



## The Portable Dog Killer

**Description:** In commemoration of the 50th anniversary of the invention of the LASER, this week Steve is going to relate a story from his own past, 39 years ago, containing a strong moral about the importance of getting out from behind the video game screen and actually building something.

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**Leo Laporte:** This is Security Now! with Steve Gibson, Special Christmas Holiday Episode 281 for December 30, 2010: The Portable Dog Killer.

It's time for Security Now!, the show that covers everything you need to know about keeping yourself safe, secure, and private online. Who better to do that than the man who discovered spyware, coined the term, wrote the first antispyware program? He's been a security maven for years, the author of SpinRite, the world's best hard drive utility, Mr. Steve Gibson of GRC.com. Steve.

**Steve Gibson:** Hey, Leo.

**Leo:** Good to see you.

**Steve:** Great to be with you again, as always. We have today a very different episode, one that I really do believe our listeners are going to get a big kick out of, something I've never done before. A number of - there's sort of a confluence of things that came together. This is, actually this coming Sunday, May 16th, is the 50th anniversary of the invention of the laser.

**Leo:** Whoa.

**Steve:** First time that it was done practically. Einstein gave us the fundamental theory back in 1917, which predicted that you could stimulate the emission of radiation, which is what the SER of LASER stands for, that you could stimulate the emission of radiation from molecules. But it wasn't until many years later, and May 16, 1960 was the day that

some researchers at Hughes first made a laser lase. There was a MASER beforehand, a Microwave Amplification through Stimulated Emission of Radiation, but never super high frequency, which is to say Light Amplification through Stimulated Emission of Radiation. Anyway, the show is not about lasers. This is about something I did when I was 16 years old.

**Leo:** Oh.

**Steve:** That was sort of related. The episode is called - this episode is called "The Portable Dog Killer."

**Leo:** Oh, god, I can't wait [laughing].

**Steve:** Which I'm going to explain, of course. But the anniversary of the laser got me thinking about this.

**Leo:** Okay, I'm ready for the story of the dog that ate the laser, or whatever that is.

**Steve:** Okay. Well, so it's 1971, and I'm 16 years old, a sophomore in high school. And we had a real problem with a dog in the neighborhood. I don't know if this dog was clinically rabid or what its problem was. But it was about two blocks away from where I lived. And the people who owned this dog had sort of an RV trailer or something parked in the backyard, and a fence which went right up to the sidewalk which contained, not only this RV, but this unbelievably vicious dog. And so the fence had a gate where sort of this driveway was, right onto the road. But this was not, like, their main garage entrance. And the fence, the two wings of this gate were pinned just at the bottom, so that it was sort of flapping open if there was any pressure on it.

So what would happen was, for I don't even know how long this was going on, but, I mean, it was a serious problem, people walking by the sidewalk would virtually be attacked by this amazingly vicious dog. I'm a dog person. I grew up with dogs. I love dogs. Actually at the time of this going on I had a redhead cocker spaniel. And so this dog was just unbelievable. It would scare the bejeezus out of people because they'd be walking on the sidewalk, and this thing would hear them and come galloping through the backyard and lunge at the top of this gate, which looked like it was about to spring open.

And, I mean, and the dog, I think it was a German shepherd, I can't quite remember the breed now, but, I mean, it was big. And, I mean, the owners, I don't know what could have been in their mind. They must have known this was a problem. They must have been getting complaints from people. But times were different then. Dogs were not on leashes. Kids were not on leashes. I mean, dogs roamed the streets. Times were, as I said, this was 39 years ago. But finally one day, as I was coming around my block, there was this elderly lady - and this all happened in San Mateo, up in Northern California, which is where I was in junior high and high school. And this dog scared this elderly lady so much that she tripped and fell off the sidewalk into the street. I mean, it was that big a problem. It was just unbelievable.

And so I thought, okay. I need to take matters into my own hands. This dog needs some training that this is not okay to rush people and lunge at the gate and look like it's about

to jump over the gate. And the gate looks itself like it's about to give way because it's only pinned at the bottom and wasn't closed at the top. So I thought, in order to train this aberrant canine, I need to do something that will shock it, something - give it an experience which is negative which is completely outside of its normal daily experience. So I thought, I need some sort of a sonic, loud sonic weapon. So...

