

1
2 UNITED STATES DISTRICT COURT
3 EASTERN DISTRICT OF NEW YORK
4 Case No. 1:23-07477-RPK-VMS

-----x

4 VARIA HOLDINGS LLC,
5 Plaintiff,
6 - against -
7 APPLE INC.,
8 Defendant.

9 -----x

10 March 6, 2024
11 10:02 a.m.

12
13 VIDEOTAPED DEPOSITION of JACOB
14 SHARONY, PH.D., held at the offices of
15 Schulte Roth & Zabel LLP, located at 919
16 3rd Avenue, New York, New York 10022,
17 before Anthony Giarro, a Registered
18 Professional Reporter, a Certified Realtime
19 Reporter and a Notary Public of the State
20 of New York.

Page 2 1 2 A P P E A R A N C E S : 3 4 SCHULTE ROTH & ZABEL LLP Attorneys for Plaintiff 5 919 3rd Avenue New York, New York 10022 6 7 BY: NATALIE DANA LIEBER, ESQ. natalie.lieber@srz.com 8 9 10 GIBSON, DUNN & CRUTCHER LLP Attorneys for Defendant 3161 Michelson Drive 11 Irvine, California 92612 12 BY: NATHANIEL R. SCHARN, ESQ. NScharn@gibsondunn.com 13 14 15 16 17 18 19 20 21 22 23 24 ALSO PRESENT: DEVERELL WRITE, Videographer 25 TANYA MANNO, ESQ., Apple	Page 4 1 2 THE VIDEOGRAPHER: Good 3 morning. We are going on the record 4 at 10:02 a.m. on March 6th, 2024. 5 This is Media Unit 1 of the 6 video-recorded deposition of Dr. 7 Jacob Sharony, taken by counsel for 8 the defendant, in the matter of Varia 9 Holdings LLC, Plaintiff, versus Apple 10 Incorporated, Defendant. This case 11 is filed in the United States 12 District Court for the Eastern 13 District of New York. 14 My name is Deverell Write, 15 representing Veritext, and I am the 16 videographer. The court reporter is 17 Anthony Giarro from the firm 18 Veritext. 19 Counsel and all present, 20 including remotely, will now state 21 their appearances and affiliations 22 for the record, beginning with the 23 noticing attorney. 24 MR. SCHARN: Nathan Scharn 25 of the law firm Gibson, Dunn &
Page 3 1 2 S T I P U L A T I O N S 3 4 IT IS HEREBY STIPULATED AND AGREED, 5 by and among counsel for the respective 6 parties hereto, that the filing, sealing 7 and certification of the within deposition 8 shall be and the same are hereby waived; 9 IT IS FURTHER STIPULATED AND AGREED 10 that all objections, except as to form of 11 the question, shall be reserved to the time 12 of the trial; 13 IT IS FURTHER STIPULATED AND AGREED 14 that the within deposition may be signed 15 before any Notary Public with the same 16 force and effect as if signed and sworn to 17 before the Court. 18 * * * 19 20 21 22 23 24 25	Page 5 1 DR. JACOB SHARONY 2 Crutcher on behalf of the defendant, 3 Apple Inc. And with me today is 4 in-house counsel from Apple, Tanya 5 Manno. 6 MS. LIEBER: Natalie Lieber 7 from the law firm of Schulte Roth & 8 Zabel on behalf of plaintiff and the 9 witness. 10 THE VIDEOGRAPHER: Will the 11 court reporter please swear in the 12 witness. 13 D R. J A C O B S H A R O N Y, after 14 having first been duly sworn by a Notary 15 Public of the State of New York, was 16 examined and testified as follows: 17 EXAMINATION BY 18 MR. SCHARN: 19 Q Good morning, Dr. Sharony. 20 A Good morning. 21 Q Have you been deposed 22 before? 23 A Yeah. Many times. 24 Q About how many times? 25 A 15, 20 or something.

Page 6 1 DR. JACOB SHARONY 2 Q So recognizing that you know 3 generally how this works, I'll still lay 4 out a few basic ground rules to try to 5 help things go smoothly. So the first 6 one is that it's important we take turns 7 talking because the court reporter is 8 making a transcript. And we want to be 9 able to allow him to do that in a clean 10 way; okay? 11 A Yes. 12 Q If you don't understand a 13 question that I ask, please let me know, 14 otherwise I'll presume that you 15 understand it; okay? 16 A Sure. 17 Q And please answer all the 18 questions I ask to the best of your 19 ability; okay? 20 A Yes. 21 Q And I'll try to take a break 22 about every hour or hour and a half or 23 so. And you can request a break if you 24 need one. I just ask that if there's a 25 question pending that you answer it	Page 8 1 DR. JACOB SHARONY 2 Q Were all of those in 3 intellectual property cases? 4 A Most of them. Some of them 5 were not IP-related. They were more 6 breach of contract, international 7 investment, arbitration. 8 Q About how many of your 15 to 9 20 depositions related to an intellectual 10 property case? 11 A I would say the majority, 12 like 80 percent or 75 percent. 13 Q So within that, somewhere in 14 the order of 13 to 17 of your 15 to 20 15 depositions were in intellectual property 16 cases? 17 A Yes. 18 Q And in those, do you 19 remember how many times you've testified 20 on behalf of a defendant or accused 21 infringer? 22 A So it varies. Sometime it's 23 50-50. So I did work for a plaintiff, I 24 did work for a defendant. But maybe it's 25 a little bit now more towards plaintiff.
Page 7 1 DR. JACOB SHARONY 2 before we go on break; okay? 3 A Of course. 4 Q As you know, counsel may 5 object to certain questions. But unless 6 your counsel specifically instructs you 7 not to answer, you're still to answer the 8 question; okay? 9 A Yes. 10 Q And do you understand that 11 you're under the same oath today as if 12 you were in a courtroom testifying before 13 a judge or jury? 14 A Yes. 15 Q And is there any reason 16 today that you're unable to think clearly 17 or testify truthfully? 18 A No. 19 Q Not under the influence of 20 any kind of medication that would alter 21 your ability to think clearly? 22 A No. 23 Q You said you've been deposed 24 about 15 to 20 times; right? 25 A Yes.	Page 9 1 DR. JACOB SHARONY 2 Q Do you have an estimate of 3 the relative balance of testifying on 4 behalf of plaintiffs or patentees versus 5 defendants who are accused of infringing? 6 A Cases or, for example, there 7 was IPR. There was a bunch of multiple 8 IPRs. So I don't know if you count these 9 as one or multiple. But I would say 10 maybe 60-40 or 70-30, something like 11 that. 12 Q When were you first 13 contacted in connection with this case? 14 A It was the end of 2023, 15 around November time, I would say, 16 November or December. 17 Q And who contacted you? 18 A Counsel. 19 Q Do you remember who? 20 A Natalie, yeah. 21 Q Have you worked with the 22 entity, Varia Holdings, the plaintiff in 23 this matter, before? 24 A No. 25 Q Have you worked with Varia's

3 (Pages 6 - 9)

Page 10 1 DR. JACOB SHARONY 2 counsel before? 3 A On this case? 4 Q So other than in this case, 5 have you worked with counsel, the counsel 6 who's currently Varia's counsel before? 7 A Varia counsel, no. 8 Q So what I'm asking is, for 9 example, have you worked with Ms. Lieber 10 or Mr. Gilman before? 11 A No, never. We met around 12 November. 13 Q When were you asked to 14 submit a declaration in this matter? 15 A Around -- about a month to 16 two months. So it's maybe the end of -- 17 no. We submitted on February 9th. So it 18 was sometime in November, in January, the 19 beginning of the year, something like 20 that. 21 Q Do you remember 22 approximately when in January? 23 A Let's say about a month 24 before, like beginning of -- could be the 25 last week or last two weeks of December	Page 12 1 DR. JACOB SHARONY 2 motion to dismiss and the reply. So many 3 technical documents that I reviewed 4 before. And I also prep with Natalie. 5 Q And when you say the reply, 6 just to clarify, you mean Varia's 7 opposition brief; right? 8 A Yes. 9 Q And you said you met with 10 Ms. Lieber. 11 Did you meet with anyone 12 else to prepare for your deposition? 13 A Shortly with another 14 colleague. 15 Q Do you remember that 16 colleague's name? 17 A I know that his first name 18 is Chris. I'm not sure I know his last 19 name. 20 Q Approximately how long did 21 your meetings with counsel last? 22 A We met for two days. 23 Q About how many hours did you 24 spend on each of those days preparing? 25 A The first day was a full
Page 11 1 DR. JACOB SHARONY 2 and maybe the first week of January. 3 Q So I'll represent to you 4 that your report or your declaration is 5 dated February 14th. 6 So would you estimate about 7 January 14th, you were asked to prepare a 8 declaration? 9 A 9th or 14, okay. I thought 10 the 9th. But that's fine. Yeah, at 11 least a month, at least a month. 12 Q So you had a month to work 13 on your declaration that was ultimately 14 submitted in this case? 15 A Well, I said that I was 16 basically engaged in around late 17 November, December. So I start to review 18 the case material, the patents. And 19 later, it was about the declaration. 20 Q How did you prepare for 21 today's deposition? 22 A I reviewed the material, my 23 declaration, the patents, the file 24 histories of the patents, any cited 25 material in my declaration. I read the	Page 13 1 DR. JACOB SHARONY 2 day. So eight, nine hours. And the 3 second day, it was not a full day. It 4 was about six hours, something like that; 5 six or seven. 6 Q And what days were those? 7 A The last two days, the last 8 two days. So today is Wednesday. So it 9 was Monday and Tuesday. 10 Q Apart from those meetings, 11 did you spend additional time preparing 12 for today's deposition? 13 A On the weekend before we 14 met, I reviewed some of the material, 15 yeah. 16 Q So altogether, how much time 17 would you say you spent preparing for 18 today's deposition? 19 A Something around 20 or 30 20 hours, about. 21 Q Did you speak to any 22 non-lawyers in the course of preparing 23 for your deposition? 24 A No. 25 Q Did you review any documents

4 (Pages 10 - 13)

Page 14 1 DR. JACOB SHARONY 2 that you hadn't seen before in preparing 3 for your deposition? 4 A No. 5 Q Did you review any documents 6 that weren't cited in your declaration in 7 preparing for your deposition? 8 A I'm sorry. What was the 9 last question? 10 Q The earlier question was, 11 did you review any documents that you 12 hadn't seen before in preparing for your 13 deposition? 14 A So not for preparing for the 15 deposition. But I continued to do 16 research, even after I submitted the 17 declaration on February 14. 18 Q What additional documents 19 did you look at in continuing to do 20 research? 21 A I basically looked into 22 various standards that were extended or 23 modified. It's all public information, 24 of course, available on the web. So 25 along the lines of these.	Page 16 1 DR. JACOB SHARONY 2 What did you learn in this 3 additional research? 4 MS. LIEBER: Object to form. 5 A So, for example -- so as you 6 said, you don't want to basically talk to 7 every reader. So if there is a necessary 8 exchange as I mentioned before because 9 you want to select the right tag or phone 10 in order not to answer, you know, for 11 every question. You basically would get 12 some information. But the reader or the 13 payment terminal may be, for example, the 14 phone would not work with certain 15 terminals or other cases. 16 I can tell you from personal 17 experience where I use my phone, and you 18 can charge it in the car, in the early 19 days, it basically would show as if there 20 is a transaction which doesn't make 21 sense. 22 Q What kind of phone do you 23 have? 24 A I have an iPhone. 25 Q Have you looked at your
Page 15 1 DR. JACOB SHARONY 2 Q Were those standards for 3 near-field communication? 4 A Yes. Well, near-field is 5 basically deals with other RFID standards 6 that they are built on. So some of them 7 were a kind extended to -- let me give 8 you an example so you appreciate what I'm 9 trying to say. 10 So in payments, usually, we 11 don't deal -- it's not like where you 12 take inventory in a warehouse where you 13 have many tags outside there. Usually, 14 maybe it's one or two when you do 15 transactions. It would make sense to 16 maybe limit it to take account of it or 17 have the mobile device that is involved 18 in the transaction, not answer to every 19 reader. This would be kind of a waste. 20 So along these lines. 21 Q Right, because if every time 22 I walked by an RFID reader, my phone 23 automatically sent a payment, then I'd 24 end up buying people coffee when I don't 25 intend to.	Page 17 1 DR. JACOB SHARONY 2 iPhone to analyze any of the issues in 3 this case? 4 MS. LIEBER: Object to form. 5 A It was basically on previous 6 experience, nothing specifically for this 7 case. 8 Q Do you know what model 9 iPhone you have? 10 A Yeah. The 14. 11 Q Do you remember the name of 12 the standards that the additional 13 research you did, what the name was? 14 A This was additional research 15 that was done after -- I don't remember 16 the -- it is not a new standard. It's 17 just -- let me explain to you. Sometime 18 a standard would give you a frame that 19 you can put some information there. 20 So you could -- for example, 21 say I'm this terminal, this type. So the 22 phone on the other side will be able to 23 say, you know, I want to talk to you or 24 not, yeah. So I appreciate the NFC, 25 RFID. There is always the reader say,

5 (Pages 14 - 17)

Page 18 1 DR. JACOB SHARONY 2 hey, anyone out there, and people would 3 answer back. So sometime they don't want 4 to answer because there is nothing to do 5 with this reader. 6 Q Was it the EMV contact list 7 standard that you were looking at? 8 A No. 9 Q What standard was it? 10 A It was not a standard. It 11 was just sort of an extension of the 12 14443, the ISO14443. 13 Q Understood. Thanks. 14 Did you look at any other 15 documents besides these ones that were 16 extensions of ISO1443 that weren't cited 17 in your report or your declaration? 18 A Not in my report, not that I 19 recall, not that I recall. 20 Q You're being compensated at 21 a rate of \$550 an hour for your work on 22 behalf of Varia in this case; right? 23 A Correct. 24 Q Did any of the other cases 25 where you've been retained as an expert	Page 20 1 DR. JACOB SHARONY 2 more of a terminal that you take 3 inventory or you go to the concert and, 4 you know, they scan your pass or 5 something like that. 6 Q So mobile communication 7 devices that weren't cell phones? 8 A Sorry? 9 Q They're mobile communication 10 devices that weren't cell phones? 11 A Right, yeah. Some of these 12 terminal can make, as we mention, calls 13 or voice calls, yeah. 14 Q The terminals in the other 15 cases, the Zebra, NPH cases, could make 16 voice calls as well, you're saying? 17 Let me re-ask the question. 18 The terminals in the HP and 19 Zebra cases, those could also make voice 20 calls? 21 A The HP, it was not mobile 22 device. I mentioned -- I remember one of 23 the patent, they had like a tag inside 24 the cartridge of a printer. They do 25 it -- if you buy today from Amazon, a
Page 19 1 DR. JACOB SHARONY 2 witness or expert consultant involve NFC 3 technology? 4 A Yes. I served on some 5 RFID -- RFID, NFC cases. 6 Q Which cases are those? 7 A One had to do with -- it was 8 a patent, I think, if I recall, with HP 9 because HP put like a tag inside the 10 cartridge. So to avoid counterfeiting 11 and the like. So this involved RFID 12 and/or NFC and also with the Zebra 13 technologies. 14 Q What was the technology 15 generally at issue in those cases? 16 A It involved RFID, as well 17 as -- RFID/NFC. 18 Q Did they involve RFID/NFC in 19 a cell phone? 20 A Not cell phone as we know 21 it. It's more a terminal; you know, 22 Zebra does the terminals, handheld 23 terminals, like PDAs. Those are more for 24 vertical application. So they don't take 25 the phone just to be recognized. So it's	Page 21 1 DR. JACOB SHARONY 2 cartridge for your HP printer. So 3 sometime it would say not January, an HP 4 cartridge. So they put like a tag 5 inside. And in the Zebra case, yeah, 6 this involve mobile devices. 7 Q Were you deposed in either 8 or both of those cases, HP and Zebra? 9 A Yes. In the HP, I wrote an 10 expert report. And there was sort of a 11 settlement just after or something like 12 that. And in the Zebra, yeah, I was 13 deposed -- there was several IPRs and 14 also -- and also litigation. 15 Q Were you retained on behalf 16 of the patentee in both of those cases, 17 the entity that owned the patent? 18 A I was defending Zebra. 19 Q And Zebra was accused of 20 infringing? 21 A Correct. Well, it's 22 involved because, you know, they started 23 to switch other, and then it was an ITC. 24 And in an ITC, you have to show -- there 25 is a technology prong. You have to show

6 (Pages 18 - 21)

