The Open Hardware Revolution

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WHAT IS OPEN SOURCE HARDWARE
A Key Example
WHY IS THIS HARD?
WHY IS THIS IMPORTANT?
Opening Hardware Workshop
March 17th, Eyebeam

By: Ayah Bdeir (littleBits),
John Wilbanks (CC),
Thinh Nguyen (CC)
OPEN SOURCE HARDWARE DEFINITION
Open Source Hardware (OSHW) Definition 1.0

OSHW Draft Definition 1.0 is based on the Open Source Definition for Open Source Software and draft OSHW definition 0.5. The definition is derived from the Open Source Definition, which was created by Bruce Perens and the Debian developers as the Debian Free Software Guidelines. Videos and Documentation of the Opening Hardware workshop which kicked off the below definition are available here. Please join the conversation about the definition here.

Introduction

Open Source Hardware (OSHW) is a term for tangible artifacts -- machines, devices, or other physical things -- whose design has been released to the public in such a way that anyone can make, modify, distribute, and use those things. This definition is intended to help provide guidelines for the development and evaluation of licenses for Open Source Hardware.

Hardware is different from software in that physical resources must always be committed for the creation of physical goods. Accordingly, persons or companies producing items ("products") under an OSHW license have an obligation to make it clear that such products are not manufactured, sold, warranted, or otherwise sanctioned by the original designer and also not to make use of any trademarks owned by the original designer.

The distribution terms of Open Source Hardware must comply with the following criteria:

1. Documentation

The hardware must be released with documentation including design files, and must allow modification and distribution of the design files. Where documentation is not furnished with the physical product, there must be a well-publicized means of obtaining this documentation for no more than a reasonable reproduction cost, preferably downloading via the Internet without charge. The documentation must include design files in the preferred format for making changes, for example the native file format of a CAD program. Deliberately obfuscated design files are not allowed. Intermediate forms analogous to compiled computer code -- such as printer-ready copper artwork from a CAD program -- are not allowed as substitutes. The license may require that the design files are provided in fully-documented, open format(s).

2. Scope

The documentation for the hardware must clearly specify what portion of the design, if not all, is being released under the license.

3. Necessary Software

If the licensed design requires software, embedded or otherwise, to operate properly and fulfill its essential functions, then the license may require that one of the following conditions are met:
Open source hardware – (OSHW) Draft Definition version 0.3 and...

Today is a big day for anyone who designs (or builds) open source hardware. For about 5+ years or so the term “open source hardware” has been used more and more to generally describe projects in which the creators have decided to completely publish all the source, schematics, firmware, software, bill of materials, parts list, drawings and “board” files to recreate the hardware - they also allow any use, including commercial. Similar to open source software like Linux, but this hardware centric.

We're also quickly approaching a 1.0 of the Open-source hardware definition. 0.4 is here, take a look.

Open-source hardware statement of principles and draft definition 0.4

A new statement of principles and draft definition 0.4 is up for Open-source hardware – your feedback and participation is needed! After the Open-source Hardware summit one of the requests was for all of us to figure out an “overview” of what/why we do this. We think we have a good start based on what many people have helped outline – here’s the draft:

Open Source Hardware (OSHW) Statement of Principles (Draft)
Open source hardware is hardware whose design is made publicly available so that anyone can study, modify, distribute, make and sell the design or hardware based on that design. The hardware’s source, the design from which it is made, is available in the preferred format for making modifications to it. Ideally, open source hardware uses readily-available components and materials, standard processes, open infrastructure, unrestricted content, and open-source design tools to maximize the ability of individuals to make and use hardware. Open source hardware gives people the freedom to control their technology while sharing knowledge and encouraging commerce through the open exchange of designs.

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They, the people of the open source hardware movement, in order to form a more peaceful community for sharing, establish bigger and cuddlier Chumbies, ensure continued Arduino creativity, promote the general welfare, and secure the blessings of hackery to ourselves and our posterity, have established the Open Source Hardware Draft. It’s a sort of 11 commandments for those who would share or use an open source hardware design, indicating what documentation is required, how derived works must be allowed and, perhaps most importantly, that each use must include attribution to those founding engineers who came before. Its current version, 0.3, was ratified yesterday by a group of dignitaries including folks behind the Arduino, Adafruit, and Chumby, along with plenty of other underground industry big-wigs.
OSHW Licence

CERN Open Hardware Licence

The CERN Open Hardware Licence was written for CERN designs hosted in the OHR and can also be used by any designer wishing to share design information using a licence compliant with the OSHW definition criteria.
OPEN HARDWARE SUMMIT
September 15\textsuperscript{th}, 2011 –
NY Hall of Science

Openhardwaresummit.org
CENTRALIZE A COMMUNITY
## DIY Open Source Companies (partial)

<table>
<thead>
<tr>
<th>Companies</th>
<th>Companies</th>
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<tbody>
<tr>
<td>Adafruit</td>
<td>Parallax</td>
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<tr>
<td>Arduino</td>
<td>Rachel’s Electronics</td>
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<td>Beagle Board</td>
<td>Rogue Robotics</td>
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<td>Bug Labs</td>
<td>Seeed Studio</td>
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<tr>
<td>Centeye</td>
<td>Sparkfun</td>
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<tr>
<td>Chumby</td>
<td>SnootLab</td>
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<td>DIYdrones</td>
<td>Texas Instruments</td>
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<td>DIYLILCNC</td>
<td>ThingM</td>
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<tr>
<td>Evil Mad Scientist</td>
<td>Wiring</td>
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<td>GoGoBoard</td>
<td>WillowGarage</td>
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<td>inMojo</td>
<td>XiVO IPBX</td>
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<tr>
<td>LilyPad</td>
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<td>mcu Labs</td>
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<td>Makerbot</td>
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<td>MITRE</td>
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MAKE IT ACCESSIBLE
GOALS