**Leo:** Oh, Steve [laughing]. I can see where this is going.

**Steve:** Oh, this - actually this has unforeseen consequences, which is part of the moral of this story.

**Leo:** The case of the aberrant canine.

**Steve:** So my parents were divorced at the time, my father and his wife living up in the city, in San Francisco. So my sister and I would jump on the train Friday afternoons and take it up to San Francisco, and then the trolleys over to the marina on the other side of the city, where Dad and his wife were. And then Saturday mornings was sort of free-for-all time. Basically, it was "Kids, get out of the house. Go play." I mean, as I said, times were different 40 years ago. And one of my favorite areas in the city was Mission Street. It was a couple blocks out of the city from Market. That's one of the main - like Market Street's the main drag. And back then Mission Street was lined with war surplus stores.

**Leo:** I think it still is, actually.

**Steve:** Is it still?

**Leo:** Yeah, I think there's a bunch of Army surplus stores down there, yeah.

**Steve:** Okay. And so I was hacking when I was five. In fact, on my rsum page there's a picture of me that Dad took before I was five years old, in the backyard building something with wiring circuits and things. I mean, I just had this drive from forever. So for me, I would just - I could spend hours in these war surplus stores. I mean, radar sets, dynamometers, all just - it was like nirvana for me. But this particular weekend I was on a mission because I had to build some sort of a sonic beam weapon in order to deal with this dog. So...

**Leo:** [Laughing] Was there no parental supervision at all?

**Steve:** None at all.

**Leo:** No.

**Steve:** No, they'd given up.

Leo: Yeah.

Steve: I'd beat them to - beat them senseless.

Leo: That's just Steve.

Steve: They knew I was a good kid. They knew I was not going to get them into any real trouble.

Leo: No, right.

Steve: I mean, the Boy Scouts of America might disagree with that, but that's a story for a different time.

Leo: I mean, most parents, if they heard the phrase "sonic weapon," "military surplus store," and "dog," might exhibit some concern.

Steve: Yeah. Mom just said, "Okay, I don't know what you're doing, just don't kill yourself." So I found the pieces I needed. I don't know if it was over one week or several visits. But I found this amazing, like, grip from like maybe a helicopter trigger handle or something. But, I mean, it was a gun grip with a switch in it. Which was like, okay, perfect. And I needed a transducer, some sort of a high-frequency, high-powered transducer. And rummaging around in these bins with my sister sort of in tow - she's two years younger than me, so she was 14 and just sort of following big brother around - I found some sort of a piezo - it was in like a black steel casing, a piezoelectric crystal with a pointed silver dome. And I said, oh, that looks like the right kind of thing. So, and none of this cost anything. It was 50 cents for this, two bucks for something else. And so I got those things. I also found just a perfect photoflash parabolic reflector that at the widest part it was probably about maybe 10 inches in diameter.

Leo: This is very Tom Swift here.

Steve: Oh, this, I mean, this is what happened. And so, like, then I needed a body for it. And in San Mateo down on 42nd Avenue was, like, a real electronics store. Not like a Radio Shack that was just kind of cheesy. This was 42nd Avenue Electronics. And so I found a steel little mini box to - I think it was, like, two inches by two inches by six - to be the body of the gun. And then set about building this sonic weapon. There was a chip at the time called the 555, the NE555. I think Signetics innovated this thing. It was this incredibly versatile oscillator.

Leo: What year was this?

Steve: 1971.

**Leo:** Oh, this is very early in terms of microprocessors, yeah.

**Steve:** Yeah. Oh, we didn't have those. No, no, no. I mean, and my first job was - it might have been this same year, or the year after, with - this is where I encountered the PDP-8 for the first time.

**Leo:** Aha, aha.

**Steve:** So I built an oscillator. And I wanted the frequency to be, I mean, I understood that dogs have very sensitive hearing, and they're able to hear outside of the range that we can, like the classic dog whistle where we blow it, and the dogs perk up. We sort of hear maybe like air blowing, or maybe we can get a sense of something. But on the other hand, I didn't want it to be supersonic because I wanted to know if it was working. So I wanted to be able to hear it, too. So I pitched it somewhere like around 15 KHz, is my guess, way high, but still audible to us.

