



Cool Tools Show Podcast Episode 171: Donald Bell

Transcript

April 2019

Visit [Cool-tools.org](https://cool-tools.org) for shownotes

Mark: Welcome to the Cool Tools Show. I'm Mark Frauenfelder, Editor and Chief of Cool Tools, a website of tool recommendations written by our readers. You can find us at Cool-Tools.org I'm joined by my cohost, Kevin Kelly, founder of Cool Tools. Hey, Kevin.

Kevin: Hey, it's great to be here.

Mark: In each episode of the Cool Tools Show, Kevin and I talk to a guest about some of his or her favorite uncommon and uncommonly good tools they think others should know about. Our guest today is Donald Bell. Donald creates tool reviews for Cool Tools. He also hosts a weekly YouTube show called Maker Update, which collects interesting projects, news, tips and tools for the maker community. Hi Donald. How's it going?

Donald: It's going well. Thanks for having me back.

Kevin: Yeah, it's so great to have you. We're looking forward to your next set of great tools.

Donald: Well, I've been doing so many review videos for Cool Tools, happily, I love doing them, but then I've also been collecting lots of things that haven't quite fit into like a tool comparison roundup video, so I'm happy to be able to go through some of these that haven't been able to get to, put into video form yet.

Mark: Perfect. That sounds great. You're always so good at describing tools, so that's another great reason to have you on. Why don't we go ahead and just have you start and tell us about your first tool.

Donald: All right. The first tool here is, it's called flexible silicon neon, like LED strip. I believe that's one description of it. I've seen it in a few different places. The first place I came

across it was on the Adafruit site, and they still have kind of the best selection of color options for this. It's LED strip that takes 12 volts, which is a little unusual. It is the most realistically neon alternative I've come across before. I don't know if you've seen things like EL wire ...

Mark: Yeah.

Donald: Or like you see maybe LEDs diffused into like a tube of some kind that can diffuse them to kind of look like a continuous strip of something. This really is geared towards people who want to make a neon-style sign or replacement signage without all the mess and hassles of going and really using glass neon tube.

Mark: That's cool. Is the light consistent along the length of the tubing?

Donald: Absolutely. You can't see the LEDs in this stuff. I don't know if that's a trick of the silicone sheeting that's on it or the way that the LEDs might be underneath it. I haven't ... I've got one strip of this stuff that I used to make a little neon sign for my studio here, but I didn't dare ... It's kind of expensive enough that I didn't dare cut into it to see what's going on under the hood.

Mark: What kind of bend radius can you get in it?

Donald: Oh, you can do a complete like U in it. I mean, you can bend it in half. It's very flexible.

Kevin: Speaking of cutting, can you cut it to different lengths? Because you can do that with EL wire, which is for those who don't know, it's a very thin wire that glows like neon, but it's a very tiny, like a pencil lead dimension, which you can cut to length. Can you cut this at all or do you have to ... Are you stuck with just whatever length you buy it in?

Donald: You can, you can cut it. Actually, John Park, who you've had on the show, he did a whole guide on using this stuff to make a neon-style sign in his workshop. His is cooler than mine. His will animate. He's got like a, I think it's like a thunderbolt going through a robot or something like that, and they kind of alternate. You can cut it to length, just like addressable LED strip, and to get exactly the length you want, or also to do, to bridge between different sections of it. It's useful, it's not cheap though.

Adafruit has a meter of it for about 14 bucks. I've also seen online, there's places like AliExpress that will ship it out to you. It takes a while, and you can't vouch for the consistency of the color or the brightness of the strip. I'm also starting to see it now on Amazon. Actually. I just bought a batch of it today on Amazon to see if this other brand is going to be as nice a color as what Adafruit is able to provide.

Mark: Donald, tell me about your experience with AliExpress. Mine is, it's like playing a slot machine. Sometimes, it's like, "You're great," and other times it's like, "Oh my god. It's crap."

Donald: My favorite AliExpress story is when I was really involved in doing hacking experiments with the Billy Bass singing fish, and this is a few years back, and I still have a pretty well-trafficked instructable on how to hack the fish to respond to any kind of audio input. Those fish are ridiculously expensive if you buy the name brand ones, they're like \$40 for a novelty talking fish. AliExpress had a version of it for about \$14 a fish. I took a chance on that thinking, "What could hurt or 14 bucks? It's worth knowing." It showed up, and it wound up to be a Russian speaking version of the fish, with like a little Russian nameplate on it, "Made in China," but for the Russian market. You hit "play" on the thing and it does this kind of Russian march. It sounded like ... You couldn't have played it better for what you'd expect a Russian Billy Bass fish to do.

