Transcript

Date: 01/19/2015 at 1:21 p.m.

Information: Phone Interview of "John Doe"

Length Recording: 28 minutes, 31 seconds

Legend:

Abtin Amir ("A") = Interviewer

John Doe ("J") = Interviewee

A	"Alright, uh... so, alright so it is recording and, essentially, I'm going to start off with a few background questions to get an idea of what your background is in terms of your education and how you know, uh, how to do what you do. Um, and I might ask more specific questions about the technology itself, uh, because essentially when we write the petition to the U.S. Copyright Office, uh, it's going to be going to people who aren't necessarily familiar with the technology you you're going to be talking about, and so I'll ask questions to sort of flesh it out to make it clear what we're talking about."
J	"Ok well, well we may have a little bit of a problem. Um... I ... me personally, even though I'm one of the owners here, I don't... I don't do the actual programming myself. Um..."
A	"Are you familiar with the process? Or um..."
J	"Yeah, Yeah I'm familiar with the process for sure."

A	"Ok well you can answer whatever questions that you feel you can answer, that you have personal knowledge of. Uh, and uh… if you like, I mean, we would appreciate it if we could talk to other people as well, uh, if you think they might know other things, uh, or if they could even, uh... uh, say things that are similar to what you're saying. Basically, the more people we could speak to that could give us information, the better we could prove this... um, to the U.S. Copyright Office. So if you want to just answer whatever questions you're familiar with and comfortable with, then that works."
J	"Alright well, yeah let's see what this is uh... how this is going to go."
A	"Okay sure."
J	"Before I let anyone else on the phone."
A	"No, that's fine. Okay so, to start off, I would like to know what your education is, or your educational background is."
J	"Some college in sports medicine."
A	"Ok. Did you have any education relevant to what you do now?"
J	"No."
A	Ok. Um, let's see... and what is it exactly that you do now?"
J	"Uh, well... owner of a company that does automotive and uh... truck computer programming."
A	"Ok, and how long have you been doing that?"
J	"Uhm... 21 years."
A	"21 years, ok. Um, and you said you're the owner, ok. And what is it that you do there, specifically?"

J	"Well, we either develop hardware to send to customers, um, which will allow them to read or write the information that's in their vehicle's computer, or, we require the customer to pull the computer off their vehicle's and ship it to us, where, you know, at that point we get into it and, you know, re-write the information inside the computer."
A	"Ok. And uh, so that's what your business does in general right?"
J	"Right?"
A	"Ok. Now, uh... I want to get a little into the specifics of the technology as far as your understanding of it. Can you tell us what products you create in regards to agricultural equipment?"
J	"Modules. Modules that can go in-line of the uh... the vehicle's engine harness and PCMs, as well as computer programming."
A	"Ok."
J	"Computer programming is not really a product, it's more of a service."
A	"Ok. And what is the purpose of the product?"
J	"To improve uh, fuel efficiency, and to improve performance."
A	"Ok, and uh, let's see... and how does that benefit people involved with agriculture?"
J	"Well, for fuel efficiency, it saves them money on fuel costs."
A	"Ok."

J	"As far as performance, it allows them to do more work, or same amount of work in a uh, shorter amount of time."
A	"Ok, great. And how does your product actually increase performance?"
J	"Well, by re-writing the calibration sections of the uh, the programming. The program of the computer."
A	"Ok, and so, by that you mean you essentially give the computer a different set of commands that tells it to perform differently? Or..."
J	"Right."
A	"Ok. And uh, and why is it necessary for people involved in agriculture to, um... for instance, increase performance? I think you kind of actually answered that with uh... getting more work done in essentially the same amount time."
J	"More work done and, you know, savings on fuel costs."
A	"Ok, and... Do your products reduce emissions at all? Or when you have these performance tweaks, how does it affect emissions?"
J	"Uhm... Most of it, well, it can... It can reduce emissions."
A	"Ok. And, you already said they do reduce fuel consumption. Ok... And, your... the tuning in terms of power or fuel consumption or emissions, these are all things… uh, does the customer choose which things they want, uh, for each individual application? Or...?"

