

proto labs®

Journal

2011 ISSUE 2



Products that
ROCKED
our world

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→ WHAT'S UP?

Summer 2011

I've been thinking if I ever write a memoir, it'll be based on how various gadgets have made their mark on the big moments in my life. Take communication devices for instance...

Age 8: I make a string/paper cup "phone" with three-way call capability between different rooms in the house. Yep...a nerd right from the start.

Age 12: My first walkie talkie. I talk to my best friend in his room from a tent out in the woods. Technology is awesome!

Age 14: My parents install an "intercom" in our house. We don't use it, preferring to yell. Technology is redundant!

Age 16: I use a rotary dial phone to ask for my first date. I am turned down, so I call again the next day, hear one ring and quickly hang up (this was before caller ID).



Age 17: I use the family's new touch tone phone to ask for a date with another girl. (The date goes well. I end up marrying her.)

Age 18: I buy a CB radio and talk to truckers until 1 AM, just because I can. My call sign was "Mellow Yellow" (don't ask).

Age 22: I use my first fax machine at my first real job, waiting in line at the Fax Room to do so.

Age 24: I call my wife's pager—the only way to reach her.

Age 29: I early-adopt one of the very first cell phones—the original Motorola flip phone with the giant battery that snaps on the back. I carry it everywhere, in case my people need to reach me. Not that they even know my number, but still...

Age 51 (that would be now): I have a phone that's more powerful than any computer I ever laid hands on before the age of 40. I phone, text, email, Skype and FaceTime my daughter currently in Peru via its cell signal or wireless network, which is in place pretty much everywhere I go.

Age 60: I'm hoping pretty soon someone will make voice control work so we can finally get past the whole keypad thing. And let's go for ubiquitous satellite links, so we're never out of touch (unless we want to be.)

Age 80: The grandkids talk me into having the surgery everyone's getting to embed Bluetooth technology in my skull. We get the Family Plan. See that old guy talking into thin air? He's not demented. He's me—and he's connected.

Brad Cleveland, CEO
brad.cleveland@protolabs.com

HOW ARE WE DOING?

"This is a very streamlined operation and the website is well designed. Overall I was very pleased with Proto Labs."

— Christopher King, Stanley Black & Decker, Inc.

"Thank you for the great service!"
—Don Nicoll, Environment One Corporation

"You guys are on top of things! Your ability to make high quality molded parts in as short of time as you do is amazing. There simply isn't another company like you, keep up the great work."

—Edward McCracken, Acuity Brands Lighting

"Castlewood Surgical has really enjoyed working with your team. The company would not be where it is today without Protomold's help."

—Kirk Honour, Castlewood Surgical

"Great turn around on shipping parts on time."

—Paul Kolokowski, 3M Company

"Excellent quality and breathtaking speed! You gave us functional test and appearance models from the same parts. A refreshingly drama-free service, I look forward to our next project together."

—Stuart Cooper, Xylotek

We would love to hear from you! Send your comments to us at news@protolabs.com.



My Eco Can

Speaking of thirst, we're thinking there might be a gap in your portable beverage container collection. All those bottles and mugs are okay, but somehow your user experience is missing something—the anticipation of popping a top open, the joy of guzzling liquid from a pleasingly cylindrical vessel. Let's face it, sometimes a person just wants to drink from a can. That's why you need My Eco Can, a snappy-looking reusable can made from eco-friendly, 100% biodegradable PLA, which is a kind of cornstarch. With a screw-on lid that makes pouring in beverages easy, My Eco Can is perfect for hot and cold drinks, and is microwave and dishwasher safe. Eco-friendly, guilt-free, trendsetting enjoyment. www.uncommongoods.com/product/my-eco-can

Dreamslide

Part scooter, part bicycle, part bionic feet, the Dreamslide is just the ticket for buzzing around town and burning some calories while you're at it. Designed for riders of 230 pounds or less, the Dreamslide's ingenious gearless pedaling system leverages your body weight to propel you along at bike-like speeds—without electrical assist. It's a little like riding a traditional bike standing up—only without the fatigue, jarring, and bouncing up and down.