And I had a - I remember that I had power settings. Remember that at this time "Star Trek" was happening. And so of course they had phasers. And so I was obviously modeling this on something sort of that I'd seen in science fiction. So I had, I remember, a knob on the back with - it had four positions: off, just so you wouldn't hit the trigger by mistake; and then three power settings. And I had three different colored dots that I got at the stationery store, a green dot, a yellow dot, and a red dot. And this thing had three nine-volt transistor radio batteries in it. So the green dot gave it nine volts on the output stage. The yellow dot was 18 volts, and the red dot was 27 volts, all three batteries ganged in series.

And so I assembled the oscillator, built the output, the power amplifier stage that was transformer coupled to this piezoelectric transducer, and it worked. Then I built this thing together, you know, mounted the pistol grip on the bottom of the box, this perfect photoflash parabolic mirror on the front, and then positioned the transducer in the focus of the parabolic mirror so that it would work. And the machine was finished. Now, back then I was 16. I called this the "portable dog killer."

**Leo:** Not worried too much about SEO, I guess.

**Steve:** Well, exactly.

**Leo:** Or police.

**Steve:** And, I mean...

**Leo:** Or the ASPCA.

**Steve:** It wasn't that I wanted to kill this dog. Certainly not. But the dog would have killed anybody walking by if it could get loose. I mean, this thing was out of control. So

the name was more inspired by the fact that the dog was the killer than that this was going to do any killing. I just wanted to teach the pooch that it's not safe any longer to go lunging at passersby. I mean, literally, the fence was at the edge of the sidewalk. And, I mean, this was a hazard to public health. And frankly, I was probably saving the dog's life, or I hoped to, by training it not to do this because sooner or later something horrible was going to happen, and the dog would be put down. So, I mean, it would just - that dog would be destroyed.

So this thing, oh, my god, it really worked. Two things I remember about it vividly is I was surprised by how quiet it was off axis. That is, it really did, this parabolic mirror really did focus the beam of sound that it produced so that it wasn't - it didn't hurt you at all to, like, be behind it, to be the shooter, or even to the side. But boy, you aimed this at yourself, it was - it made the weirdest sensation. There was, I think it was probably...

**Leo:** You felt it. You didn't hear it, but you felt it.

**Steve:** Well, there was, like, this - yes. No, no. You also heard it. I mean, it was pitched down low enough that it was, I mean, it was really loud. But something about the phasing of it with your ears, it made this weird sort of like bone-crunching feeling in the middle of your head.

**Leo:** Oh, dear.

**Steve:** It was just strange. Anyway, I thought, well, this ought to do the trick. So I snuck up to the gate the first time and did, you know, "Here, doggie," or something to the effect. And I heard [galloping and roar], as it always did. And I blasted it in the face pointblank.

**Leo:** Ooh.

**Steve:** Now, the dog made...

**Leo:** Now, it's not lethal. We should emphasize.

**Steve:** It's not lethal, no. And the dog was never hurt. I mean, it wouldn't hurt ants. It might make them go around in circles, but it wouldn't hurt them. The dog's legs collapsed, I mean, they fell out - it fell to the ground and then ran as fast as it possibly could away. So I thought, okay, round one. And an hour later I came back and, like, nudged the fence a little bit, and I heard [galloping and roar]. And I blasted it again. And this went on for a couple hours.

**Leo:** [Laughing] Oh, geez.

**Steve:** And then I remember...

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**Leo:** We are not recommending this. And we will not - this may not be your first blog post is the plans for this device.

**Steve:** No. So...

**Leo:** I don't want the ASPCA calling me.

**Steve:** Well, like I said, this ended up working out well for the dog, I really believe...

**Leo:** Oh, no. Oh, no.

**Steve:** Because a few hours later I went up to the fence, and the dog didn't attack. And I will never forget carefully - because, I mean, this thing was really, this would have taken your head off - peeking over the fence. And there was the dog. I could see its nose and one eye peering fearfully around the corner of the house.

**Leo:** There's something over there, I don't know what it is.

**Steve:** [Laughing] So I was delighted with this. And I think it took about three days before the first shot of the day wouldn't, like the dog was realizing, okay, this is just not something I'm going to be able to continue doing. This had been its favorite thing, attacking people, for who knows, I mean, for months or years. I mean, it was sort of a known problem in the neighborhood. And it was finally when I saw a block away this poor elderly lady literally blown off the sidewalk...