J	"Yeah, well. I mean, the final, they have the final say you know. We offer... you can either get uh, you know, as much performance as possible, as much mileage as possible, or somewhere in between. You know, a combination of you know, two... of both."
A	"Ok, and do your products allow users to modify or repair their own equipment?"
J	"Does it allow the customer to do that?"
A	"Right. Right. Or is it something that you basically, set it up in the module and they install it and it does what it was set up to do."
J	"Right."
A	"So are they able to use your product themselves to make any changes?"
J	"No."
A	"Ok. Roughly how many of your products are purchased annually by those involved in agriculture?"
J	"Uh, that's a good question. Probably about 3000 units."
A	"Ok, and uh... can you explain the electronic systems used in agricultural equipment that your business works with? Like the ECU, or basically how your product interacts with the uh… the systems that are built into these machines."

J	"Well, for the programming aspect, you plug into what's called a "BDM port," you plug into the BDM port and then you're able to communicate or read out the stock information. Our software allows us to, you know, make the changes, and after that just flash it back in."
A	"Ok, now, the software that... do you use your own proprietary software to communicate with, with the uh... with the ECU, or, is this."
J	"Yes."
A	"Do you need to... in order to create your software, did you need to first access the systems on the machines?"
J	"No. No."
A	"No need to access, Ok. What... are there any other systems you interact with other than the ECU?"
J	"Just the manufacturer's systems."
A	"What is that?"
J	"I mean, they sell equipment you can buy to do that."
A	"Oh, the manufacturers of the farm equipment create devices that you can use to interact with the systems?"
J	"Oh, I forget we're talking about farming equipment. No. There's no other. Just, just what we developed."

A	"Ok uh... In order to create the products you sell... Ok you already answered that... Um, now are you able to, are you able to um, create the systems or basically tune the ECU without connecting to it... without reading the software on the ECU? Essentially, in order to know how to program it, do you first need to access the ECU?"
J	"Yes."
A	"Ok. Um... let's see here... Um, do you ever need to make a copy of the software that's embedded into the machine in order to make the modifications or tweaks or anything?"
J	"Yes. Uh huh."
A	"Ok, and where do you make that copy?"
J	"What do you mean? I'm not sure I understand."
A	"Ok, in order to, let's say you get a new machine like a tractor or something and you want to create a module to upgrade its performance, um, in order to... when you access the ECU in order to figure out what you need to tweak, do you use your systems, your software, your equipment to basically just send the new commands into the ECU, or do you need to first make a copy of what's on the ECU, and then tweak that somewhere else, and then put that back onto the ECU."
J	"If you're talking about programming, then yes, that's the case. If you're talking about a module, then no."
A	"The programming, do you basically program directly onto the ECU, or do you copy what's on the ECU and then do that elsewhere?"

J	"Yes. Oh, yeah we'll copy it, do it elsewhere and put it back."
A	"Ok, so you'll copy what's on the ECU, do it on your computer, then put it back?"
J	"Right."
A	'Ok. Is it possible to um, just modify directly what's on the ECU without actually copying it off and doing it elsewhere? Or does the first time you do it..."
J	"Uh, it's possible but, not really a smart way of doing it."
A	"Ok, and uh, why is that? Does it uh, is there a potential for damage? Or...?"
J	"Yeah, it can lead to failure."
A	"Ok, if you make the change directly onto the system as opposed to copying it first, and putting it back?"
J	"Right."
A	"Ok. Ok uh... does your product access the system when it's installed, or do you only access the system when you're designing the product? In other words, when you... so, you create the module after you do the tuning right, and then module basically implements the tune once they install it into the machine is that correct?"
J	"Well the module doesn't, again..."
A	"Or is the module and tuning separate?"
J	"They're separate."
A	"Oh ok. Oh, so you do custom ECU tuning which is separate from the module, which does its own thing?"

J	"Right."
A	"Ok, I got you."
J	"The module does not... does not go into the ECU and make changes. It just gathers the information the ECU is sending out and modifies that."
A	"Does it need to get past any technological protection measures in order to do that? Essentially, does... when you plug in the module, is there any kind of protection... uh, that the manufacturers put in that prevents reading what's coming out of the ECU that the module can get around, or is that information not protected in any way? Is it totally accessible?"
J	"It's, it's somewhat protected, yes."
A	"Ok. So even for the module to work, it needs to have a way to get itself around that protection, is that right?"
J	"Right."
A	"Ok, and what kind of protection is in the way? What does the ECU have to block that? What is it that you need to get around essentially? If you can describe that technology."
J	"Well, it would cause um, without getting around, it would cause it to run poor. The engine would run poorly, as well as causing the dash lights, the check engine lights to come on."
A	"Ok, so is it a password that you need to put in first? How is... what is the actual type of virtual lock that's being used?"
J	"Well... for the module I would rather not say."

