Year of the Maker

WRITTEN BY DALE DOUGHERTY, founder and CEO of Maker Media.

WHEN WE STARTED MAKE MAGAZINE nine years ago, we wanted to show that anybody can make things, and celebrate those who do it well — the makers. That is also what led us to organize the first Maker Faire and invite makers to showcase their work.

Maker Faire has become a global celebration of making that invites everyone to become a maker. In 2013, there were 100 Maker Faire events, 44 of which were hosted by museums, libraries, and schools. While the two largest Faires are the ones we organize in the Bay Area and New York City, with 125,000 and 75,000 participants, respectively, even more people are experiencing a local version of Maker Faire. Some 530,000 people attended a Maker Faire in 2013.

The majority of events are still in the United States. However, Maker Faire Rome, the first large European event, hosted 35,000 people and was a big success. France had its first Maker Faire in the town of St. Malo on the Brittany coast. Germany also had its first Faire in Hannover last August. Taipei, Shenzhen, Tokyo, and Seoul produced second-year events, as did Santiago, Chile.

Already, 2014 is off to a good start with Maker Faire Oslo in Norway having taken place in mid-January. I went to Oslo, where the organizers, Jon Haavie and Roger Antonsen, asked me to choose an Oslo Maker of the Year. I balked at first. I don't like picking favorites, but then I saw it as another way to celebrate makers.

My criteria for selection were simple. I wanted to choose a person who was enthusiastic, generous, and a true believer, as Mister Jalopy once phrased. Someone who represented the core values of the maker movement and engaged others in making in a playful way. Also I looked for originality — something that I hadn't seen other makers doing in the same way, or quite as well.

I gave the award to Erik Thorstensson of Gothenberg, Sweden (above right). Erik demonstrated a modular construction system he developed called Strawbees. An open-source design, Strawbees uses simple connectors, die-cut on demand from scrap plastic. I watched kids and adults walk up and build structures from straws — a hat, a wand, a diamond that folds in on itself, and a pyramid. Part of a network of designers called Creatables, Erik has boundless energy and enthusiasm, with a flair for showmanship, deriving his sense of purpose from understanding the educational value of making.

There are makers who deserve recognition in every community, both local and virtual. I will encourage the independent organizers of Maker Faires, who themselves deserve recognition, to follow Oslo's lead and select a Maker of the Year in their community. Some makers, like Erik, go from one community to the next to share what they do. (Mitch Altman probably tops the list of makers who will travel anywhere, anytime to introduce new people to hacking and making.)

Makers who've created successful businesses are increasingly in the spotlight, too. Bre Pettis had a great year, establishing MakerBot as the frontrunner in consumer 3D printing and then merging with one of the largest industrial 3D printing companies, Stratasys. Chris Anderson left *Wired* to go all-in as CEO of 3D Robotics and discover new commercial applications for drones. Ayah Bdeir has taken littleBits from a grad school project to a company with sights on putting an educational electronics play system in toy stores everywhere. Lisa Fetterman developed Nomiku, a sous vide cooker, following the increasingly common path from Maker Faire to Kickstarter to HXLR8R in Shenzhen, China, to commercial product.

Let us not forget small, independent maker businesses. Last fall, I visited Ken Burns of Tiny Circuits in Akron, Ohio, and in Detroit I met with the team of SeeMeCNC of Carmel, Indiana, makers of the Orion 3D printer (a Delta-style printer that I bought). David Lang published the *Zero to Maker* book and, with Eric Stackpole, began delivering OpenROV kits to the classroom. Designer Carla Diana published a children's book on 3D printing titled *Leo the Maker Prince*.

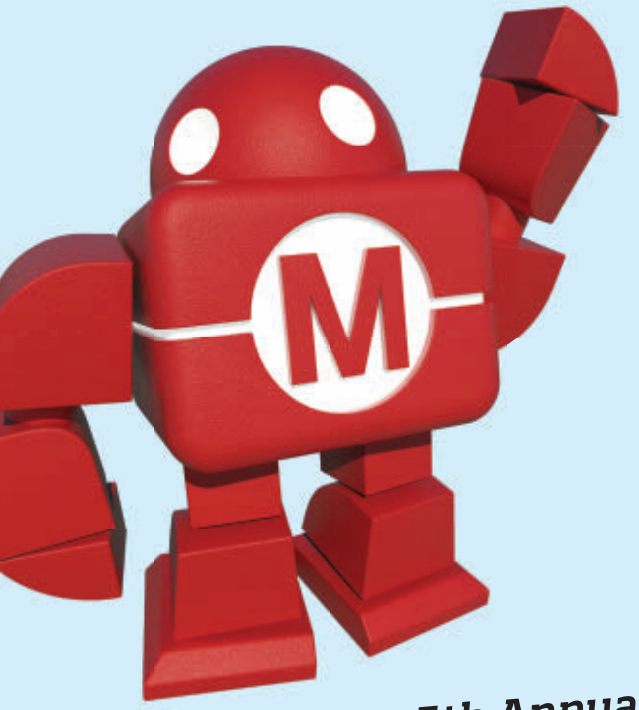
At Adafruit, Limor Fried and Phil Torrone went from successful business partners to lifelong partners, getting married on Halloween in 2013. Like Lenore Edman and Windell Oskay of Evil Mad Science, Limor and Phil are examples of what we might call Maker Couples, who live, work, and make together. Both of these couples have been leading advocates for open-source hardware.

