

**Sketching in Hardware 2013: PROJECTIONS**



# **Sketching A New Product Ecosystem Starting with 'Peripheral' Products**

July 18, 2013

Xerox Palo Alto Research Center, Palo Alto, California, U.S.A.

**Shigeru Kobayashi** (Institute of Advanced Media Arts and Sciences [IAMAS])

How might we sketch new product ecosystems to facilitate mutual understanding between manufacturers and 'makers' to creating innovation?

This is the most interesting design challenge for me. Japan is a so called developed country with many highly skilled manufacturers. But there are many restrictions, especially for product liability issues. If we made the relationship between manufacturers and users more flexible, we might be able to facilitate innovation within manufacturers.

# **THE NEW PRODUCT DEVELOPMENT ECOSYSTEM**

## HOW WE WILL SKETCH PRODUCTS AND REINVENT MANUFACTURING IN THE PROCESS

**Mike Kuniavsky**

July 20, 2012

Portland, Oregon

Mike Kuniavsky, The New Product Development Ecosystem: How We Will Sketch Products and Reinvent Manufacturing in the Process, Sketching in Hardware 12, 2012

Mike proposed a new product development ecosystem at the last Sketching, consisting of an Amazon like front end and rapid and flexible manufacturing systems as the back end.

Introduction

## Case studies

- Maker Conference Tokyo 2013
- konashi Make-a-thon

**Shigeru Kobayashi** | Sketching in Hardware 2013 | Xerox Palo Alto Research Center, Palo Alto, California, U.S.A.

I was inspired by the talk. I'd like to introduce two case studies, then talk about a new product ecosystem for 'peripheral' products.



## Case 1: KORG's monotron

# Maker Conference Tokyo 2013

- A paid conference held at June 15 in Tokyo
- About 250 attendees
- 5 sponsors including Intel
- Keynote talks by Mark Frauenfelder and Eric Pan
- Sessions with speakers of manufacturers and makers
  - Creating maker friendly products
  - Maker × Maker (Manufacturer)

Maker  
Conference  
Tokyo 2013

[http://makezine.jp/blog/2013/06/nuchack\\_mct2013.html](http://makezine.jp/blog/2013/06/nuchack_mct2013.html)

Maker Conference Tokyo 2013 was a paid conference held at June 15 in Tokyo. There were about 250 attendees. Keynote speakers were Mark Frauenfelder (Make) and Eric Pan (Seed Studio). I was a PC member and a moderator of two sessions with speakers of manufacturers and makers: 'Creating maker friendly products' and 'Maker × Maker (Manufacturer)'.



Makerフレンドリーな製品をつくる -Maker Conference Tokyo 2013

**Maker Conference Tokyo 2013**  
**Makerフレンドリーな製品をつくる**

# KORG

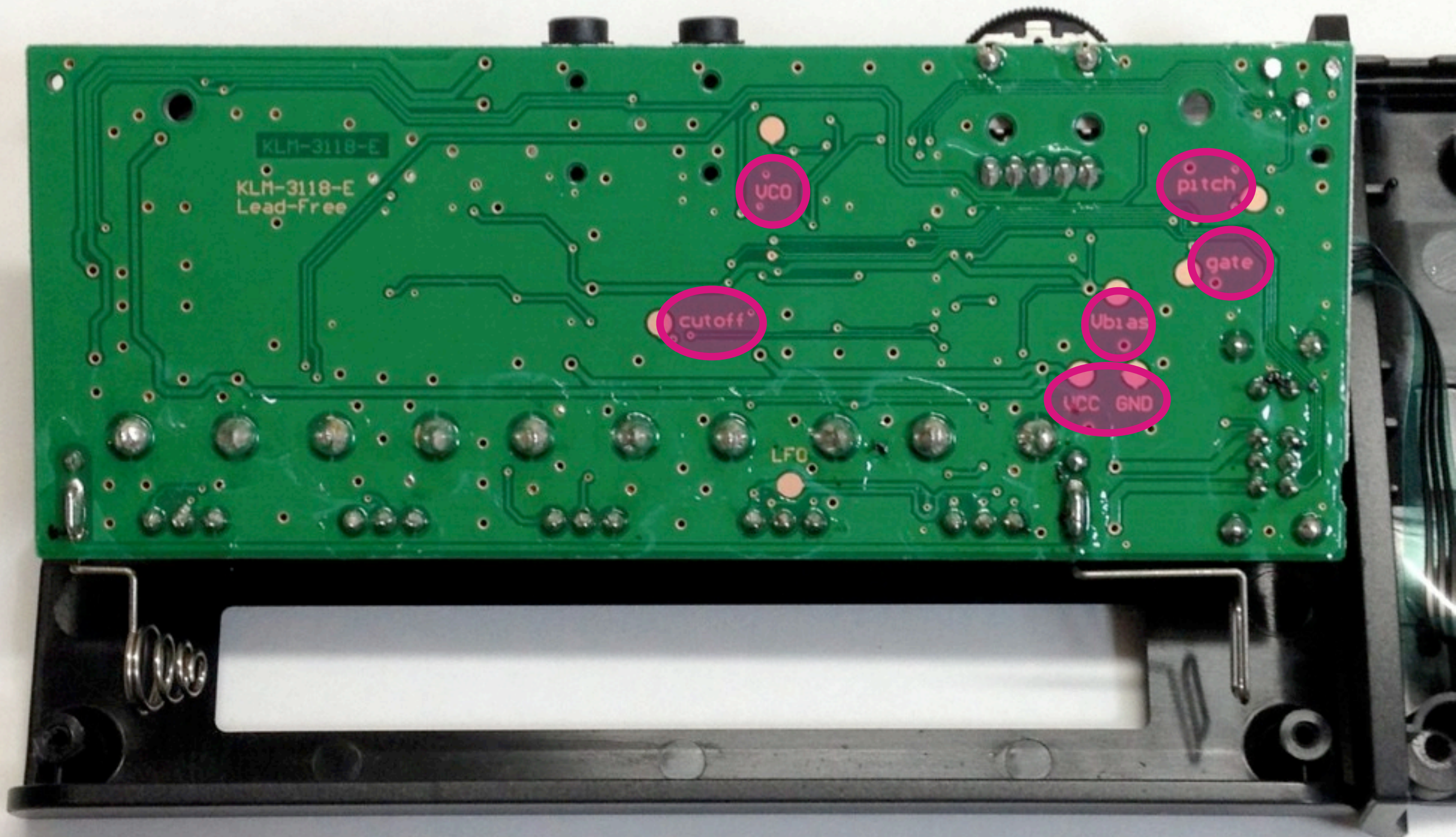


Regarding the 'creating maker friendly products' session, we invited speakers from Roland D. G. and KORG. The planner of KORG introduced the maker friendly history about 'monotron'.



monotron is a cheap analogue synthesizer. Initially, the product planner wanted to put synthesizers back into the hands of customers to rediscovery the joy of the synthesizer, since he thought that digital synthesizer have not been as attractive as analogue synthesizers.