Page 22 1 DR. JACOB SHARONY 2 that -- so, yeah. So it was kind of 3 both, both sides. 4 Q So you analyzed whether 5 Zebra's products practiced Zebra's 6 patents for the technical prong and 7 domestic industry and the ITC? 8 A Yes. You have to do that 9 and also to show that they infringe the 10 very same patents, yes. 11 Q And who was the respondent 12 in the ITC? 13 A On Asset. 14 Q Did On Asset assert any 15 patents against Zebra in that case? 16 A I don't think so, no. I 17 don't think so. 18 (The above-referred-to 19 document was marked as Sharony 20 Exhibit 1 for identification, as of 21 this date.) 22 Q I'm going to hand you what 23 has been marked as Exhibit 1. 24 Do you recognize this 25 document?	Page 24 1 DR. JACOB SHARONY 2 on a project that we do. So we hire, you 3 know, people to work, like 1099. 4 Q Are there currently any 5 other employees besides you at Mobius 6 Consulting? 7 A At the moment, no. 8 Q Is your litigation 9 consulting work part of your Mobius 10 Consulting business? 11 A Yes. 12 Q So, for example, your 13 invoices in this case are issued by 14 Mobius Consulting? 15 A Yeah. I have another 16 company that is called Wireless Expert 17 Consulting that was basically -- so 18 Mobius started at 2004 and until today 19 and ongoing. And the Wireless Expert 20 Consulting was founded in 2014 or so, 21 about ten years ago, because the work of 22 the expert consulting, expert witness 23 started there. There is no good reason 24 to -- they're doing the same. So it's 25 the same.
Page 23 1 DR. JACOB SHARONY 2 A Yes. My CV. 3 Q Is this your current CV? 4 A Yes. 5 Q The first entry there is 6 Mobius Consulting. Do you see that? 7 A Yes. 8 Q Can you tell me what is 9 Mobius Consulting? 10 A So after I moved on from 11 Symbol Technologies, it was acquired by 12 Motorola. I founded Mobius Consulting 13 after seeing the, you know, pent-up 14 demand for wireless, both by residents 15 and enterprises. So I provided at the 16 beginning, consulting for, say, let's 17 call it smart or high-end homes back 18 then, like 2004, and later on, 19 enterprises. 20 Q Does Mobius Consulting have 21 any employees? 22 A I'm Number One. That's what 23 I learn. Since it's S Corporation, I'm 24 not just an owner, I'm an employee. But 25 it varies, yes. So sometimes depending	Page 25 1 DR. JACOB SHARONY 2 Q The second bullet says, 3 "Trusted advisor role, facing large 4 clients in telecom, vertical enterprises 5 and government, building trust and 6 relationships." 7 Do you see that? 8 A Yes. 9 Q What does it mean, trusted 10 advisor role facing large clients? 11 A So, for example, let's take 12 one of the big customer at the time, was 13 Walmart for Symbol Technologies. So I 14 was an R&D. And it was important to meet 15 clients and hear their issues or see, for 16 example, let's say they want to deploy 17 802.11 Wi-Fi network in their site, they 18 have like I think thousands of sites. So 19 it was very important to hear from them, 20 any issues. 21 So we kind of were sort of 22 the glue that would tell them, this is 23 the trusted advisor. If you become a 24 trusted advisor, they would like to work 25 with you and give you business. So it's

Page 26 1 DR. JACOB SHARONY 2 an ongoing relationship between a company 3 and the client. 4 Q Have you ever consulted for 5 Apple? 6 A No. 7 Q Have you ever been adverse 8 to a company that you had previously 9 consulted for? 10 A At first to a company that I 11 consulted for, I don't think so. 12 Q Just to clarify, by adverse, 13 I mean retained by the other party in a 14 litigation against a party that you had 15 consulted for. 16 A I don't think so. But since 17 technology is very agnostic, you know, 18 it's like we basically -- if there is a 19 case that I can help, sometime I take, 20 sometime not, if I cannot help. So I 21 don't think so. I did in the past work 22 as part of FRAND analysis, reviewing 23 patents. It was not part of litigation 24 or before litigation. I don't think so. 25 But maybe there is something that -- but	Page 28 1 DR. JACOB SHARONY 2 A Yes. 3 Q And that's been since 2010; 4 right? 5 A Yes. 6 Q So about 13 or 14 years, 7 you've been an adjunct professor at 8 Columbia? 9 A Yes. 10 Q Is Columbia on a semester 11 system? 12 A Yes. 13 Q Have you taught a class 14 every semester at Columbia since then? 15 A Yes. Maybe there was one -- 16 one skipped years. But at least in the 17 last five years, ever semester, I teach 18 the fall semester. So I just taught a 19 course that ended in December. 20 Q What was that course? 21 A Millimeter Wave 22 Communications and Application for 5G. 23 5G is like in the phone, the new 24 standards, new generation. 25 Q Have you ever tried to
Page 27 1 DR. JACOB SHARONY 2 usually, you know, it's like if you do 3 work for one, they don't want to hear 4 from you. But it's not impossible to do 5 because it's technology, different area. 6 And these are big companies. 7 Q So you would not decline a 8 litigation consulting role because you 9 had previously served as a trusted 10 advisor to the adverse party; right? 11 MS. LIEBER: Objection, 12 mischaracterizes. 13 A No. That's not accurate if 14 I'm privy to internal information, you 15 know, if you sign a protective order or 16 something. So you see all the documents. 17 In this case, you are really 18 not supposed to -- you are sort of 19 conflicted unless you divide your head 20 and say, you know, I'm not touching this, 21 this is something else. But it didn't 22 happen, I don't think so. 23 Q The next entry is Columbia 24 University, adjunct professor. Do you 25 see that?	Page 29 1 DR. JACOB SHARONY 2 become a full-time or tenure track 3 professor at Columbia? 4 A Not a tenure track because 5 in order to be considered, you have to 6 publish a lot and be there. I haven't 7 tried to do that. I tried in the past, 8 you know, I talk with some colleagues. I 9 suggested them to have like a wireless 10 center. But it didn't -- it didn't pan 11 out. 12 Q Have you ever applied for 13 like an associate professor role? 14 A No, never, never. 15 Q Why not? 16 A Because I like to deal with, 17 you know, with the industry. So this was 18 kind of, you know, a site of academia, 19 yes. I'm coming from a teacher's family. 20 But I don't want to do it all the time, 21 you know. I like to do research. I like 22 to work with the industry. I like to, 23 you know, see how the technology evolves, 24 rather than, you know, dedicate myself 25 just for teaching.

Page 30 1 DR. JACOB SHARONY 2 (The above-referred-to 3 document was marked as Sharony 4 Exhibit 2 for identification, as of 5 this date.) 6 Q I'll hand you what's been 7 marked as Exhibit 2. 8 A Thank you. 9 Q Do you recognize this 10 document? 11 A Yes. 12 Q What is this? 13 A This is my declaration in 14 this case. 15 Q And who wrote this document? 16 A It was a collaborated work. 17 Counsel, we discussed a lot. This is in 18 general too. Usually, before we write 19 anything, we discuss the case. In many 20 situation, I provide my input later on 21 into the writing and the draft. So it 22 was a collaborated work. Some parts was 23 transcribed by counsel. Sometime I edit 24 or if I didn't think that something is 25 correct, I edit it, yeah.	Page 32 1 DR. JACOB SHARONY 2 Q -- you see it's dated 3 February 14, 2024? 4 A Correct. 5 Q And is that your signature? 6 A Yes. 7 Q So you've sworn to every 8 statement in this document under penalty 9 of perjury; right? 10 A Correct. 11 Q How would you describe your 12 assignment that led to this declaration? 13 MS. LIEBER: I just want to 14 caution the witness not to reveal any 15 confidential communications regarding 16 the case in general, to the extent 17 they're outside the scope of your 18 declaration. 19 THE WITNESS: Right. 20 A So on page 21, basically, I 21 outlined, you know, my assignment. I was 22 asked to review the patents and provide 23 my opinions as to the technical matters, 24 yeah. I just want to look and -- yeah. 25 I think it's in paragraph 2. I was asked
Page 31 1 DR. JACOB SHARONY 2 Q About how much time did you 3 spend on it? 4 A Tens of hours. It was less 5 than 100, I know. 6 Q Do you know if it was more 7 or less than 50? 8 A Maybe around that number. 9 Q So around 50 hours spent 10 working on this declaration? 11 A Could be 60; between 50 to 12 100, more or less. 13 Q You don't recall if it's 14 more than 60? 15 A No. For the declaration, 16 I'm comfortable with 50, 60, yeah. 17 Q Did anyone other than you or 18 Varia's counsel work on this document? 19 A No. 20 Q You don't have any employees 21 or students that helped with it? 22 A No. 23 Q And if you turn back to 24 page 94, the very last page -- 25 A Yes.	Page 33 1 DR. JACOB SHARONY 2 to consider. So there are three patents 3 in this case. And there were four 4 independent claims. 5 So, yeah, that was my 6 analysis, to compare the Apple products, 7 the so-called accused products and see if 8 they meet the limitation of the four 9 claims that I analyzed. So it has to do 10 with technical opinions, analysis 11 concerning these products, concerning, as 12 I said, the infringement of the claim of 13 the products, of the patents, I should 14 say. 15 Q And you also offered 16 opinions on the proper construction of 17 certain terms in the asserted claims; 18 right? 19 A Well, I'm aware of -- I'm 20 aware of currently on one dispute, I 21 don't know if there are other disputes, 22 but my understanding that Apple construed 23 certain claim terms in a certain way. 24 And I thought that they are not accurate. 25 Q And as stated in paragraph 3

Page 34 1 DR. JACOB SHARONY 2 in your declaration, one of your 3 assignments is to respond to certain 4 attorney arguments set forth by Defendant 5 Apple in its motion to dismiss; right? 6 A Where do you see that? 7 Q Paragraph 3. 8 A Yeah, yeah. That's correct, 9 the first sentence. 10 Q I'll hand you what have been 11 marked as Exhibits 3 through 5. 12 (The above-referred-to 13 document was marked as Sharony 14 Exhibit 3 for identification, as of 15 this date.) 16 (The above-referred-to 17 document was marked as Sharony 18 Exhibit 4 for identification, as of 19 this date.) 20 (The above-referred-to 21 document was marked as Sharony 22 Exhibit 5 for identification, as of 23 this date.) 24 MS. LIEBER: Can you just 25 let me know when patent is which?	Page 36 1 DR. JACOB SHARONY 2 to your declaration, please. 3 A Yes. 4 Q You offered an opinion on 5 the qualifications of a person of 6 ordinary skill in the art for this case; 7 right? 8 A Correct. 9 Q And if I use the phrase 10 POSITA, will you understand that is an 11 acronym for a person of ordinary skill in 12 the art? 13 A Yes. 14 Q And you give that definition 15 in paragraph 20 of your report; right? 16 A Yes. 17 Q And in your opinion, a 18 POSITA would have had a bachelor's degree 19 in computer science, computer 20 engineering, electrical engineering or a 21 related field in competing technology and 22 at least two years experience in wireless 23 communication networks and RFID systems 24 or equivalent education, research, 25 experience and knowledge; right?
Page 35 1 DR. JACOB SHARONY 2 MR. SCHARN: Yes. I was 3 going to ask him next to identify 4 each of Exhibits 3 through 5 for the 5 record. 6 Q So, Dr. Sharony, if you 7 could please identify Exhibits 3, 4 and 5 8 and which patents they are for the 9 record. 10 A Yes. So the '984 patent is 11 Sharony 3; the '974 is Sharony 4; and the 12 '947 is Sharony 5. 13 Q Are these the patents that 14 Varia has asserted against Apple in this 15 case? 16 A Yes. 17 Q So I'll just tell you, those 18 documents will come up a lot throughout 19 the course of the day, as will your 20 declarations. So you want to keep those 21 handy and be sort of nimble with flipping 22 back and forth between them. 23 A Yes. 24 Q So we'll start with flipping 25 back and forth now, if you could go back	Page 37 1 DR. JACOB SHARONY 2 A Yes. 3 Q And then looking back at the 4 patents, Exhibits 3 through 5, the 5 asserted patents claim priority to a 6 provisional patent application filed in 7 June 2003; right? 8 A Correct. 9 Q So in your opinion, this 10 definition that is provided in 11 paragraph 20 is for a person that meets 12 these criteria as of June 2003; right? 13 A Correct. 14 Q Were you a person of at 15 least ordinary skill in the art as of 16 June 2003 under your definition? 17 A Yes. 18 Q Were you a person of greater 19 than ordinary skill in the art under your 20 definition as of June 2003? 21 A As you mentioned, I 22 exceeded. 23 Q And at that time, you worked 24 at Motorola; right? 25 A Symbol Technologies. It was

10 (Pages 34 - 37)

Page 38 1 DR. JACOB SHARONY 2 acquired by Motorola in around 2005, 3 something. 4 Q What kind of products did 5 Symbol Technologies make or what kind of 6 services did they offer? 7 A So Symbol basically served 8 the vertical market as I mentioned 9 before: Education, government, 10 transportation, logistics. And in these 11 markets, you usually need, for example, 12 to take inventory or to scanning bar 13 codes, scanning RFIDs. So it was the 14 produced terminals with these scanning 15 capabilities, as well as the 16 infrastructure that would connect them to 17 networks, for example, Wi-Fi. So Symbol 18 was one of the forefathers of Wi-Fi. 19 So envision, again, let's go 20 to the example of the Walmart. So on the 21 floor, you would have people with 22 terminals, workers with terminals, and 23 they would be connected to information 24 system. 25 Q Did any of the terminals	Page 40 1 DR. JACOB SHARONY 2 Q Did the Net Vision phone and 3 the Net Vision data phone predate the 4 acquisition by Motorola? 5 A Yes. 6 Q When, approximately, were 7 those products launched? 8 A In the late '90s. I joined 9 them in 1997. So it was before Year 10 2000. 11 Q Did any of those Net Vision 12 phones have RFID capabilities? 13 A No. 14 Q What about Bluetooth 15 capabilities? 16 A Bluetooth came in the early 17 2000. I think it was formed around 2000, 18 early 2000s. And then they came with the 19 standards. 20 Q So as of June 2003, had you 21 done any work on RFID technology? 22 A Yes. We did lots of work on 23 RFID and Wi. So Symbol sort of invented 24 the mobile reader for bar codes. In the 25 late '90s, the Department of Defense and
Page 39 1 DR. JACOB SHARONY 2 that Symbol made have the ability to make 3 voice calls? 4 A Yes. 5 Q Were those voice calls made 6 over telephone networks, Wi-Fi networks, 7 something else? 8 A So as I mentioned, there was 9 both, both cellular and Wi-Fi. But since 10 we were like the forefather of Wi-Fi, I 11 think we made, you know, the very first 12 Wi-Fi -- what they call Wi-Fi calling 13 today, like a phone call, yeah. And 14 envision, sometime you are in a hospital. 15 It might be hard to make a phone call. 16 So when you are inside the building, it 17 will be -- they would use Wi-Fi. 18 Q Do you have a particular 19 product in mind when you're talking about 20 a terminal that could do Wi-Fi calling? 21 A I think the very first one 22 was called Net Vision phone. And the 23 other one was Net Vision data phone. So 24 you can do data and calls. And later, it 25 entered many terminals.	Page 41 1 DR. JACOB SHARONY 2 Walmart basically sort of mandated they 3 move to RFID, basically said you want to 4 be our supplier, you have to involve 5 RFID. And that's how we entered. 6 So as soon as I joined back 7 in 1997, there were all kind of patents 8 that we reviewed. And also being in 9 RFID, we did lots of work with RFID. 10 Q What were the applications 11 for the work with RFID that you did at 12 Symbol? 13 A So we were in R&D. So it 14 was for -- it was very dear to us to -- 15 you know, I remember this is like the 16 four questions, you know. It's like, do 17 you know what you have? Do you know how 18 many you have? Do you know where is it? 19 And do you know what's its status? 20 So we doubled a lot with 21 location also and tracking. But it was 22 different application. I would just 23 describe one application that -- this 24 could be like in a library. You want to 25 know certain books, if they are in the

Page 42 1 DR. JACOB SHARONY 2 right location, or in a warehouse, you 3 can drive with a forklift and basically 4 see the type of product you have, maybe 5 you can count them, and also using other 6 technology, you can locate them. 7 Q So you were focused on 8 geolocating RFID tags? 9 A Not geolocating, almost 10 pinpointing. We wanted to know with very 11 high resolution where it is, very high 12 resolution because, you know, if I see -- 13 you know, it's the 3rd of July and I see 14 that you buy hot dogs, maybe I'll offer 15 you to buy mustard and Coke. We had like 16 sort of inference engines that would -- 17 basically based on your location, you are 18 near the pasta or the meat department. 19 So we could basically offer all kind of 20 incentives, coupon. Some of it was, you 21 know, forward-looking. 22 Q So your work with RFID 23 focused on pinpointing RFID tags? 24 A Not only. We used it. RFID 25 used also for identification. You	Page 44 1 DR. JACOB SHARONY 2 So we wanted to basically 3 know, for example, at any given point, 4 you know, if there is a specimen that 5 left the operations theater and went to 6 pathology. So these tags were more of 7 the NFC type because they are based on 8 induction of magnetic field. And certain 9 tags or certain frequency will not work 10 with, for example, if you have a vial 11 that you want to track, so you will not 12 be able to do it with any tag. So there 13 are many flavors of tags that we 14 consider. 15 Q But as of 2003, you hadn't 16 done any work on NFC or RFID in a mobile 17 device; right? 18 MS. LIEBER: Object to form. 19 A I mentioned that we did scan 20 with mobile devices, all kind of tags. 21 Q Did any of those mobile 22 devices have the ability to do voice 23 calls? 24 A Yes. I mentioned voice 25 call, yes.
Page 43 1 DR. JACOB SHARONY 2 capture -- you capture data. And then 3 you move it. And then you manage it. 4 Q Did any of your RFID work 5 relate to payment using RFID? 6 A We looked into that. And if 7 I recall, maybe there was an acquisition 8 of something with payment. I'm not sure. 9 I do not recall names. But we looked 10 into different -- at that time, also, 11 there was lots of activity with NFC which 12 is sort of a specialized subset of RFID 13 built on RFID. And at that time, I think 14 Sony and Philips announced collaboration. 15 And the standards came a little bit 16 after. 17 Q Did any of your work relate 18 to NFC? 19 A Also, yeah. We looked 20 into -- the tags, the standard was 21 ratified or published in late 2003. So 22 we had all kind of tags that we played 23 with. Later, I was also with -- I was at 24 Stony Brook University. And we worked 25 with the local hospital.	Page 45 1 DR. JACOB SHARONY 2 Q So which mobile devices both 3 scanned RFID and could do voice calls? 4 MS. LIEBER: Object to form. 5 A Could you rephrase? Because 6 what do you mean by that? Because there 7 are several modalities of what you can do 8 with RFID. So I can tell you even before 9 you ask, there was no -- at that time, 10 maybe you could use it as a reader. But 11 I don't recall -- I don't recall. There 12 were readers and tags but definitely not 13 emulation of cards or something like 14 that. That came later. The Symbol 15 business was mainly reading for 16 identification. 17 So some of these terminal 18 had only readers, sort of replacing bar 19 codes. But some I believe also had the 20 voice, I believe. But I cannot point to 21 a model number or something like that. 22 So we basically played with as part of 23 RFID, with all kind of tags, NFC tags, 24 yeah. 25 Q Do you remember the names of

