Cool Tools Show Transcript

Episode 32: Alexander Rose

Link to Audio File and Show Notes:
http://kk.org/cooltools/archives/tag/cool-tools-show

Mark Frauenfelder: Welcome to the Cool Tools show. I'm Mark Frauenfelder, editor-in-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 co-host, Kevin Kelly, founder of Cool Tools. Hey, Kevin.

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

Mark Frauenfelder: In each episode of the Cool Tools show, Kevin and I talk to a guest about some of his or her favorite uncommonly good tools they think others should know about. Our guest today is Alexander Rose. He's the executive director of The Long Now Foundation which was founded in 1996 to become the seed of a very long-term cultural institution that fosters very long-term planning. He was hired to build their clock that lasts 10,000 years. He's also the founder of the Robot Fighting League and is a contestant on the ABC series, BattleBots, which is currently airing on Sunday nights. Hey, Zander. How's it going?

Zander Rose: Good. How are you doing?

Mark Frauenfelder: I'm doing really well.

Kevin Kelly: Yeah, welcome, Zander. It's really great to hear you and also, I'm a fan of the BattleBot championship now reigning on TV. Best of luck to you ...

Zander Rose: Thank you very much, Kevin.

Kevin Kelly: In your BattleBot.

Mark Frauenfelder: Tell me a little bit about your BattleBot. Do you have one that you're using or do you have several?

Zander Rose: Yeah. Well, if some of you remember, this actually all started back in San Francisco with an event called Robot Wars way back in the mid-90s. Then, it became a TV show that was based in the United States called BattleBots that was on the air for five seasons on Comedy Central, strangely. That went off the air in 2002 and I didn't really think it was going to be coming back again in the time that I would compete, but ABC picked up six-episode season this year and our BattleBot that we entered is similar to some of the successful ones we had in the past series but with even more power and with even less weight. This one is called Bronco and it can launch other robots its own weight as high as 14 feet in the air.

Mark Frauenfelder: That sounds cool. You've given us a neat list of tools and it looks like some of them are good for building robots and then other ones are good for repairing humans that have been damaged by robots.

Zander Rose: Yeah. There's a bit of that, yes.

Mark Frauenfelder: Yeah. Why don't we start off with the Knipex parallel plier wrenches?

Zander Rose: Yeah. It's a good question. I'm not totally sure how that sound. I always call it Knipex, but yeah. It's a European brand that is ... They make some of the nicest things like adjustable wrenches but they recently came out with this type of parallel wrenches. The funny thing about them is that you would look at them and you'd go, "Oh, well, this is like a normal kind of sliding adjustable wrench." But until you use them, you don't quite understand how amazing they are.

You can adjust them but then when you actuate them, they have flat jaws that stay totally parallel. You can actually use them ... They're way more powerful than a crescent wrench even though they look like a set of pliers. They don't damage the flat surfaces that you're working against. Let's say if it's a nut that's an offsize or something that's custom-flat on it, you can adjust it to that size and it won't damage it.

We used these in a lot of the construction of the clock, the 10,000-year clock project because we end up making a lot of custom fasteners and things with custom flats for tightening. These just are indispensable. We have them in every toolbox that we use.

Kevin Kelly: For those who are searching for this, it's important to understand that Knipex is a brand name, so there are other tools called Knipex.

Zander Rose: Yes, that's right. Knipex [crosstalk 00:04:16]

Kevin Kelly: Right. The tool is, well, I don't know what they call the tool. It's a parallel pliers set.

Zander Rose: Yeah, I call them parallel pliers. They're not super cheap but they are one of those tools that you are very glad that you have and you end up using way more than you think you ever would.

Kevin Kelly: A good way to get them is a series of different sizes and so the length it will probably have will take you to one that has three different sizes. The other thing about them is that they will probably outlive you.

Zander Rose: Yeah. They're extremely well made. I believe it's a German company and all of their tools are very good but this particular, it's a unique category even though it looks like a normal set of sliding fulcrum pliers. It's actually a totally different action that they work. It's hard to appreciate until you have some in your hand, but there might be some YouTube videos out there of them being operated. I guarantee you that if you have them in your toolbox, you will use them more often than just about any other wrench.

