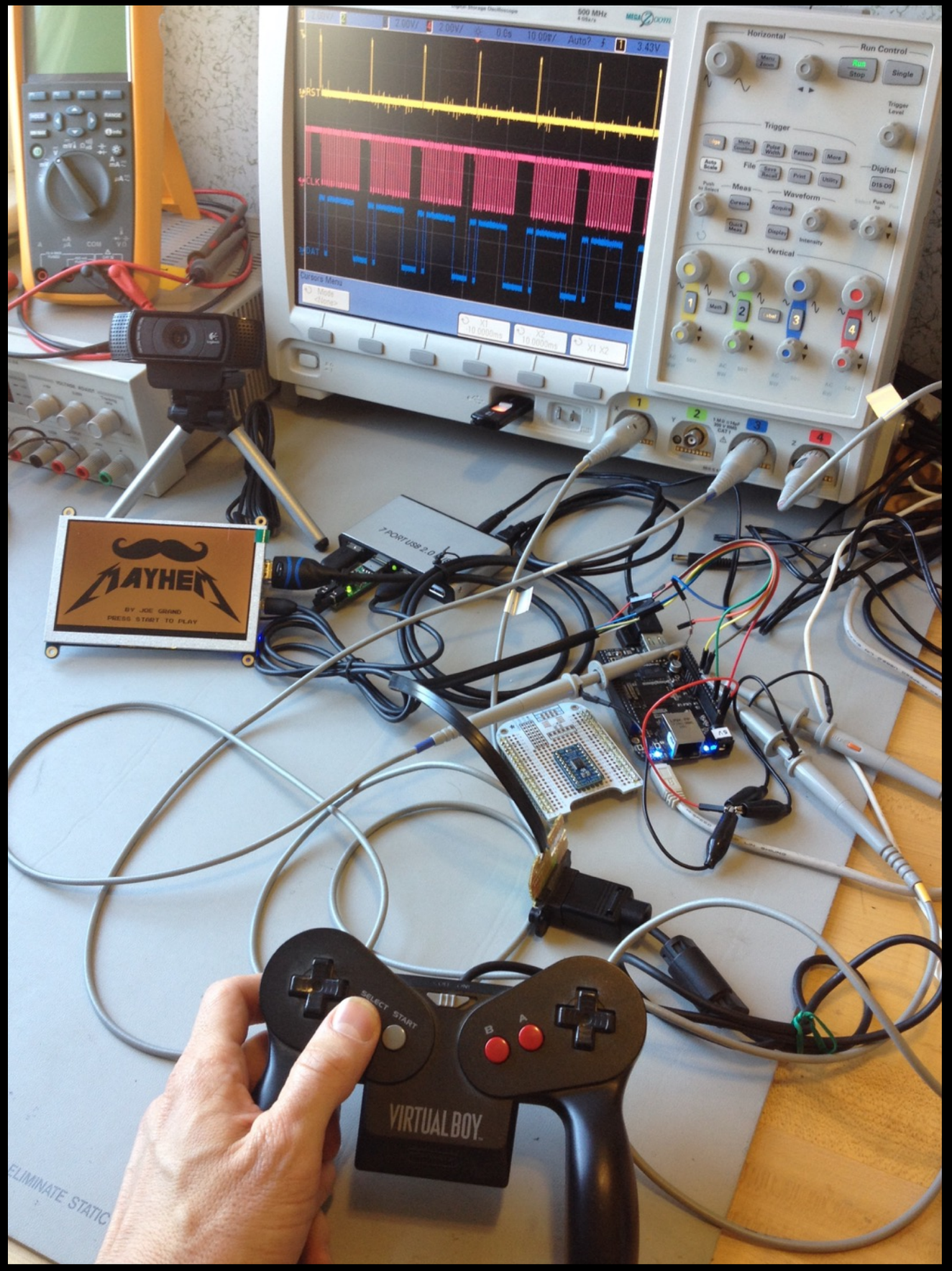
rdx – Right DPad, where x is Up, Down, Left, Right
ldx – Left DPad, where x is Up, Down, Left, Right
sel – Select
str – Start
lbb, **rbb** – Left/Right Button on back of controller
bat – Battery low, may flicker so test multiple times.