In the development process, the hardware designer proposed putting tips on the back of the PCB to let users hack the synthesizers since he felt that monotron is too simple for deep synthesizer lovers like him.



ホーム > 製品情報 > ダンス/DJ > monotron > We love monotron!!



## We love monotron!!

発売以来、大きな反響を頂いているKORG monotron。一部のユーザーの中では、monotronを自分の求める形に作り替える新しい動きが生まれているようです。ここでは、そんなユーザーの製作品を見ながら、monotronから広がる別世界をちょっとだけ覗いてみましょう。

\*コルグは製品の改造を推奨しておりません。

\*製品のネジを外して開けたり、改造した場合、保証の対象外となりますので、ご注意ください。

\*ここで紹介しているものはMake Tokyo Meetingに出展されたものです。

▶ [Make Tokyo Meeting 05](#)



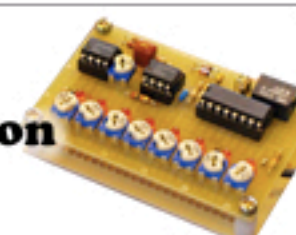
#01  
**naotron**



#02  
**Monodular**



#03  
**改造 monotron  
& NSQ-10**



#04



#05



#06



After it's release in April 2010, user immediately understood the developers intent, and hacked the product to create something new. The developers found hacked products at Make: Tokyo Meeting 05 (a Maker Faire in Tokyo in May 2010) and featured the products on their official website in June 2010. <http://www.korg.co.jp/Product/Dance/monotron/welove/>





- PRODUCTS
- NEWS
- ARTISTS
- SUPPORT
- PROMOTIONS
- DEALER LOCATOR
- MEDIA



# Analog Products Schematics

**Country**

**First Name**

**Last Name**

**Address 1**

**Address 2**

**City**

**State**

**Postal Code**

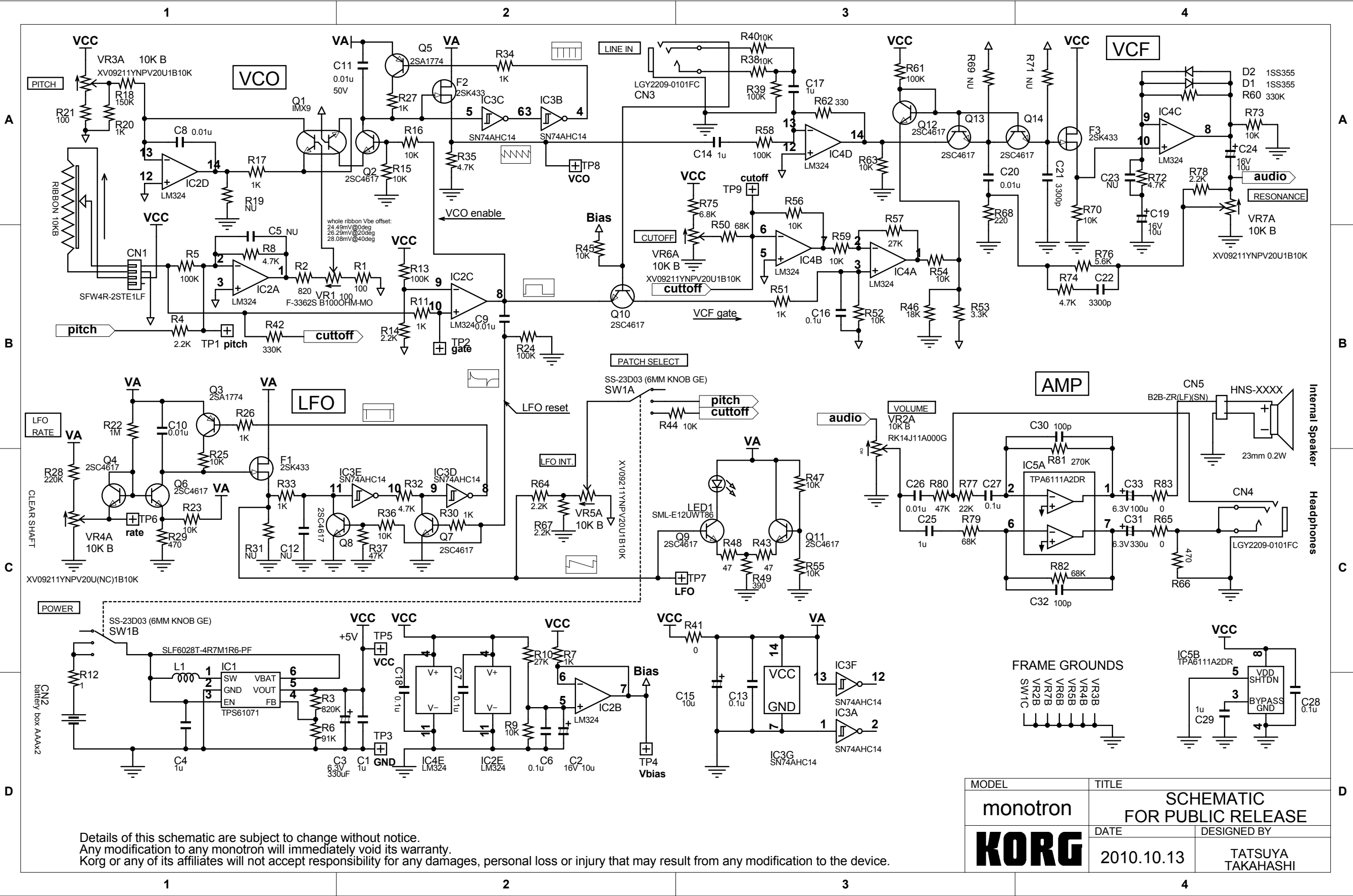
**Email**

☒ **Newsletter**



By clicking the "I Agree" button, you hereby agree that any modification to any Korg product, whether made by you or any other person, will immediately void any and all warranties, express or implied, including without limitation any warranty of merchantability or of fitness for a particular purpose, related to any Korg product, and agree that you shall be deemed to have irrevocably and unconditionally waived any claims or rights you may have against Korg Inc, its distributors, subsidiaries, Korg USA Inc., its dealers and its affiliates related to or arising out of any Korg product. Furthermore, by clicking the "I Agree" button, you agree to indemnify Korg Inc, its distributors, subsidiaries, Korg USA Inc., its dealers and its affiliates and hold them harmless from and against any damages, loss or injury that may result from any modification to any Korg product.

Moreover, KORG decided to release the schematic in response to requests from makers in November 2010.