Kevin Kelly: It's true actually. I have a set and it's the one that I always reach for first even for an ordinary wrench job, it will work fine but of course, if you have something that you're trying to protect, whatever, it's especially good.

Mark Frauenfelder: Like you're saying, Zander, my problem with adjustable crescent wrenches is that they just get loose after you turn a knot or a bolt a couple of times. Do these actually lock on?

Zander Rose: They don't lock on but it's the action of squeezing the handles. But when you look at this style of pliers, you would think it's a single fulcrum. Normally, you'd end up like chewing up the knot or whatever it is that you're working on. But these actually have a second fulcrum in that joint so that as you squeeze on to it, it becomes stronger and stronger fulcrum or squeezing angle on there, yeah. It's very difficult to damage anything that you're working on and it's very easy to get a lot of force. Very different than a crescent wrench or normal adjustable pliers.

Kevin Kelly: Right. I think the point that Zander is trying to make is that if you're familiar with the crescent wrench, this is really a different tool.

Zander Rose: Yeah, and it's also not even like the normal adjustable pliers, so they called them plier wrenches. They're somewhere in between the two concepts but they operate with their own double fulcrum principle. That's really great. When they squeeze together, they squeeze parallel to the faces. Actually, I end up using them like if I have a pin to insert into a shaft or roll pin, or even to take something out, you can use them almost as a small arbor press for small delicate pin work and things like that as well.

Mark Frauenfelder: That sounds really great and a tool that I've never heard of before. I always love that hearing about it.

Kevin Kelly: Yeah. They're really great. If you're trying to make a minimal tool set, this is what you want to have for your pliers and wrenches.

Mark Frauenfelder: Excellent. Okay. Next, you have the gear drive case ball end hex keys.

Zander Rose: Yes. These are funny one. The actual tool in this case is not the amazing thing, and these are by Wiha, another European company, I believe. They make excellent tools. The ball end hex wrench, for those of you who don't know, they make these in both hex and torques styles and therefore, turning socket head cap screws, any hex or torque screw.

But the thing about this particular set, that seems like you wouldn't care until you use L wrenches a lot. There's these little gears in the actual case that gear them all together so when you grab one wrench and you turn it, they all turn out together, and so that you can pull one wrench out and then relock them all back in. People who've used like say the most common brand, Bondhus, will know that you spend a lot of time wrestling with two hands trying to get these things in and out of the case. As soon as they're out of the case and you don't know that size you're reaching for, it's a total pain. This is an optimization of the way to hold wrenches so that they come in and out of their case much better and have just become a total favorite.

Kevin Kelly: It's also worth mentioning that the ball end to these wrenches is an innovation and a desirable feature itself that's different than the normal cheap IKEA version of a hex wrench because the ball end allows you to get the wrench started a little easier because you come at a slight angle.

You don't have to get exactly parallel to the whole. You can come in and feed it in.

Mark Frauenfelder: Yeah. [crosstalk 00:10:09]

Zander Rose: That's right. The ball end was an absolute godsend to anybody who uses hex keys or torques keys, but the annoying thing has always been the way to hold them. I'm also going to post the ... There's a little YouTube video on these. They have one other option with these which is interesting. There's a thing called the Magic Ring which is a little metal band around the ball end that holds the screw so you can put the screw on the wrench and then feed it down into the whole and not lose it. [crosstalk 00:10:55] You can get those with or without that in there. They're really great.

Kevin Kelly: Cool.

Mark Frauenfelder: Great. Next up, you have a kit on making your own electric bike.

Zander Rose: Yeah. I've been researching electric bikes for quite a while. I wanted an electric cargo bike for my wife and daughter to be able to do the second half of their commute across San Francisco, dropping my daughter off at six and then my wife heads on to The Mission. Most e-bikes use a powered wheel and the bummer about that is that you have this extremely heavy wheels. Let's say if you want to use it in pedal only mode, you're trying to turn this 40-pound wheel. Also, if you've ever tried to change a flat tire on an e-bike, it means all the wires are going into the wheel. The wheel is very heavy. It's nonstandard. I think it's strange that the trend has been to make all e-bikes put the motor in the wheel.