Page 46 1 DR. JACOB SHARONY 2 the devices that could do a voice call 3 and read RFID or NFC tags? 4 A Definitely not model number. 5 But I do know that they start with MC for 6 mobile computer. But I cannot tell any 7 model number. 8 Q And these were devices made 9 by Symbol Technologies before 2003? 10 A Yes. Symbol did terminals 11 in the late '80s or '90s. But this were 12 not the type of terminal that you are 13 referring to. 14 Q Sorry. 15 To clarify, the devices that 16 could make a voice call and read an RFID 17 or in this case tag, Symbol made those 18 devices before 2003; right? 19 A No. I didn't say that. 20 Q When did Symbol start making 21 those devices? 22 A You said read, read RFID. 23 Yeah. The voice call, the Wi-Fi calling, 24 for example, it was around early 2000s. 25 I'm not sure if they were together	Page 48 1 DR. JACOB SHARONY 2 like, you know, sometime they say from 3 patent -- no, from patent for sure to 4 product, could take even longer. But 5 from standards to product, it takes 6 several years, several good years, like 7 1997 was like, for example, Wi-Fi. It 8 was just, you know, the vertical markets, 9 it was not in the homes, at least five 10 years later. 11 Q So as of June 2003, had you 12 ever worked with mobile devices that 13 actually transmitted an RFID or NFC tag 14 as opposed to mobile devices that read an 15 NFC or RFID tag? 16 A It was more devices that, 17 yes, would read RFID. 18 Q So you had not ever worked 19 with a mobile device that could transmit 20 RFID as of June 2003? 21 A What do you mean by transmit 22 RFID? 23 Q Transmit an RFID tag. 24 A It is not so clear to me. 25 You can read, you can write, you can
Page 47 1 DR. JACOB SHARONY 2 because we had like a handheld devices. 3 So it's a plethora of so many devices 4 there. And some devices at the beginning 5 just said RFID. It's like we call it a 6 gun. So you hold it. And it has a bar 7 code capability. And it would there 8 also. 9 So the integration together 10 was not so quick. I think but now, I'm 11 sure that they have everything together 12 with bar code, with NFC, with readers, 13 with the voice call. But at the 14 beginning, it was -- it was separated. 15 It was not integrated together. 16 Q And why was the integration 17 not so quick? 18 A Because the market -- 19 remember with the NFC, it just started 20 the building on RFID in the very early 21 2000. The standard was published in the 22 late 2003. And then there is activity in 23 the market. So it takes time until you 24 develop applications. 25 So I would say usually takes	Page 49 1 DR. JACOB SHARONY 2 emulate a tag, or you can do like 3 peer-to-peer. So when you said -- I'm 4 not trying to say that you're incorrect. 5 But you don't use the word transmit RFID. 6 It's not -- 7 Q Thank you. 8 That's a helpful 9 clarification. 10 So as of June 2003, you had 11 not worked with a mobile device that had 12 an RFID tag, either literally or 13 emulated, that could be read by another 14 device; right? 15 A There could be -- you know, 16 some products have a tag just to identify 17 them. But it was not -- it was, I would 18 say, completely isolated from the 19 electronics of the device. Think about 20 like a bar code. So it just give you the 21 manufacturing date, the serial number. 22 Sometime it's important in the supply 23 chain to see when this was manufactured 24 or when it was maybe serviced. So this 25 would be maybe just a tag that would be

Page 50 1 DR. JACOB SHARONY 2 basically inside a product. But I 3 wouldn't say it's the device that being 4 read. It's like something on the cover. 5 Q So you may have worked with 6 a device that could make a voice call 7 that also had an RFID transponder in it 8 separately that could be read by an RFID 9 reader; is that right? 10 MS. LIEBER: Objection, 11 mischaracterizes. 12 A Could you rephrase, please? 13 Q So to sort of level set us, 14 we're talking about devices you had 15 worked with as of June 2003 at Symbol or 16 otherwise. 17 A Yes. 18 Q And some of the devices were 19 mobile devices that could make voice 20 calls; right? 21 A Not at the very early. I 22 mentioned that we had mobile devices that 23 can make phone calls over a, you know, 24 Wi-Fi, for example. It would have 25 sometimes a bar code scanner or imager.	Page 52 1 DR. JACOB SHARONY 2 would come in the late 2000, you know, 3 not the later part of the year, 2000, but 4 the later part of the 2000s, like 2008, 5 2009. 6 Q So, for example, the Net 7 Vision or Net Vision data phone, would 8 those have had RFID tags on them? 9 A No. 10 Q What are some examples of 11 mobile devices that had these RFID tags 12 that you mentioned for keeping track of 13 the device when it was serviced, 14 everything like that? 15 A I can not point to specific 16 products. But I think it was things that 17 maybe later on, going into the supply 18 chain. I don't recall. 19 Q So before June 2003, did you 20 ever have the idea to have a mobile 21 device that could make a voice call and 22 also would have an RFID tag on that 23 mobile device? 24 MS. LIEBER: Objection, 25 outside the scope.
Page 51 1 DR. JACOB SHARONY 2 Separately, there was RFID 3 activity that was not integrated very 4 quickly to these terminals. So it was 5 like a gun that was like you trigger, and 6 you either read the bar code or RFID. 7 This came later. But some of the 8 products, I think there were just to -- 9 you know, sometime there is no line of 10 sight that you need for bar code. 11 So you wanted to know, you 12 know, when it was manufactured because 13 sometime appreciate that we worked with 14 very ruggedize environment, like UPS, 15 FedEx, they take the terminal, they throw 16 it into the truck. So you wanted 17 something that you can -- so I think this 18 was the purpose, to include just a tag 19 that would give this information. It's 20 completely isolated from the device. 21 It's like as if you put like a label, 22 like a sticker on it. 23 So they were not integrated 24 very quickly. And I said because the 25 market was not ready yet. I think this	Page 53 1 DR. JACOB SHARONY 2 A No. If I had an idea, I 3 would file a patent. 4 MR. SCHARN: We've been 5 going about an hour. Should we take 6 our first break? 7 MS. LIEBER: Sure. 8 THE VIDEOGRAPHER: The time 9 on the video monitor is 11:14 a.m. 10 We're off the record. This ends 11 Media 1. 12 (A short recess was taken.) 13 THE VIDEOGRAPHER: We are 14 back on the record. The time on the 15 video monitor is 11:27 a.m. This 16 starts Media 2. 17 Q Welcome back, Dr. Sharony. 18 A Hi. 19 Q On the break, did you 20 discuss the substance of your testimony 21 with anybody? 22 A No. 23 Q So we were talking about 24 your experience as of June 2003 before 25 the break. Do you recall that?

Page 54 1 DR. JACOB SHARONY 2 A Yes. 3 Q So let's go back to that. 4 As of June 2003, did you 5 have experience designing transceivers? 6 A Basically before Bluetooth 7 came to life, we had the need to have 8 sort of a relatively short distance RF 9 communications. So the answer is yes. 10 Q Did you design any 11 transceivers related to Wi-Fi signals? 12 A Well, in that case, at the 13 very early days, there were not cheap 14 manufacturer. So we had to do anything 15 ourselves, including the access point, 16 the mobile device. So we looked into 17 designing some -- some of the circuit 18 rate that is involved. 19 Q As of June 2003, did you 20 have the expertise to be able to design a 21 transmitter that could output a voice 22 call signal? 23 MS. LIEBER: Object to form. 24 A You mean over data? I said 25 that we did a lot of Wi-Fi calling.	Page 56 1 DR. JACOB SHARONY 2 signals over Wi-Fi? 3 MS. LIEBER: Object to form. 4 A So within the phone, you 5 transmit and receive phone calls. 6 Q So the answer is yes, you 7 had, in fact, done that? 8 A It's not just me. It was a 9 team effort. But I was involved in, in 10 fact, trying to improve -- doing research 11 to improve the number of phone calls that 12 we can do. 13 Q As of June 2003, did you 14 have the expertise to be able to design a 15 transmitter that could output RFID 16 transponder data? 17 A Please rephrase. 18 Q Sure. 19 So as of June 2003, did you 20 have the expertise to be able to design a 21 transmitter that could output RFID 22 transponder data? 23 MS. LIEBER: Object to form. 24 A So design a tag or design a 25 reader or what are you referring to?
Page 55 1 DR. JACOB SHARONY 2 Okay. Let me go back. 3 In the prior history, the 4 phone was basically not -- not by 5 history. Why am I saying prior history? 6 Let's say like 20 years ago, so there 7 would be more analog in the first 8 generation of cellular. But later, we 9 basically moved into data. 10 So since LTE came and Wi-Fi 11 before, all the voice call would be 12 carryover data. And before that, there 13 would be over digital. But it was not 14 the voice as we know it now. 15 Q So we talked about the 16 devices with Wi-Fi calling. 17 As of June 2003, did you 18 have experience designing a transmitter 19 that could output a voice call signal 20 over Wi-Fi? 21 A Yeah. The whole system, 22 yeah, we dealt with it. 23 Q And as of June 2003, could 24 you have designed communication circuitry 25 that could receive an output voice call	Page 57 1 DR. JACOB SHARONY 2 Q Sure. 3 So did you have the 4 expertise as of June 2003 to be able to 5 design a tag that could output RFID 6 transponder data? 7 A I'm familiar with the 8 technology, with the theory behind it. 9 So it's hypothetical question because 10 there are so many different tags. 11 Q So my question is, as to 12 your expertise, as of June 2003, did you 13 have the expertise to design an RFID tag 14 that could output RFID transponder data? 15 MS. LIEBER: Objection, 16 asked and answered. 17 A As I said, I'm familiar with 18 the technologies, the principle of 19 design. We never designed the tag 20 itself. Tags came from all kind of 21 manufacturers because you need a specific 22 manufacturing. 23 In fact, we bought a company 24 that makes tags. But during that course, 25 we were involved with the antennas and

15 (Pages 54 - 57)

Page 58 1 DR. JACOB SHARONY 2 how it works. 3 Q Did you ever design a system 4 that transmitted RFID tag information, 5 using an antenna? 6 A I did not design. But I'm 7 familiar with what's happening between 8 the reader and the tag. 9 Q So as of June 2003, were you 10 aware of any RFID tag information being 11 transmitted using an antenna? 12 MS. LIEBER: Objection, 13 scope. 14 A Must have been antenna in 15 general because it's called RF. For RF, 16 you need an antenna. 17 Q That's true both on the 18 transmitting and on the receiving side; 19 right? 20 A Correct. 21 Q I want to ask you about some 22 of your colleagues at Motorola. 23 A Sure, if I remember. 24 Q Sure. Motorola is a big 25 company.	Page 60 1 DR. JACOB SHARONY 2 part of your work at Motorola; right? 3 A No. I don't think Motorola 4 did that at that time. 5 Q Or if they did, you just 6 didn't know about it; right? 7 A It's a big company. So I 8 don't know. 9 Q So fair to say while you 10 were at Motorola, you didn't work on 11 smart cards in cell phones; right? 12 A No. 13 Q And the same is true at 14 Symbol? You didn't work on RFID smart 15 cards in cell phones while you worked at 16 Symbol; right? 17 A When you say smart card in 18 cell phone, what do you mean? 19 Q RFID smart cards, for 20 example, that could be preloaded with 21 cash or cash equivalent. 22 A No. There was no smart 23 cards, no. 24 Q That you worked on; correct? 25 A Right. You said within cell
Page 59 1 DR. JACOB SHARONY 2 So there's plenty of people 3 you may not have known or may not 4 remember. 5 A Right. 6 Q So are you familiar with an 7 individual named Eric Le Roy Krenz? 8 A No. 9 Q What about Rachid Alameh? 10 A No. 11 Q Are you familiar with an 12 individual named Thomas Michael Fox? 13 A No. 14 Q Are you familiar with 15 Motorola's work on RFID for smart cards 16 in connection with a cell phone from 17 around 1999? 18 A No. 19 Q Are you familiar with 20 Motorola's work on RFID for smart cards 21 in connection with a cell phone from 22 around 1997? 23 A No. 24 Q So the RFID smart cards with 25 cell phones at Motorola, that was never	Page 61 1 DR. JACOB SHARONY 2 phone, meaning integrating it inside the 3 phone? 4 Q Correct. 5 A No. 6 Q And you're not aware of any 7 work related to smart cards in a cell 8 phone in the 1990s; right? 9 MS. LIEBER: Objection, 10 scope. 11 A No. I think this came 12 later, much later. 13 Q Let's go back to Exhibit 3. 14 That's the '984 patent. 15 A Yes. 16 Q And if I could have you turn 17 back to Claim 13. 18 A Yes. 19 Q I want to get your 20 understanding about what the inventors of 21 the '984 patent invented; okay? 22 A Sure. 23 Q So as a person of at least 24 ordinary skill in the art and likely 25 higher skill in the art as of June 2003,

16 (Pages 58 - 61)

Page 62 1 DR. JACOB SHARONY 2 you're familiar with the state of the art 3 as of 2003; right? 4 MS. LIEBER: Objection, 5 scope. 6 A Right. 7 Q And you're familiar with the 8 components recited in the claims of the 9 asserted patents; right? 10 A Yes. 11 Q There aren't any elements, 12 for example, in Claim 13 that you're 13 looking at now, the '984 patent, where 14 you didn't know what the element was or 15 what the claim language meant; right? 16 A Well, first, it's very 17 small. And this will not help because -- 18 wrong side. Let me read it and see 19 what's going on. 20 Q Sure. 21 A Okay. So what is your 22 question? 23 Q So I wanted to make sure 24 that there aren't any claim elements in 25 Claim 13 of the '984 patent that you	Page 64 1 DR. JACOB SHARONY 2 that. 3 Q Why? 4 A Because there was no RFID 5 that would output a signal in response to 6 receiving a signal, let alone integrated 7 together in a phone with a voice 8 capability. 9 Q So when an RFID reader reads 10 an RFID tag, is that not an RFID 11 transponder outputting a signal in 12 response to receiving a signal from the 13 RFID reader? 14 A If you take an RFID reader 15 and a tag, if you basically shine the tag 16 or energize the tag, it will respond. 17 Q So a reader energizing an 18 RFID transponder is an RFID reader 19 sending a signal to the transponder and 20 receiving an RFID transponder signal 21 back; right? 22 A That is correct. But this 23 is not what described in the 13. 24 Q Why is that not what's 25 described in 13?
Page 63 1 DR. JACOB SHARONY 2 didn't understand what the claim language 3 was or that you weren't familiar with. 4 A Me, POSITA, and when? 5 Q As of 2003. 6 A Okay. 7 MS. LIEBER: I'm going to 8 object to the extent that it calls 9 for a legal conclusion. 10 A So I mentioned in 2003, this 11 was not something that -- that was done 12 before or -- yes. RFID is RFID, and 13 voice call is voice call. But the 14 combination and outputting a signal was 15 not something that was known or used. 16 Q So let's go element by 17 element. I want to start with a 18 switchable mobile communications device. 19 Taking that along, 20 switchable mobile communications devices 21 existed as of June 2003; right? 22 MS. LIEBER: Object to form. 23 A I don't quite agree with 24 you. Why you say that? Because I said 25 that there was no -- no. I disagree with	Page 65 1 DR. JACOB SHARONY 2 A Because we are talking about 3 within one device, within a mobile device 4 that you switch between two state. One 5 is a voice call, one is reading an RFID, 6 outputting, yeah, reading an RFID where 7 the phone really emulate the tag. 8 So this is missing. This is 9 not something that you would have a 10 device that can make a phone call and can 11 be read as an RFID tag. There were no 12 such a thing. 13 Q You mentioned switching 14 between an RFID state and a voice call 15 state. 16 Does that mean that it's 17 doing either, RFID or a voice call, or 18 could it be doing both at the same time 19 if it's switching between them? 20 A Could be all the above, 21 meaning, it's, A -- let's say A is a 22 phone call; B is the RFID tag. So it 23 could be A or B or A and B. 24 Q If it was A and B, would 25 that mean that the Circuit A is