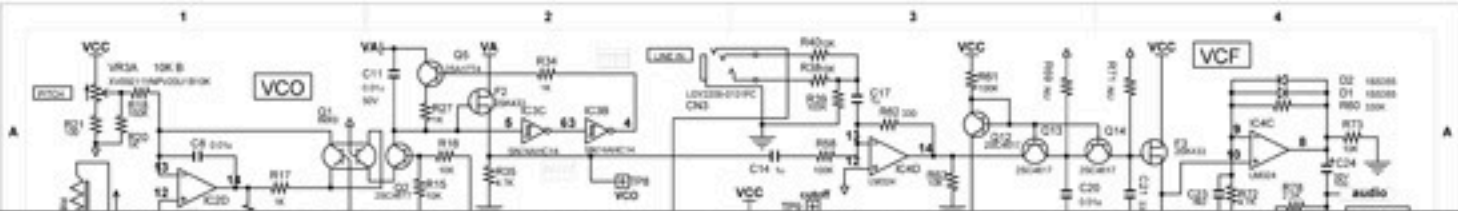


This is the circuit diagram of monotron. Makers can hack and expand a monotron easily with the aid of the diagram.



# Makey Awards 2011 Nominee 04: Korg Monotron, "Best Product Documentation"

By Sean Michael Ragan Posted 2011/06/30 @ 6:00 am Category Music, General Comments 7



楽天 ICHIBA

 ¥14,900	 ¥2,990	 ¥154,000
 ¥6,900	 ¥56,000	 ¥1,980

Join the **Make: Forum**  
Where the Makers Meet

About half a year later, monotron nominated at Makey Awards 2011 as the ‘best product documentation’ in June 2011.





A few months later, KORG released derivative products of monotron inspired by hacked products, monotron DELAY and monotron DUO, as answers in November 2011. The hidden concept was 'what if KORG hacked monotron?'.



So far, KORG has been opening products by putting hints and releasing circuit diagrams, with no claims from customers. Since these are not mainstream but ‘peripheral’ products, the developers have been able to major advancements instead of being lead by the voices of established customers or dealers.



## Case 1: KORG's monotron

# Lessons learned from monotron

- Embedding messages for makers transforms a product into an open platform
- The planner thought analogue is the key of putting synthesizers back into the hands of customers, but open platform is the key
- Even after opening the circuit diagram, everyone purchased monotron to hack instead of making clones (cost and/or respect?)
- Not a simple open components but an attractive and hackable product is the key, and releasing hackable products is an effective way of open innovation

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Still there are gaps between maker and player communities, but they are trying to approach connecting communities.

## Case 2: konashi Make-a-thon

# konashi Make-a-thon

- Held on June 1 and 22 at OpenCU by loftwork, a global open platform for creative talents, in collaboration with Yukai Engineering, an engineering farm of robots
- konashi is a physical computing toolkit to create wireless devices for smartphones and tablets created by Yukai Engineering

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I was a adviser of the make-a-thon



<http://konashi.ux-xu.com/documents/>

Technically, konashi is consisting of a Bluetooth Low Energy wireless module and software libraries for Objective-C and JavaScript. But they promote not as BLE evaluation kits but a physical computing toolkit to communicate with designers and artists to expand possibilities of wireless products and services.





There were over 30 participants consist of iOS developers, engineers, web designers, artists and planners. We divided into 6 teams randomly.





<http://www.flickr.com/photos/opencu/sets/72157633896214841/>

I facilitated idea sketching sessions. As a result, there were over 230 ideas from about 30 participants in 2 hours.

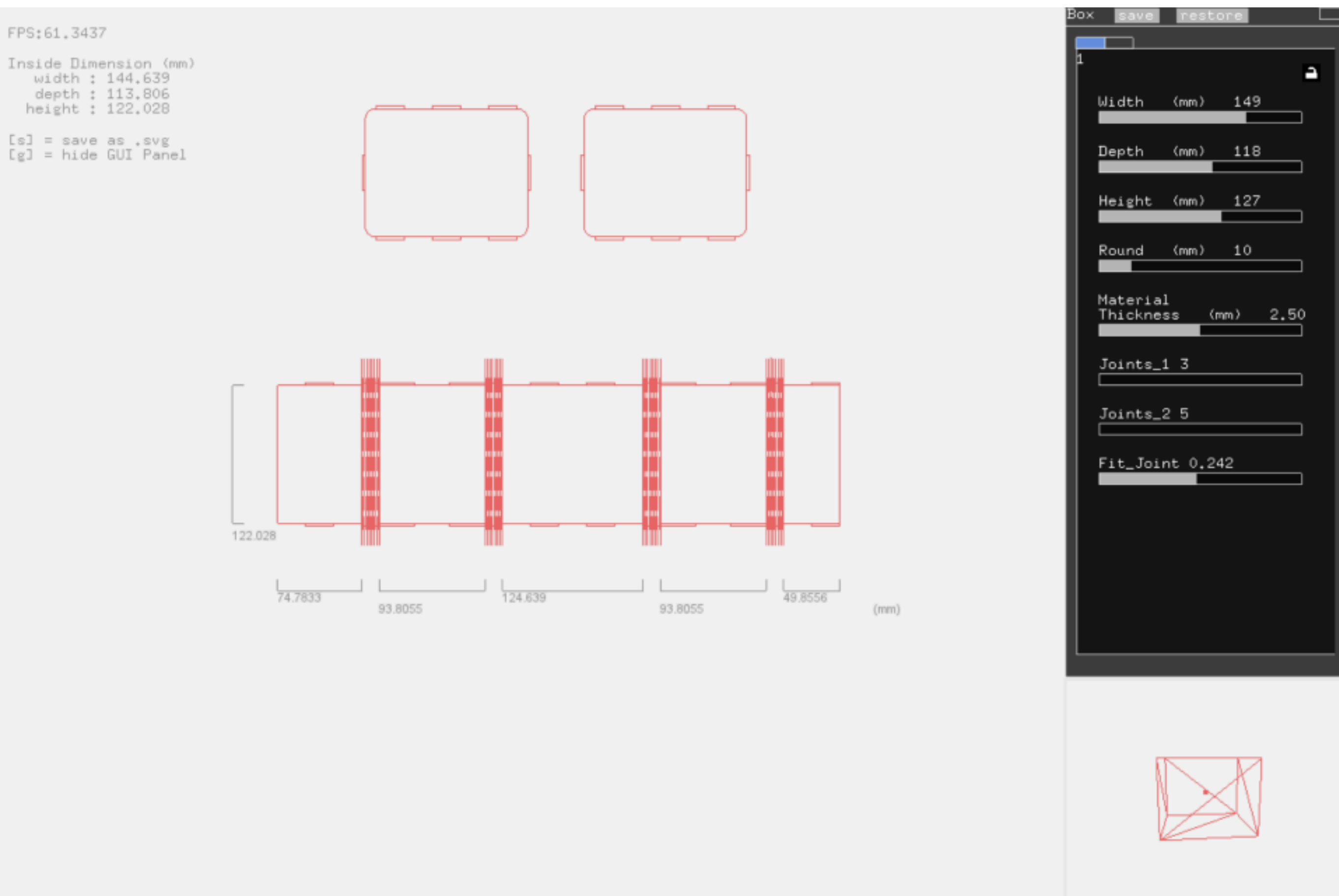




<http://www.flickr.com/photos/opencu/sets/72157633896214841/>

In addition to the idea sketching sessions, we introduced the software library for Objective-C in 1 hour with the aid of Grove toolkit. A conversion board for konashi and Grove were really useful to let participants try various inputs and outputs in a short period of time.