**Leo:** Oh, dear, yeah.

**Steve:** ...I said, okay, this is not okay. So that was done. Now, my buddies at school had sort of been aware of the project. I was telling them what I was doing.

**Leo:** Steve, you must have been such a cool kid. I am - this is so cool.

**Steve:** So they wanted to see this.

**Leo:** Sure they did.

**Steve:** So it was, I think, okay, it's show-and-tell day. So I brought the portable dog killer to high school. Before first period, the gang had gotten together. We had what we called the MRC Gang, which was the Math Resource Center. In other words, this is the...

**Leo:** Nerds. Geeks.

**Steve:** ...geek, this is the nerd group of the high school, a Math Resource Center group.

**Leo:** Oh, boy.

**Steve:** And I don't remember which one of us it was, but we had a real problem in the school. And I need to explain a little bit about the structure of the school, the layout, because this comes into play here in a little bit. Aragon High School in San Mateo was in the form of, like, a huge square doughnut. So it was hollow in the middle, and there was an Olympic-size swimming pool and some other concrete, sort of on a lower level. And then sloping up from the lower level, up to the normal class level, was this huge green lawn with some trees. And, you know, we called it "the quad" because it was a quadrangle. And then in the inner perimeter was sort of sidewalk, and against the wall were all of the student lockers. So it was this, you know, large square structure, one single structure was the entire high school with then classes all around the outer perimeter. And sort of going down in spoked halls from this center quad.

Well, we had a problem with seagulls. You know, we're not far from the ocean. I don't really know where the seagulls came from. But they were constantly circling around, and no doubt looking for potato chips or unguarded sandwiches or scraps of food that students would leave behind. And of course unfortunately they created a big mess just with their own droppings. Someone, and I don't remember now who...

**Leo:** Uh-oh.

**Steve:** ...shot a seagull with the portable dog killer.

**Leo:** Want to emphasize, at this point, for those just tuning in, the name "dog killer" is...

**Steve:** Euphemistic.

**Leo:** It doesn't kill. It's a sonic blast that is harmless.

**Steve:** Yes.

**Leo:** But annoying.

**Steve:** Yes, well, what it did was it nearly knocked the seagulls out of the sky. Now, we're 16 years old.

Leo: Oh, dear. Oh, dear.

Steve: Pong won't be invented for another year.

Leo: Oh, no.

Steve: Until 1972.

Leo: Oh, no.

Steve: We had no videogames. Until now, we didn't have any kind of a beam weapon. We saw it on "Star Trek," of course. Now we had one, and it shot birds. Now, it didn't kill them, but it definitely surprised them. And this was the best thing that had ever happened to us because it was like, something was reacting to this. It was fantastic.

Leo: Sure. The nonlethal bird stunner.

Steve: Yes, it was fantastic. And so Aragon High School was performing an experiment in the district. This was the second year of what was called "flexible scheduling." More like college scheduling, instead of all students being in classes periods one through seven, we had blocks of free time scattered throughout the day, different times and different days of the week.

Leo: Santa Cruz High did that, too, when I was there, at the same time, yup.

Steve: And so what happened...

Leo: Very trendy.

Steve: Very trendy. And we loved it. What happened was, that meant that various of us in the gang had free time in different slots. So then it became a matter of handing the gun from one to the other. And basically we would, in small groups that were free during that period, lay on the grass, having target practice.

Leo: Oh, man.

Steve: You know, shooting seagulls. Which was just fantastic. I mean, each seagull reacted a little differently. But there was definitely a reaction. I mean, you knew when you got a shot off. And so that's the way we spent the day. It was just, you know, we were having the time of our life.

So at this time I was creating curriculum for the third year of electronics. The high school had Electronics I and II, which was the first two semesters of the first year, which taught basic electrical theory using tubes, unfortunately. And the professor, Harold Ferrin [sp], was a neat guy, old, gnarly, ex-Navy guy, and tubes was what he knew. For him, transistors was a big deal. He wasn't quite sure about them. That was Electronics III and IV in the second year of electronics. And of course this was - I felt like I'd died and gone to heaven, to actually be in school taking electronics. I mean, here I already knew electronics. I'd force-fed myself...