Page 66 1 DR. JACOB SHARONY 2 independently switchable from Circuit B? 3 A So here, you have like -- 4 there is nothing that says either-or. So 5 you can have A, you can have B, you can 6 have A and B. I think these are all the 7 possibilities. 8 Q So if I had a cell phone in 9 1999 and I made a phone call, that's a 10 switchable mobile communication device 11 capable of outputting a voice call 12 signal; right? 13 MS. LIEBER: Object to form 14 and scope. 15 A When you say switchable, 16 what is the other state? Just describe 17 the A. 18 Q So one state would be making 19 a call, and the other state would not be 20 making a phone call. 21 MS. LIEBER: Same objection. 22 A So this is completely 23 different from here because you have a 24 different -- they are talking about 25 different state.	Page 68 1 DR. JACOB SHARONY 2 patent? 3 A It's not a third state. 4 It's basically keeping A and B. I mean 5 there is nothing in the claim or the 6 specification that would say that it's 7 mutually exclusive. I think in one of 8 the -- if I recall correctly from the 9 file history of the '947, the examiner 10 also said that it's not mutually 11 exclusive. 12 Q So if a mobile communication 13 device has the ability to output RFID 14 transponder data and has the ability to 15 output a voice call signal, then in your 16 opinion, it would be a switchable mobile 17 communication device within the meaning 18 of the claim here? 19 A So it has the capability to 20 have a voice call and the capability to 21 have an RFID being read. So what is your 22 question? Is it what? 23 Q So to meet this switchable 24 element, it's not required that the 25 device switch between a first and a
Page 67 1 DR. JACOB SHARONY 2 Q Right. 3 There's the element first 4 state and second state in the claim; 5 right? 6 A Yeah. They refer to a first 7 state and a second state. 8 Q And first state is 9 outputting RFID transponder data in a 10 format compatible with said RFID reader; 11 right? 12 A I'm sorry. Where are you 13 reading now? Also Claim 13? 14 Q Yes. After first state. 15 A The first state RFID and the 16 second state, a voice call, yes. So what 17 is your question? 18 Q So you're talking about 19 changing states. 20 What state would it be if it 21 was doing both RFID and a voice call at 22 the same time? 23 A A and B. 24 Q Is that a third state? How 25 would you describe that in terms of the	Page 69 1 DR. JACOB SHARONY 2 second state; it just needs to be capable 3 of doing either or both of the first and 4 second state; right? 5 A Either-or both. Either-or 6 or both. 7 Q And just to clarify on the 8 first part of my last question, this 9 switchable element doesn't require 10 switching between RFID and voice call 11 signal output; right? 12 A So the way I looked at it is 13 the following. You have one state that 14 you can enable it and another state that 15 you can also enable or disable. So when 16 both of them are enabled, it will be both 17 A and B. 18 Q So I was asking earlier 19 about a cell phone that has a voice 20 calling state that you can enable or 21 disable. 22 So in that case, would a 23 cell phone that has a voice calling state 24 that you can enable or disable be a 25 switchable mobile communication device?

Page 70 1 DR. JACOB SHARONY 2 MS. LIEBER: Object to form. 3 A It's a different context. 4 Q In the context I'm asking. 5 A In the context of the '984 6 patent, it is not because they basically 7 describe the state, the word switch. 8 This is also a switch, can put it on and 9 off. But in that context, a phone that 10 you can switch it on or switch it off, 11 it's not in this context. That's what 12 they are -- they are not referring to 13 that. 14 Q So in the patent claims, 15 switchable means you can switch on and 16 off the first state, independently of 17 switching on and off the second state; 18 right? 19 A There is no switch there. 20 It's either there or not, like, for 21 example, I can do something with the 22 phone. And then a phone call comes in. 23 So I didn't do anything to switch or 24 something. It just -- because the cell 25 phone is always connected to the tower.	Page 72 1 DR. JACOB SHARONY 2 second state, they call it, or in the 3 first without RFID. So these are 4 basically the two states that are 5 basically described here. 6 Q So switchable does not mean, 7 in your opinion, switching between the 8 first state and second state; right? 9 A You are describing either-or 10 by saying that. We said it's not 11 either-or, not mutually exclusive. 12 Q So is the answer to my 13 question, yes, switchable does not mean 14 in your opinion that switching between 15 the first state and second state? 16 MS. LIEBER: Object to form, 17 asked and answered. 18 A In this context, they refer 19 to -- the word between basically said, 20 you know, you sort of shut off the other 21 one, and you kind of enable the other 22 one. This is not what is referred to 23 here. You can have, you know, either-or 24 or both. I don't know if I can give you 25 an example from another field.
Page 71 1 DR. JACOB SHARONY 2 So it just tells you, you can be in, you 3 know, what we use with the A, B or A and 4 B. So you can, for example -- you know, 5 going back to daily life application, you 6 can pay in CVS, for example, and a phone 7 call can come. So it doesn't mean that 8 you cannot do both at the same time. 9 Q You're talking about in the 10 accused product with your iPhone? 11 A For example. 12 Q So I'm still trying to 13 understand the switchable element and 14 your opinion about what it means. 15 So it doesn't mean that you 16 have to switch between the first state 17 and the second state. It means that you 18 can independently switch on and off the 19 first state or independently switch on 20 and off the second state, such that they 21 could both be off or both be on or some 22 other combination; right? 23 MS. LIEBER: Object to form. 24 A The claim basically says 25 that you can be with the phone call, the	Page 73 1 DR. JACOB SHARONY 2 I think about like two 3 garden hoses that basically bring water. 4 So you could have one bringing from, you 5 know, the left side, one bringing from 6 the other side. You can switch between 7 them, if you want, or keep them both 8 open. So when they are both open, it's 9 like the A and B. So according to this 10 context, it doesn't say -- the word 11 between is more suggesting either-or. 12 Q Right. 13 You could have one garden 14 hose on or off, independently of the 15 other garden hose; right? 16 A What do you mean 17 independently? 18 Q You can turn the left garden 19 hose on and off? 20 A It's not one-to-one. But 21 this is just to give you a scenario where 22 you have a one or the other or both. So 23 both of them are on. So they are coming. 24 Same here. You have -- you do something 25 with RFID, phone calls comes or you

Page 74 1 DR. JACOB SHARONY 2 already on the phone, and you talk. When 3 I say talk, transmit, receive. When we 4 talk, there is transmit and receive. And 5 you can do -- so let's say you go to -- 6 to a U2 concert in this sphere and you 7 are talking with someone, but you have to 8 enter, so they have to take it and 9 basically scan your pass, for example. 10 So both of them can happen at the same 11 time. 12 If you were in a different 13 location, you just make a phone call. 14 That's a phone call or forget the phone 15 call. You are basically just doing -- 16 reading something. Again, you enter to 17 the concert without a phone call. So 18 it's not mutually exclusive. It's not 19 between. 20 Q So in the patent itself, 21 switchable means that the first state 22 RFID can turn on and off, and the second 23 state, voice call signals, can turn on 24 and off; right? 25 A When you say turn on and	Page 76 1 DR. JACOB SHARONY 2 them both. So if you wanted just, you 3 know, to limit it or narrow it to 4 either-or, you have to write it in the 5 specification of the claims. I don't see 6 at the moment, an example that -- looking 7 at Figure 4, I don't see a reason why you 8 cannot enter them both. 9 Q Why do you say that? 10 A Because, again, it's just an 11 embodiment. But they're separating on 12 different frequencies. So they don't 13 interfere with each other. 14 Q The Switch 420 in Figure 4 15 in this embodiment, is that what makes 16 this embodiment switchable? 17 MS. LIEBER: Object to form. 18 A I don't see -- where do you 19 see a switch? 20 Q Item 420 in Figure 4. 21 A 420? 22 Q Correct. 23 A This is just the antenna. 24 Q Item 420 is the antenna? 25 A You switch between the
Page 75 1 DR. JACOB SHARONY 2 off, there is not turning on and off. 3 The phone call is talking to the tower 4 all the time. So you don't need to do 5 anything. Same with the RFID. I don't 6 think the phrase turning on and off is 7 the right description. 8 Q Are there any examples in 9 the specification of the asserted patents 10 of transmitting RFID transponder data and 11 a voice call signal at the same time? 12 A You mean -- what do you mean 13 if there is an embodiment that describe 14 both situation? 15 Q An embodiment or any other 16 statement, indicating that the RFID and 17 voice call signals can be transmitted 18 from the mobile communication device at 19 the same time. 20 A Well, there is nothing that 21 says that they cannot. 22 Q Is there anything that says 23 that they can? 24 A I'm looking. There is 25 nothing that says that you cannot have	Page 77 1 DR. JACOB SHARONY 2 receive or transmit antenna. We usually 3 use the same antenna. 4 Q So I want to look at your 5 declaration again. 6 A Okay. 7 Q Paragraph 35. 8 A Paragraph 35. Okay. 9 Q So you see that it says, 10 "The '984 and '974 patents share a common 11 specification and generally relate to 12 mobile communications device with 13 transceiver infrastructure configured to 14 perform both RFID tag emulation and 15 telephony. The claims of the '984 and 16 '974 patents cover specific improvements 17 in RFID technology that go beyond what 18 was well-understood, routine and 19 conventional in the field of the art." 20 Do you see that? 21 A Yes. 22 Q What specific improvements 23 are you referring to in the claims? 24 A The many improvement. I 25 think we see it every day with one

20 (Pages 74 - 77)

Page 78 1 DR. JACOB SHARONY 2 device, I can -- basically, I don't have 3 to carry multiple credit cards. I have 4 everything on the phone; could be a pass 5 or key. Sometime you go to hotel, you 6 know, they give you an electronic key. 7 So it's convenience. And I 8 think people like it because they use it. 9 I know I use it. I see other people also 10 use it. So this was not before. 11 Q And looking at Claim 13, 12 what in Claim 13 provides that multiple 13 credit card improvement? 14 MS. LIEBER: Object to form 15 and scope. 16 A It is enabled by -- the 17 claim does not go against that, you know. 18 It allows it because you have an RFID 19 capability there and the phone call. And 20 you can basically dress this RFID with 21 different credit cards. It's not 22 specific in the claim. But it basically 23 does not preclude or exclude these 24 capability. 25 Q So this multiple credit card	Page 80 1 DR. JACOB SHARONY 2 and it output only data from that one 3 preloaded card, would that still be 4 within the scope of this claim or do you 5 need to have multiple credit cards? 6 A Anything, one, zero or many. 7 Q So there's nothing in this 8 claim that necessarily results in the 9 multiple credit card improvement you 10 mentioned a moment ago; right? 11 MS. LIEBER: Objection, 12 asked and answered. 13 A As I said, what you are 14 looking is more like a narrow, kind of 15 narrowing it. You can do it, you know, 16 in a dependent claim. But this is broad 17 to include, you know, any number of 18 credit card or pass. 19 Q So Claim 13 doesn't 20 necessarily result in the multiple credit 21 card improvement; right? 22 MS. LIEBER: Objection, 23 asked and answered. 24 A It supports any number of 25 cards.
Page 79 1 DR. JACOB SHARONY 2 improvement is possible in light of the 3 claims but not required by the claims; 4 right? 5 MS. LIEBER: Object to form. 6 A I mean, again, in the 7 context of the specification, I mean it 8 is described. I mean that's the whole 9 title of the patent, is the tag 10 emulation. And the emulations because 11 it's -- remember the isolated tags that 12 you could have multiple tags or multiple. 13 Here, you have the possibility to 14 basically have the tag being different 15 credit card or different -- because it's 16 part of the electronics because the 17 antenna just, you know, send or receive. 18 But it depends on what it is fed with. 19 So there is nothing that 20 exclude it. It basically says that you 21 output an RFID signal or data in response 22 to a probing signal or when you are 23 within the field of external reader. 24 Q So if you just had one 25 preloaded cash card on your mobile device	Page 81 1 DR. JACOB SHARONY 2 Q So besides the ability to 3 have multiple cards on, for example, a 4 phone, were there any other specific 5 improvements in RFID technology that 6 result from or necessarily present in 7 these claims? 8 A Look, there could be even 9 application that were not invented yet. 10 It is just telling you, you can make a 11 phone call, and you can have an RFID that 12 would respond. So you can have many more 13 applications, you know, that comes down 14 the line or services that would kind fall 15 under it. 16 Q So the improvement that you 17 referred to a moment ago, the multiple 18 credit cards, what did the inventors of 19 the '984 patent contribute to make that 20 possible? 21 MS. LIEBER: Object to form 22 and scope. 23 A So first, it's not only 24 multiple credit card. It's really making 25 a mobile device be or seen as a tag

Page 82 1 DR. JACOB SHARONY 2 within the mobile device. That can have 3 also phone calls. And, again, it's not 4 limited just to credit cards; could be 5 making, you know, the mobile device 6 behave like a tag. And there could be 7 endless application; you know, some of 8 them, we will learn in the future. But 9 these are some of the applications that 10 exist today. 11 Q Did the inventors of the 12 '984 patent accomplish that improvement 13 to RFID technology by creating any new 14 hardware? 15 MS. LIEBER: Object to 16 scope, outside the scope. 17 A I cannot answer it. It 18 depend on the implementation. 19 Q Based on what's disclosed in 20 the patent, did the inventors of the '984 21 patent come up with new hardware that 22 makes this multiple credit card or 23 different tag implementation possible? 24 MS. LIEBER: Same objection. 25 A I didn't see something that	Page 84 1 DR. JACOB SHARONY 2 What do you mean they came with a design? 3 I mean if you look at the figure, there 4 is no specific hardware that was -- that 5 is designed to enable it. But it is in 6 the phone. The phone has to basically, 7 as the claim suggests, respond to signal 8 and support the phone call also. 9 Q So focusing in on Claim 13, 10 Claim 13 doesn't require any specific 11 novel hardware to emulate an RFID tag; 12 right? 13 MS. LIEBER: Objection, 14 scope and form. 15 A It depends on the 16 implementation, you know. I cannot say 17 that it does not require a new hardware. 18 Q But can you say that it does 19 require specific novel hardware to 20 emulate an RFID tag? 21 MS. LIEBER: Objection, 22 scope, form, asked and answered. 23 A All the claim says is 24 basically the switchable that we 25 discussed and having the form behave as a
Page 83 1 DR. JACOB SHARONY 2 they came or describe a new hardware, 3 just describes, you know, what is the 4 method or what would be in that phone 5 that will enable it. 6 Q So it's more the idea of 7 being able to use multiple credit cards 8 or different RFID tags in a phone that 9 also does voice calls that they 10 contributed; right? 11 MS. LIEBER: Objection, 12 mischaracterizes. 13 A It's mainly -- the title 14 said it emulate tags, emulate tags, 15 different tags at different time. The 16 emulation of the tag is an important 17 thing together with the mobile device 18 with the phone call. 19 Q So did the inventors of the 20 '984 patent disclose any new hardware 21 that made it possible to emulate tags? 22 MS. LIEBER: Objection, 23 scope, asked and answered. 24 A There is no description or 25 schematics or block tag that I can see.	Page 85 1 DR. JACOB SHARONY 2 tag, monitoring, basically receiving the 3 signal from outside reader and the 4 outputting a signal. That can be in the 5 format of the reader. Obviously, we need 6 hardware here. 7 Q But my question is whether 8 the claim requires like novel hardware 9 that had never been used before to enable 10 this RFID tag emulation. 11 MS. LIEBER: Objection, 12 scope, form, asked and answered. 13 A It does require because if 14 you have just the tag in a reader. So 15 it's isolated, and now you have a phone 16 that just makes phone call. Now you 17 bring not a tag, you have some other 18 components that now has to work, you 19 know, within the phone. So, yes -- 20 listen. 21 If you compare a phone 22 pre 2003 --okay?-- it has a different 23 hardware than a phone today, not today, 24 but, you know, a couple of years ago or 25 more that do both or basically that

Page 86 1 DR. JACOB SHARONY 2 conform to 13, definitely changes in 3 hardware. 4 Q So what changes in hardware 5 are required in Claim 13 specifically? 6 MS. LIEBER: Objection, 7 outside the scope. 8 A Well, you need to include 9 RFID capability that would behave like a 10 tag and be controlled through a process, 11 for example, and also supporting the 12 phone call, you know. 13 Q So you need specific 14 hardware that can provide RFID capability 15 and behave like a tag; that's the 16 hardware improvement required in Claim 17 13? 18 MS. LIEBER: Object, to the 19 extent it calls for a legal 20 conclusion, object to form, outside 21 the scope, asked and answered. 22 A I said you do need -- if you 23 take just a phone that makes phone calls 24 and just -- you have on the side a reader 25 that read a tag on the table, now you	Page 88 1 DR. JACOB SHARONY 2 behave like a tag. 3 Q So what changed about 4 hardware that allowed the phone to behave 5 like a tag? 6 MS. LIEBER: Objection, 7 scope. 8 A The whole -- the whole RFID 9 component that basically give you the 10 capability in the phone. 11 Q Is there an example of that 12 RFID component that gives you the 13 capability in the phone in the 14 specification of the '984 patent that you 15 can point me to? 16 A Well, you saw that you have 17 an RFID -- I think Figure 1 basically 18 describe. So you see RFID emulation, 19 hardware, software and in mobile 20 communication, hardware, software. 21 Q Right. 22 And there's a Box 106 that's 23 RFID emulation, hardware, software 24 elements; right? 25 A Yes.
Page 87 1 DR. JACOB SHARONY 2 have to integrate it together. So you 3 need hardware that would support both in 4 the -- yeah. So you do need new 5 hardware. 6 Q And so what specifically did 7 the '984 patent inventors change or add 8 to what was known about hardware in the 9 '984 patent to make this possible? 10 A It's a different hardware 11 because now you have, for example, an 12 RFID capability or component that 13 basically work together side by side with 14 a phone call. And this claim enables 15 because now, it is not isolated. You can 16 do anything with this RFID. 17 And we all know that. You 18 can have it exchanging a business card 19 with a friend or a colleague. You can 20 read yourself, what is smart, like even 21 in a museum, you can read the picture and 22 get some information about the Mona Lisa, 23 for example, or you can use it for these 24 payment. So Claim 13 basically requires 25 that you will be able to have this phone	Page 89 1 DR. JACOB SHARONY 2 Q So what's different in that 3 Box 106 from circuits that existed before 4 the '984 patent? 5 MS. LIEBER: Objection, 6 scope. 7 A Before, you had a reader 8 that will read the tag. It's not tag 9 emulation, for example. 10 Q So is there a particular 11 configuration of circuit elements that 12 suddenly made RFID tag emulation possible 13 that's disclosed in this patent? 14 MS. LIEBER: Objection, 15 outside the scope. 16 A Well, it says tag emulation. 17 So meaning it's not a tag that you see, 18 but basically, the phone becomes or 19 behave like a tag. 20 Now, with the electronics 21 and the processing, you can dress it with 22 different type of information. So they 23 have the flexibility. It's not like you 24 have -- it's not isolated. So, you know, 25 if it's isolated, you really cannot do

