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SPEAKERS

Paul Cutler, Mark Komus



Paul Cutler 00:01

Welcome to the Circuit Python Show. I'm your host Paul Cutler. This episode I'm joined by Mark Komus. Mark is a geek maker, computer architect and general nerd. When he isn't using circuit Python to build his own projects. Mark is a community member who contributes to both the circuit Python core and its libraries. This episode is brought to you by PCBWay. With over a decade of experience PCBWay is one of the most experienced manufacturers in PCB prototyping and design. Whether you're an engineer students or hobbyist PCBWay offers a simple and fast prototyping service and it's cost effective at only \$5 for 10 PCBs and check out [PCB way.com/project](https://www.pcbway.com/project) Where PCB way helps makers and hobbyists collaborate on their designs and projects. Make your design a reality and check out [PCB way.com](https://www.pcbway.com) For all your PCB needs. And they also now offer CNC machining and 3d printing services. Visit [PCB way.com](https://www.pcbway.com) For more information, thanks to PCBWay for their sponsorship. Mark, welcome to the show.



Mark Komus 01:01

Thanks for having me.



Paul Cutler 01:03

How did you first get started with computers and electronics?



01:06

So I think my path is like a lot of other people in this hobby is I started getting a Commodore 64 When I was a kid, I started learning to program in Cub Scouts. Actually, one of my neighbors down the street was also into computers at the time and taught us and it was just something immediately I love doing as I think an eight year old it was people thought it was strange, but just fascinating for me. And I progressed that way throughout elementary high school, I always knew I wanted to go into computer science to pursue that as a career. I was never the kid that

you asked, What are you going to do when you grow up? I knew what I was going to do when I grew up. And that really got me down the path. But it was interesting. Once I actually got a job out of university, I found that I wasn't doing programming on the site anymore. I wasn't doing my own projects. Now that I was doing it sort of nine to five, that part went away, got into other interests at the time, probably thinks I should have been exploring more when I was younger. But now as an adult, I was doing more in terms of like recreational sports and just getting out in the world. Because by the time the day was over, I didn't want to sit down anymore.

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Paul Cutler 02:27

How did that change for you? How did you discover Circuit Python?



02:31

Eventually, my job moved from more of a development job into a computer architecture job. As I got more seniority and I got sent on a conference. They had a workshop about the IoT Internet of Things. And they gave us all these Intel Edison's you can't find them anymore. It was a little system on a chip. It's the first time I'd seen something like that. I started building a weather station, one of my first projects, and then eventually I got shelved put in a box like a lot of projects do. And then it was years later, I wanted to continue found that the Edison was no longer supported. And I was just like, well, I've heard about arduino and other projects like that. So let's see what's out there. And that's what led me down to discovering Adafruit. And the first microcontroller I really bought was a feather m zero with Wi Fi, because I wanted to actually be able to check on the weather that eventually led me to going on show Intel, or the Adafruit show Intel, because I wanted other people to see what I was working on. I had been watching the show for a while. And this was something I thought, hey, this would be neat to do. I hope no one goes back and watches some of my first appearances on Shawntel. They were fairly rough. But during that time, I was on the Adafruit discord met a lot of people and it was Scott Aquarius, who's like you have to try circuit Python. You'll love this. And I think when I really realized I was getting into it was when I was working on my Arduino code and started forgetting semicolons and C. And that was the moment when it's like, oh, this Python thing was pretty cool. Circuit pythons really neat. I never used Python before I'd had coworkers telling me how much they loved it. But I had never even looked at it at till circuit Python.

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Paul Cutler 04:22

Never having used Python. What were your initial impressions of Circuit Python?



04:26

It was quick and easy to do things. As Phil always says it's too easy. People get mad they've made development and programming too easy. Where I've found it going forward in my life now is I can work on a project be working on the circuit boards, the electronics wiring it 3d printing, and come to the end. And now the development side of things is that final mile and it's no longer hours and hours and hours of work like I've finished projects and just a couple hours coding to hook it all together, versus when I found myself in Arduino land. That could be a long

time Oh, is this library, right? Is this compiling even just the turnaround cycle of compiling it, uploading it to the board starting circuit Python, you hit Ctrl D and it's just it's back again, when you're prototyping and developing is so valuable.

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Paul Cutler 05:26

Speaking of Show and Tell Halloween was last month, and one of your projects went viral. Tell me about your monster eyes.



05:32

So the monster eyes the original code, full credit was written by Philby from Adafruit. He's done some amazing work, highly recommend anyone that wants to check out his projects, some of the coding you will learn in there is just amazing. So I wanted to get it working on one of these new round displays that have been making their way around Twitter, there's the GC, nine a Oh, one I was forget the driver name. They're just little circular displays. And I thought that would be perfect for an eye, I initially got them. For a totally unrelated project, I want to do something with a heads up display. That project is now also sitting on a box. So these I project, the first step was to get it running on the circular display that actually wasn't that difficult. The code is already written for the Adafruit monster mask, which is just a m for baseboard, and I had a Feather M for Express sitting around that I was able to put it on, I posted the original little video, just as I Hey, this is something I'm working on this afternoon. And then as I continued to work on my project, my phone just like I looked over and there was like 50 notifications from like, what's going on like, and it just kept going all day all night, I woke up the next morning to just hundreds, I was trying my best to respond to people, people wanted to know how to build this themselves how I built it. But then my goal was finding an M for right now is very difficult. The SAM D 51 is basically impossible to find. So I wanted to try getting to work on RP 2040. That became what I thought would be a quick and easy project became a much longer endeavor. Because of the supported libraries. They'd never been moved to the ERP 2040 There was a lot of library support to get it to work, eventually, a week later, and managed to go not quite as fast as them for but one thing people might not be aware of is the M fours got a floating point unit in it, versus the RP 2040 does not. So the speed of calculations is always going to be a little bit slower when it comes to that. But yeah, eventually got it working, got the eyes placed in a pumpkin, literally just in time for Halloween and was very happy with the result. Yeah,

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Paul Cutler 07:55

it looked fantastic. And it was it was I love seeing all the likes on the Twitter post. Just keep going up and up and up and up.