Virtual Boy Programmers Manual
www.goliathindustries.com/vb/download/vbprog.pdf

Controller

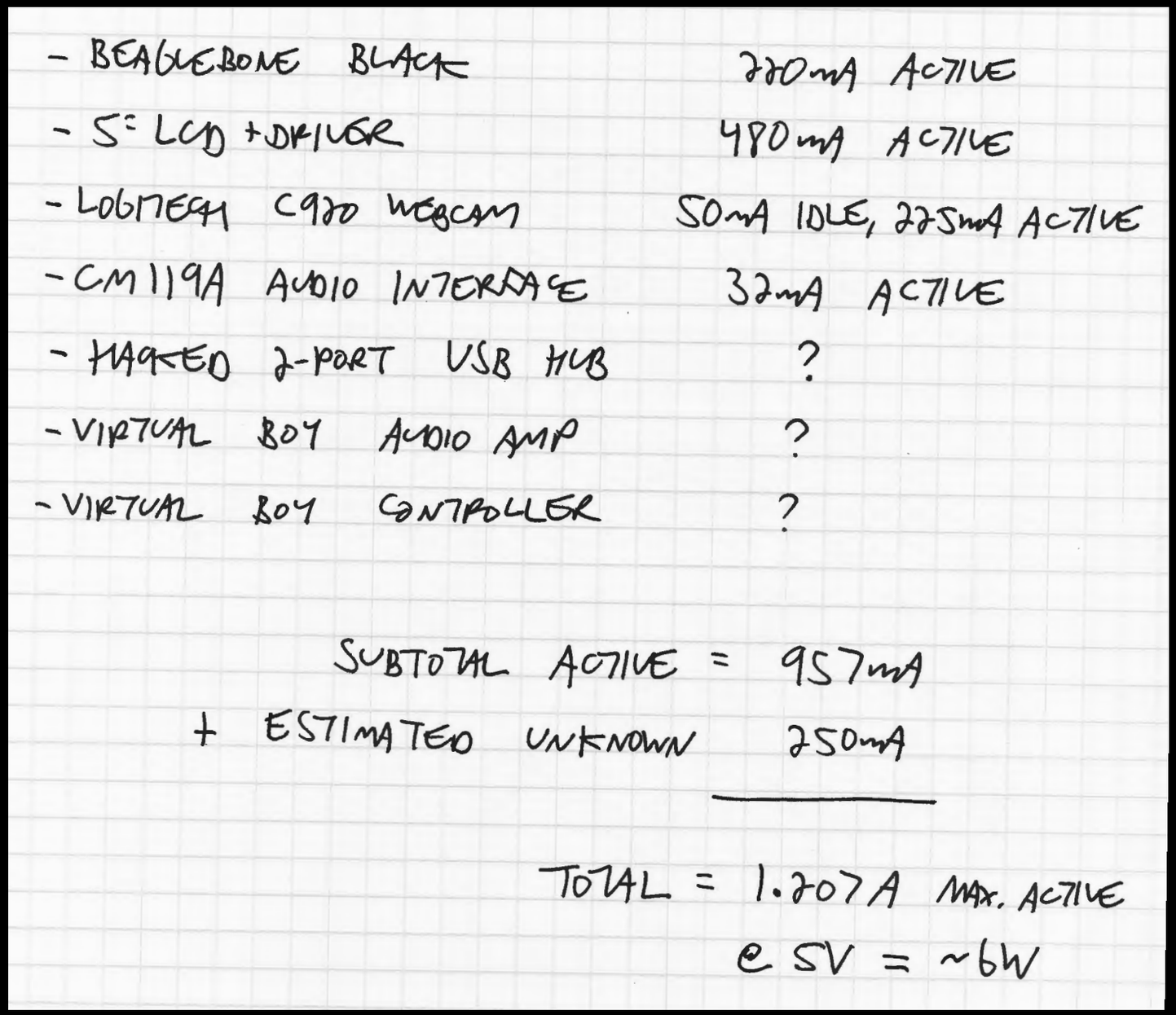

Clock
Reset
Data
15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0


(Brown)
reset
(Blue)
+5v
(Yellow)
data
3 2 1
6 5 4
vcc
(Red)
from
battery pack
gnd
(Black)
clock
(Orange)