The entire sole of your shoe stays in contact with the pedals as you ride, "creating the sensation of a brisk walk." At speeds up to 24mph, we'd say that's pretty darn brisk. Folds up for easy transport and storage.

www.dreamslide.com



Zoku Quick Pop™ Maker

Tasty, healthy, cute...what's not to love about a homemade ice pop—especially one you can make in 7 minutes flat. That's right—real pops, really fast. The Zoku Quick Pop Maker freezes yummy ice pops for high speed gratification right on your kitchen counter—without electricity. You can make striped pops, yogurt pops, fruity pops, bacon pops...oops, we said healthy, didn't we. But you get the idea. Complete with a specially designed Super Tool to zap your pops effortlessly from their molds, and reusable sticks with drip guards for tidy eating. Sweet!

www.zokuhome.com/pages/products-quickpop-maker

Remote-controlled rolling beverage cooler

So you're relaxing on the deck with your homeboys and girls—beverage in hand, feet up, mind drifting—when "HEY COULDJA GRAB ME A COORS LITE, YO" shatters the peace of the moment. You stagger to your feet to do your hostly duty, wishing the drinks would just serve themselves. Well, wish no longer. Get one of these fabulously energy-saving (that's your energy we're talking about) remote-controlled beverage coolers, and you'll be keeping your guests well-watered as well as endlessly amused with a mere flick of a finger. The sturdy insulated vinyl vessel holds up to 12 cans or bottles plus ice, keeps beverages cold for hours, and boasts a range of up to 40 feet from the remote. Let the good times roll!

www.hammacher.com/Product/76019



Products that **ROCKED** our world



In the wake of our Cool Idea! program launch, we've been pondering the whole concept of innovation here at Proto Labs headquarters. Innovation is important to us not only because it fuels our business—it also has the power to transform our lives. In fact, we're convinced someday a product we've had a part in developing is going to change the world.

This got us thinking about world-changing products in general. What are the products that have changed everything for us? We decided to survey our team at Proto Labs to find out. Just to keep things semi-manageable, we stuck to products—as opposed to principles or technologies—and drew the line at things that were invented within at least some of our lifetimes.

Here, then, is a brief random selection of our unscientific, totally arbitrary gallery of products that changed the game for all of us.

Apple iPod (2001)



Sure, there were portable mp3 players before Steve Jobs unveiled the iPod on October 23, 2001, but they were clunky behemoths with bad interfaces and no sense of personal style. Then along came the iPod, with its compact, sleek design, intuitive scroll wheel navigation and innate coolness. It redefined the category, sold beyond anyone's wildest expectations, and went on to change the music and entertainment industries forever.

Motorola DynaTAC 8000X Cell Phone (1983)

We will not even attempt to meditate on how we ever managed without mobile

phones, or how they continue to shape our lives in ways ranging from the ridiculous to the most profound. Let's just give a shout out to the first FCC-approved model. At 28 ounces, 10 inches long and a price tag of \$3995 (more than \$8000 by today's standards) the DynaTAC 8000X had a battery life of about 20 minutes. But, said Martin Cooper, one of its inventors, "that wasn't really a big problem because you couldn't hold the phone up for that long." *Fun fact: Cooper was inspired to develop the device by Captain Kirk's communicator on Star Trek.*

Zenith Space Command Remote Control TV (1956)

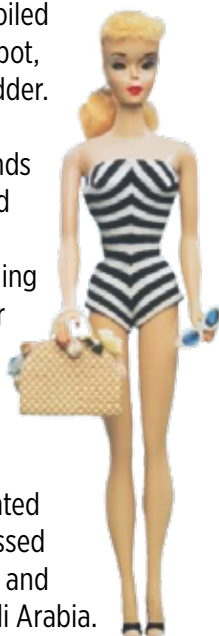
Couch potatoes everywhere owe a big fat debt of thanks to Zenith, whose Space Command



remote control ushered in the era of endless and effortless channel surfing. The Space Command replaced previous attempts, which involved wires running from the TV to your recliner—a safety hazard and an eyesore. The new wireless model used a mechanical clicking device to change the channel—thus the quaint old-school nickname “clicker.”