MAKE IT SEXY
We added some bling

Source: Windel Oskay’s design for the 2011 OHS badge
We added a red carpet

Source: Mateo Zlater’s design for the 2011 OHS red carpet walk
The Anthrax Killer: Did They Get the Wrong Guy?  
The Cocaine Smuggler's Submarine  
10 Cool New Gadgets, Tested and Rated  

INSIDE  
THE SHAKE-UP  
AT GOOGLE

The DIY Revolution Starts Now

HOW TO MAKE STUFF

25 AWESOME PROJECTS

If You Can Think It, You Can Build It!
STATE OF OPEN HARDWARE BUSINESSES
Open source hardware projects:

Source: OSHW annual - Torrone, MAKE magazine

Source: Phil Torrone, Foo Camp
Openwashing?
Industry Openwashing

Accenture + Open Source Hardware

BusinessWeek recently published an article entitled “Accenture Goes the Tailor-Made Route” by Damian Joseph. It describes how Accenture is working with Bug Labs to develop a number of compelling hardware + service offerings that they believe will drive significant interest from their customers and prospects. In fact, Accenture's Andy Zimmerman was clearly thinking about how this could work last year when he posted Build your own Open Source Product. Read more here...

AT&T Announces Plans to Open Innovation Centers to Spur Development of New-Generation Mobile and Wired Broadband Applications, Devices

Facilities to Support AT&T LTE Trials and Testing Beginning Later this Year

DALLAS, Feb. 18 /PRNewswire-FirstCall/ -- development of next-generation devices, broadband.

Bug Labs and Pitney Bowes Announce First Modular, Mobile Device Development Platform with Hardware-level Security Protection

BUGsecure offers enterprises a flexible, trusted platform for secure wireless device innovation

NEW YORK, March 14, 2011 - Bug Labs, an open source hardware and software provider that gives companies the tools and support needed to prototype, pilot and produce innovative networked devices with ease, and Pitney Bowes Inc. (NYSE:PBI) today announced the industry’s first modular, mobile device development platform incorporating hardware-level
SUCCESS STORIES
Success Stories
Success Stories

The head of Stephen Colbert by Colbert

Description
At long last, everyone in the world (ok everyone who has access to a 3d printer) can have their own bust of America’s greatest entertainer and statesman, Stephen Colbert.

Even better, you can use this model and your favorite 3d modeling software to add Mr. Colbert’s face to objects which were formerly lacking in Colbert heads, like banisters, umbrella handles, toothpaste squeezers, and rabbits. (To name a few.)


Instructions
“HighRes” versions are very high-res. The LowRes and LowerRes versions still have a lot of detail and are more reliable, so start with those.

This bust should print well on a MakerBot Thing-O-Matic even without support material.

Check out olhemus.com for more information about their great scanners.

Other People’s Copies

Other People’s Variations

view more

view more
Success Stories

Gameduino: an Arduino game adapter
A Technology project in Pescadero, CA by James Bowman

471 BACKERS
$38,297
PLEDGED OF $3,333 GOAL
0 SECONDS TO GO

FUNDING SUCCESSFUL
This project successfully raised its funding goal on April 1.
## Success Stories

### List of Affordable Geiger Counters

<table>
<thead>
<tr>
<th>Image</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Price</th>
<th>GM tube</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td>SparkFun Electronics</td>
<td>SEN-09848</td>
<td>$149.95</td>
<td>LND 712</td>
</tr>
<tr>
<td><img src="image2.png" alt="Image" /></td>
<td>Liboilum</td>
<td>Radiation Sensor Board for Arduino + Geiger Tube</td>
<td>€95.00</td>
<td>SBM-20</td>
</tr>
<tr>
<td><img src="image3.png" alt="Image" /></td>
<td>Seeed Studio</td>
<td>?</td>
<td>?</td>
<td>J409y</td>
</tr>
<tr>
<td><img src="image4.png" alt="Image" /></td>
<td>Tokyo Hackerspace</td>
<td>Tokyo Hackerspace/HIDTN Geiger Shield</td>
<td>?</td>
<td>External geiger tube carrier board. Targeting low/med/high end tubes</td>
</tr>
</tbody>
</table>
OSHW Logo - Winner

Submitted by: Golden Orb
Author: Macklin Chaffee
Date: February 11th, 2011
OSHW Logo – community contributions

- Kerning cleanup
- AI files – havehalf
- Eagle ULP script - WestfW - oshw-logo.ulp
- Revised ULP prompts user with a dialog for line width & size - Shimniok
- Eagle Library - Andrew Tergis - OSHW.lbr
- gEDA files - Evil Mad Scientist
- SVG files - Brandon Stafford

Logo cleanup - Mateo Zlatar
3D rendering - Jase

Kicad – Wayne and Layne

openScad - clothbot
OSHW Logo - applications

Logo Decal Jason Kruse, Mr. Decals – Over 500 decals sent free
Thank you!

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