Page 90 1 DR. JACOB SHARONY 2 much. The tag has its own identity. And 3 you cannot add more electronics to it to 4 let it, you know, send or -- send 5 information as you like. It is -- this 6 open a door to support many application, 7 existing and future. 8 Q So I see the Box 106 in 9 Figure 1, and I see the words RFID, 10 emulation, hardware, software elements. 11 And what I'm wondering is if 12 there's any more detail in the '984 13 patent that tells you what is in that Box 14 106 that suddenly makes RFID emulation 15 possible where it wasn't before. 16 MS. LIEBER: Objection, 17 scope; objection, calls for a legal 18 conclusion. 19 A So let's go to Figure 1. I 20 don't know what you are looking for, for 21 a schematic, diagram. It just tells you 22 what -- and these are embodiments that 23 just basically examples. 24 Q But your testimony is that 25 this patent made RFID emulation in a	Page 92 1 DR. JACOB SHARONY 2 the tag emulation. The phone will not 3 talk unless it receives certain signals. 4 Well, first, it has to be energized. But 5 unless it received the command from an 6 external device. 7 Q So receiving a probing 8 signal and sending a response is a little 9 bit different idea than the broader idea 10 of RFID emulation in general; right? 11 A No. It's the same. The 12 phone is being capable of doing it. To 13 be able to emulate a tag, you need to 14 basically receive a signal and respond 15 accordingly. And the phone is doing it 16 now. And you can send all kind of 17 information that could be -- that you 18 desire, depending on the application. 19 Q So your testimony is that 20 the '984 patent made it possible to 21 emulate an RFID tag where that was not 22 possible before the '984 patent; right? 23 A In a phone and supporting 24 phone calls at the same time. 25 Q And so what I've been trying
Page 91 1 DR. JACOB SHARONY 2 mobile device possible; right? 3 A Yeah. RFID emulation. But, 4 for example, look in Figure 7 through the 5 flowchart, you see that give you 6 different options. So you have a list of 7 RFID options. It gives what kind of an 8 input it is. 9 Q So I'm trying to understand 10 what from this patent made it possible to 11 emulate an RFID tag where it wasn't 12 possible before. 13 And I believe you said that 14 there's hardware that made it possible to 15 emulate an RFID tag disclosed in this 16 patent where it wasn't possible before. 17 Am I recalling that correctly? 18 MS. LIEBER: Object to form 19 and scope. 20 A Maybe I don't understand the 21 question. So the claim basically 22 described the RFID capability to 23 basically you don't do anything before 24 you hear someone. This is not the case 25 in general in RFID. It's that part of	Page 93 1 DR. JACOB SHARONY 2 to get at is what hardware or software, 3 if it's disclosed, allowed this RFID 4 emulation where previously before the 5 '984 patent, RFID emulation was not 6 possible? 7 MS. LIEBER: Objection, 8 scope. 9 A So if it was not in the 10 phone now, you have to interact with the 11 user interface and select, for example, a 12 credit card or select things that you 13 want to basically transmit back to an 14 external device. 15 Q So sorry. I'm not sure if 16 that was an answer to my question. 17 My question's about what 18 hardware or software is disclosed in the 19 '984 patent that made it possible to 20 emulate RFID tags. 21 MS. LIEBER: Objection, 22 scope, asked and answered. 23 A So one example is like 24 Figure 7, if you go to Column 8, line -- 25 starting line 36. So it describes

Page 94 1 DR. JACOB SHARONY 2 software that you will need. And this 3 goes with the hardware in order to 4 basically manage the inputs and outputs. 5 For example, on 41, it says on receipt of 6 a user input/request, support Logic 322, 7 determines the nature of the input 8 request, Block 706 taking into the 9 context, the portion of the user 10 interface being displayed and with which 11 user just interacted in submitting the 12 input, output. This was never before 13 when you had the isolated thing of a 14 reader and a tag on a table. 15 Q And are the steps recited -- 16 you were reading from Column 8, line 41 17 to 45 -- in the '984 patent; right? 18 A For example, yeah. 19 Q Now, the steps recited in 20 Column 8, line 41 to 45 of the '984 21 patent, are those steps required in Claim 22 13? 23 MS. LIEBER: Object to form 24 and scope. 25 A This is an example. So you	Page 96 1 DR. JACOB SHARONY 2 you have the old user interface that the 3 user interact with. So you need 4 something behind it. There is 5 processing, user interface, logic. 6 Q So the logic that allows 7 selection of which RFID tag to output 8 transponder data from, that is the 9 hardware that is new in the '984 patent 10 that allows RFID tag emulation; right? 11 MS. LIEBER: Objection, 12 mischaracterizes, outside the scope. 13 A We said you need also, the 14 hardware piece, the RFID component that 15 would behave like a tag. It can behave 16 in other modes as well. But we are 17 interested in the tag emulation. 18 Q So what was different about 19 the hardware piece that allows it to 20 behave as a tag from what existed before 21 the '984 patent? 22 A Mainly before, it was 23 reading or writing into the tag. 24 Q So I understand that's what 25 it does.
Page 95 1 DR. JACOB SHARONY 2 don't need to read it into the claim. 3 Q And so far, tell me if I'm 4 wrong, but you have not pointed me to 5 hardware elements that were new or 6 different that allowed this RFID 7 emulation; right? 8 MS. LIEBER: Objection, 9 mischaracterizes the scope. 10 A I think it's incorrect 11 because they are talking about the logic 12 that does functions. 13 Q So how -- 14 A -- for example, in this 15 specific. 16 Q And what's different about 17 that logic than logic that existed before 18 the '984 patent? 19 MS. LIEBER: Object to 20 scope. 21 A Because now you have to 22 select specific tag or RFID tag that you 23 want to emulate and send. So it's new, 24 bringing this capability to a mobile 25 device that can do also phone calls. So	Page 97 1 DR. JACOB SHARONY 2 But as a hardware element, 3 what was different about the hardware 4 element, structurally? 5 MS. LIEBER: Objection, 6 scope, asked and answered. 7 A So it's the whole firmware 8 and software that basically tells the 9 device that now you have to behave not 10 like a reader. You have to behave like a 11 tag. 12 Q And where is that firmware 13 and software described in the '984 14 patent? 15 MS. LIEBER: Objection, 16 scope. 17 A Well, they talk about the 18 logic and the software. And also 19 Figure 1, it tells you that there is -- 20 if you don't tell it to behave like a 21 tag, how does the form would know if 22 maybe we just operate like a reader or 23 something. 24 Look, I know that you are 25 asking about the hardware. But it's a

25 (Pages 94 - 97)

Page 98 1 DR. JACOB SHARONY 2 radio wave. So you have the antenna. 3 Q So if you read this patent 4 specification in June 2003, would you be 5 able to go and then design a circuit that 6 could emulate RFID based on the 7 information in this patent specification? 8 MS. LIEBER: Objection, way 9 outside the scope of his declaration, 10 calls for a legal conclusion. 11 A I haven't considered that. 12 So I don't know if I can answer this 13 question. 14 Q You don't know if you would 15 have been able to design such a circuit 16 based on the disclosure in this patent? 17 MS. LIEBER: Same objection. 18 A No. The disclosure does 19 mention what you want to do. But using 20 existing, you know, phone capability, we 21 don't need to invent this. But with the 22 RFID, I would basically take an RFID -- 23 we are not going to put tags there. I 24 will take an RFID controller, and I 25 basically would be able to feed this RFID	Page 100 1 DR. JACOB SHARONY 2 response signal. So there would be a 3 response signal. So it go through these 4 processor. He sees what's in the 5 response, and he basically send it back. 6 Q Did the inventors of the 7 '984 patent invent RFID controllers? 8 MS. LIEBER: Objection, 9 scope, form, vague. 10 A They didn't invent RFID in 11 general. But later controllers that were 12 available in the market basically 13 supported these capability because before 14 that, there was just tags. And you would 15 embed them into employee cards or credit 16 cards. So we know how it works; right? 17 You have to energize it. And then it 18 basically respond. So now, oh, wow, we 19 can now put it inside the phone together 20 with phone calls which is new. 21 So that's how the market 22 evolved. And now they are making these 23 controllers and embed them or integrate 24 them inside the phones. 25 Q So my question is different
Page 99 1 DR. JACOB SHARONY 2 with different -- depending on the 3 application, like in this example, 4 different cards. And when basically it 5 is energized, it would output these -- 6 this information to the other side. So 7 you do need an RFID controller. And 8 these are -- a POSITA would know how to 9 basically design this. 10 Q Is that because RFID 11 controllers were already known in the art 12 as of June 2003? 13 MS. LIEBER: Objection, 14 calls for a legal conclusion, outside 15 the scope. 16 A I haven't considered this. 17 But what's an RFID controller, you have 18 an antenna, which is the coil. We know 19 the frequency with which it works. It 20 basically feeds into a processor, small 21 processor. Then you basically write the 22 software. First, you are energized by 23 the signal, by the field. And then you 24 sort of run through a logic that tells 25 you, you wait to get basically, a	Page 101 1 DR. JACOB SHARONY 2 than that. 3 My question is, did the 4 inventors of the '984 patent invent RFID 5 controllers? 6 MS. LIEBER: Objection, 7 scope, form, vague, asked and 8 answered. 9 A Well, it chose, you know, an 10 antenna, a processor, you know, the DSP 11 or signal processing. So it basically 12 described some of the components and 13 basically -- and the logic that we looked 14 at before. 15 And would a POSITA be able 16 to design it? Yes, because it is the 17 hardware of just the reading or 18 responding just an antenna and some 19 circuitry. And then basically, you have 20 a processor. 21 Q So my question isn't whether 22 the inventors implemented an RFID 23 controller. My question is whether the 24 inventors invented RFID controllers in 25 total.

Page 102 1 DR. JACOB SHARONY 2 Did RFID controllers exist 3 before the '984 patent? 4 MS. LIEBER: Objection, 5 outside the scope, objection to form. 6 A You have to define what is 7 controller. I don't know what's the 8 scope because I mentioned you had a 9 reader and a tag. So in that little tag, 10 is there a controller? There is circuits 11 that tell it when you receive a signal, a 12 probing signal, you have to respond. 13 So this existed. It went on 14 a tag. But the tag, I don't know if you 15 saw an RFID tag, it's like a square 16 millimeter. It's very small. There is 17 no much smarts there. You basically know 18 how to receive and send back. And now 19 you have to put it into the phone. And 20 there are new capabilities that it is not 21 limited to only one, an example, credit 22 card or one pass. Now you have to 23 basically have multiple -- multiple -- 24 and like Figure 6B, it shows you exactly, 25 different application. You have a car,	Page 104 1 DR. JACOB SHARONY 2 THE VIDEOGRAPHER: We are 3 back on the record. The time on the 4 video monitor is 1:57 p.m. This 5 starts Media 3. 6 Q Welcome back, Dr. Sharony. 7 A Hi. 8 Q Did you discuss the 9 substance of your testimony with counsel 10 during the last break? 11 A No. 12 Q Before the break, we were 13 talking about what the inventors invented 14 in the '984 patent. Do you recall that? 15 A Yes. 16 Q I'm wondering if you could 17 just tell me in your own words what it is 18 that the inventors invented. 19 MS. LIEBER: I'm going to 20 object to this question as outside 21 the scope and a standing objection 22 for this entire line of questioning 23 as outside the scope of his 24 declaration. 25 A Yeah. So I basically
Page 103 1 DR. JACOB SHARONY 2 front door, officer, driver's license. 3 So you have now to basically have a 4 processor that would support this and 5 feed it through the, you know, RFID 6 radio. 7 Q So your testimony is that 8 the '984 patent inventors invented a new 9 processor that made RFID emulation 10 possible? 11 MS. LIEBER: Objection, 12 mischaracterizes, outside the scope. 13 A Not necessarily a new 14 processor. But a processor that also 15 shared with the other components in the 16 mobile device that basically support this 17 functionality. So this functionality was 18 not before. 19 MR. SCHARN: Should we take 20 our lunch break? 21 THE VIDEOGRAPHER: The time 22 on the video monitor is 12:48 p.m. 23 We're off the record. This ends 24 Media 2. 25 (A lunch recess was taken.)	Page 105 1 DR. JACOB SHARONY 2 mentioned I haven't discussed it in my 3 declaration as you know. But I'll answer 4 your question. 5 Basically, having the whole 6 new set of -- enabling a whole new set of 7 applications in a mobile device that has 8 the legacy voice capability with the RFID 9 capability, they are integrated together. 10 And that's basically, you know, in a 11 nutshell what we see here. 12 And now when I say RFID, I 13 should be more specific. It's all these 14 tag emulation that is captured in the 15 title as I mentioned. It's something 16 that was not -- was not done before. 17 Q So is it your opinion that 18 tag emulation is required by the claims 19 of the '984 patent? 20 MS. LIEBER: Object to form. 21 A Well, you see that the 22 claims, the mobile device become sort of 23 the passive device in a sense that it 24 basically receives a probing or -- a 25 probing signal, and then it responds.

Page 106 1 DR. JACOB SHARONY 2 Q Can you tell me what does 3 RFID tag emulation mean? 4 A So as the word emulation, 5 what emulation means, emulation basically 6 tells you that the specific device can 7 take a role of another object or 8 function. 9 So up until then, you would 10 have all kind of cards, smart cards, tags 11 that there were isolated devices or 12 products, components. And now you 13 basically made the mobile device behaves 14 like a tag. So it's not -- you know, if 15 you look at it, it's not a tag. But it 16 behaves like a tag. So this is -- that's 17 what we call tag emulation. 18 Q So if you had a mobile 19 device that had the voice calling 20 capabilities like a typical mobile device 21 and then it also had an actual RFID tag, 22 not an emulated one, but an actual RFID 23 tag, could that still meet the elements 24 of Claim 13 of the '984 patent? 25 A No.	Page 108 1 DR. JACOB SHARONY 2 So you ask what's in the claim. So if 3 you have like the cover, it would fall on 4 the -- 5 Q Let me break this down a 6 bit. 7 So the word emulation is in 8 the title of the patent; right? 9 A Correct. 10 Q Emulated radio frequency 11 identification. 12 But the word emulation or 13 emulated is not specifically recited in 14 Claim 13; right? 15 A Yeah. But the POSITA would 16 understand that this is emulation of a 17 tag because what we said emulation, it's 18 something like an object. 19 Let me give you an example. 20 What would be a good example? It's a 21 device when you look at it or the 22 conventional device, doesn't look like a 23 tag, doesn't behave like a tag. It's a 24 telephone or making phone calls. We know 25 how a tag looks like before that it is
Page 107 1 DR. JACOB SHARONY 2 Q And why not? 3 A Well, in fact, one of the -- 4 during the prosecution, this came in 5 Zalewsky, and I think it's kind of a 6 cover that you put on a phone. So this 7 is not emulation. It's really a tag. 8 Q So looking specifically at 9 Claim 13, what language in Claim 13 10 limits the claim to emulating RFID? 11 MS. LIEBER: Objection, 12 calls for a legal conclusion. 13 A Could you rephrase, please? 14 Claim 13. 15 Q To make sure I understand -- 16 I think this is a yes-or-no question, but 17 tell me if you can't answer it yes or 18 no -- your opinion is that Claim 13 of 19 the '984 patent requires emulation of 20 RFID; right? 21 A Yeah. Based on what I said 22 before, the phone become a tag which is 23 not -- sorry -- which is not a tag by 24 itself. A tag is -- usually, we know how 25 a tag is. But, okay, please continue.	Page 109 1 DR. JACOB SHARONY 2 integrated into different application, 3 into cards, put on as a label or a 4 sticker. And now the phone is behaving 5 like a tag. So the claim basically talks 6 about a mobile device. 7 How do we know it's a tag? 8 Because it's basically getting a probing 9 signal and responding. So it's not a 10 reader. And it basically behaves like a 11 tag. It's like emulating the 12 functionality of a tag. And because it 13 is now within the mobile device, it opens 14 the door to many application because you 15 can sort of even -- even kind of modify 16 the tag. You have a tag on the table. 17 It's -- you know, you can change maybe 18 something, the memory. But here, that 19 very tag, phone tag can be different 20 credit card, different passes. 21 Basically, you can dress the phone as 22 many object or a key. So that's where 23 the emulation comes. 24 Q So going back to the 25 language of Claim 13, what language in