Mr. Coffee (1972)

Forget your medium double soy mocha whip morning pick-me-up. We all know who the real hero of the AM is. Dependable, steady, lacking in flashiness but always there when you need a nice cup of hot java to get you going or wash down a slice of pie, Mr. Coffee is the guy-next-door of caffeine delivery devices. Let’s not take him for granted. Before Mr. Coffee’s automatic drip technology, your home coffee options were a bitter brew boiled in a percolator pot, or instant. Shudder. No wonder Mr. Coffee commands such loyalty and remains the world’s bestselling coffeemaker for home use.



Barbie (1959)

She’s been painted by Warhol, dressed by Calvin Klein, and banned in Saudi Arabia.

She’s a high school senior, she’s a high-powered professional, she’s a stewardess, she’s an astronaut, and we hope she’s an attorney, considering all the lawsuits coming both from and at her. Innocent fun, sinister instrument of female body image distortion—you can love Barbie or you can hate her, but you definitely can’t ignore her. How could a handful of plastic parts in a wig become an industry, an influencer and a world-famous icon? Let’s just say your friends at Proto Labs aren’t surprised.

Pong (1972)



A dark television screen is bisected by a white “net”. Two players turn knobs to manipulate “paddles” to hit a tiny “ball” back and forth. Directions: “Avoid missing ball for high score.” And there you have it—the simple but wildly popular game that launched the gazillion-dollar home video gaming industry. Making its first appearance in ’72 as an arcade game, then introduced in a home version by Atari in ’74, Pong is a far cry from, say, Red Dead Redemption—or even Mario Tennis. No matter. Pong brought a whole new world of entertainment to generations

of nerds who would otherwise be stuck reading comic books and creating explosives with their Christmas chemistry sets.

EN-V (?????)



Who knows what world-changing products are coming up the road? We’re hoping the EN-V (Electric Networked Vehicle) from General Motors will be one of them. Designed to alleviate urban congestion, pollution and safety issues, the two-seater personal mobility pods are a sixth the size of a regular car, can drive themselves with or without passengers using GPS and wireless sensor technologies, can be parked and retrieved remotely with a smart phone app, and plug into an ordinary household outlet for recharging. The three concept models each have distinct personalities—Xiao (Laugh) is anime-cute, the more macho Miao (Magic) has a consumer electronics vibe, and Jiao (Pride) combines the DNA of a bullet train and a Chinese opera mask.

What's Cool?

By: Larry Lukis, founder and CTO, Proto Labs

These days at Proto Labs, Cool is hot.

With our Cool Idea! program in full swing and entries of every description coming our way, our team has been thinking a lot about the Cool factor.

We talk about what makes some things cool and others not so cool, how cool is hard to define, but you know it when you see it.

Which brings me to this: As the designated CJO (Chief Judging Officer) for the Cool Idea! program, I wanted to get down a few thoughts about what I see as cool for purposes of the awards.



First a little background. I'm an engineer with strong tendencies toward nerdiness and a soft spot for entrepreneurs who get an idea and run with it. (I've got some history with that myself, having come up with a process for making injection molded parts at turbo speeds. The result was a company called Protomold. Maybe you're familiar with it.)

So what's cool from my entre-nerdial perspective?

- **Robotics.** Robots = cool.
- **Tech-y gadgets.** The joy of tech toys never pales.