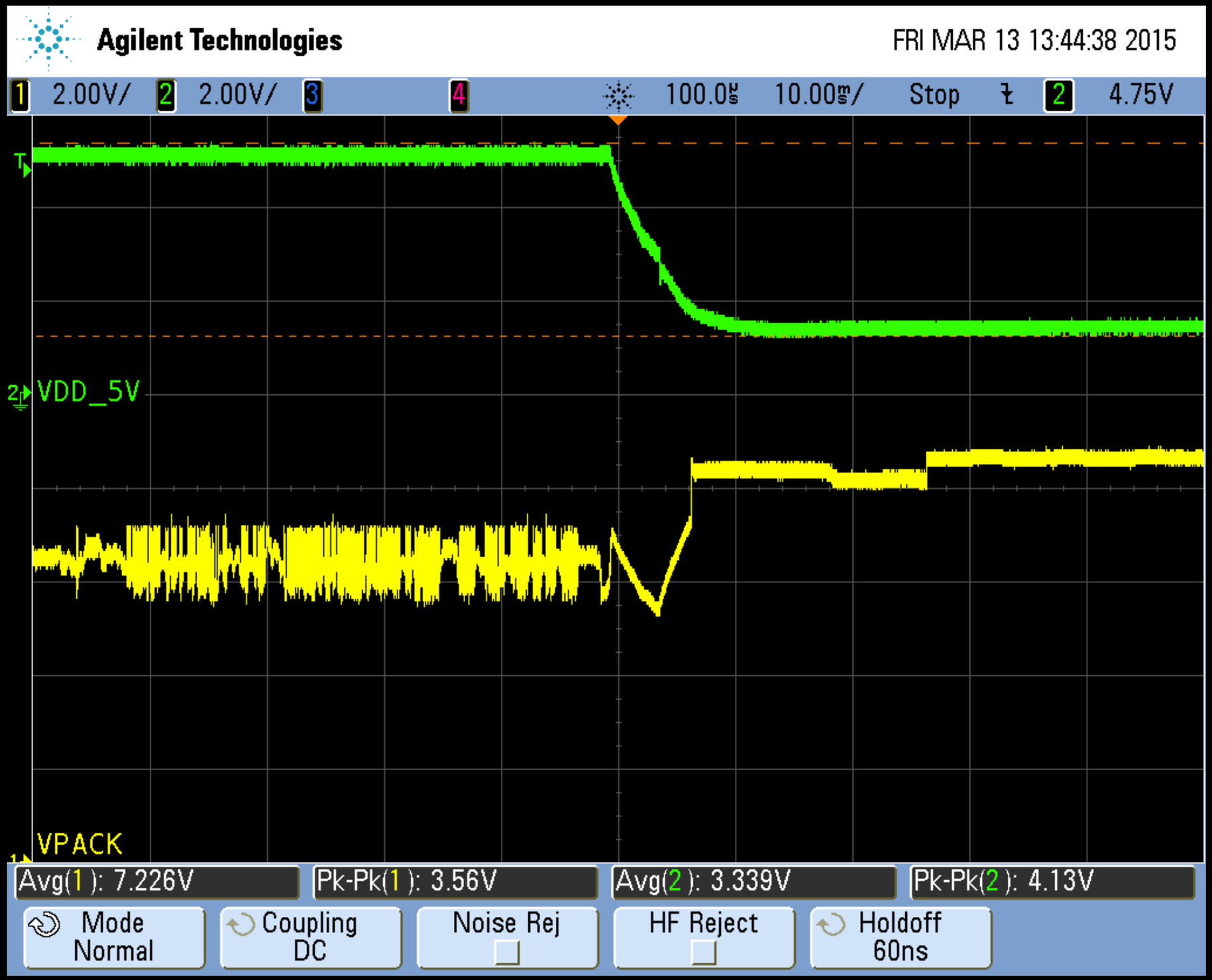

MAYHEM
VIRTUAL BOY

Power to the Mustache!