This kit made by Bafang, a Chinese company, there are several kits that you use what are called mid drive. This is just one of them. Mid drive kits mean that the power comes in at the cranks. That means your wheels are standard. Your transmission is standard. You can use normal gear sets and things like that in conjunction with your electric bike kit. This particular one, you can get up to 1,000 watts which if you're trying to build a cargo bike for a whole family, is you really do want that extra power. There's other ones by Bosch that go up to, I think 350 watts right now probably. The Bosch one, I suspect, might be better made but it doesn't have enough power for a place like San Francisco with big hills and a bike that's going to weigh 60 to 70 pounds plus two people on it.

After looking at all of the various kits, this is the one that we settle on and now, I have about seven friends who were all using these for various versions of electric bikes. They've been amazingly robust and have all really lasted very well. The bike that we chose to pair it up with is a short wheelbase cargo bike. There's a lot of cargo bikes out there that are extremely long, by both Yuba and Xtracycle. The problem with those is that they don't fit on bike racks. In our case, we're going to do a two-part commute where we drive across the Golden Gate Bridge together and then they do the second half of their commute by bike. There's no way to do that easily with one of these very long wheelbase cargo bike.

Also, if they want to hop on a minibus or one of the transit buses for one leg of their commute, they can't do it with one of these really long bikes. Not only they're really long, they don't fit on those racks, they're also another 40 pounds heavier than the already heavy cargo bike. It's right at the shorter wheelbase cargo bikes like the Boda Boda by Yuba that which has an aluminum frame. It's a little bit longer wheelbase than a normal bike but still fits on normal bike racks and then that with the e-bike, this Bafang mid drive kit has become a pretty great combination.

Kevin Kelly: I used a mid drive electric bike for a long haul tour from Canada to Mexico which was a very small 250-watt thing, kind of more of a boost. What range do you get on the battery and the set-up that you have right now with 1,000 watts?

Zander Rose: Well, a lot of it depends on how you have settings on how much pedal assist you do although they're from 1 to 9 and it also depends on what kind of terrain you're on. For extremely steep terrain and trying to get across the city pretty quickly, you have about an hour and a half of actual pedaling that you can do which seems to be more than enough for them to get across the city and back and still have some leftover. You can also carry a charger with you. The batteries pop off. In our case, I think she has a 14 amp-hour lithium battery.

The downside of this is you buy the mid drive kit. You buy the bike and then you buy the battery and you need to do some wiring and stuff like that. I haven't found any really good sources that put these all together for you. There are some places but you need a place that will locally do it just because shipping the stuff around once you've got it is a little bit difficult. It's definitely the best of those options and I ended up building electric bike for myself.

The other amazing thing that I found about having electric bikes like this that the whole family can get on is that we live in [inaudible 00:16:59]. It could be plugged up with lots of traffic and all of the sudden, all the times that we've decided not to do things because of traffic, we've completely changed and we'll ride up to the top of the headlands just to watch the sunset on a Sunday evening. Things that you just wouldn't do in a car, you all of the sudden would do on electric bikes. It's like being a tourist in your own town again which has been really great.

Kevin Kelly: Is there enough power to actually power the bike without any pedaling at all?

Zander Rose: Yes. That kit has both throttle mode and pedal assist mode so you can decide how much of each you're after and how much you want to save power versus how much exercise you want to get. I end up going as fast as I can go at a given time. If I'm fine with arriving somewhere and being sweaty, I end up really pushing the bike and just getting there a lot faster but still getting plenty of exercise, but it's nice to have the option as if you're wearing nice clothes and you want to get somewhere and have the rest of your day not be in sweaty clothes. You can do that too.

Kevin Kelly: That's cool.

Mark Frauenfelder: How long did it take you to attach the kit to the bike, Zander?