I wind up, I got ... I had a few friends who really wanted these, so I wound up selling them out to a few friends, and needed another order of them because they were still, internally, they were the same design. The second order of them, they just disappeared. They fell off the back of a shipping container somewhere, and I had to get my money back for them. Yeah, my experience has been like yours, Mark. There's some really, really delightful things that you can uncover, but actually getting them in any reliable way is a crap shoot.

Mark: Yeah. It's kind of fun to take that chance as long as you're not like spending too much money.

Kevin: Back to the neon-like LED strip, the idea is that unlike a regular neon, which takes glass blowing equipment, it's very complicated. This one, you can kind of fake the neon by bending it into shape, and you'd need something, I guess, it's so flexible, something to hold it in place once it's bent, because it is very flexible, so it's not going to hold the bend.

Donald: Yeah.

Kevin: Then you have, you say it's 12 volt, so just a 12 volt adapter would keep it going.

Donald: Yeah, a 12 volt DC, yeah.

Kevin: Is the idea that when you're trying to make a fake neon sign, would you connect pieces of it together? Can you go beyond a meter just by connecting one piece to another?

Donald: Yeah. You can do all the same tricks you would do with a regular neon sign. You can duck it behind another color of the same style of strip, or you can black out sections. Or you can really use it the same way a sign maker would use neon, but it's not delicate. It's weatherproof. It only, the other trick with this stuff is that, and I think this is an advantage of it, is that it only shines out in one direction. Like the sheathing along the LED strip really shines the light out on just one edge of the strip, so you're not getting a lot of color bleed all around it.

The way I found to mount mine, and I haven't really seen anyone else do this before, but it was the first thing that occurred to me, was to get a piece of plywood and use a router to just route out a shape using like, maybe it's like a quarter inch routing bit, just like a flat bit, just to dig in enough of a groove that I could fit the LED strip into the shape that I put in with the router. Then run a cable out the back and plug it in.

Mark: You could do that with a laser cutter, right? Just cut out the shape and then push the wire in through from the back.

Donald: Yeah, absolutely. I mean, I think with the laser cutter, you're either kind of like rastering an image on it, or you're cutting all the way through the wood. For my router trick, I was just kind of routing in just a little, maybe halfway through the plywood just to kind of seat the LED strip around and get the shape I wanted.

Kevin: That's cool. Yes, and then you have permanent support and you can paint it black or something. What's another tool in your toolbox these days?

Donald: Well, the other thing I've been playing a lot with recently is the WaterColor Bot from Evil Mad Scientist. This is a CNC plotter that will draw out designs onto a piece of paper, but it can use a set of watercolors to make the drawings, which is a really unusual and funky and playful way to do it. I've been kind of playing around with plotter art recently, and there's kind of upswell of a plotter art enthusiasts who are kind of getting together on Twitter and sharing their designs. I wanted to kind of join that, but I wanted to do it in an interesting way. This has been a fun device to start playing around with.

Kevin: I can understand when you're having to attach a marker to a plotter, and it kind of just draws. I mean you could maybe draw for as long as the marker would last, but paint, a watercolor paintbrush doesn't hold much ink before it's expended, so is there a way around that? Kind of like a continuous feed into the brush?

Donald: What's really is that the Evil Mad Scientist people, and you've actually had both of them on your show here before, both Lenore and Windell. They've made software for it that will re ... Like will actually kind of go through and know when it needs to re-ink the brush or repaint the brush, and will also go through a little routine of cleaning the brush in these little trays, these little Petri dish trays that are off to the side. It'll clean the brush between colors and it will re-wet the brush and get some more paint on the brush after a certain predetermined amount of time.

It's pretty intelligent how it's thinking about reapplying the paint to the brush, but also that aspect of the brush running out of paint over a few seconds lends itself to the artwork you get. There's this unpredictability that's built into the machine, that even if you kind of paint the same thing twice, you're going to get some variation, that I think is great.