08:01

It was something that you hear about and it was, it was unreal, just to see something and I know compare it to some posts that get 10s and hundreds of 1000s. But for electronics. I'll take what it was.

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Paul Cutler 08:15

Yeah, it was huge. It was great to see and it inspired so many different projects. As you mentioned, I think you know, DJ Devin three built the project. Todd Whitehead is going so it was you know it was the the zeitgeist of the moment.



08:27

Yeah, I'm really happy about how it came out. And I'm really happy. So many people said they want to take this into their own projects, because that's really the goal.

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Paul Cutler 08:37

You mentioned earlier coding and C, which is what the circuit Python core is coded in. If you're in the circuit Python community, you probably know of the core developers like Scott Danner, Jeff, you've been contributing to the core, how was being a volunteer working on the core different than maybe being one of the paid developers. It's different



08:54

because I'm not beholden to anyone. I got interested in programming in the core, because I still wanted to occasionally get my hands sort of dirty at that low layer programming level. I enjoy that type of development. It's really nice to have circuit Python to like, make your projects polished and quickly get them out. But it's fun to get your hands dirty at times. And I also wanted to contribute back to the community. That was part of my reason on it. And I had embedded development see experience in my past. So I started I was watching Scott's deep dive stream probably a couple years ago, and they had talked about wanting Adafruit bus device. In the core. It's a library that helps a lot of other libraries talk to eye to C and SPI devices. And putting in the core. Everyone hoped would speed up this rather than having an in Python. So that was my first contribution of substance to the core was, again something that I thought would be Employment ended up being this rabbit hole I went down. And then it just built up from there it was areas I was interested in, or if I saw community need, that might not be a priority for Adafruit, but was a priority for a lot of other people. When the RP 2040 came out, the main libraries were all done for lunch, but there was a lot count IO comes to mind, just a simple counter that wasn't a high priority, but still has a lot of functionality. And I'm like, Okay, this is something I can get into. It led me to want to the first time I'm really looking into the datasheet for a microcontroller. 650 pages of fun technical specs, if you ever can't sleep at night, a lot of the core development I've done has just been areas that I've wanted to see improved. The is 31 FL 3741 LED glasses came out as an eight a box about a year ago, and there was no display IO support display I O for the graphics and for the text was something I really wanted on the display to put on the glasses. So I worked on adding that in similar to the RGB matrix. Those glasses actually got me media coverage. I'm from Winnipeg, the Winnipeg Blue Bombers football team are one of my favorite teams. We won the Canadian championship last year, the Grey Cup I was at in Winnipeg, Portage. And main, one of the big gathering spots. Traditionally, after sports teams are in a big celebration. I was there wearing my LED glasses. And I've never been in so many selfies in my life. And people were asking, well, how, where did

you get these and I was like, Well, I got the board. And then I programmed it myself. And I had cameraman coming up to me from the media, saying I need to interview you. So it was a real experience on top of the team winning

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Paul Cutler 11:57

what other opportunities has working with the non circuitpython brought you



12:02

since getting involved in the community written a couple of magazine articles. And seeing yourself published in print is something that's really exciting. And it's just led me to meet a lot of people and get involved in a lot of projects and see what's out there. Like I've had companies reach out to me with samples or to ask questions, things that I never thought were possible before I got involved. And I still have that impostor syndrome, which I know a lot of us have are like, Am I really good enough for this? Are people really asking my opinion? And it's trying to get over that and always thinking yeah, yeah. I'm not promising answers to the world. But if it comes to circuit Python, hopefully I can help somebody.

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Paul Cutler 12:48

Last question before we go, and you've listened to the show. So you know what's coming. You're about to start a new project or prototype, which microcontroller board do you reach for?



12:57

I thought about this question quite a lot. Because I've listened to all the podcasts, I very much will vary which microcontroller I pick based on my project. But if I had to pick one, one of my favorite is unexpected makers feather s two. It was one of the first boards they had that had the Wi Fi built in, Bluetooth built in and had lots of IO. It had everything you'd expect in a feather. And for some reason, even though most of my projects don't incorporate Wi Fi, I like having it there with the new circuit Python eight, and being able to edit over Wi Fi. That's an even bigger reason. And unexpected maker, again, isn't a huge company. It's the person. But all his boards that I've used have been amazing. They're well made, and has made working on any projects. Really easy, and they've been durable. I've thrown them outside on a cardboard box for a year and it kept working.

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Paul Cutler 13:58

Mark, thank you so much for being on the show.



14:01

Well, thanks for having me. It was a pleasure to be here and I look forward to listening to more

podcasts.



Paul Cutler 14:08

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