<https://www.facebook.com/CuttingBoxTool>

Additionally, a student of IAMAS introduced his domain specific design tool to design boxed to be fabricated with a laser cutter.

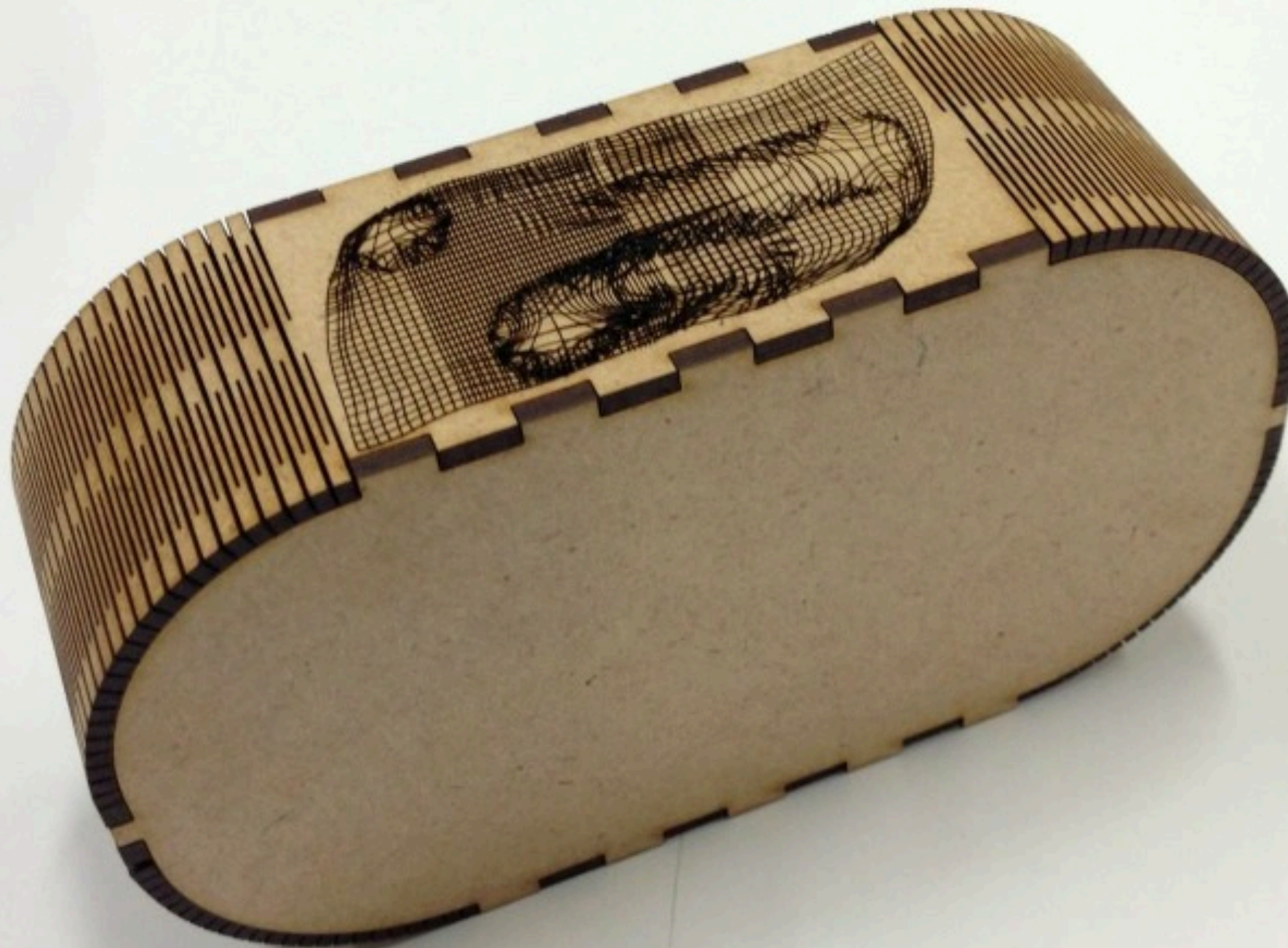


<https://www.facebook.com/CuttingBoxTool>



<https://www.facebook.com/CuttingBoxTool>





<https://www.facebook.com/CuttingBoxTool>





<http://www.flickr.com/photos/opencu/sets/72157633896214841/>

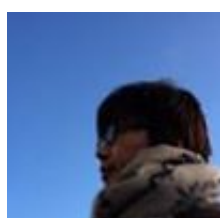
At the end of the first day, each team presented what they will make by the end of the 2nd day. Members of each team kept working together online and offline.



擬人化パッチ(仮)  
~トイレットペーパー編~



大塚 翔



平田 孝広



巽 孝介



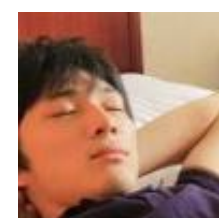
山岸 昂介



間下 知紀



松川 佳弘



Yuji Miyano



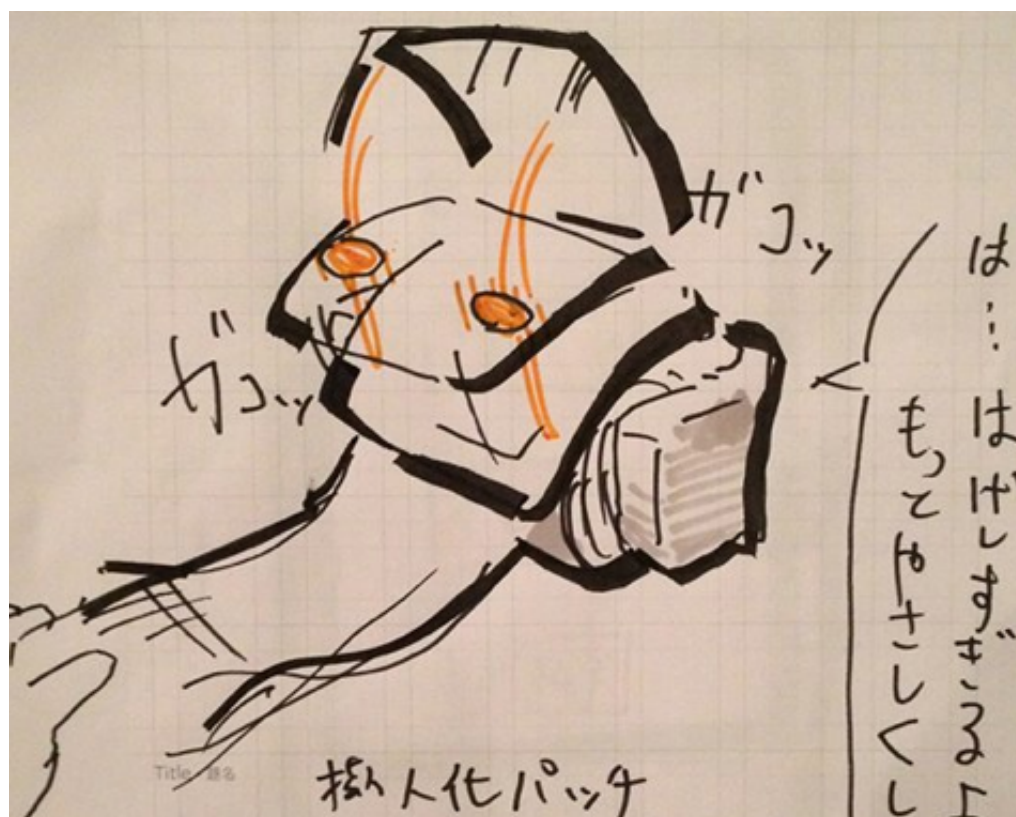
玉城 絵美

<http://kakeru.in/e-team/>

This is an example of one of the six teams.