- **Renewable energy.** We're not going to solve the world's problems here, but every good idea helps, and it's going to take a lot of them.
- **Plastic parts,** used in any innovative application. Obviously.
- **Student design competitions.** Show us your stuff, engineers and designers of tomorrow! It's a great way to learn, and we look forward to supporting your efforts. And if your projects have anything to do with renewable energy, energy efficiency, autonomous motion or control—that's extra cool.
- **Good causes.** As it turns out, some of the strongest award contenders so far fall into this category. Projects that make the world a little better are deeply cool, and we like to help them move forward.
- **Conviction.** If you think you've got something cool—whether it falls in one of the above buckets or not—tell us why. The best ideas often come from unexpected directions.

Another source of coolness inspiration is the incredibly broad range of products we've worked on at Proto Labs. I never cease to be amazed at the innovation we see, in everything from the most esoteric and specialized products to cool stuff you'd pick up at the nearest big box store. For example...

- Flame Offroadboards, a snowboard-like piece of equipment used for hurtling down the side of mountains

when there is no snow. Protomold was crucial in the design and manufacture of this mountain board, which provided European markets a moderately priced option for extreme thrills.

- The FROG early warning system, a device that generates an alarm in the event of flash flooding or a precipitous rise in water levels, designed for use in remote areas where other systems are expensive and difficult to install. Great example of innovation for a good cause.
- In the "why-didn't-someone-think-of-that-before department", there's the Dotz CordIdentifier™, small, brightly-colored plastic dots that snap on the end of power cords, making it easy for you to tell what cord in that massive tangle under your desk belongs to which device.
- And just to show that no idea is too out there, consider artist Allison Luedtke's hummingbird and vine sculpture for Minneapolis Children's Hospital's new Ronald McDonald house. Luedtke worked with Protomold to create the sculpture's brilliantly colored resin flowers, which look like glass but hold up much better in the outdoor space where the piece is installed.

You've probably got cool ideas floating around in your head. But they'll never go anywhere unless you take action. We want to help, which is why we came up with the plan to award \$100,000 worth of machined and/or molded parts to get cool ideas on the road to the real world. So get started! Develop your 3D CAD model and submit it for entry in the Cool Idea! program. To borrow a phrase, a cool idea is a terrible thing to waste.

*Cheers,
Larry*

Firstcut Helps U of M Team Gear Up for Formula SAE Competition



It isn't Formula One racing, where annual spending is measured in billions of dollars, but the college teams building Formula SAE (FSAE) open-wheeled race cars take their machines just as seriously. In this international competition run by the Society of Automotive Engineers (SAE), cars compete in acceleration, skid-pad handling, autocross, and a 20-mile endurance/fuel economy run. Entries are also judged on design, cost, and the team's marketing presentation.

In May of 2011, the University of Minnesota team was one of 98 competing at Michigan International Speedway. In compliance with Formula SAE's 610cc engine displacement limit, the team's entry was powered by a 599cc, four-cylinder, fuel injected Yamaha R6 motorcycle engine, purchased used. The car's frame was built by hand, and while a few components were purchased off-the-shelf, most were designed, and in many cases fabricated, by team members.

Andy Simon, chief engineer for the University of Minnesota team, describes

the development process. "Teams have just nine months of a school year to produce a finished vehicle," he says. "We planned to spend five months doing design work, two months fabricating, and two months testing. By emphasizing good design from the start, we kept rework to a minimum.

"Our 3D CAD design was done in Solidworks. That let us check many aspects of fit and performance before we began fabrication, so when we finally did start making and assembling parts, things worked right the first time. We bought some components, made others ourselves and, for some of our custom-designed aluminum parts, turned to Proto Labs' Firstcut service. Their automated machining process was quick, accurate, and inexpensive. Initially, we had them make our brake and accelerator pedals, a pair of differential mounts, and two CV joint cups. We probably could have machined them ourselves, but that would have taken at least 50 man-hours and we just didn't have that kind of time.