28 (Pages 106 - 109)

Page 110 1 DR. JACOB SHARONY 2 this claim makes clear that an actual 3 RFID tag is not within the scope of this 4 claim, but an emulated RFID tag is within 5 the scope of this claim? And, again, I'm 6 just asking about the specific language 7 of Claim 13. 8 A Well, it says the mobile 9 device communication, determining 10 proximal presence. So if the tag is just 11 a sticker or a cover, it's not really the 12 mobile device. It's the cover. 13 Q So it's the step of 14 determining proximal presence that tells 15 you that RFID transponder data is limited 16 to emulated RFID transponder data? 17 MS. LIEBER: Objection, 18 mischaracterizes, and calls for a 19 legal conclusion. 20 A It's also the switchable 21 mobile communication. It's not 22 switchable. I believe that's what the 23 examiner also determined by rejecting 24 Zalewsky. You basically ask why Zalewsky 25 is not basically describe what Claim 13	Page 112 1 DR. JACOB SHARONY 2 talking about a method performed from a 3 switchable mobile communication device 4 that is capable of RFID communication and 5 voice. And if you have just an isolated 6 tag. It's like a cover, you know. When 7 you buy a phone, you can buy later covers 8 or switch covers. 9 So it's not -- and all the 10 good reasons that was given by the PTO. 11 Also, I mean it's almost every word there 12 that you can pick, like it talks about a 13 transceiver that output a voice call and 14 RFID signal or data in response to 15 receiving a probing signal. 16 So when you have a cover and 17 non-integrated on a cover, for example, 18 it is not -- it is not part of the 19 transceiver. It's a different object. 20 It's not the same equipment, whereas in 21 the phone itself, you have it inside. So 22 it's part of the transceiver. And that 23 transceiver is -- in functionality has to 24 do with receiving a probing signal and 25 outputting a signal. So a separate tag
Page 111 1 DR. JACOB SHARONY 2 does. This was considered lengthy, I 3 should say, by the PTO. So for the very 4 same reasons. 5 Q So the claim language, 6 switchable and determining proximal 7 presence, that's the claim language that 8 limits Claim 13 to emulated RFID in your 9 opinion? 10 MS. LIEBER: Objection, 11 calls for a legal conclusion, 12 mischaracterizes. 13 A It's also all the 14 monitoring. It's not -- it's the phone 15 that behave like a tag, just the tag. 16 It's isolated electronically from the 17 mobile device. So it's not basically 18 part of the mobile device, yeah. It says 19 from a switchable mobile communication 20 device, comprising. 21 So if the tag, the RFID 22 capability is not integrated or part of 23 the phone itself, then it is not 24 satisfying. I don't see it satisfying 25 anything in these claim because we are	Page 113 1 DR. JACOB SHARONY 2 is not -- is not tag emulation or doesn't 3 satisfy 13, Claim 13. 4 Q So the language that 5 requires tag emulation is all of the 6 language in the claim; is that your 7 testimony? 8 A Well, it's not part of the 9 transceiver, part of the transceiver 10 meaning it has to be electronically 11 coupled to the functionality of the 12 phone. It is not. It is isolated. 13 Q It has to be electronically 14 coupled to be part of the transceiver, 15 the RFID tag? 16 A Well, depends how you 17 interpret the coupled. I mean it's not 18 integrated to the electronics of the 19 device, of the mobile device. 20 Q For example, in Zalewsky, 21 the RFID tag wasn't an electronic 22 communication with the processor as you 23 recall it; right? 24 A It was not part of the 25 transceiver also.

29 (Pages 110 - 113)

Page 114 1 DR. JACOB SHARONY 2 Q Sorry. 3 My question was, the RFID 4 tag in Zalewsky was not an electronic 5 communication with the processor of the 6 cell phone; right? 7 A In Zalewsky? 8 Q Yes. 9 A It's isolated electronically 10 or not integrated. So there is nothing 11 between the electronics of the mobile 12 device and the tag of Zalewsky, yeah. 13 Q So if the RFID tag in 14 Zalewsky were electronically coupled to 15 the processor in the phone in Zalewsky, 16 such that you could reload cash, for 17 example, on to the RFID tag, could it 18 then fall within the scope of these 19 claims? 20 MS. LIEBER: Objection, 21 calls for speculation. 22 A It's not also part of the 23 transceiver. And it's hypothetical. I 24 haven't considered it. How would you do 25 it even?	Page 116 1 DR. JACOB SHARONY 2 of the device. It's on the cover. So it 3 doesn't really satisfy this. 4 Q Let's look at Zalewsky. 5 MR. SCHARN: Mark this as 6 Exhibit 6. 7 (The above-referred-to 8 document was marked as Sharony 9 Exhibit 6 for identification, as of 10 this date.) 11 Q Do you recognize this 12 document, Dr. Sharony? 13 A Yes. 14 Q What? 15 A That's the '981 patents 16 which title Electronic Device Cover with 17 Embedded RFID Transponder and Method of 18 Using the Same. 19 So in this case, we have a 20 phone which basically has a cover. And 21 in the cover, we have an RFID transponder 22 or tag. 23 Q And this is the Zalewsky 24 reference we've been referring to in the 25 last few minutes; right?
Page 115 1 DR. JACOB SHARONY 2 Q Why is it not part of the 3 transceiver in that scenario? 4 A What? 5 Q Why is the RFID tag not part 6 of the transceiver if it's electrically 7 coupled to the processor? 8 A How is it electrically 9 coupled? 10 Q If there were a connection. 11 A You know, if -- what do you 12 mean? Tell me exactly how you do it 13 because I don't think that this is 14 feasible. 15 Q Why isn't that part of the 16 transceiver? 17 MS. LIEBER: Objection, 18 incomplete hypothetical. 19 A It's not -- so the 20 transceiver is -- again, I'm basically 21 quoting the PTO after discussions several 22 times. It said it's the sum total of all 23 the functionality of the transmitting and 24 receiving in the device. I assume you 25 agreed with me before that it's not part	Page 117 1 DR. JACOB SHARONY 2 A Yes. 3 Q And the cover with the RFID 4 tag that you're referring to is depicted 5 in Figure 2B; right? 6 A Yes. 7 Q And the RFID tag is 8 Item 110; right? 9 A Sorry. And? 10 Q Item 110 is the RFID tag? 11 A Yes. 12 Q Now, if instead of being on 13 the cover, that RFID tag were inside the 14 body of the cell phone, would it then 15 meet Claim 13? 16 MS. LIEBER: Objection, 17 incomplete hypothetical, calls for 18 speculation. 19 A Where exactly? I haven't 20 considered this. So you have to explain 21 to me in more detail, what are you 22 referring to? 23 Q Sure. 24 This cover goes on a cell 25 phone; right?

Page 118 1 DR. JACOB SHARONY 2 A Yes. 3 Q And the cell phone 4 presumably would have a housing; right? 5 A Right. 6 Q So if you put the RFID Tag 7 110 inside the housing of that cell 8 phone, would it then meet Claim 13? 9 A It's the same. 10 MS. LIEBER: Same objection. 11 Q How is it the same? 12 A It's completely isolated 13 electronically from the guts of the 14 phone. So you put it on the inside. If 15 it's not a cover, it's just -- it's 16 like -- think about like when you kind of 17 design a phone. It's like an afterward. 18 It's like a sticker or a label that you 19 basically put. 20 Q Now, the reason it wouldn't 21 meet the claim elements is because it's 22 not electronically connected to the guts 23 of the phone; is that your testimony? 24 A It's not part of the mobile 25 device. It's not --	Page 120 1 DR. JACOB SHARONY 2 the cover to share memory with the 3 electronic device." 4 Do you see that? 5 A Yes. 6 Q "In the case of a mobile 7 station, interfacing with the mobile 8 station allows for uploading/downloading 9 of data from wireless networks." 10 Do you see that? 11 A Yes. 12 Q "Thus, digital money or 13 other equivalents, such as digital 14 coupons and the like, can be loaded into 15 the phone for use in an exchange using 16 the RFID transponder equipped Cover 100." 17 Do you see that? 18 A I do. 19 Q "The transponder may also 20 send a coded signal through the registers 21 of MCU to instruct the mobile station to 22 change to a passive mode or even power 23 down." 24 Do you see that? 25 A Yes.
Page 119 1 DR. JACOB SHARONY 2 Q It doesn't talk to the 3 processor, for example? 4 A For example. 5 Q But if it did talk to the 6 processor, would that change your 7 opinion? Would it then be part of the 8 mobile device? 9 MS. LIEBER: Same objection. 10 A I have to see exactly how it 11 is integrated to the electronics. 12 Q Can you turn to -- keep a 13 thumb on Figure 2B -- Column 8, line 40? 14 Let me know when you're there. Are you 15 there? 16 A Yes. 17 Q So Column 8, line 40 18 says, "As was described in Figures 2A and 19 2B, Contacts 180 allow for electrical 20 signal coupling between an electronic 21 device such as Mobile Station 4 in 22 Figure 2A and the Cover 100." 23 Do you see that? 24 A I do. 25 Q And it goes on, "This allows	Page 121 1 DR. JACOB SHARONY 2 Q So this describes the RFID 3 Tag 110 having an electrical connection 4 to the guts of the phone to use your 5 language earlier, via Contacts 180; 6 right? 7 MS. LIEBER: Objection, 8 mischaracterize, outside the scope. 9 A Yeah. But it's still a 10 cover. It's not part of the phone. You 11 basically just connected a wire to the 12 memory. 13 Q So when you latch the cover 14 on to the phone and form an electrical 15 connection to the MCU, which is the 16 master control unit and the memory of the 17 phone, your testimony is that the cover 18 is not then part of the phone? 19 A It's not part of the mobile 20 device. 21 Q Why not? 22 MS. LIEBER: Objection, 23 outside the scope. 24 A It's a cover that you can 25 put on or off or replace it with

31 (Pages 118 - 121)

Page 122 1 DR. JACOB SHARONY 2 something else. 3 Q Well, the battery, you could 4 take in and out or replace it with a 5 different battery; right? 6 MS. LIEBER: Same objection. 7 A But it is not -- as I said, 8 it is not a switchable. 9 Q Why isn't it switchable? 10 MS. LIEBER: Objection, 11 scope, calls for a legal conclusion. 12 A You could, for example -- 13 Q I'll withdraw the question. 14 In one state, the mobile 15 device could make a phone call; right? 16 MS. LIEBER: Objection, 17 form, calls for a legal conclusion. 18 A I have to consider this. 19 And I would like also if you could give 20 me the file history because I'm relying 21 on -- also on this. 22 Q Well, my question is whether 23 the mobile phone in this embodiment we're 24 talking about from Zalewsky in one state 25 can make a voice phone call.	Page 124 1 DR. JACOB SHARONY 2 Q So let me ask the question 3 again. 4 When the cover's placed on 5 the phone and has the RFID tag, then it 6 also has a state where it can communicate 7 using RFID, such as digital money; right? 8 MS. LIEBER: Objection, 9 scope, calls for a legal conclusion, 10 asked and answered. 11 A Look, I didn't consider 12 this. I need more time because it's a 13 hypothetical question. But I would like 14 to see the file history. 15 Q Well, it's not a 16 hypothetical question; right? 17 A Okay. I want to see the 18 file history. 19 Q You can't answer based on 20 the Zalewsky patent itself? 21 A I don't think that it 22 satisfy the switchable. 23 Q But it has an RFID 24 state --right?-- because it can transmit 25 RFID transponder data?
Page 123 1 DR. JACOB SHARONY 2 MS. LIEBER: Same objection. 3 A It's a phone. So it's 4 supposed to make a phone call. 5 Q And when the cover is placed 6 on the phone and has the RFID tag in it, 7 then it also has a state where it can, 8 for example, communicate using RFID, for 9 example, using digital money or other 10 equivalents such as digital coupons; 11 right? 12 MS. LIEBER: Objection, 13 scope, calls for a legal conclusion. 14 A No, because the operation 15 does not suggest they're switchable. It 16 just said that you can bring from memory 17 and dress it with some data. But then 18 what? It's one time. 19 Q So my question, actually, 20 didn't have the word switchable in it; 21 okay? 22 A Sorry? 23 Q My question didn't have the 24 word switchable in it; okay? 25 A Right.	Page 125 1 DR. JACOB SHARONY 2 MS. LIEBER: Object to form, 3 argumentative. 4 A So yeah. 5 Q And it has a voice call 6 state because it can transmit and receive 7 voice call data; right? 8 MS. LIEBER: Object, to the 9 extent it calls for a legal 10 conclusion and scope. 11 A You were referring to Column 12 8? 13 Q Sorry. The question is, the 14 phone has a voice call state because it 15 can transmit and receive voice call data; 16 right? 17 A It could. 18 Q So your testimony was it's 19 not switchable, so since it can do both 20 of those states, can you explain to me 21 what switchable means that it would not 22 encompass the mobile device with the RFID 23 tag cover on it? 24 MS. LIEBER: Object to form, 25 scope, legal conclusion.

Page 126 1 DR. JACOB SHARONY 2 A So looking at the Contact 3 180 in Figure 2B, you are basically 4 dressing the tag with something. It 5 looks as if it requires a manual 6 intervention here because you have to 7 basically input some data and have the -- 8 I don't know what are these Contact 180, 9 how it is connected to the rest of the 10 electronics of the phone. 11 Q Have you ever used Apple 12 Pay? 13 A I used it. 14 Q Did you have to add your 15 credit card manually to Apple Pay to be 16 able to use it? 17 MS. LIEBER: Objection, 18 calls for speculation. 19 A In the beginning. 20 Q So the fact that you had to 21 add your credit card manually, does that 22 mean that Apple Pay is not using a 23 switchable mobile communication device? 24 MS. LIEBER: Object to form, 25 calls for a legal conclusion.	Page 128 1 DR. JACOB SHARONY 2 transaction while you're also on the 3 phone? 4 MS. LIEBER: Objection, 5 mischaracterizes. 6 A No, no. You can do 7 transaction when you are on the phone, or 8 you can do transaction without making a 9 phone call, or you can make a phone call 10 without doing transaction. 11 Q So you don't think that 12 switchable means changing states, 13 including either or both a voice call 14 communication and RFID communication? 15 MS. LIEBER: Objection, 16 mischaracterizes. 17 A Can you rephrase? 18 Q Do you agree that switchable 19 means changing states, including either 20 or both of a voice call communication and 21 RFID communication? 22 A I said switchable includes 23 either-or, or both. A alone; B alone; 24 and A and B together. 25 Q Right.
Page 127 1 DR. JACOB SHARONY 2 A So you have to show me -- as 3 we discussed switchable before, you have 4 to show me that you can -- basically, it 5 supports the mode of a phone call or an 6 RFID or both because it is not clear that 7 these can be done here. For example, 8 show me that it's more than either-or. 9 Q So if it were either RFID or 10 a voice call, then it wouldn't be 11 switchable? 12 MS. LIEBER: Object to form, 13 mischaracterizes. 14 A We said it include also both 15 modes. 16 Q So to meet the definition of 17 switchable as you understand it, you have 18 to have all of a mode with outputting 19 RFID, a mode with outputting voice call 20 signals and a mode outputting both RFID 21 and voice call signals? 22 A That's what we said before, 23 A or B or A and B. 24 Q So in your opinion, iPhone 25 is only infringing when you do a	Page 129 1 DR. JACOB SHARONY 2 So if you had a device that 3 could do A or B, but it couldn't do A and 4 B, then it wouldn't be switchable? 5 MS. LIEBER: Objection, 6 mischaracterizes. 7 MR. SCHARN: Let me rephrase 8 the question. 9 Q If you had a device that 10 could only do A or B and it couldn't do 11 both, would it be switchable? 12 MS. LIEBER: Calls for a 13 legal conclusion. 14 A It's a completely different 15 capability of device. It's kind of more 16 inferior. It's not equivalent. 17 Q But would it be within the 18 scope of the claim element switchable? 19 MS. LIEBER: Same objection. 20 A Based on the way I 21 understand switchable. I mean this was 22 not construed. But I don't know 23 what's -- I don't know if you're going to 24 dispute it or you can have your one 25 construction. But that's how it was also

33 (Pages 126 - 129)