# 擬人化パッチ

トイレ時間を有効活用  
トイペケースを恋人にする



トイペケース恋人機能  
→使用具合でコミュニケーションをはかる

擬人化パッチ(仮)~トイレトペーパー編~ 特攻野郎Eチーム

<http://kakeru.in/e-team/>

The selected idea was a patch to anthropomorphize a toilet paper holder. Usually, a restroom is a public space. But once a person entered a restroom stall, the stall became a personal space. 'anthropomorphize patch' is a way to personalize a restroom stall with a smartphone application that plays voices by favorite characters.



# 2013年6月1日の夕方

## Facebookで特攻野郎Eチーム が集結



<http://kakeru.in/e-team/>

After the end of the first day, they created a Facebook group to communicate online.



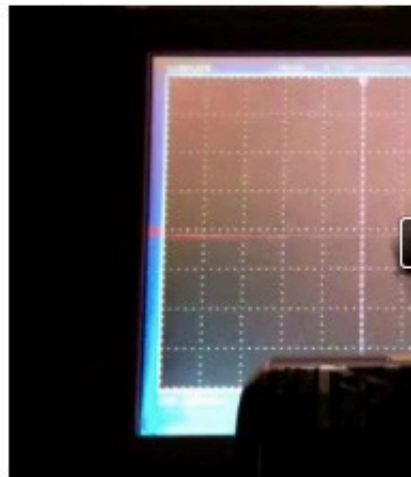
# 3日後の 2013年6月3日~

## トイペケースのガラガラ検出に向け、 間下主任が色々なセンサを試しだす



間下 知紀

連投すいません。玉城さんからあった圧電スピーカーも試してみました。意外と電圧です。ただし、振っただけではほとんど出ません。完全にトイレトペーパーのふた？に貼り付けた状態だと信号としては微弱かもです。ここでは缶を叩いてみました。するとかなり大きな電圧が取れます。例えば、今回は「優しい」「激しい」などとせず、トイレトペーパーを使用する際に声が出れば、これにちょっとした回路をつ



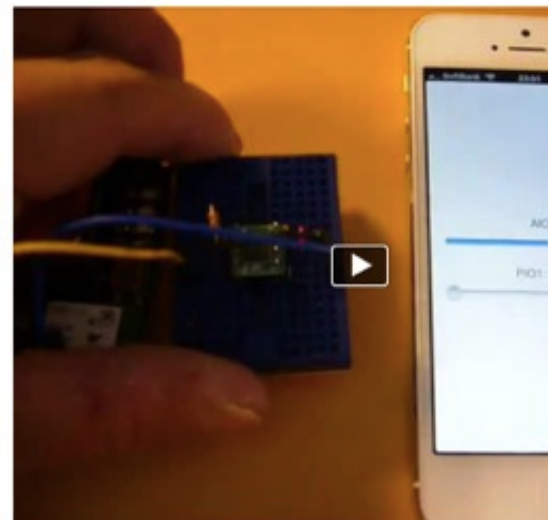
いいね！を取り消す・コメントする  
23:50、柏市付近

あなたが「いいね！」と言っている  
他7件のコメントを表示



間下 知紀

本日の実験結果です。昨日の続きです。ちょっとオフセットが、昨日より加速度がかかっていない状態でほぼ中心になりました。ゆっくりな動作と激しい動作で多少触れも大抵は中心に近いです。土日あたりにペーパーホルダーに仮止めして実験をします。



いいね！を取り消す・コメントする・投稿をフォロー・6月7日 0:01

あなたと平田 孝広さんが「いいね！」と言っています。全員が既読  
大塚 翔 おおお。いい感じに動いてる！！



間下 知紀

先日のOpenCUの際に使用したAnalogInPWMOutを使って加速度センサの出力を分圧してkonashiのAnalogInputに入力してみました。ご覧の通り触れ幅が小さいのが難点です。このままだと2段階をつけるのが難しそうです。また、停止時にオフセットのようなものが乗っていますが、これは加速度が正負に振るのでその真ん中の値と見て下さい。あれ、でも予想より小さいな。もう少し、触ってみます。ひとまず、加速度センサの値を取り込むとこんな感じという例です。  
> 平田さんI2C通信は信号線が一本しかないで、ちょっと面倒くさそうです。時間もありますので、今回はアナログ入力に容易に実装出来るかなので、そちらにしようと思いますが、いかがですか？



いいね！・コメントする・投稿をフォロー・6月5日 23:40

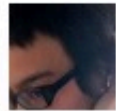
平田 孝広さんが「いいね！」と言っています。全員が既読

<http://kakeru.in/e-team/>

The engineer evaluated sensors and implemented electronics.

# 6日後の 2013年6月6日

## 皆でトイペとトイペケースについて議論する



異 孝介

いくつか覚え書きを。

・ペーパーホルダーは既製品でもいいかも？  
その代わりパッチの部分に力入れるとか。  
例

...

もっと見る

	<b>BAREN トイレットペーパーホルダー クロムメッキ[イケア]IKEA(70179297)</b> www.amazon.co.jp  デザイナー Tord Bjorklund 商品の大きさ 長さ: 17 cm 奥行き: 13 cm 高さ: 10 cm お取り扱い上の注意 中性洗剤を含ませた布で拭いてください きれいな布でから拭きしてください 素材 & アイテムのサイズと重量 ステンレススチール パッケージの大きさと重さ パッ
--	---

いいね！を取り消す・コメントする・投稿をフォロー・シェア・6月6日 23:13

あなたと関下 知紀さん、山岸 昂介さんが「いいね！」と 全員が既読言っています。

**関下 知紀** 反応があってよかった(T\_T)。しばらく潜ろうかと思ってました。ペーパーホルダーも作りますか！？加速度センサを格納する場所つきとか。でも、そこは既製品でもいいかと。私もオークションとかで見ましたw。音声はこえ部とかになにかないか探してました。セリフとか専用のスレッド？たてちゃって、コメントで勝手なことを書いてってもらうようにした方がいいですね。あと、あいんちゃんが覗きにきてくれたようですね。  
6月6日 23:17・編集済み・いいね！

**Yuji Miyano** 賛成です。  
擬人化パッチという元の名前から、トイレットペーパーホルダは普通の方が、パッチの良さが生きる気がします。

音声をつなげると聞いてラップムシを思い出しました。



山岸 昂介

トイレットペーパーをガラガラしてみました。笑  
紙はあんまりいいやつじゃなくて、安くてカピカピのものを  
使ったほうが良さそうです。

生活感あふれた動画ですみません。笑



いいね！を取り消す・コメントする・投稿をフォロー・6月3日 23:31

<http://kakeru.in/e-team/>

The team members discussed together how to realize the idea.