Kevin: The other thing that I would kind of expect is that ... Is there sets of algorithm or software that kind of translate a drawing into watercolors? Because the ink, the paint is

sort of spreading as it goes on. It's not just a line, it's there's some width to it. Do you, yourself, have to kind of figure out what the painting's going to look like and work backwards, stroke by stroke? Or is there some kind of software that does that for you?

Donald: They have software. There's two different flavors of it. You can use the, kind of the really user-friendly software, which is called RoboPaint, which is a program that they developed that's on GitHub and there's a lot of support for. They've deliberately made that as kind of kid-friendly and classroom-friendly as possible. With that, you can load in a drawing and then you could have it automatically try to do its best guess at separating out the colors of your drawing. It will take solid elements of your drawing and apply like a hatch fill to it. It's a little slow, or maybe my computer's a little slow, but so it takes a little patience but the results have been always pretty fun to get at the end of the result.

There's a little, like I said, there's a little unpredictability there, but as someone who's just kind of getting started with it, even the worst drawing I make on this thing still has like a fun, childlike quality to it that I can't be mad at.

Mark: Is this a kit? Do you assemble this thing or does it come already assembled?

Donald: Mine came preassembled. I think there might be a kit version of it you can save a little money on, but the preassembled version was fine. I should also go back and mention the other way you could use the software for it. There's a set of Inkscape plugins that you can load up, and with that you can get pretty advanced with having different layers of an Inkscape SVG file, covered, different colors and different aspects of the design you want to print out.

Kevin: I'm not sure, what is an ink space? I don't know what that is.

Donald: Oh, Inkscape, which is-

Kevin: Inkscape.

Donald: It's an open source, kind of like an Adobe Illustrator alternative, but it's a pretty popular option for converting files and working with SVG type Vector files.

Mark: It's free and it works really well. It's like a pain in the butt to install on a Mac though because you have to install the developer tools onto your Mac, but if you have a Windows machine and you can't afford Adobe Illustrator license, get Inkscape. It's pretty awesome.

Kevin: Great. Donald, what's third on your list?

Donald: Third on the list kind of dovetails with the WaterColor Bot. It's a site I just learned about last week called Turtletoy or Turtletoy.net. If you think of like the Turtle, like graphics language from your old Mac, it's talking about, it's mentioning Turtle there in that aspect of it. It's a repository of people's shared kind of plotter illustration graphics. I think of it almost like a Thingiverse for plotter art. Like if you get a plotter, just like if you got a 3D

printer, you go and plug it in your wall, and you get it warmed up and ready to go, you're like, "Okay. Now what do I print?" You go to Thingiverse, and you could download a file and you could 3D print it, and you could get something going right off the bat.

Turtletoy is kind of like that for plotters, and there's, each of these like illustrations you can find on the site. You can click on it. You have both the illustration on the left, and then you have the code that generated the illustration on the right. You can go in and you can tweak the code. You can make the illustration a little bigger. You can make the algorithm that generates the art do something a little stranger. Then you can save the output as an SVG file that you can send over to pretty much any plotter, or also like a laser cutter or a vinyl cutter.

Mark: When you say "plotter," you mean a little plotter, which has a pen in it, versus an inkjet or a, whatever, like a laser printer.

Donald: Yeah, I mean I think the SVG file's pretty versatile. You could probably just print, you could print out these illustrations too, just on your conventional, home printer, but the community that's built around this site is mostly using it for using CNC plotters. Like you're saying, like a robot that holds a pen and makes an illustration for you.

Mark: How do people actually make these graphics? Like they're not just hand coding the Turtle instructions like, "Rotate 90 degrees, move forward 10, rotate, lift pen," that kind of thing. Is that, what's going on?

Donald: Now, I think these ones are all done in JavaScript. I could be wrong about that. Yeah, it's a programming language here, and I am not a programmer, but I'm comfortable enough with things like this, like Arduino code, where I can open it up, I can kind of get a sense of what sections do what, and I can figure out what numbers to change and see if that does something different. That's as far as I get with this stuff. That's exactly what you can do here. You can find a setting and change a value, and then you hit the "compile and run" button and then you see what it does on the graphic on the left hand of the screen, that'll redo it.

Some of the graphics are deliberately built to randomize every time you load it up. There's some pretty interesting stuff here. There's some people who've taken ... Google has like a ... What do they call it? They're like their doodle library, like their AI Library of people who've doodled a thing, that when they're prompted with a word, they create a doodle and they submit that doodle to this ongoing library of doodles. There are some of these illustrations that actually pull from these repositories of different files to create interesting illustrations that randomize every time. It's neat.