Page 130 1 DR. JACOB SHARONY 2 understood by the PTO. That's the way I 3 understand it was. 4 Q So you think that Claim 13 5 requires that the mobile communication 6 device be able to output RFID and voice 7 call signals at the same time; right? 8 A We have to be careful at the 9 same time. But while you talk on the 10 phone, you can do also transaction. 11 Q The RFID component, the tag 12 110 in Zalewsky, do you have any reason 13 to believe that that could not be read by 14 an RFID reader at the same time that 15 somebody was making a telephone call on 16 the device? 17 MS. LIEBER: Objection, 18 scope. 19 A I haven't seen that it is 20 control from the processor. The 21 processor was just mentioned that, you 22 know, you can dress it from the memory. 23 But it is not controlled. And that's why 24 it is not switchable. 25 Q Why does being controlled	Page 132 1 DR. JACOB SHARONY 2 other equivalents. 3 Q Could that be done without 4 using the processor? 5 MS. LIEBER: Objection, 6 scope. 7 A Well, we are not without 8 RFID. You just download data from the 9 network into the memory. 10 Q That data is then loaded on 11 to the RFID tag which can be used for 12 digital money; right? 13 MS. LIEBER: Objection, 14 scope. 15 A It doesn't show here, how 16 this is done and if you maintain, for 17 example, both phone calls in outputting a 18 signal. 19 Q Right, because in your 20 opinion for it to meet Claim 13, the 21 device would have to be capable of 22 transmitting RFID transponder data and a 23 voice call signal at the same time to 24 meet the switchable element; right? 25 A Concurrently, yeah.
Page 131 1 DR. JACOB SHARONY 2 from the processor make it make something 3 switchable or not? 4 MS. LIEBER: Objection, 5 mischaracterizes. 6 A Because you are involving 7 the, for example, user interface. You 8 can select a card. 9 Q Well, the tag is in 10 communication in Zalewsky with the master 11 control unit --right?-- according to 12 Column 8? 13 A They just said that it 14 shares memory. And you downloading the 15 digital money from the network. So you 16 download the digital money from the 17 network. It goes to the memory. And 18 these memory is shared with the tag. So 19 you dress the tag with the new money. 20 Q How does the money get to 21 the memory? 22 MS. LIEBER: Objection, 23 scope. 24 A So you download it. It says 25 you download it from the digital money or	Page 133 1 DR. JACOB SHARONY 2 Q Can you look back in your 3 declaration, paragraph 61? 4 A Paragraph 61? 5 Q 61. It's on page 21. 6 A Okay. 7 Q And looking at the last 8 sentence of paragraph 61, it says, "Based 9 on my knowledge and experience, a POSITA 10 would understand that the accused 11 products are switchable devices because 12 they are capable of changing states, 13 including either or both a voice call 14 communication and RFID communication." 15 Do you see that? 16 A Yes. 17 Q So do you need to correct 18 that now in light of your testimony to 19 eliminate the either, it has to be both? 20 A No, no, no. This includes 21 A, B and A and B. So either-or is A or 22 B, meaning A, B or both A and B. 23 Q I see. 24 So if you could only do A or 25 B on the iPhone, it would not infringe;

Page 134 1 DR. JACOB SHARONY 2 correct? 3 A It would infringe because 4 it's included in this situation. 5 Q Oh. 6 So just doing either A or B 7 would still meet the claim? 8 A We have three possibilities: 9 A, B and A and B. 10 Q But to be switchable, it has 11 to be capable of doing all three 12 possibilities? 13 A Right. 14 Q So I'm saying if iPhone 15 could only do either-or and it couldn't 16 do the both, then it wouldn't be a 17 switchable? 18 MS. LIEBER: Objection, 19 calls for speculation. 20 A No. A switchable includes 21 this. In order to infringe, you have to 22 do at least one of them. 23 Q Right. 24 So all you did was either A 25 or B, and you could switch between those	Page 136 1 DR. JACOB SHARONY 2 I understanding that correctly? 3 MS. LIEBER: Objection, 4 mischaracterizes. 5 A I repeat what you said. So 6 switchable -- I use the A and B because 7 it's easier to refer to. Switchable 8 means you can do A or B or A and B; okay? 9 Now, if your phone or mobile 10 device has the capability to do this 11 scenario, it would infringe. Let me give 12 you another example. 13 Let's say you take a legacy 14 phone without any capability of RFID, it 15 does only A. So it's not -- it does not 16 infringe, common sense. 17 Also, if you have just a 18 card, it doesn't have the phone call. So 19 it will not infringe. But they are 20 together, you have now a device with the 21 capability to play in this three: The A, 22 B and A and B. Then it would infringe. 23 Q And the phone in Zalewsky 24 with the cover on it, with the RFID tag, 25 the whole unit with the cover on it could
Page 135 1 DR. JACOB SHARONY 2 two, but not do both at the same time, 3 you could still infringe; right? 4 MS. LIEBER: Objection, 5 mischaracterizes. 6 A So let's actually take the 7 mobile phone, and you don't do 8 transaction; okay? But you have these 9 capability; okay? So when you introduce 10 a reader, it will happen. Basically, 11 what you are saying to me, you know what, 12 I just talk on the phone. I don't do 13 transactions. But when you introduce an 14 external reader, the processor would know 15 to basically include concurrently, the 16 transaction with the phone call. 17 Q So my question is just 18 trying to understand what switchable 19 means. And I think what you're saying is 20 that switchable means it has to be able 21 to do an RFID state, a voice call state 22 or both, and if a device could only do an 23 RFID state and separately, a voice call 24 state, and it could not do both, that it 25 would not meet the switchable element; am	Page 137 1 DR. JACOB SHARONY 2 do A because it can output RFID 3 transponder data; it could do B because 4 it can output a voice call signal; and 5 the only question in your mind is whether 6 it can do A and B at the same time; and 7 if it can, then it's a switchable device, 8 and if it can't, then it's not switchable 9 as you understand the term switchable; 10 correct? 11 MS. LIEBER: Objection, 12 scope, to form, mischaracterizes, 13 calls for a legal conclusion. 14 A I haven't considered this. 15 So either you repeat your question or -- 16 you know, I didn't do this analysis. But 17 I explained to you that -- and this is 18 the root cause of it -- the tag there 19 basically just, you download something 20 from the network. And then it goes to 21 memory. And from this memory, it is 22 basically -- somehow, the tag get this 23 credential or details. So why do you 24 think that it can be done at the same 25 time? I haven't seen that capability.

35 (Pages 134 - 137)

Page 138 1 DR. JACOB SHARONY 2 Q Right. 3 And so if it can't be done 4 same time, then it's not switchable in 5 your opinion; right? 6 MS. LIEBER: Objection, 7 mischaracterizes, scope. 8 A Yeah. We have to be careful 9 when we say at the same time because, you 10 know, it can be a millisecond after. 11 Concurrently maybe is a good word because 12 while you are on a phone call, you can do 13 this, you know. When you take a 14 snapshot, maybe you would see only one or 15 something like that. 16 Q So if A and B, meaning 17 outputting RFID signal and outputting a 18 voice call signal, can be done at the 19 same time in the Zalewsky device with the 20 cover on it, then it would be switchable; 21 right? 22 MS. LIEBER: Objection, 23 mischaracterizes, scope. 24 A It's hypothetical if we 25 could or could not?	Page 140 1 DR. JACOB SHARONY 2 question of whether the device in 3 Zalewsky with the cell phone cover can 4 output RFID transponder data at the same 5 time or currently output with voice call 6 signals is the difference between that 7 device in Zalewsky being switchable or 8 not within the meaning of Claim 13 of the 9 '984 patent; right? 10 MS. LIEBER: Objection, 11 mischaracterizes and outside scope. 12 A With your permission, we 13 will go back to 13. It says that the 14 mobile device is the switchable. Here, 15 they maintain that the mobile device is 16 not -- that the cover is not part of the 17 mobile device because it says coupling 18 into the mobile device. 19 So you have two entities, a 20 cover with an RFID and a mobile device. 21 And in 13, we have one entity which is 22 called mobile device. 23 Q So the only difference from 24 Claim 13 is that it's a cover that is 25 removable, even though the RFID tag is in
Page 139 1 DR. JACOB SHARONY 2 Q Right. It's hypothetical. 3 So in that hypothetical, is 4 it switchable? 5 MS. LIEBER: Objection, 6 scope, calls for a legal conclusion. 7 A But I don't know if it can 8 be done. You know, it's like you asking 9 me something that maybe cannot be done. 10 Q And whether it can be done 11 is the difference between it being 12 switchable or not within the meaning of 13 Claim 13; right? 14 MS. LIEBER: Objection, 15 mischaracterizes, outside the scope, 16 calls for a legal conclusion, form. 17 A So Claim 13 -- I'm going 18 back to Zalewsky. 19 Q When you're done reading the 20 materials, let me know, and I'll re-ask 21 the question since it's been a while. 22 A Okay. It uses the word a 23 coupling. So it's still not part of the 24 mobile device, just coupling. 25 Q So my question is, the	Page 141 1 DR. JACOB SHARONY 2 communication with the innards of the 3 cell phone; right? 4 MS. LIEBER: Same objection. 5 A It's two devices. And here 6 in 13, we have one device. 7 Q And it's two devices because 8 the cover is removable? 9 MS. LIEBER: Same objection. 10 A They maintain that it's not 11 the same device, the mobile device. 12 That's the whole point, that you have one 13 device. I'll give you an example. 14 Let's say you have a mobile 15 phone, and you have a tag here. So you 16 can basically say that you transfer the 17 credential from here to here. And this 18 would basically do a transaction for you. 19 But it's not -- this part of the tag is 20 not part of the mobile device. 21 Q So when the cover is 22 attached securely to the phone, it's not 23 part of the mobile device in Zalewsky? 24 That's your testimony? 25 A I maintain that it is not

Page 142 1 DR. JACOB SHARONY 2 part of the mobile device. 3 Q And earlier, you were saying 4 they maintained. 5 Who's the they, the 6 inventors in Zalewsky, the patent office? 7 A Could you remind me when I 8 said about the -- 9 Q You said they maintain it's 10 not the same mobile device. That's the 11 whole point, that you have one device. 12 So who was the they in that 13 sentence? 14 A What was my answer? What 15 was the question? I'm sorry. Who are 16 the they? 17 Q Are the question was, and 18 it's two devices because the cover is 19 removable, and you said they maintain 20 it's not the same device, the mobile 21 device. 22 Who was the they that you 23 were referring to? 24 A I meant also the PTO there; 25 no?	Page 144 1 DR. JACOB SHARONY 2 cover -- this is Column 8, line 22. It 3 said Cover 100 may also be used to 4 transfer optical signal, using optical 5 relays currently in the art. Other 6 equivalents. So it is a different 7 entity. They talk about a cover, and 8 they talk about the device. 9 Q And why isn't an attachable 10 cover that's electrically coupled to the 11 memory and the MCU of the cell phone just 12 a component of the cell phone? 13 MS. LIEBER: Objection, 14 scope, calls for a legal conclusion, 15 asked and answered, mischaracterizes. 16 A It is a mobile device and a 17 cover. It's not the same entity. The 18 very fact that you can refer to them as 19 two -- as two entities. 20 Q I mean, couldn't you refer 21 to your iPhone as a phone and a camera, 22 and those are two entities? 23 A Well, it's integrated very 24 tightly together. This is very loose. 25 It's not integrated.
Page 143 1 DR. JACOB SHARONY 2 Q That's what I'm asking. 3 Is the they the PTO? 4 A Yeah. 5 Q So the PTO maintained that 6 the cover in Zalewsky is not part of the 7 mobile device of Zalewsky in your 8 opinion? 9 A I think so. And this 10 doesn't satisfy the switchable and other 11 things in my opinion because the whole 12 claim refers to a single entity, which is 13 called the mobile device, yes, a mobile 14 device. 15 Q And mobile devices have 16 multiple components in them --right? -- 17 such as a battery, a processor, an 18 antenna? 19 A It is not the same. I gave 20 sort of an example. What it will make a 21 difference if the cover was here? And 22 you basically send the credential via 23 optical. 24 In fact, the paragraph 25 before, they mentioned something with a	Page 145 1 DR. JACOB SHARONY 2 Q So how tight does the 3 connection or integration need to be for 4 it to be part of the mobile device? 5 MS. LIEBER: Objection, way 6 outside the scope of his declaration, 7 calls for a legal conclusion. 8 A The cameraized part of the 9 phone. 10 Q So I'm just trying to 11 understand from the perspective of one of 12 skill in the art when a component is part 13 of the phone or not part of the phone. 14 So here, we have an 15 electrically coupled cover that attaches. 16 And you're saying that's not part of the 17 mobile device. 18 And I'm trying to 19 understand, what makes it not part of the 20 mobile device since this seems to be a 21 matter of degree? 22 MS. LIEBER: Objection, way 23 outside the scope. 24 A You basically rely on the 25 word coupling electronically to transfer

Page 146 1 DR. JACOB SHARONY 2 the information or the credential to the 3 tag. So why necessarily it should be 4 even a cover. It could be on the side. 5 And you can send it by other means. 6 Q But it is on the cover, and 7 it does attach to the phone in this 8 embodiment in Zalewsky; right? 9 MS. LIEBER: Objection, 10 scope, relevance, argumentative. 11 A You just used the word 12 attached which tells me that it's not the 13 very same device. 14 Q So if something has to be 15 attached to the phone, then it's not part 16 of the phone? 17 A It's not. 18 Q And so the reason that this 19 embodiment in Zalewsky does not meet 20 Claim 13 is because the cover is 21 attachable and removable; right? 22 MS. LIEBER: Objection, 23 asked and answered many times, 24 mischaracterizes, scope. 25 A Yeah. Because it is	Page 148 1 DR. JACOB SHARONY 2 application was filed in September of 3 2001; right? 4 A I believe so. But where do 5 you see that? 6 Q So Item 22, date of filing. 7 A Yes, correct. 8 Q And then Item 30, it claims 9 priority back to November of 2000; right? 10 A Item 30 -- I'm sorry. 30, 11 priority 2000, correct. 12 Q And so the filing of this 13 application and the priority document 14 predates the asserted patents, the filing 15 of the asserted patents here by several 16 years; right? 17 A Correct. 18 Q Was this patent related to 19 any hardware product that Symbol or 20 Motorola actually made? 21 MS. LIEBER: Objection, 22 scope. 23 A Based on my recollection, we 24 did the wireless LAN. Bluetooth was 25 usually manufactured by other
Page 147 1 DR. JACOB SHARONY 2 attached, it basically is not -- yeah. 3 It's two entities. It's not tightly 4 integrated into the phone that basically 5 would allow it to be a switchable device, 6 one device. 7 MR. SCHARN: Mark this as 8 Exhibit 7. 9 (The above-referred-to 10 document was marked as Sharony 11 Exhibit 7 for identification, as of 12 this date.) 13 Q Do you recognize this 14 document, Dr. Sharony? 15 A I see my name. So I should 16 recognize, yeah. It's a patent of 17 existence between Bluetooth and the 18 wireless LANs with, yeah, many 19 coinventors, yeah. 20 Q And you're one of the 21 coinventors on this patent; right? 22 A Yes. I'm listed as a 23 coinventor. 24 Q And as you could see on the 25 cover of this document, this particular	Page 149 1 DR. JACOB SHARONY 2 semiconductor companies, yeah. At that 3 time, there was many semiconductor 4 companies that started to do even 5 wireless LAN chips. 6 Q If you could turn to 7 paragraph 17, it's on the fourth page. 8 A Okay. 9 Q So there, it says, "The 10 first radio transceiver and second radio 11 transceiver are mounted together in 12 housing which may be suitable for wearing 13 on a belt or a laptop computer or a PDA." 14 Do you see that? 15 A I do. 16 Q So if two transceivers are 17 mounted together in a housing, is that 18 one transceiver or two transceivers? 19 MS. LIEBER: Objection, 20 calls for a legal conclusion. 21 A Okay. So this depends very 22 much on the context. Let's say you want 23 to buy a Bluetooth radio and a Wi-Fi 24 radio, so you call a vendor, say, you 25 know, I need one radio, one transceiver.