"Overall, the development process went well this year, but still, by the time we got to

testing we were running a little behind schedule. We had a few minor problems and, at the end of April, one major failure when a front wheel spindle broke. That's a part that needs to be turned on a lathe rather than milled; otherwise we'd have turned to Firstcut for a replacement. All of the parts they made for us have worked perfectly. I was particularly impressed with how quickly they got us quotes and finished parts. In one case we submitted a model on a Saturday and got a quote back on Sunday. That kind of blew me away."

In early May, the team had Firstcut machine additional parts—two pairs of suspension bell cranks. The original prototypes had been made on a manual Bridgeport mill in the student machine shop to verify the design, but weight is a critical factor, so the team turned to Firstcut for lighter-weight parts to use in competition. "We've been extremely impressed with Firstcut's prices, the ease of uploading designs, and how quickly parts were made," says Simon.

"The race went really well," he concluded. "We ended up finishing 56th overall, and we're pretty happy about it. A lot of generous donors, including Proto Labs, helped us produce our finished car. It was good to have services like Firstcut machining, which helped us make the most of those donations and meet tight deadlines without cutting corners."

Complete FSAE competition rules can be found at <http://students.sae.org/competitions/formulaseries/rules/2011fsaerules.pdf>.





USA

Proto Labs, Inc.
5540 Pioneer Creek Dr.
Maple Plain, MN 55359
United States

877.479.3680 phone
763.479.2679 fax
info@protolabs.com
www.protolabs.com



EUROPE

Proto Labs, Ltd.
Halesfield 8
Telford
Shropshire
TF7 4QN United Kingdom

+44 (0) 1952 683047 phone
+44 (0) 1952 683048 fax
info@protolabs.co.uk
www.protolabs.co.uk



JAPAN

Proto Labs G.K.
729 Nakano
Ebina City, Kanagawa
243-0425 Japan

+81 (0) 46-237-3951 phone
+81 (0) 46-239-1932 fax
info@protolabs.co.jp
www.protolabs.co.jp

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Email article ideas, cool projects or great design stories to the editor at stacy.sullivan@protolabs.com.

→ THE SPEEDWAY

A quick look at what's new from Proto Labs

GET YOUR PROTOGAMI ON



Would you like to broaden your knowledge of surface finishes, materials and design techniques? Do you enjoy playing with brightly colored objects? We thought so. That's why the Proto Labs parts gurus created the Protopami, a 3-dimensional folding design aid demonstrating the interaction of materials and surface finishes. It comes with a handy guide that explains the materials, finishes and design features we used. You'll learn, you'll be endlessly amused, and you just might be inspired. To get yours, register at www.protolabs.com/parts and enter code PLJ2011.

COOL IDEA! UPDATE

proto labs
Cool Idea!
AWARD

With our Proto Labs Cool Idea! program underway for more than 3 months, we're delighted to report that the response has been great, the ideas are flowing in, and...we've got winners! In fact, our first winner's Cool Idea will be featured in our next Journal Issue and added to our website soon. So stay tuned and keep sending in those ideas! You never know—the next Cool Idea! might be yours. To apply, visit www.protolabs.com/cool-idea

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VIDEO DESIGN TIPS

Bosses! Bump-Offs! Bayonet Mounts—and so many more! Check out the Protomold video design tips featuring Proto Labs' own design star Kevin Crystal. And if you'd like to subscribe, you'll be notified you as soon as a new video has been posted.

www.youtube.com/user/ProtoLabsInc

IT'S ALL ABOUT THE PEOPLE



Proto Labs, Inc. has been named one of the Top 100 Workplaces in Minnesota by the Star Tribune. We were the highest scoring manufacturing company, and #8 in the mid-sized company list. Each year, they recognize the most progressive companies that focus their efforts on employee retention and engagement. Find the full report online at www.StarTribune.com/topworkplaces