- Major oversight of power consumption requirements
- Wasn't discovered until opening night at Byte Me 4.0



Energizer L91 Lithium AA



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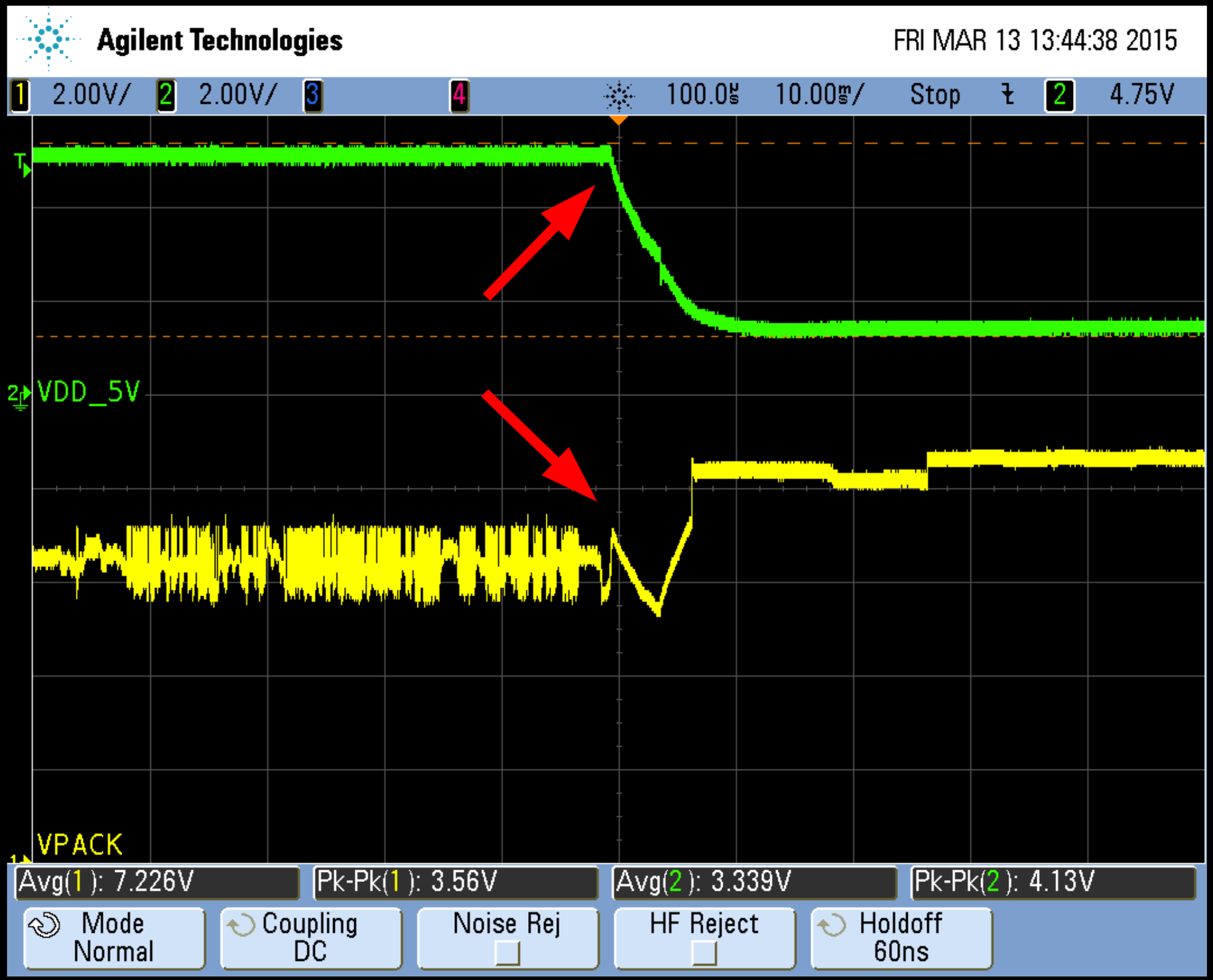
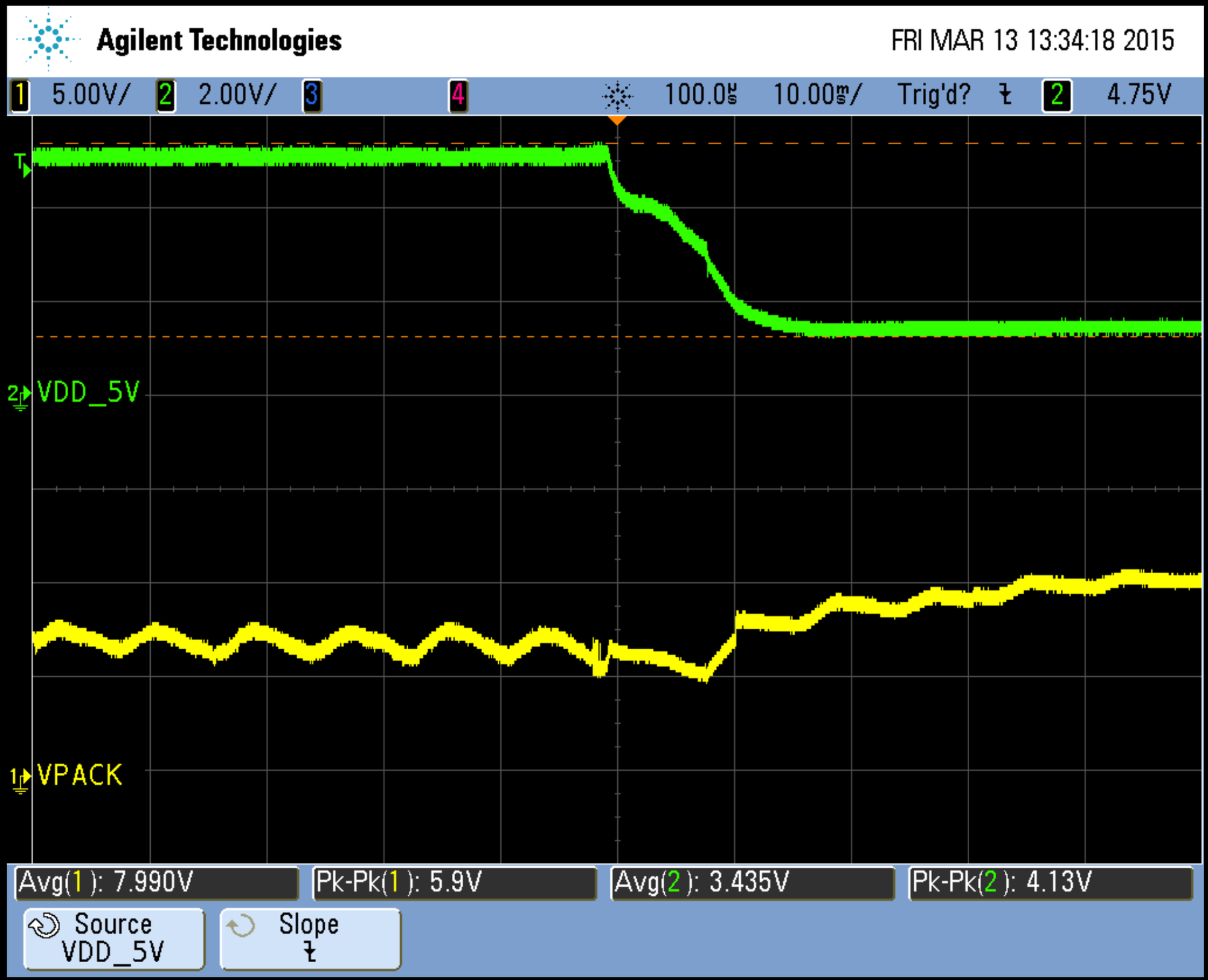
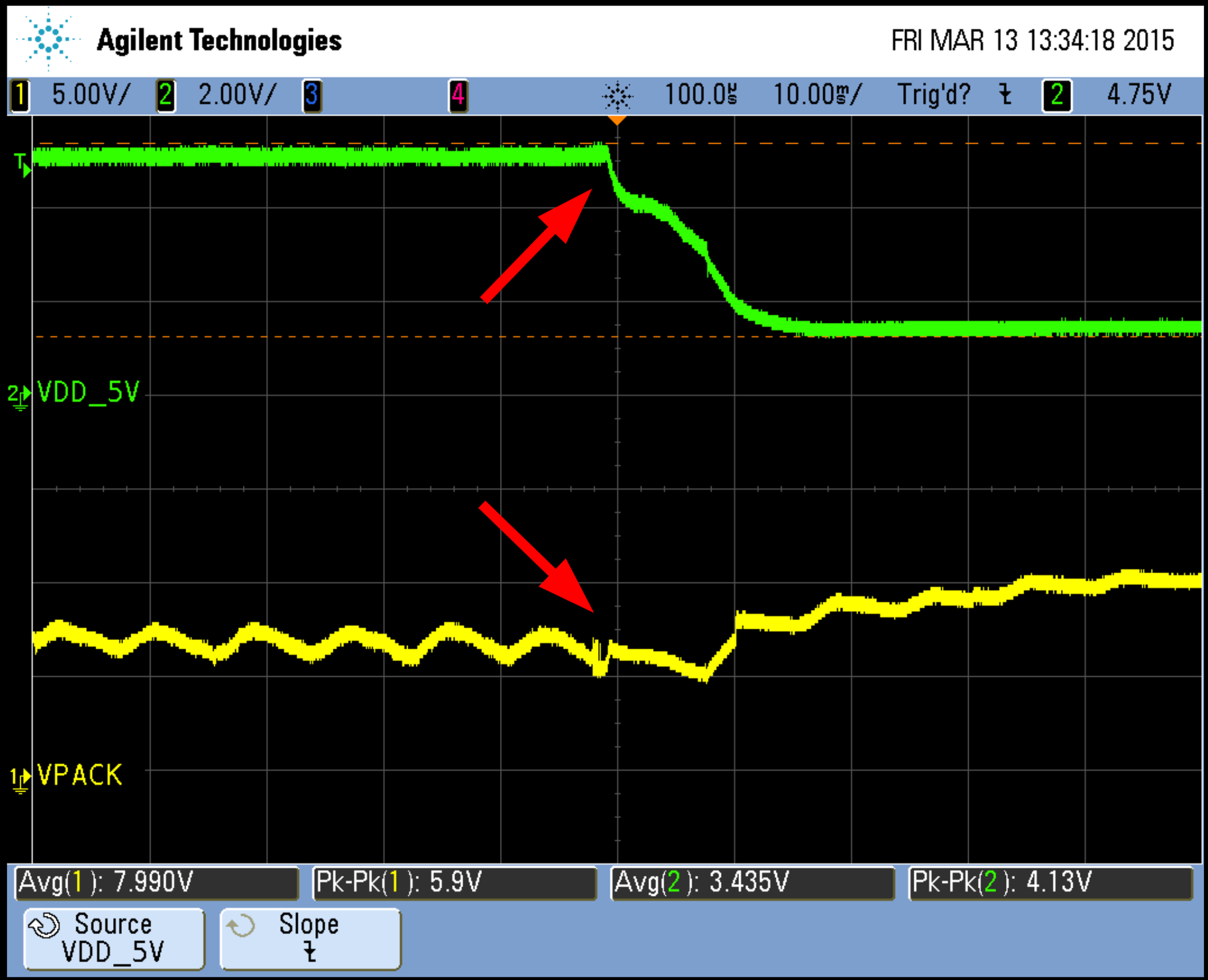