# 8日後の 2013年6月8日

## 間下主任が実機(トイペース)で実験開始！

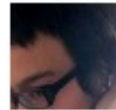


<http://kakeru.in/e-team/>

They made various hardware sketches.

# 9日後の 2013年6月9日

## 擬人化パッドのケースを検討



異 孝介

今日ハNZ(渋谷)で物色したかんじ  
半球、円柱、楕円の亚克力ボックスがけっこうたくさんありました。  
(もちろんアキバとか行ってみても多種多様にありそうですが)

形デザインして3Dプリントや真空成形もできないことないですが

...

[もっと見る](#)



<http://kakeru.in/e-team/>

And the product designer found a way to realize good enough cases in a short time.

# 9日後の 2013年6月9日

## 擬人化キャラの台詞を検討



間下 知紀

キャラとセリフを決めましょう。

- 1.ペーパーを優しく引き出す場合
- 2.激しく引き出す場合

あと、0.アプリを起動してTasuiに接続した際  
っていう3つくらいでいかがでしょうか？

例)

キャラ:普通の女の子

0:来てくれたんだ！

1:優しいのね。

2:そ、そんなに激しくしたら....

な感じで。っていうか、これすっげえ恥ずいんですが。

とにかく、これがないと先に進めないところもあるんで、最低ひとりひとつくらいはだしませんか？

いいね！を取り消す・コメントする・投稿のフォローをやめる・6月9日  
23:44、柏市付近

あなたと山岸 昂介さん、巽 孝介さんが「いいね！」と言  
っています。 全員が既読



玉城 絵美 キャラ: 男の娘

0: エヘヘ 今日もトイレタイムだね。

1: きょうもー仕事、おえたね

2: うおおおおおおおおお！！なんじゃこりゃああ

6月10日 0:00・いいね！・♡2



玉城 絵美 キャラ: 犬

0: ワオン！ワンワン！

1: わふんわふん！

2: キャイ〜ン



巽 孝介 >すっげえ恥ずい

ははは、たしかに、でもきっと恥ずかしさを越えたところに名作台  
詞があります。笑 なんかに思いつきください投稿します

6月10日 0:06・いいね！を取り消す・♡1



Yuji Miyano キャラ: 師匠

0: この巻物には秘伝の技が書かれておる。心して読め。

1: そんなに急いで読むでない。

2: おぬしっ！もしや秘伝高速トイレットペーパー巻きを体得したか！

トイレットペーパーを巻物に見立てて。  
でも頬を赤らめる要素が全くないですね。

6月10日 0:18・いいね！を取り消す・♡3



Yuji Miyano キャラ: AD

0: 巻物に秘伝の技が書かれておる。心して読め。

1: そんなに急いで読むでない。

2: おぬしっ！もしや秘伝高速トイレットペーパー巻きを体得したか！

これも頬を赤らめる要素が...

6月10日 0:21・いいね！を取り消す・♡1



間下 知紀 宮野さんの師匠や玉城さんの犬とか、既に悪人でもなん  
でもないような

でも面白い！

あと、できればアプリ自体に録音機能も欲しいな。そしたら、その場  
で録音してそれを使うとかいけるんだけど。

6月10日 0:22 (携帯より)・いいね！を取り消す・♡2



間下 知紀 キャラ:お女中

0: ああ、お代官様、今宵もまた...

1: お代官様、お代官様、お戯れを。

2: あ〜れ〜

6月10日 0:29 (携帯より)・いいね！を取り消す・♡2



Yuji Miyano キャラ: 部長と不倫中の女子社員

0: ふちょー今日はどこ行きますう？

2: あんな奥さん早く別れちゃいなよ

3: ちょっとお！奥さんにばれちゃうよ！

この設定で、もう少しいい台詞がありそう。経験者のアドバイス求  
ム。

6月10日 0:53 (携帯より)・いいね！を取り消す・♡1



玉城 絵美 キャラ: 高校の時の彼女

0: トイレ？ここで待っているね。

1: すっきりだね。今日はどこいこっか？

2: 大丈夫？そんなに急がなくても、ずっと待っているよ。

6月10日 1:04・いいね！・♡1



山岸 昂介 キャラ: 悟空

0: オッス！オラ悟空！いっちょ踏ん張ってみっか！

1: オラ、ワクワクしてきたぞ！！

2: かあ〜まいった！！お前え強えなあ〜！！

6月10日 1:48・いいね！を取り消す・♡1



コメントする...

<http://kakeru.in/e-team/>

They generated ‘embarrassing’ phrases, and iOS developers implemented an iOS application.



# 2013年6月16日(日)

## Eチームが秋葉原に集まる



<http://kakeru.in/e-team/>

They worked together to finish making a prototype. In the end of the second day, all teams presented their prototypes and all participants were really excited.

# 擬人化パッチ

<http://kakeru.in/e-team/>

This is the movie of the final prototype demonstrated in the end of the second day.