Mark: It looks cool. I'm just, I'm amazed that someone can do like figurative art on here. There's like some human bodies that are here, and to think that they're doing that just by entering commands, JavaScript code, is pretty mind boggling. I wonder if there's some other way they're doing it.

Donald: Yeah, I haven't gotten brave enough to try to make one from scratch, but maybe some day.

Mark: Very cool. You have one more tool for us. Tell us about this.

Donald: Yeah, this one's kind of a call back to my obsession with these Canary style cardboard cutter knives. I may have talked about one last time I was on the show, but I've gone through a few of them. There's the yellow handled one. There's a green handled one that I found last year that's retractable. Now recently, there's this pink handled one that has a little nub of a knife that sticks out. Maybe about an inch out from the handle. About as much as you'd think like a utility knife would extend. It's really just made to, I think, open up boxes. It's like it's just long enough that you can rip open a box. It's the kind of knife that should, anytime someone signs up for Amazon Prime, this should come in your first package because it's the tool that's like ...

It's not sharp, you're not going to stab anyone with this thing. It's deliberately made to be a little blunt at the top so that you're not cutting into the thing that's in the box. The sides of this knife are serrated in this very fine way that just loves to go through packing tape or the paper-based Amazon type of packing tape. It can cut through cardboard really easily. I just, I love grabbing this thing. When a box arrives at my doorstep, I know that I've got just the right little tool to kind of get through it, and make quick work of opening it up.

Kevin: Apparently, you can also cut through the yellow strapping, plastic strapping ...

Donald: Yeah, yeah.

Kevin: ... that oftentimes comes with heavier duty packaging.

Donald: Yeah. It's 10 bucks and it's just one other option in the growing variations of Canary cardboard cutters.

Kevin: On the Amazon website, there's a couple little versions. It's hard to tell what's happening. There's one called a 130F and a 130R.

Donald: I can tell you the difference. The F, which is the one that I have, has a fluoride coating on the blade, which makes it nonstick, so it's less likely to get tacky if you're cutting through duct tape or something that's going to have a residue. The R is more of like a stainless steel.

Kevin: Okay. The F is the one that we want.

Donald: I found those to be the most useful.

Kevin: Okay, great. Wow. That's really fantastic. Yeah, I think you're right. It should just go out with your first order on Amazon Prime. It has a little hook, and should hang by the front door where you get your packages.

Donald: Really, you should. It's one of these tools where I talked about it years ago, the first version with the yellow handle. I've had a number of people come up to me talking about how they order these for their entire family for Christmas. Or they make good gifts, and they're one of those things that's just unusual enough that you can suspect that most people aren't going to have one.

Kevin: Wow, that's really great. Donald, what are you up to these days? I know that you are still doing some videos for us, but you are doing many other things as well.

Donald: I've been, yeah, I've been pretty busy. My main gig these days is I'm a writer for the Tinkercad team, and so I help them out with their blog and their social media. For people who don't know, Tinkercad's like an online tool for people who want to ... It's a free online tool for people who want to design their own 3D designs. There's also a new Codeblocks system that's in there for people who want to generate designs using like a Scratch-style Codeblock editor. There's an electronic simulator within Tinkercad now that another mutual friend of ours, Becky Stern, has done a lot of work to buildup and have lots of interesting projects, where people can experiment with programming and Arduino, virtually, or creating or circuits and breadboard designs, virtually. It's a fun team to be on and a fun tool to get to know better. That's my main gig.

Mark: You have a newsletter, an email newsletter?

Donald: Yeah, and then I've got Maker Update, which I still continue to do every week. That's a video, a YouTube show. I now do it for Adafruit once a month. I have moved the show as of this week, that we're talking, from Make Magazine's YouTube channel to Digi-Key's YouTube channel. Digi-Key is going to be my new sponsor for the show, and I'm really glad to have a new home for it. The show also has an email newsletter that I've been really trying to push for people to get a signed up for because it's a great way for people to stay on top of the show. Especially as I've just kind of fumbled the explanation of where it is.

There's a couple different ways to get it. It's got a couple different homes. The newsletter is really like the one-stop place where people can get the Maker Update information every week.