A	"Oh, Ok."
J	"I mean that's... you're kinda getting into why we have a product and other people don't."
A	"I got you, that's ok. What about the tuning? What is it that the manufacturer does to protect the ECU from people getting in there and fiddling with it?"
J	"Well, when you access it through the BDM connector, they have no protection."
A	"Oh ok, does everyone have access to the BDM connector, or do you have to have special hardware or software to make any sense of it once you connect to it? Or...?"
J	"Yes, you gotta have special hardware and software."
A	"Ok. Now, the special hardware and software, is that something that the manufacturer gives you, or is it something you created yourselves?"
J	"No. Developed ourselves."
A	"Ok, so essentially, what the manufacturer has done to protect their system is: one, you need to have special hardware to connect to the port right?"
J	"Right."
A	"And, uh, even if you have that hardware, you need to have software to go along with it in order to... to use the system, is that what you're saying?"
J	"Yes."

A	"Ok. And, the software... is that something you guys had to develop yourselves, otherwise does only the manufacturer have access to that kind of software?"
J	"Right."
A	"Ok. Um... let's see here. Give me one second. Are you aware of any other uh... uh, like... licensed versions of the hardware or software that you can go to like, a... I don't know, some other kind of third party that sells... like for instance, with automotive, you can go get various types of OBD II type equipment. Can you just go to a shop somewhere and get equipment that's licensed to use, or are people forced to create their own hardware and software in order to access this stuff?"
J	"Um..."
A	"For example, you said you guys actually created your own hardware and software to interact with these machines right?"
J	"Right."
A	"Did you have the option of going somewhere and just buying it? Like from a store? Or is it very much like, a do it yourself kind of thing?"

J	"Well... I'm trying to think... There is a... there are some companies that... that will sell you equipment but you kind of have limited access. You're kind of at their mercy. You can read and write the information, but you're kind of at the mercy of the company that sold you that equipment. You have to rely on them down the road, which... I mean so they can continue to profit on you."
A	"Right."
J	"I mean, they're selling you something for you to make money on them. They're gonna want a piece of it as well."
A	"I see. And what kind of restrictions do you face when you use those?"
J	"Well, you have to rely on them... you have to rely on them to create the um, or to make changes to the programming."
A	"Oh. Oh, so you're saying you can buy the hardware and software from them to go ahead and do the actual change, but you can't choose what that change is. You have to use what they give you and you are just able to then physically put it on the system."
J	"Right. Correct."
A	"So what you guys did is, you made your own hardware and software and you can make whatever tweaks you want and implement those, whereas, if you use theirs, you basically have to download whatever software they give you, and then you are just physically able to put that software on the machine?"
J	"Right, that's correct."

A	"Ok. I see. Uh, are there ever instances when manufacturers have put some kind of protection in place that you haven't been able to get past?"
J	"Oh sure. Yeah."
A	"Can you give me some examples?"
J	"Um, you mean the actual manufacturer?"
A	"Oh yeah, that would be great."
J	"I mean, Caterpillar."
A	"Uh huh."
J	"And, as far as what we come across that's probably it as far as 'AG.'"
A	"And so what is it that prevented you guys from accessing the system?"
J	"Um, just being able to communicate."
A	"So were you... did you have the hardware but when you connect it, it just doesn't show anything, or does it tell you you're restricted, or can kind of break down what the process is and... basically, what are the steps you take to try to access it, and then, what is it that happens when you try?"
J	"Um... Well, there's just no communication. I mean, the first thing when you connect, the computer wants a "handshake" and it's kind of like you need 'Ali Baba.' You know... if you don't have a password, you're not continuing on. You're not getting past that handshake."

A	"Ok, so when you connect your hardware to the Caterpillar system, um, does it ask you for a password, or does it not respond at all as if you didn't connect anything?"
J	"There's just no response. Yeah, there's no messages or anything like that. You just can't... you just can't move forward on what you need to do."
A	"Ok, so then, I'm assuming caterpillar gives dealers or something a special kind of hardware that is able to do that "handshake" and connect?"
J	"Right."
A	"Ok. Ok. Were there any other instances when you were completely unable to access at all?"
J	"I mean there were, but uh... you know, we figured it out."
A	"Oh, ok. Uh... ok."
J	"I mean currently uh... that's it. Just the 'Cat'"
A	"Gotcha. And, uh... I'm assuming you're usually able to bypass the TPMs then if it's just the Caterpillar? Are you usually able... for the most part, are you able to get in when you try?"
J	"Yeah, yeah. I mean, but you're talking years and years of trying."
A	"Right. 'Haha' gotcha."
J	"It's not trying for a few minutes and then you got it. You know, we're talking years of working on it to figure it out."