Nintendo SNS-002



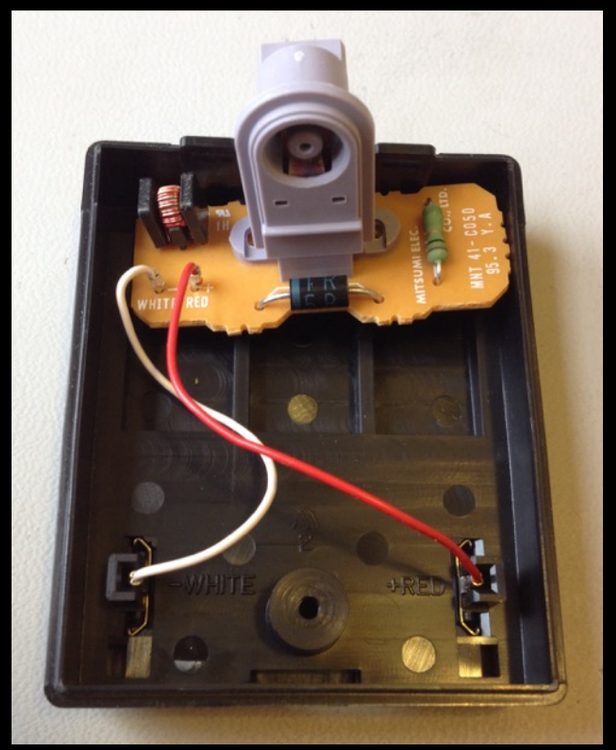
10V, 850mA

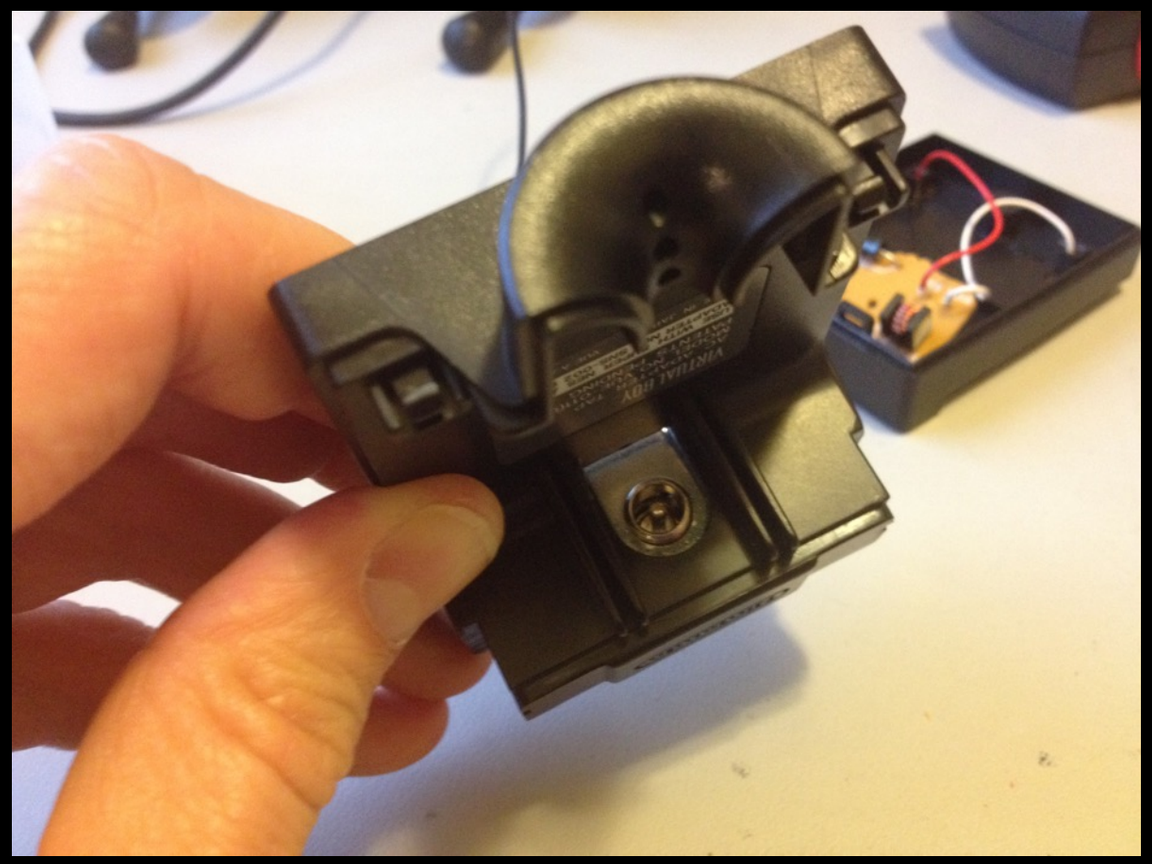
Nintendo SNS-002