**Leo:** Apparently.

**Steve:** ...this stuff, you know, years before. But now I was actually getting credit for it and had a lot of enthusiasm for it. And at one point I said to him, I guess in my second year, I mean that year, my sophomore year, I said, "Mr. Ferrin, why - what about digital electronics? Why - it's nice that we learned about tubes last year, and transistors are good, but the future is digital." And he said, "Well, I don't know digital." And I said, "Well, it's really not that hard." And he said, "Well, why don't you teach it?"

**Leo:** Wow.

**Steve:** And so during my sophomore year I created an entire curriculum for third-year electronics, which we created there. And I heard years later that it had gone district-wide and was being taught throughout the whole San Mateo Union High School District.

**Leo:** That's so neat.

**Steve:** So the point of this is that, after school, I would go into the electronics lab and work on this stuff. And I had free rein. I'd come to the attention of the administration very early on. I think it might have been the incident with the shock machine. I'm not quite sure what the first...

**Leo:** The shock machine.

**Steve:** Oh, yeah. Well, that's another story.

**Leo:** Another story [laughing].

**Steve:** So but Mr. Ferrin knew that he could trust me. And he would leave, and leave the doors locked. And I just...

**Leo:** Wow.

**Steve:** My requirement was just - oh, yeah, I mean, I was trusted - just to, you know,

make sure that I'd pulled the door behind me. So this afternoon of the sonic beam weapon, I was probably leaving around 4:30. And so the school was completely deserted, nobody there. I mean, literally, it was completely empty, the whole quad was empty. I went to my locker, got the books that I needed, got the portable dog killer out of the locker, which is where I had stowed it at the end of seventh period. And to this day I don't know what I was thinking.

**Leo:** Oh, no.

**Steve:** Because I saw on the far other side of the quad Mr. Archibald, the assistant principal. And so...

**Leo:** No. No.

**Steve:** ...there was good cover where I was.

**Leo:** No. No.

**Steve:** We had these big concrete containers for the garbage and big cement planters. And so I crouched down behind one of these cement garbage can containers and shot Mr. Archibald with the portable dog killer.

**Leo:** Oh, dear. Oh, dear.

**Steve:** Now, I mean, it was a long way away, he was, and I was hidden. What completely jarred me was his reaction. You would think that a regular person being shot at great distance by a sonic beam weapon would be a little confused. They'd look around, kind of like look up maybe, it's like what is going on. Not Mr. Archibald.

**Leo:** Gibson.

**Steve:** No, he couldn't see me. So I was hidden. I was undercover. He spun around. And that's what took my breath away. It's like, oh, my god. I just - I didn't expect a reaction like that at all. And he stood there motionless, trying to take in the entire scape of this huge high school quad. And he just - he was motionless. And he was looking for, like, anything. And so I'm thinking, oh, my god. So I was probably starting to shake at this point. But I kept my cover. And he stood there, slowly looking from side to side. And then he appeared to give up. And he turned back around and continued walking in the direction he had been before.

[Clip] And I've gotten word that a child is using his imagination, and I've come to put a stop to it.

Leo: Principal Skinner. On his way.

Steve: So I stood up and started to get the heck out of the quad. But I kept one eye on him, of course, because he was the danger.

Leo: Oh, yeah.

Steve: Well, he had faked me out.

Leo: Oh.

Steve: He spun around again and saw me.

[Clip] I saw that.

Steve: And pointed at me. Pointed at me and then beckoned with his other hand.

Leo: Oh, oh, dear. He's smart. How did he know?

Steve: Oh, this was, well, you know...

Leo: I guess you were well known by now.

Steve: Well, yeah. I was. And so we met about halfway in front of the office wing. And he - and I was doing everything I could with my body language to have this gun be as inconspicuous as possible.

Leo: What did it - it had this parabolic thing.

Steve: Oh, it wasn't inconspicuous at all. I mean, it was clearly a gun.

Leo: Like a ray gun.

Steve: I mean, it was a ray gun. That's the way I designed it, you know, with a power control knob on the back with green, yellow, and red, and a big reflector out the front. So it was dangling at my side, sort of as inconspicuously as possible. So we approached. And he looked at me, and he said, "Steven?" I said, "Hello, Mr. Archibald." And he looks down at it and then back at me and said, "What is that?"

Leo: Oh, boy.

Steve: And I said, "Well, it's a sonic beam gun." I wasn't going to use its real name.