Young makers also made their mark in 2013 with Super Awesome Sylvia demonstrating the WaterColorBot to President Obama at the White House. Quin Etnyre of Qtechknow was invited to Maker Faire Rome to give a talk titled "Lessons from a 12-year-old CEO." He tweeted that he had met the mayor of Rome and saw the Pope. The second annual virtual Maker Camp engaged millions of young makers, and Maker Corps organized summer internships for 108 college-age makers to engage young makers at 34 host sites around the country.

2013 was an awesome year for makers. Yet I believe that 2014 will be even better. Young maker Joey Hudy was part of President Obama's State of the Union address, and he was part of an announcement that the White House will host a Maker Faire in 2014. Let's find new ways to celebrate makers and elevate the maker community internationally.

Maker Faire®

MAY 17&18, 2014



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Raygun Circuits, Free Beer, and the Quest for Long-Lasting 3D Printers

IN RESPONSE TO THE "RAYGUN VECTOR WEAPON" PROJECT FROM VOLUME 35

» I bought the Vector Weapon Kit from the Maker Shed for my 6-year-old son Desmond as a Christmas present. This was the first real electronics build we've done together. It was a good opportunity to show him a little bit about soldering and how some of the elements in the circuit work. It's really rewarding to do this kind of project with Desmond, as it gives us a fun way to spend time together, a creative way for me to teach him things, and of course, results in a unique toy that will hold memories we will both have for a lifetime.

—Genji Siraisi, New York City, N.Y.

Read more about their build and check out their fun videos: makezine.com/go/genji

» I had so much fun with this [Raygun Vector Weapon] circuit! I made an instrument with it and a modified version of Eric Archer's Mini Space Rocker circuit (vimeo.com/85130857). Right now it's a manually operated four-voice drum synth. I plan to add an external sequencer and a piezo trigger for fills and live play. Please give us more cool lo-fi audio projects. I got into DIY synths and noise circuits a few years ago after Collin Cunningham did a piece about the Atari Punk Console. After a quick trip to RadioShack I had a fun noise toy and I was hooked. Thanks MAKE!

—Chuck Stephens, Tampa, Fla.

IN RESPONSE TO OUR MAKE: ULTIMATE GUIDE TO 3D PRINTING 2014:

» I bought a printer after reading through the excellent 2013 version of the 3D printing guide — good advice and worth every penny. After several months of experience with the technology, here is what I would find useful: a side-by-side comparison of printers put through extended rigorous production. Simply running a test print off a model that is new and has been calibrated by the supplier is not adequate to evaluate how good a design really is. How long before each extruder clogged? How does each printer do running several 6 hour+ print jobs? How many failed prints did you have? How does each printer hold up after extended daily use for 30+ days? What parts shake loose, and what parts are inadequate for constant duty? My hope is to get another printer in the next year or so, but in my experience the $2,500 printers break down and suffer from poor design (especially in the filament handling) just like the $300 printers do. This industry will remain a tinkerer's playhouse so long as the large-print success rate is below 95% with printers more than 30 days old.

— Brian Cooper, Denver, Colo.

DIGITAL FABRICATION EDITOR ANNA KAZIUNAS FRANCE RESPONDS:

» Thanks for your feedback! Your comments raise some excellent points. We understand that long-term testing is critical to making hardware recommendations and evaluating performance. Future testing will be focused on exploring exactly those issues that you mention. We will also be increasing the frequency of our testing, as new printers are being developed at an astonishing rate. Look for them both online and in MAKE magazine shortly.

» What does "Free as in beer" mean? I have only recently discovered MAKE magazine, and am now reading my second issue. (I love them!) Both issues have contained the phrase. I live in Colorado, where beer costs money, especially the fancy microbrews. So what gives?

TECHNICAL EDITOR SEAN RAGAN RESPONDS:

» Great question! "Free as in beer" is a phrase that originates in the open software movement. It's used to make a point about the meaning of the word "free," which, especially when it comes to software, represents two very distinct ideas that often need to be separated for clarity. There's "free," in the sense of something that is given away ("free as in beer"), and there's "free" in the sense of freedom ("free as in speech"). Some software is given away for free but is nonetheless closed-source and proprietary, making it "free as in beer" but NOT "free as in speech."