Kevin: If you could just explain what the Maker Update is, for those who don't know.

Donald: Yeah, I mean maybe this is ... I'll take the long version, which is that I used to be a projects editor for Make Magazine. I really, I got a muscle developed for finding cool projects that would be worth featuring in the magazine along with some tips and interesting insights that makers would probably enjoy hearing about. Make laid me off then, this is maybe two and a half years ago. I just kept wanting to do my job, so I found

... I figured doing this as a YouTube show every week would be a fun exercise that would allow me to keep going back and looking for cool projects and sharing those with makers. I've just been plugging away at it. I think I'm at a 118 episodes now, and it's still a lot of fun.

I just really get a kick out of finding cool projects that have been well documented on sites like Instructables or Hackaday, and sharing those out with people so that they can put it on their to-do list of possible projects to get involved with.

Kevin: The way I would describe it is that instead of someone out there spending several hours a week or more looking for really cool things, you are doing that. You're, of course, scouting and scouring through the entire Internet looking for people who have done cool maker projects and you're bringing back some of the highlights into kind of "the best of" for that week or however, what the frequency is. You're kind of showing, "Here's what people have been doing recently, and saving you time for having to scout through the Internet yourself."

Donald: Yeah, yeah. That's it. I mean, it's a curated list of projects, DIY projects. I think the filter that I have in my brain is stuff that's really, that you could really achieve in the same kind of vein as what you'd see in a Make Magazine. There's a lot of really cool stuff out there that you can find on Reddit threads. Or, "Oh my god. I can't believe this guy made a thousand foot flaming sculpture," but you're never going to do it. The stuff I tend to find is within the realm of the hobbyist who could put together, in Arduino, a basic woodworking project and make something happen.

Kevin: Where should people go to kind of track your latest or to find your newsletter?

Donald: The home for all my stuff is MakerProjectLab.com. That's the site and the business I put together after Make. Through that, you can find the videos, the show notes, project links and the newsletter. It's all there.

Kevin: Great.

Mark: Donald, I just have one quick question before you go. I'm a big Tinkercad user, and I've used it to make some pretty sophisticated parts on my 3D printer and using it for laser cutter. I haven't really messed around with Codeblocks too much, but do you think ... Codeblocks is like a Scratch-like interface to design parts. Do you feel that that's a superior way to use Tinkercad to design 3D parts?

Donald: For me, it's been a learning curve to think about designing things in that way. My sense is that it was really a feature that was added, and we're excited has been added, that would allow teachers and students to get into 3D design, to have a code style avenue to get there. I don't think you can do anything more advanced, necessarily, with Codeblocks than you could do using the regular editor, except to say that you could probably do more algorithmic stuff with Codeblocks than you would be able to accomplish with the conventional, 3D editor for Tinkercad.

I've seen some people do some pretty interesting algorithmic design stuff. Almost like plotter art type of, Fractal kind of design stuff in Codeblocks because you're using a loop of repeated shapes and code to do that, and you can output that as like an SVG file and send it to your laser cutter, maybe. In terms of making things you're going to 3D print, I would, personally, I would still just stick with the 3D editor. Once you've got a muscle memory for getting around on that thing, that's going to be your best ally.

Mark: Right, okay. I just like the idea that you have these steps here, and then you can change the parameters for like if you have a cube and you have the dimensions there. You can change them, be really precise about it without pulling out the ruler. You don't have to worry about undue steps and things like that. I'm going to give it a try and see for my next project, to see what it's like and then compare it to the way I usually do it. I'll let you know.

Donald: Yeah. Let me know what you think and what you come up with, and maybe I can get it out on the Tinkercad account and give you some, give you a tweet.

Mark: Sounds great. Donald, this has been such a blast talking to you. Thanks.

Donald: Oh, you're welcome. I love being involved with Cool Tools. I'll be giving you some new videos soon.

Kevin: Yeah, I look forward to them all the time. I think you do a great job and I heartily recommend them to others to take a look at the Cool Tool videos that Donald has been doing for us.

Mark: Yeah, they're great. We have lots of video reviews that Donald has done, and it's a great way to learn about a tool. Because Donald not only shows you the tool and explains how it works, but he actually uses it in a realistic way so you can see how it performs. Highly recommend it, please subscribe to it. Okay, Donald, well, thanks.

Donald: Oh, this was great. My pleasure.