Leo: [Laughing]

Steve: And he said, "I see."

Leo: I see.

Steve: "And did you just shoot me with it?"

Leo: [Laughing]

Steve: And I said, "Uh, yes, sir, I did."

Leo: Well, you're very honest, Steve. That's good.

Steve: Oh, yeah. I'm, you know. And, I mean, there wasn't much - there wasn't much choice of answer...

Leo: Not me. No, I didn't shoot you, no, sir, no, unh-unh.

Steve: ...at this point. And so he said, "And where did you get that?" And I said, "I built it." He said, "You designed it?" I said, "Yes." And he said, "Why?"

Leo: [Laughing]

Steve: So I gave an abbreviated version of the dog story, about training this dog.

Leo: Oh, yeah.

Steve: So it does not attack people any longer that were walking by on the sidewalk. And he said, "And was that successful?" I said, "It was." And he said, "And you brought it to school this morning." I said, "Uh-huh." And he said, "And were you shooting it all day long?" And I said, "Um, well, it turns out that it also shoots seagulls and pretty much knocks them out of the sky." And he said, "I see." And so I said, "My friends and I..." He said, "The MRC Gang?" I said, "Oh, you know about that?" He says, "I know everything."

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Leo: Yeah.

Steve: And I said, "Well, yeah. We were sort of handing it around during our various free periods for target practice." And he said - oh, and I said, "It didn't seem to be a problem." He said, "Oh, we'll be talking about problems in a minute." And he said, "We began getting phone calls in the morning from teachers all over the school who were reporting high-frequency sounds."

Leo: [Laughing]

Steve: They didn't know what was wrong. They thought maybe the heater system had gone on the blink. And I said, "Oh." And he said, "So we called the district engineers."

Leo: Oh, boy.

Steve: "And they came out, and they heard these sounds, too. We heard them in the office wing, as well. Everyone was hearing them. And they thought maybe it was the ultrasonic alarm system that protects the school had gone on the fritz. And of course we couldn't close down the school with an alarm system that wasn't functional because there'd be all kinds of consequences for that. So they worked on the alarm system, trying to figure out if it had gone wonky somehow. So now we know what it was. It was you and your sonic beam weapon." He said, "I guess I'm glad you shot me because the mystery is solved." He said, "Now, I want you to take that home."

Leo: Oh.

Steve: "And I don't want to ever see it or hear it again."

Leo: I'm amazed he did not confiscate it.

Steve: He did not. Well, he knew me. I mean, I was...

Leo: You were a good kid.

Steve: I was a good kid. I'm sure that the office knew I had permission even to stay in the electronics lab after hours and all that because, I mean, Ferrin was very much by the book, being ex-Navy. He was not liked by most students, who thought he was way too rigid. I just thought he was great. So I took the gun home, put it on the shelf. My friends and I were all very disappointed. They were all anticipating many more days of target practice. Although, to be fair, I have to say that by the end of the day there really weren't so many seagulls any longer, circling around overhead.

**Leo:** Trained them, too, I guess.

**Steve:** Well, I think they decided this is not where we want to be.

**Leo:** No.

**Steve:** So that's the story of the portable dog killer.

**Leo:** Unbelievable. Steve, what a great story.

**Steve:** And when I was thinking about this, I was thinking about all the email that I've received during the podcast from young listeners who wonder how to get going, how to get started, what would I recommend? How do they differentiate themselves? And the second employee at Gibson Research Corporation, one of the most brilliant engineer programmers I've ever known, a guy named Steve Ranck, went on to found a couple gaming companies. He has one now called Specular Entertainment. His first one was Swingin' Ape, which he sold to Blizzard. And what stood out in my mind about Steve actually is really that, like me, he was building things from the beginning. Nothing could stop him from building things. He was involved. I mean, I heard about all the projects that he had built, much as I had, as a kid.

**Leo:** It's a good sign, isn't it.

**Steve:** Well, that's my point, yes, is clearly there were incredible unintended consequences from my creating this gun to train this incredibly vicious, ferocious dog. But that's what happens when you build things. Nothing happens if you're sitting behind a screen shooting aliens in a videogame. Doesn't happen. All the discoveries that have been made have been made by people experimenting.