MAKE AMENDS: In "Anatomy of a Drone" (Volume 37, page 34) some components in the bottom row of the diagram are mislabeled. The correct labels from left to right are: Motor (C), Electronic Speed Controller (H), Flight Controller (I), Receiver (K), Gimbal Controller (Q), and GPS Module (J). Thanks to MAKE reader Qameron Alforque for the tip.

We apologize to "Luminous Lowtops" (Volume 37, page 66) author Clayton Ritcher for misspelling his last name.

Engineering for Real World Problems

Ten tips on using your maker skills for humanitarian, environmental, and social causes. Written by Benedetta Piantella

BENEDETTA PIANTELLA (pictured with the head of a Maasai village in Narok County, Kenya) is a designer turned humanitarian technologist who has built partnerships with organizations such as the UN and UNICEF and has deployed projects in countries such as Uganda, Kenya, and Tanzania. She is currently a full-time faculty member at NYU-ITP.

IT ALL BEGAN FOR ME NINE YEARS AGO: I was a designer and artist interested in processes and new techniques, busy building interactive environments to provide complete sensory experiences for users, when I found myself in the midst of one of the most devastating natural disasters in our recent history: the Indian Ocean tsunami of 2004. Surviving such an experience and seeing firsthand what happens after an emergency, how the community reacts, and what kind of methods and efforts are implemented to provide relief triggered something inside of me. I knew I had found my calling.

Everything I had learned up until that day and any skill I possessed, from practical know-how to critical thinking, could very well be applied to help and address challenges involved in similar situations and more. Since that day, I've been involved in creating R&D companies to focus specifically on research, consulting, designing, and implementing custom solutions to humanitarian, environmental, wildlife conservation, and other social challenges worldwide. Here's what I've learned over the years.

1. Start with the problem. Often you'll hear of a problem from invested parties that have spent a long time overanalyzing the challenge and might be missing the point. Start by asking hard questions to identify the real core of the issue at hand. Don't fall for their assumptions.

2. Research a lot. Especially when dealing with a context or country you have no experience with, there's no such thing as too much research to get a better sense of the social, cultural, and economic aspects of the location you're designing for.

3. Sabali. Probably my favorite Bambara word, meaning patience. Everything takes longer than you expect when dealing with large challenges, so embrace it, be patient, and keep on your path. What would take you one day to accomplish at home might take weeks to accomplish in the field.

4. See it for yourself. The best way to learn about your challenge is to personally be involved and witness it. There's nothing like firsthand experience, so if you can travel to your location, do it. Everything will be much clearer and a lot of assumptions will automatically be dispelled.

5. Be creative with funding. Except for a few consolidated funding channels, which are often limited to nonprofit entities only, partners are still shy about spending money to fund research and development projects. But the good news is that there are a lot of creative ways to raise funds to take you and your project into the field, from design competitions to crowdfunding and grants.

6. Fail early, fail often, but please fail. A lot of things can and will go wrong once you get to field-testing and implementing a project in its intended environment, and this is where you learn the most. A lot of projects fail and people are ashamed to document them, denying others the chance to learn from their mistakes and not waste resources replicating those failures. Learn to let go of your ego and not get attached to your solution, but instead let the things that didn't work teach you the right path to success.

7. Be disruptive. Most work in this field is still championed by organizations that have been around for a long time and have a set way of doing things, often using a top-down approach of developing solutions in a silo and then expecting communities to adapt themselves in order to adopt them. Disrupt this method by developing a bottom-up approach that starts with your users, the community, and the local environment to design the final solution. The users hold the answers, so provide them an outlet to let their voices be heard.

8. Harness local innovation. Long-term solutions don't come in a box. Most of the resources for the right solution are already there — it's a matter of harnessing the local talent. There's plenty of innovation, ingenuity, and makers to be fostered locally, making the solution much more sustainable in the long run. Allow them access to resources and share skills with them to let them develop their own solutions.

9. Build sustainably. Importing materials and components that no one knows how to fix and maintain locally is a recipe for disaster that we encounter way too often. Most things developed this way break within the first six months (if lucky) and stay broken indefinitely. Design your solution with long-term goals in mind, considering locally available materials, in order to build things that will survive the environment and the course of time.

10. Never give up. This type of work represents a long, hard road to walk on. The hills are steep and the terrain is rough, so don't get discouraged. Just when you're about to give up, you might actually be closer than you think to making a real difference in the world and in the lives of others. Remember that really tough challenges can't be solved overnight.

John Simeonidis Jr.