A	"That's great information. That is uh... what we're trying to figure out. 'When you can get in, how long does it take, how hard is it?' Ok..."
J	"So far, never on the Cat ('Caterpillar')."
A	"Ok."
J	"You know, I mean we've been going at it for years. Um... It just, you know, you can't predict something like that. It can happen tomorrow. You know..."
A	"Ok."
J	"Or it may never happen. You know, you just keep plugging away."
A	"I gotcha. Ok. Does it take special knowledge to get past these TPMs?"
J	"Yes."
A	"Uh... in your experience with your farmer clients, do they have the knowledge necessary to do this themselves?"
J	"No."
A	"Ok, uh... and does it take special equipment to get past these TPMs?"
J	"Yes."
A	"And in your experience with your farmer clients, do they have the equipment necessary to do this themselves? The equipment?"
J	"No."
A	"Ok. Um... and, ok so you said... can you kind of describe a little bit more the type of equipment that you use to be able to access these things?"

J	"Well I mean it's just really mainly just a cable that plugs into the ECM, and of course, and obviously your PC. The software, everything is really just driven off your software."
A	"Got it. Ok so, you have your laptop with the software on it, and then, a cable that plugs into the USB port, and the other end plugs into the machine."
J	"The BDM, right."
A	"Gotcha. Ok, and you said that, uh... in terms of this cable, do you create the cable yourself? Or is that something that's available? Or...?"
J	"I mean, it's a ribbon cable you can buy anywhere, but you gotta modify whether it's a 3-pin, a 6-pin, or 10-pin. You know."
A	"Ok, got it."
J	"I mean, they're readily available but you have to adapt it to your application."
A	"Um... Is this equipment expensive?"
J	"The cable? No."
A	"Ok. The cable is cheap. And the software you said you guys designed yourself?"
J	"Right. It would be extremely expensive."

A	"Ok. Extremely expensive... Um... so when you... when you are able to bypass the systems, you plug into... uh the machine to the... to the... sorry... BDM, and you're using the software on your computer to access the system. Does it ask you... at that point, does it ask you for a password? Or is there a password on these usually?"
J	"No. Once you're in, everything is there."
A	"Ok so, essentially, what you're saying is, if you have the right hardware and software, it's automatic in terms of gaining access. It's not... That itself *is* the protection?"
J	"Right."
A	"Ok got it."
J	"Now keep in mind, that can change from year to year. So if you do a 2010 John Deere, in 2011, what you're using for the 2010 may not work for the 2011."
A	"Right. Right, Ok. And then you have to go and spend time to figure out how to make that connect?"
J	"Right."
A	"Ok, got it. Uh... ok, so, I'm assuming for every make and model of equipment, it's going to be different then, for the most part? Is that correct?"
J	"Uh... for the most part, yes."

A	"Ok. Alright, um... just a couple more here... uh... alright, uh... just to get a little more information on the modules. You said that the ECU, generally, would be able to detect that some kind of module is installed, and that it will act funny, it will cause a light will go off, saying that there is a problem. It will perform poorly, unless you design the module to kind of get around that. Is that just the nature of the machine that... that because it's being modified by this module, will perform weird but you found a fix, or is it some kind of actual thing that the manufacturers intentionally did in order to prevent something like a module from working?"
J	"It mainly pertains to the newer... newer vehicles. The newer applications. Um, you know the uh computers on the newer vehicles, they just get more sophisticated."
A	"Oh, so it's just the..."
J	"They monitor more things, and they require feedback from the vehicle sensors in order to determine what to do. Um... so if that feedback is any different from what it's supposed to be..."
A	"Uh huh..."
J	"the computer assumes 'something's wrong and we're gonna shut down.'"
A	"Is see. Now, is there... uh... is there ever a case where the computer is designed to essentially completely stop working if it senses something like that, or is it more of like a, it just runs funny because it's getting, like, weird readings?"

J	"It could be either way."
A	"Ok. So, there are cases when the manufacturer designs it to just go, 'something's wrong, I'm turning off.'"
J	"Right."
A	"Ok."