**Leo:** Do something, yeah.

**Steve:** You know, Tesla was building all kinds of things. And you can't know what you're going to learn until you're confronted by it. You've got problems. Something happens you don't expect. I mean, it's just - it's amazing how opportunity-rich the environment is. But if you're not in it, you're not going to get the opportunity. And so what I would encourage people to do - Steve and I are still good friends. We get together every so often. And we sort of reminisce about the projects that we built and think to each other, can you imagine being a 10 year old now?

**Leo:** Wow. What opportunities.

**Steve:** With all the stuff there is? I mean, there are these things, programmable gate arrays, which are just amazingly powerful, where you can use software to program logic

in, like, softly in this. I mean, I don't know what I would, I mean, there just isn't enough hours in the day as it is for me. But if I were a 10 year old or a 12 year old or 15 year old, I would say turn off the videogame. That's doing nothing. Build something. Build anything. I mean, the feedback you get, the fun, but mostly the discovery. You will end up discovering things that you cannot predict, you cannot know about. That's the nature of it. But I just think that's something that our pasteurized world has sort of lost a little bit of. I mean, this sounds like a wild story. I guess it was probably a little wild in 1971. But probably not as wild as it sounds today.

**Leo:** Today the Department of Homeland Security would be coming to your door.

**Steve:** Exactly, yeah. So...

**Leo:** But it's a very good - I even have, in a very small way, a similar story. And it did start for me with videogames. I got an Atari 2600. But what the game did is made me think, oh, I want to know how this works. And it doesn't have to be a physical thing you're building. It's easy to build software.

**Steve:** Oh, yes. In fact, that's where I've switched to.

**Leo:** Yeah. Yes. And everybody has an opportunity now, for free. There are so many great choices. There's Alice.org, a great way to start littler kids on object-oriented programming. And there are so many things out there, just, yeah, I think - but I think there has to be that little seed in your brain, which you obviously have, Steve obviously has, where you get inspired to say, I want to make something. So, and I think there will always be people doing that.

**Steve:** I think it's a - maybe it's a matter of empowerment. I mean, now, I will say that my dad did encourage me. I mean, one of the things that I did when I was five, we would go down to the docks in Oakland and buy a hunk of electronic gear coming off of the naval ships down there. And they hung it on a fishhook, a big, huge fishhook, and you paid for it by the pound. And the car looked like its suspension had gone broke in the back because this thing was in the trunk. And we'd bring it home, and he'd sit it in the middle of the garage. And he'd say, okay, go at it. I mean, there was nothing I wanted to do more than tear that thing apart. And he says that he knew that I was internalizing the work of the country's best engineers as I was taking this apart. And he thought that someday I would start putting things back together again. And it turned out that was sort of the path I took.

So there has to be, I think, some encouragement. But as you said, also some spark. And nothing could stop me from this kind of inquiry. And so I would just encourage people to get involved, to do something, I mean, something proactive, something creative. Not just passive, because passive, nothing's going to happen that way.

**Leo:** I think that it's probably the case that there are people who just don't have that spark, and they're going to - look, we need people to flip burgers. And those people, not everyone is going to be a maker. But boy, if you see that spark in a kid,

just encourage it, don't discourage it.

**Steve:** Yeah.

**Leo:** It's a great lesson. And you know what, thank goodness that Vice Principal Archibald didn't beat you up over this. He knew, he sensed that this was something that was appropriate for you to do. He made sure you didn't do it at the school.

**Steve:** Yes. And he understood it was completely unforeseen, there was no way I could know.

**Leo:** Right.

**Steve:** Or that, oh, I forgot to tell you one thing he said as I was leaving with the gun and breathing a big sigh of relief. He said, "Oh, there's one thing, Steve." I said, "Yes, sir?" He said, "Next time something appears to go wrong with the high school, we're going to track you down first."

**Leo:** We're calling you [laughing]. I think that's wise.

**Steve:** Just because, I mean, he went through so much trouble. I mean, bringing people, engineers out from the district, crawling around to figure out what had gone wrong with the heaters, and then with the ultrasonic alarm system, I mean, I don't like to think about the expense that they went through. But he realized, had they just said, "Steve, are you doing anything strange today?"

**Leo:** What are you up to there, Mr. G? I think that's just a wonderful story. And I would have to ask, I don't supposed you still have the portable dog killer.