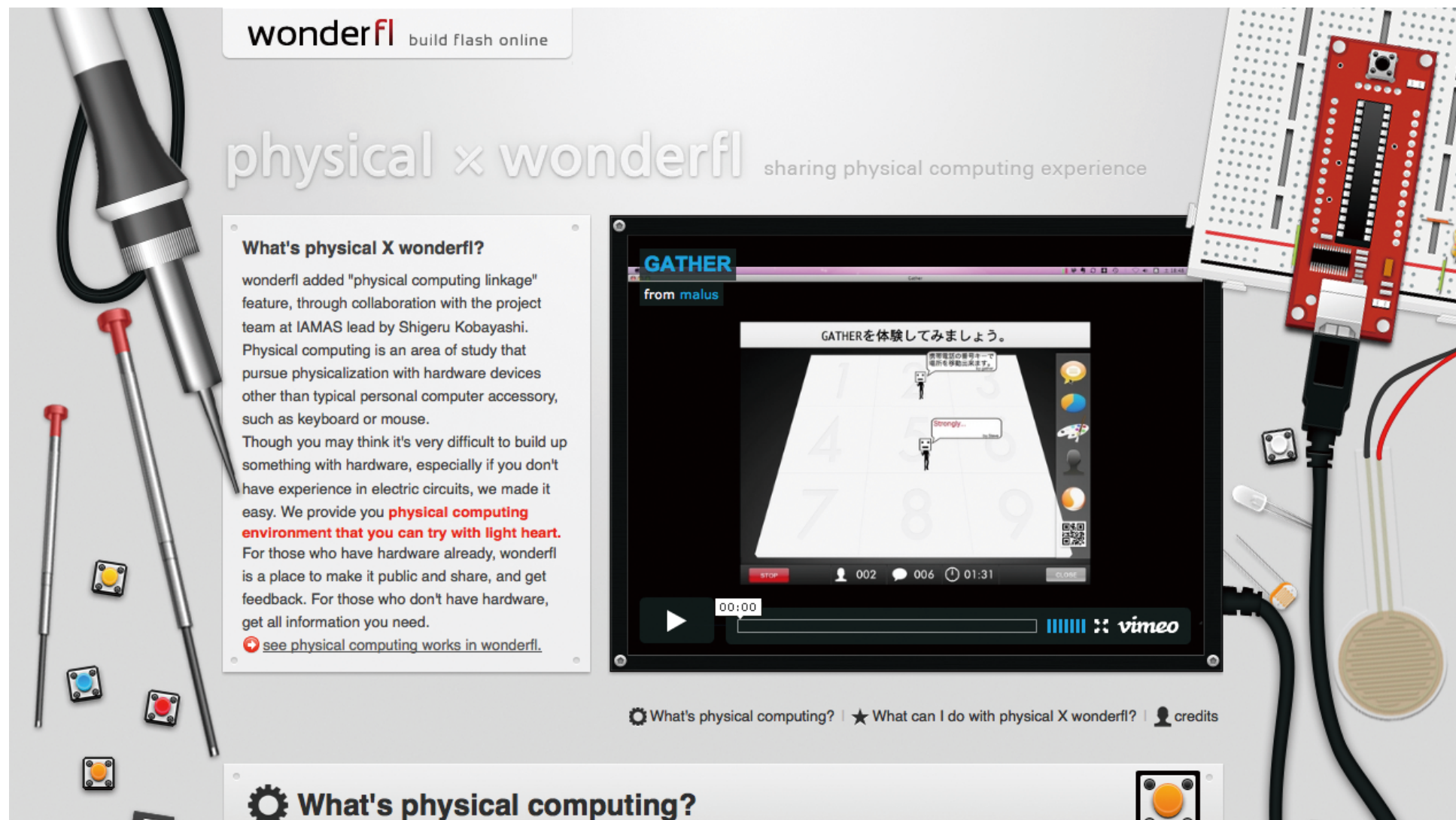
Another prototype by a different team. If a person drunk too much and feel like throwing up while train ride home, the wearable device displays how deep he is drunk and send a message to his wife in emergencies.



# Why we didn't start with the technology, BLE

- Many applications have been proposed by precedent manufacturers already
- Starting with technology and constraints will narrow participants vision and they will think like 'what we can make with Bluetooth Low Energy'
- Wanted to let participants create ideas of wireless devices and services and make hardware sketches as if it were air

# Collaboration with 'wonderfl'



Shigeru Kobayashi, Online code sharing for ActionScript and physical computing Incentives for web designers and developers, Sketching in Hardware 09, 2009

The toolkit is expanding to attract wider range of audiences. In 2009, I have introduced an online IDE for physical computing in ActionScript in collaboration with KAYAC, 'physical x wonderfl', at Sketching 09.



# Case 2: konashi Make-a-thon

## konashi.js



Shigeru Kobayashi | Sketching in Hardware 2013 | Xerox Palo Alto Research Center, Palo Alto, California, U.S.A.

Recently, Yukai Engineering released 'konashi.js', an iOS application to be combined with a popular online IDE for JavaScript (also developed by KAYAC).

## Case 2: konashi Make-a-thon

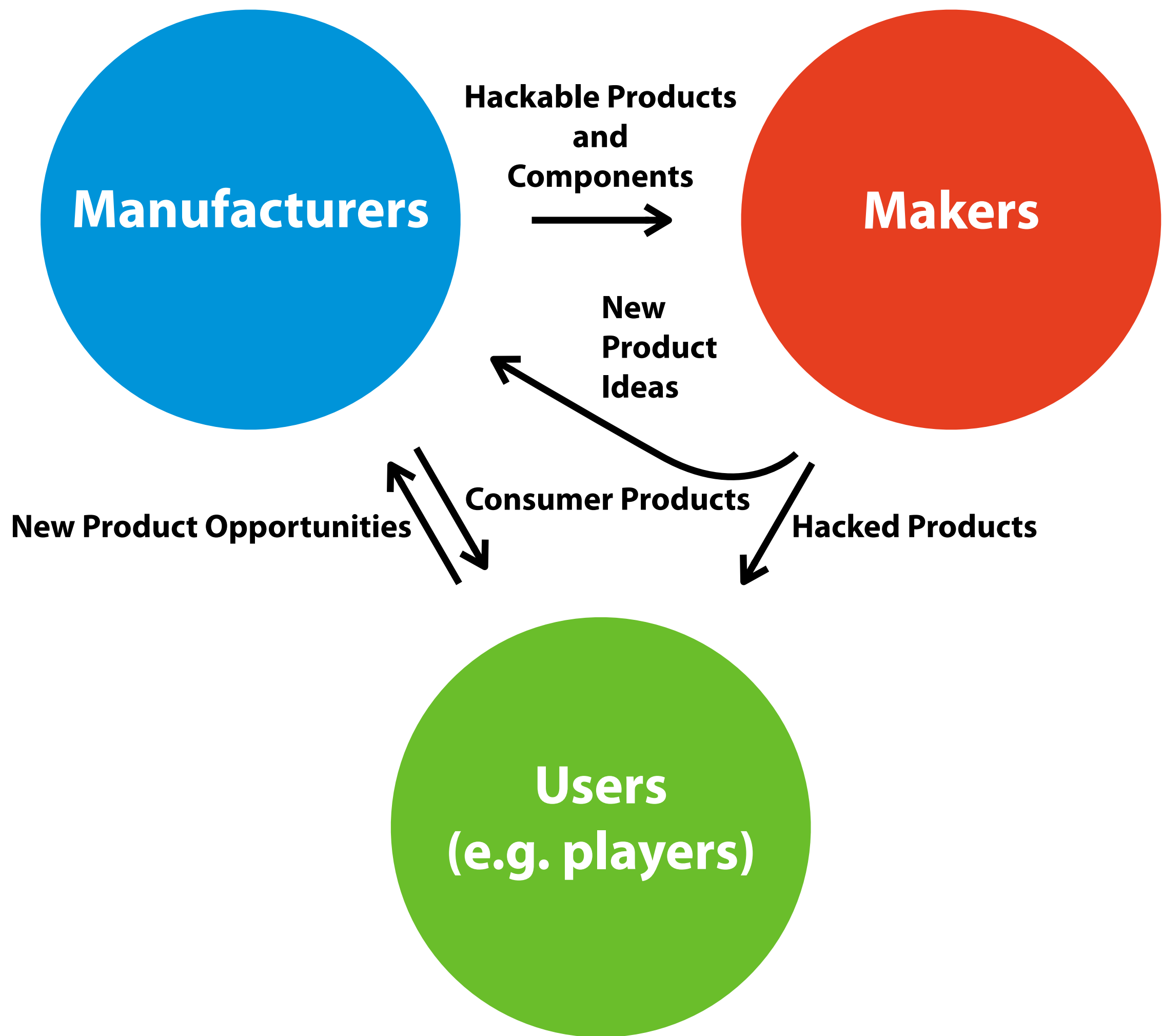
# Lessons learned from konashi Make-a-thon

- Working on a team produces diversity
- Sketching wireless devices and applications in hardware is not so difficult anymore
- Toolkit enable people realizing 'peripheral' ideas (that can't survive in planning sessions with PowerPoint presentations)
- Still there are gaps between prototypes and products, but toolkit developers can be platforms



How might we sketch new product ecosystems  
to facilitate mutual understanding between  
manufacturers and 'makers' to creating innovation?