Zander Rose: I put the whole thing together in an afternoon but to be fair, I have a pretty extensive shop and bike stand and all of that. I would say, for somebody who's a reasonable bike mechanic and knows the basics about 12 volt electric thing, you should give yourself a day to do it. If those things are out of your comfort zone, you may want to look for a local place to help you put that stuff together.

Mark Frauenfelder: Okay, that's good to know.

Kevin Kelly: The kit is pretty complete. There's nothing else you need besides what comes with this [$850 00:19:01] kit.

Zander Rose: The kit that's on that link is very complete but what it doesn't have is the battery. Actually, let me check that particular link I sent, just that won't come with a battery. No, it doesn't look like it comes with a battery but you can search for batteries for that kit and pretty much as long as you

want to get the 48-volt lithium bike battery, you want to make sure it can put out enough current which I think is about 25 amps but it's all spec on there. There's people, who definitely, if you search for the Bafang mid drive battery out there or even on Amazon, there's people who are selling batteries for it. [crosstalk 00:19:44] It just depends on the size of the battery and the quality that you're after but it's usually somewhere between $300 and $500 more than that kit.

Mark Frauenfelder: Cool. You also have another bike tool, the Chinese high-power bike lights and you gave us an example of one.

Zander Rose: Yeah. This is an interesting one. There was a German company called Lupine that started putting some of the really high-power LEDs into bike lights that we started using for night mountain bike riding. There's really no limit to the amount of light that you actually want if you're riding fast on single track in a mountain bike at night. We started riding a lot at night after having kids, getting out before dark was very hard. We started doing a lot of night riding but the bummer about a lot of the bike lights is that they required a wire going down your back to this big battery and the new LED lighting systems made the light very small but also meant that the battery could just be velcroed under your helmet that's about the size of a pack of cigarettes and run for plenty long. You can put one your bars and one on your head.

Those early Lupine lights were $600 to $700 each and now, there's just a plethora of Chinese versions that can fire is one that I sent an example of. They're down $50 for these things, so having one on your helmet and one on your bars to have a total of something like 2,400 lumens which is just pretty insane. You look like an F16 landing on an aircraft carrier when you have this setup. You definitely are seen by cars when you're on the road portion of it and I find that if you have one on your helmet and one on your bars, there are two things that you get out of that if one of the things you're doing is mountain biking. The bars being out of plane of your eyes cast shadows, the bar light, so that you can see the terrain. If you have a light that's only on your head, you won't see the shadow, let's say a big hole that's in front of you.

Generally, what we do is we run a brighter light on the bars so you see the shadow and a slightly less bright light on your helmet and then the helmet light allows you to do things like look into corners as you're approaching a switchback or make sure that a car sees you by pointing

your head right at the driver when they're about to pull in front of you on the road. That combination is a really great combo.

Kevin Kelly: Are there flashlight versions of these super lights?

Zander Rose: Yeah. These companies also make flashlights. I mean a lot of that really bright LED flashlights are using the same technology and it's just one of those things that dropped by an order of magnitude in price over the last few years.

Mark Frauenfelder: Is this comparable to a car's headlights?

Zander Rose: In some cases, even brighter.

Mark Frauenfelder: Whoa. That is amazing. If you're riding on a narrow road and you approach a car, does it cause glare for the driver? Do you think like is it equivalent to [crosstalk 00:23:34].

Zander Rose: Yeah, you absolutely have to be careful. Like I said, it's really good if you have a car that's about to pull out in front of you and you've had the experience on a bike when you're coming into an intersection at speed and a car just ... Car drivers operate on threat radar, not really on "I want to be nice to bikes" radar. You can flash the light right across their face and they all of the sudden will put on the brakes. The downside of that is you do have to be careful and set your lights down more towards the road if you're doing a lot of road riding. Most of the time that I'm using these lights, it's for mountain bikings. It's not really an issue but you want to point them a little bit further down at the ground to be sure that you're not blinding oncoming drivers in a road riding situation.

Mark Frauenfelder: Okay. If those headlights don't happen to work, your next tool could come in handy.