**Steve:** I have a lot of my paraphernalia. I've got - I did do helium neon laser guns later in life, and I have some of those. But I don't know what happened to this. I went to Berkeley and then moved to Southern California. And at one point there was - I actually had a lab upstairs in San Mateo. That's where this was built was in Steve's - I'd be "in the lab," as they put it, when I was called for dinner, which is where I built this. So, and it was just sort of an extra room that I commandeered. I said, okay, this is mine. This is my space. I need a lab. So at one point there was a purging of all the stuff I'd left behind.

**Leo:** Yeah, of course, yeah.

**Steve:** I think that that happened. I mean, I can see it clearly in my mind. And of course many people were witness to all this craziness. But, and my life was a series of wacky adventures like that. We'll share one every so often.

**Leo:** I love that spirit. And you know we celebrate that spirit today with the maker, MAKE magazine, the maker faires. And there is this notion of making which is focused, I think, on physical making, which is a great thing. But it's fine to make with software. In fact, more than ever we need software. And that's perfectly appropriate. And I think kids should learn...

**Steve:** It costs nothing. Costs nothing.

**Leo:** Costs nothing. You don't get your hands dirty. And most of the time the principal doesn't confiscate your program.

**Steve:** And, frankly, when people have asked me, and I've said this before on this show, how do I learn this language, how do I learn this, or how do I learn that, my answer is, solve a problem with it.

**Leo:** Yes.

**Steve:** That is, you just can't sit there, I mean, reading a book about a language...

**Leo:** Abstract is not good.

**Steve:** ...is dry.

**Leo:** Yeah.

**Steve:** So come up with something you want to do and make yourself do it in that language. I mean, there's no hurry. There's no deadline. Doesn't have to be tomorrow. Just start. And when you start, the rest will flow.

**Leo:** Such a great moral. I hope - anybody listening to this show is probably in that category of maker and doer. And, I mean, you wouldn't be listening to the show if you didn't have that spark. But it's good for us to remember, spread it around, let others get involved. We're going to - I want to sponsor at my kids' high school a FIRST Team, the robotics competition this fall.

**Steve:** Oh, neat.

**Leo:** Because that's an example of - it's an institu- truth is, it's better if the kid goes off and does it on his own and gets in trouble, like you did. But failing that, at least if there's some sort of institutional encouragement to do that, and some opportunity to do that, that's a good - gets you started.

**Steve:** Well, and it does, frankly, it does fit today's world more than building sonic beam weapons fits today's world.

**Leo:** Yes, yes.

**Steve:** So.

**Leo:** Great, great show. Thank you, Steve. I really appreciate it. Always a pleasure. And this was a good one. I'm glad you took a little time. And I don't know how much Twitter had to do with this, but I'm glad that you were inspired. I look forward to the blog. I presume it'll be at your website, GRC.com.

**Steve:** Yup, it will be. I'll announce it on the show and certainly through the followers who are following me on Twitter.

**Leo:** Good, good.

**Steve:** And I'll have it up here probably by next week. And again, it was - I want to remind people it was the 50th today, well, not the day, this week, the 16th, the 50th anniversary of the invention of the laser.

**Leo:** Isn't that cool.

**Steve:** And so you can see what the tie-in was. That's what sort of got me thinking about my own beam weapon and the story that it begat.

**Leo:** Isn't that great. Steve, thank you so much. Go to GRC.com for Steve's stuff - 16KB versions of this show for those of you who have limited bandwidth. And Steve's great, he edits this down and makes it available to you. He also does transcriptions on his own, out of his own pocket, and we thank you for doing that, Steve. That's all at GRC.com, including the show notes. And once you're there, you've got to get SpinRite, the world's best hard drive maintenance and recovery utility. I mean, following in the spirit of the portable dog killer, this is the portable hard drive cluster mess-up killer, sort of, 64K.

**Steve:** We know what you meant.

**Leo:** Also great free stuff, lots of it, ShieldsUP! and all his great programs. GRC, Gibson Research Corp., GRC.com. Follow Steve on Twitter, I have to add this now, @SGgrc. And GibsonResearch is the Twitter handle for the corporate account. But the fun stuff is at @SGgrc. Steve, we'll see you next week...

**Steve:** Thanks, Leo.

Leo: ...on Security Now!.

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