This is the design challenge I'd like to try.



This is a plan of the new product ecosystem between manufacturers, users and makers. Manufacturers produce hackable products with grayscale licenses like the Creative Commons license. Makers make deliberative products and communicate with other communities (e.g. players). The communication ball will make manufactures more flexible and facilitate innovations.



# Flexible Warranties

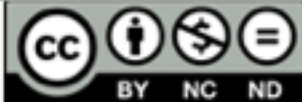





You Brick it, we'll restore it:

Company warrants to return your device to factory defaults by making **best efforts** to restore original firmware and functionality, subject to any mechanical or electrical damage due to modifications.

Sunday, July 19, 2009

Tom Igoe, After Sketching: Best Practices for Opening Product Development, Sketching in Hardware 09, 2009

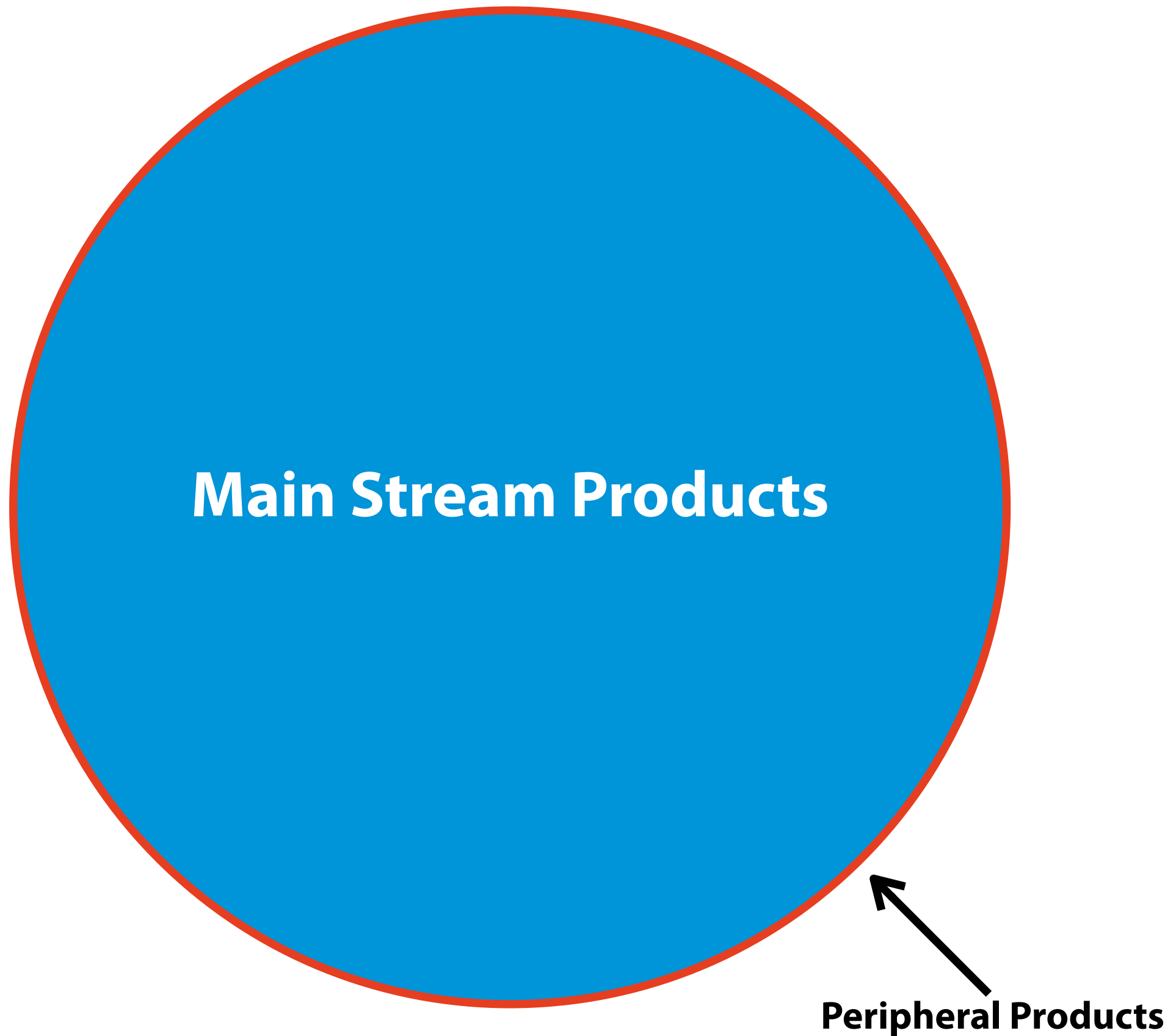
The idea regarding licenses is based on the suggestion by Tom Igoe at Sketching 09 in 2009.

	Creative Commons Licences						
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<div> <div>←</div> <div></div> <div>→</div> </div>							
Most restrictive				Most accommodating			
<b>BY</b> = Attribution		<b>NC</b> = Non-commercial		<b>ND</b> = No derivatives		<b>SA</b> = Share Alike	

<http://opencontent.uct.ac.za/files/siteimages/image/degreesofopenness.jpg>

What if we have Creative Commons like gray-scaled licenses regarding product liability between 'full warranty' and 'at your own risk'?





It might be difficult to start changing from main stream for manufacturers. But we might be able to start with ‘peripheral’ products such as musical instruments or wearable smart accessories.

We've launched an exciting new project of our own! Introducing the Kickstarter app for iPhone!

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# C.24 - The Music Keyboard for iPad

by Miselu

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San Francisco, CA

Hardware



1,113

backers

\$118,129

pledged of \$99,000 goal

20

days to go

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\$1 minimum pledge

This project will be funded on Thursday Aug 8, 1:01am EDT.

I feel signs of 'peripheral' products from new hardware projects such as C.24 by Miselu.



**Sketching in Hardware 2013: PROJECTIONS**



# **Sketching A New Product Ecosystem Starting with 'Peripheral' Products**

July 18, 2013

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