Zander Rose: The next two tools that I have listed are both in my bag that I used for rock climbing and going into the backcountry. I find that most of those first-aid kits have things like a bandage and some Band-Aids but if you have an accident in the backcountry, mostly what you're trying to do is get somebody back to pavement. The two things that I think are generally missing from those kits are these which is one is a water-activated resin cast material. You basically open up the package. You get it wet with some of the water from your water bottle and you can make a cast or a splint right then and there on the person.

Unlike most of the air splints and some of these things, first of all, they're a big thing. This is a small tiny roll of what looks like gauze but it's actually a resin-activated cast material and then you can custom make it to any shape, if a bone is sticking out, you can work around that. If you have climbing tape with you which generally we do, you can just make a splint up one side of their leg and then wrap around that or at their arm and wrap around that with the climbing tape and then it doesn't have to be cut off. If you don't, you could wrap it around the person's limb but you will have to cut that cast off when you get to a doctor.

That's definitely the best material for stabilizing a break or a sprain when you're in the backcountry. It's the lightest thing you can carry as well, way lighter than the Air splints and other backcountry splints.

Kevin Kelly: Cool.

Mark Frauenfelder: It looks great.

Zander Rose: The last one that I mentioned is another one of these and it's a skin stapler. It seems like a gruesome concept but for $20, you can buy a skin stapler on Amazon that's in a little sterile package and actually, not even. I think there's $13 and that comes with the staple remover. One of the things you really don't ... Normal people are not good at suturing but if you want to close a wound and get somebody back to pavement and it's going to take several hours or a day, if you irrigate that wound with some water and clean it out well, a person with very little experience can actually close that wound back up with the skin stapler.

There's lots of YouTube videos. You can practice on an orange at first and then you could go get some pig's feet and cut those. Put a nice wound in the pig feet from the butcher and close it back up. Pig's skin is apparently very close to the human skin. That's what doctors usually practice on.

Kevin Kelly: How does it actually work, this stapler? They're literally staples?

Zander Rose: They're literally staples. Normal staples have the bottom side of the stapler called the anvil that's under the paper but this, a skin stapler, you don't have the advantage of having the anvil under your skin. It forms the staple as it pushes it into your skin in a pattern that doesn't rip your skin. You start at one end of the wound and close it up slowly.

Kevin Kelly: I've heard of using superglue. Doctor is using that to glue. I guess that's a smaller cut.

Zander Rose: Yeah, it's actually what superglue is invented for as far as I understand. That's why it sticks to the skin so darn well usually better than the thing you're trying to glue. The skin stapler can close a pretty large gash with blood pouring out of it that would be very difficult to do with superglue, I suspect.

Mark Frauenfelder: Okay. It's a good price, $12.75.

Kevin Kelly: It looks like pretty light too, pretty small.

Zander Rose: Yes, again, those two things are extremely light, easy to have in a trauma pack. Something has been previously reviewed on Cool Tools as well is they make these things that have been adopted from the military. They're like a gauze pad with blood clotting in it. It's called QuikClot.

That's the other thing that I carry. I didn't add it here because I know that you guys have already reviewed it but those three things can ... Some splint materials, skin stapler and the QuikClot will pretty much save anybody from bleeding out and be able to get them back to a place where you can drive them to a better care. Those are three very light and easy things to have in a trauma kit which is different than a first-aid kit that's just got Band-Aids in it.

Kevin Kelly: They really should be in your first-aid kit.

Mark Frauenfelder: Yeah, absolutely. Zander, I want to thank you so much for coming on the show and telling us about all the stuff. So much of these is new to me which I love. I don't think I heard of any of these tools before, super valuable stuff. I want to wish you best of luck as a contestant on the ABC series BattleBots that's airing Sunday nights and also, just to let people know that they can go to longnow.org. Is that the right address to find out more about your organization?

Zander Rose: Correct, yes.

Mark Frauenfelder: That sounds great. I also just want to remind listeners that you can find links to all the items in our show notes about everything Zander has talked about at cool-tools.org. Zander, thanks a lot.

Zander Rose: Thank you.

Kevin Kelly: Yeah, it was really great. Great cool stuff. Thanks, Zander.

Mark Frauenfelder: All right.

Zander Rose: Take care, guys.