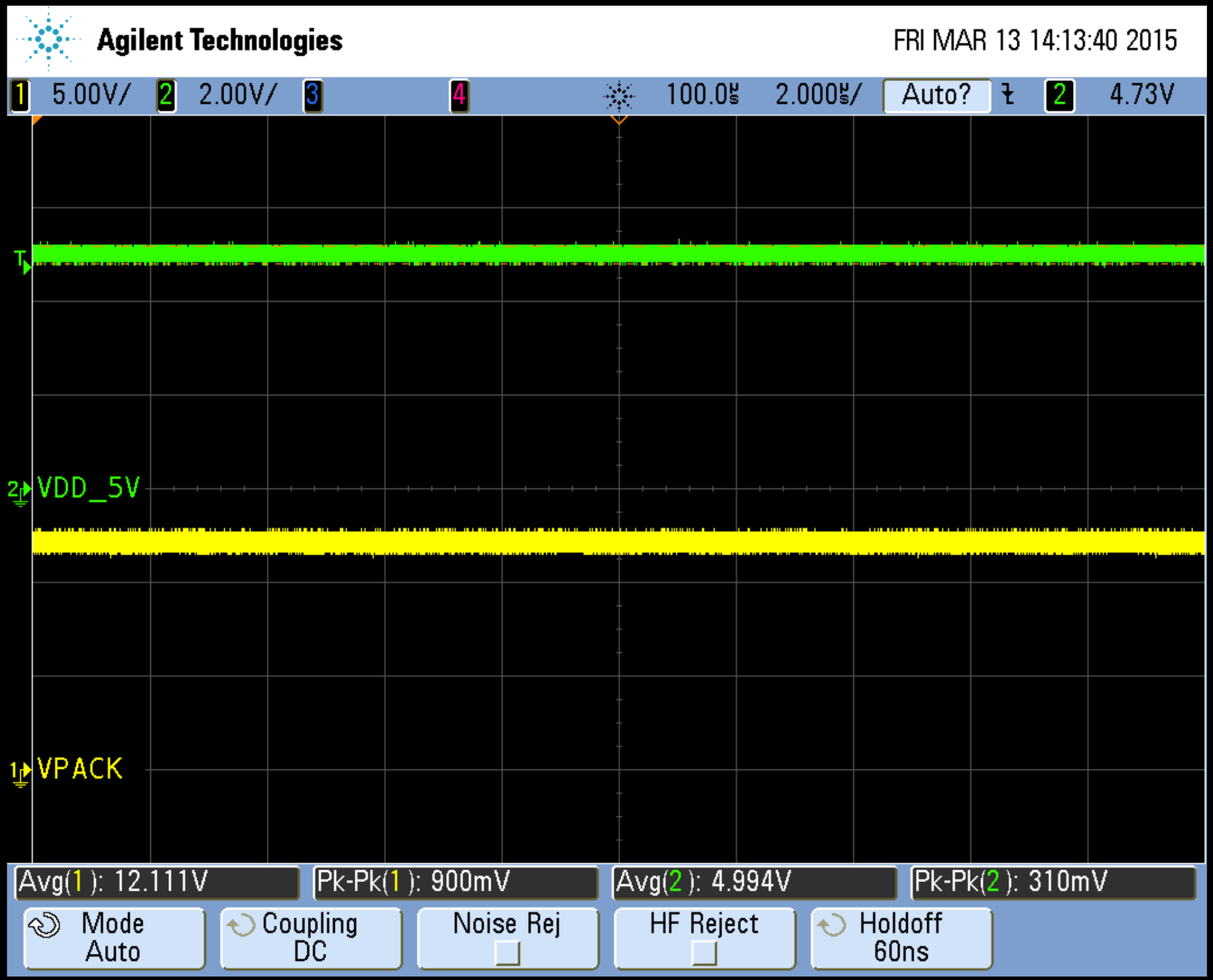
10V, 850mA

Fix of the Mustache!





CUI DMS120250-P5P-IC



12V, 2.5A

Action Shot!

www.youtube.com/watch?v=Efp4izKksvY

The End.