38 (Pages 146 - 149)

Page 150 1 DR. JACOB SHARONY 2 So by itself, it called transceiver and 3 give me also the wireless LAN and one of 4 the Bluetooth. 5 So in that context, they 6 elected to call each one of them, a 7 transceiver. In other contexts, it could 8 be different. In the patents, two 9 patents mention -- at least one patent 10 mention transceiver. The context 11 there -- and this was decided by the PTO 12 also -- that it's the sum total of all 13 the functionality of transmitting and 14 receiving. 15 So why I say depend on the 16 context, while I was in the very same 17 company, I filed my own patent, the '809 18 patent. And I cited it in my 19 declaration. And if you go, you would 20 see that -- this I remember in Claim 1, 21 you have a transceiver that is capable of 22 talking to an outside cellular 23 transceiver, WWAN wider network and also 24 to a wireless LAN, external in a 25 different place, an external wireless LAN	Page 152 1 DR. JACOB SHARONY 2 three transceiver. You have a wireless 3 LAN external transceiver, a WWAN external 4 transceiver and a transceiver dual 5 capability to talk to each one of them. 6 Q And part of the data that 7 the transceivers, at least one of the 8 transceivers transmitted, was an RFID 9 tag; right? 10 A The question was not clear, 11 or it didn't make sense to me. So please 12 ask again. 13 Q In the '809 patent, another 14 patent of yours, at least one of the 15 transceivers transmitted RFID transponder 16 data; right? 17 A So the tag -- okay. Let's 18 not confuse the tag. It's more of an 19 active smart tag that has a dual 20 capability. It can talk. It doesn't 21 have the guts that we are discussing 22 here. It has either a wireless LAN or 23 wireless WAN. We call this a 24 transceiver. And it talks to WWAN, like 25 a tower or Wi-Fi access point.
Page 151 1 DR. JACOB SHARONY 2 transceiver. Yet, within that, it was a 3 tag but different tag. You have a 4 transceiver that is capable to talking to 5 wireless LAN and WWAN. 6 Now, we know that these are 7 sometime coming from different vendor, 8 like wireless LAN would come from 9 Broadcom, and the cellular would come 10 from Qualcomm. So it depends very much 11 on the context. 12 Q And that '801 patent, is one 13 of those transceivers transmitting -- 14 A 809. 15 Q In the '809 patent, is one 16 of those transceivers transmitting an 17 RFID tag? 18 A The purpose was different. 19 It was a tag that is basically outfitted 20 with a transceiver with dual capability, 21 to talk to a remote WWAN transceiver and 22 also talk or communicate with a WLAN 23 transceiver which are also in a different 24 place. 25 So you have here, sort of	Page 153 1 DR. JACOB SHARONY 2 So when you say transmit, 3 it's not, I just brought it to show you 4 that, you know, back when it was like -- 5 it was issued later, I remember, but the 6 priority, it was in the early 2000; no? 7 It was filed. I don't have it with me. 8 But I recall it was in the early 2000. 9 Q Let's see if I could refresh 10 your memory here. 11 MR. SCHARN: If we could 12 mark this as Exhibit 8. 13 (The above-referred-to 14 document was marked as Sharony 15 Exhibit 8 for identification, as of 16 this date.) 17 A So the patent was filed in 18 2006 and claimed priority to 2002. 19 Q So it predates the filing of 20 the asserted patents here; right? 21 A Yes. 22 Q So my question is, do any of 23 the transceivers disclosed in the '809 24 patent transmit RFID tag information? 25 A Let me refresh my memory,

39 (Pages 150 - 153)

Page 154 1 DR. JACOB SHARONY 2 long time. And then I'll explain what's 3 going on here. Okay. 4 So if we go to Figure 1, 5 it'll be clearer what's happening there. 6 So our tag is tag 30. So let's say we 7 put this tag in Amazon warehouse in New 8 Jersey, and we wanted to know if -- where 9 exactly it is. Maybe it's on a pallet of 10 goods or products. And we wanted to know 11 where is it within -- because someone is 12 looking for something, for goods. So we 13 wanted to know where within the 14 warehouse, Amazon warehouse in New 15 Jersey -- Amazon is just an example. 16 Amazon warehouse in New Jersey, where it 17 is, because these are very big 18 facilities. So the wide area, the 19 cellular, which is in Tower 110, transmit 20 a cellular signal to Tag 20. I have to 21 see. It says 20 and 30. 22 Q So I don't want to interrupt 23 you too early. And I want to keep 24 talking about this. But we're about out 25 of videotape time. So this might be a	Page 156 1 DR. JACOB SHARONY 2 A So let me refresh my memory. 3 And I'll explain how this works. For 4 sure, we transmit data because it's a 5 tag. But we'll go through the details. 6 Q The question is really just 7 a simple one of whether any of the 8 transceivers transmit RFID tag data at 9 any point in the '809 patent. 10 A So I don't think it's a good 11 analogy. I'll explain why. So I started 12 to explain the Amazon, you know, 13 warehouse there. So you have a tag which 14 is on a pallet of let's say of laptops. 15 Q An RFID tag? 16 A If we include Bluetooth and 17 Wi-Fi as RF, we can call it RFID. 18 Q Okay. 19 A It has only Bluetooth and 20 Wi-Fi. So what happen, so you are, let's 21 say in headquarters, you are looking for 22 this particular laptops. So basically, 23 assume you know how to address this tag, 24 it has like a serial number. So you send 25 a request. So Tower 110 transmit a
Page 155 1 DR. JACOB SHARONY 2 good time for a break. And then we'll 3 pick up this conversation, if that's good 4 for you. 5 A Sure. 6 THE VIDEOGRAPHER: The time 7 on the video monitor is 3:25 p.m. 8 We're off the record. This ends 9 Media 3. 10 (A short recess was taken.) 11 THE VIDEOGRAPHER: We are 12 back on the record. The time on the 13 video monitor is 3:39 p.m. This 14 starts Media 4. 15 Q Welcome back, Dr. Sharony. 16 A Hi. 17 Q On any of the breaks today, 18 have you spoken with counsel about the 19 substance of your testimony? 20 A No. 21 Q So before the break, I think 22 you were getting ready to tell me whether 23 in the '809 patent on which you are the 24 inventor, any of the transceivers 25 transmit RFID tag data.	Page 157 1 DR. JACOB SHARONY 2 cellular signal within the coverage area 3 which is the shaded area. The tag has -- 4 the transceiver has dual capability of 5 cellular and wireless LAN. So the tag is 6 identifying that it was addressed. And 7 then the tag transmits. 8 So far what happened, the 9 tag receive a cellular signal. And now 10 it transmit a Wi-Fi or wireless LAN 11 signal, which is picked by access point, 12 yeah, access point, Wi-Fi Access Point 13 212, 210 and 211. And they are doing 14 something -- people sometime call it 15 triangulation. It's not triangulation. 16 It's trilateration because it's not 17 angles. So based on power or time 18 difference of arrival, they determine the 19 signal. And this signal, they 20 communicated either to a nearby computer 21 that sends back the signal with the 22 location. 23 So the tag here is really -- 24 receiving a cellular signal. He know it 25 is addressed. He send a wireless LAN

Page 158 1 DR. JACOB SHARONY 2 signal to be located. He doesn't know 3 the location. It is the Infrastructure 4 210 to 212 that determine the location 5 through the trilateration. And then they 6 send it back to the person that originate 7 the call over the cellular. So it's 8 not -- yeah. I'll stop here. But it 9 work in a different way. 10 Q The abstracts as described 11 is an RFID tracking system; right? 12 A Right. 13 Q So this is talking about 14 RFID? 15 A Yeah. But I'm saying that 16 the tag here -- I just want to see what 17 is 30 and 20. 18 Q Asset 20 having an RF Tag 19 30. 20 A It's not RFID because it's 21 really long-range. The cellular, to 22 find, to address it. And this is also an 23 active tag. 24 Q So the RF Tag 30 sends an 25 identification using RF waves to the	Page 160 1 DR. JACOB SHARONY 2 So that's why I say maybe 3 it's not so much related because the tag 4 doesn't determine proximal range because, 5 you know, you can call from San 6 Francisco. 7 Q And the RF tag can 8 communicate in two modes at least; right? 9 Cellular and wireless, Wi-Fi, WLAN? 10 A He will not communicate over 11 wireless LAN before he receive the 12 cellular because he needs to know that 13 he's addressed. So we want to locate 14 you. Then he send the signal. I mean, I 15 think, in the flow diagram, it appears 16 the subsequent step. 17 Q I think you said what was 18 transmitted was not RFID because it's not 19 that close, but then the Claim 1 says an 20 RFID tag comprising. 21 So do you consider this tag, 22 RF Tag 30 to be an RFID tag? 23 MS. LIEBER: Objection, 24 calls for a legal conclusion. 25 A So RFID stands for Radio
Page 159 1 DR. JACOB SHARONY 2 Transceivers 212, 210 and 211; right? 3 A It sends us a signal. They 4 pick the signal. They know who it is 5 because probably, there's identification 6 in the signal. They locate it. And they 7 send back somehow to the person that 8 originated the call. So it really 9 receives the cellular signal and transmit 10 a wireless LAN signal. 11 Q So the RF tag in response to 12 receiving a cellular signal then 13 transmits a wireless LAN signal; right? 14 A Yes. 15 Q Is it capable of 16 transmitting a cell signal or only 17 receiving a cell signal? 18 A Could be. But he doesn't 19 know or determine its location. So it's 20 more optimal that these access point, 21 probably they are wired to a computer. 22 And this will be sent back over the 23 Internet where it is. He doesn't know. 24 Also, it is -- it's far, you know, from 25 cellular, we have to go to New Jersey.	Page 161 1 DR. JACOB SHARONY 2 Frequency Identification. Depends what 3 you ask. Some people say no, no, no. 4 RFID is, you know, not a cellular 5 frequency. But it's RF. And we 6 identify -- I mean the main purpose here 7 is also to provide the location. But it 8 is basically identified also. We want 9 to, you know -- we want to know where is 10 it. So you need to identify the tag or 11 address the tag. So the tag may not even 12 respond back to the originator. 13 Q Thank you for that. 14 Could we go back to 15 Exhibit 7, please? That was another 16 patent where you're an inventor, 17 coexistence techniques and a gateway 18 between Bluetooth and WLAN wireless 19 networks. 20 A What the patent number was? 21 Yeah, yeah. I found it. 22 Q So toward the back of this 23 patent, there is Figure 1. Let me know 24 when you're there. It's on page 14. 25 A Okay.

Page 162 1 DR. JACOB SHARONY 2 Q So I want to talk about 3 Figure 1. And there's a description of 4 Figure 1 on page 6 in paragraph 31. 5 A Okay. 6 Q So Figure 1 depicts Radio 7 Transceivers or Mobile Units 120 and 140; 8 right? I'm looking at about halfway down 9 paragraph 31. 10 A Are we -- you're in 11 paragraph 31? 12 Q Yes. So we'll be kind of 13 toggling back and forth to the 14 description of the drawing and the figure 15 itself. 16 A Okay. 31. 17 Q So I want to kind of walk 18 through what's depicted there in 19 Figure 1. 20 So you've got Items 100 and 21 110 which are dual mode devices; right? 22 A 100 -- we are in Figure 1? 23 Q Yes. 24 A 100, yeah. 100 and 110, 25 yes.	Page 164 1 DR. JACOB SHARONY 2 So the fact that this Device 3 100 is dual mode means that it can 4 operate in at least two modes; right? 5 MS. LIEBER: Objection, 6 outside the scope, calls for a legal 7 conclusion. 8 A Yeah. Dual mode is a 9 general term. But it can operate here. 10 Q We can look at specific 11 disclosure, if it's helpful. 12 But one mode using Item 120 13 would be transmitting and receiving Wi-Fi 14 signals using the 802.11 protocol; right? 15 A Right. 16 Q And another mode is 17 transmitting and receiving Bluetooth 18 signals using the Bluetooth protocol; 19 right? 20 A Yes. 21 Q Could the Dual Mode Device 22 100 do both of those at the same time, 23 transmit and receive Wi-Fi and Bluetooth 24 signals? 25 MS. LIEBER: Objection,
Page 163 1 DR. JACOB SHARONY 2 Q And each of the dual mode 3 devices, 100 and 110, contain a Mobile 4 Unit 120 or 140 and also a Transceiver, 5 which is a Bluetooth master device, 130 6 and 150; right? 7 A Well, you are reading from 8 this. So I take your representation. 9 Q So if we look just at Item 10 100 to keep it a little simpler, on top 11 is a Transceiver Mobile Unit 1, 120. Do 12 you see that? 13 A Yes. 14 Q And on the bottom is 15 Bluetooth master transceiver. That's 16 130? 17 A You are reading the 18 description of them. 19 Q I'm paraphrasing now because 20 I'm looking at the figure. 21 A I just want to see the -- 22 just one second. The device is 100. And 23 the Bluetooth is 130. And the mobile is 24 120. 25 Q Right.	Page 165 1 DR. JACOB SHARONY 2 outside the scope, calls for a legal 3 conclusion. 4 A So the answer is generally 5 no because -- and that's where the 6 coexistent come into, because they share 7 the 2.4 gigahertz band. And the 8 Bluetooth would just puncture the 802.11 9 patents. So this is not good. So you 10 have two options. 11 One, to arbitrate them on 12 time which is not -- you could or 13 operating them on -- this came later, 14 called adaptive frequency hopping. So 15 Bluetooth, the plain-vanilla hops all 16 across the 2.4 band. So it will hit 17 802.11. And it goes on a sequence. So 18 adaptive frequency hopping, which came 19 later, will tell it somehow. That's 20 why -- guess what, they are now on the 21 same chip, you know, they are together 22 because then they can see, oh, the 23 wireless LAN using this part of the 24 spectrum. So we will hop -- the 25 Bluetooth will hop outside that band.

42 (Pages 162 - 165)

Page 166 1 DR. JACOB SHARONY 2 But if you don't coordinate it between 3 themselves, they really do not coexist. 4 And, in fact, we were at the 5 802.11/Bluetooth meeting in order to 6 address this coexistence. I guess the 7 top guy there was Steven Shellhammer. He 8 was our standards guy. 9 Q Since this dual mode device 10 would transmit and receive either under 11 802.11 or Bluetooth, but wouldn't do both 12 at the same time, it was not switchable; 13 right? 14 MS. LIEBER: Objection, 15 outside the scope, calls for a legal 16 conclusion, mischaracterizes. 17 A It depends on the context, 18 what you mean switchable. We discussed 19 the switchable there. Here, it could 20 be -- as you said, you may be able to 21 arbitrate them by time because if you do 22 adaptive frequency hopping, they can 23 manage and do it the same time. If not, 24 it is advisable that they would not 25 operate the same time.	Page 168 1 DR. JACOB SHARONY 2 mobile phone, the cellular working at the 3 same time concurrently. I don't recall 4 what's all the guts here of the patent 5 because it's talking about a coexistence. 6 So maybe there are mechanism that allow 7 it. If you allow me, I will review and 8 tell you. 9 Q Sure. Why don't we go to 10 paragraph 37. Let me know when you're 11 there. 12 A 37, okay. 13 Q And it says, "In a further 14 embodiment, the 802.11 Access Points 20, 15 30 and Mobile Units 120, 140 may be 16 designed to operate in one portion of the 17 2.4 gigahertz spectrum while the BTMs 18 130, 150 and BTSs 160, 170, 180, 190, 19 200, 210 may be designed to operate in 20 another portion of the 2.4 gigahertz 21 spectrum." 22 Do you see that? 23 A I do. 24 Q In that embodiment, would 25 this Dual Mode Device 100 be able to do
Page 167 1 DR. JACOB SHARONY 2 Q So to clarify, is your 3 understanding of the term switchable as 4 used in Claim 13 of the '984 patent 5 different than what you understand the 6 ordinary meaning of switchable to be to 7 one of skill in the art? Is it a special 8 type? 9 MS. LIEBER: Objection, 10 calls for a legal conclusion. 11 A It depends on the context. 12 In the patents, you know, it's the A, B 13 or A or B or A and B. Here, it could be, 14 for example, A or B. 15 Q So normally, to one of skill 16 in the art, switching could mean A or B, 17 but in the patent, switchable means A or 18 B or A and B at the same time? 19 MS. LIEBER: Calls for a 20 legal conclusion and 21 mischaracterizes. Go ahead. 22 A It depends on the context. 23 So in the patent, you can entertain both 24 A and B as part of the State 1 and State 25 2. So you can have the RFID and the	Page 169 1 DR. JACOB SHARONY 2 what we've been referring to as A, B and 3 A and B? 4 MS. LIEBER: Objection, 5 calls for a legal conclusion, outside 6 the scope. 7 A They operate them on 8 different bands. So it implies that they 9 operate them concurrently, the Bluetooth 10 and the wireless LAN. 11 Q So this Dual Mode Device 100 12 in this patent that you're an inventor on 13 discloses a switchable dual mode device; 14 right? 15 MS. LIEBER: Objection, 16 calls for a legal conclusion, 17 mischaracterizes. 18 A There is no word of 19 switchable here. So I can just tell you 20 what's happening here. I don't want to 21 confuse it with something else. There is 22 no switchable here. And in the context 23 of the three patent, switchable, we 24 arrived at certain construction which I 25 don't know if you agree or don't agree.

Page 170 1 DR. JACOB SHARONY 2 Here, you have dual mode 3 device that can operate on Bluetooth or 4 wireless LAN. And if you choose to do 5 the coexistence, some solution, you can 6 allow them to operate concurrently. 7 Q So you don't know if that 8 meets the definition of switchable or 9 not? 10 MS. LIEBER: Objection, 11 calls for a legal conclusion and 12 mischaracterizes the witness's 13 testimony. 14 A You can call it switchable. 15 But it has nothing to do with this. It 16 is just you can say -- let's say there 17 are no Bluetooth devices in the area; 18 okay? So it would operate with wireless 19 LANs. 20 Now let's say Bluetooth 21 device came in that area and it wants to 22 basically join PICC connect or something 23 to the master. So then you would have a 24 both wireless LANs and Bluetooth. If 25 there is no wireless LAN, there is still	Page 172 1 DR. JACOB SHARONY 2 MS. LIEBER: Objection, 3 calls for a legal conclusion. 4 A No. 5 Q Why not? 6 A I never heard this in the 7 context of coexistence. Coexistence mean 8 like that we coexist. We operate without 9 interfering with each other. They would 10 interfere badly. The Bluetooth will 11 puncture the wireless LAN packets. So 12 the existence would allow them to coexist 13 without interfering. Coexist doesn't 14 mean that everyone is happy. But the 15 intent here is to make them happy. So 16 they don't step on each other. 17 Q In the claims that we've 18 been looking at in the '984 patent, do 19 the RFID mode and the voice call mode 20 coexist? 21 MS. LIEBER: Object to form. 22 A It would never use this one, 23 never. 24 Q And why not? 25 A Because coexistence come
Page 171 1 DR. JACOB SHARONY 2 traffic on the air. But it would not be 3 susceptible to interference that much. 4 So you would have the Bluetooth. 5 Q Let's look at your report 6 again which is -- 7 A So are we done with this? 8 Q You could set it aside for 9 now. 10 A Yeah. Honestly, I don't 11 know what, you know -- okay. I don't 12 know what you want to -- I mean there are 13 many devices that can operate in this 14 mode. 15 Q What do you mean in this 16 mode? 17 A As we said, can be wireless 18 LAN. There is no Bluetooth. Bluetooth 19 comes. So they operate, granted that 20 they have, you know, a coexistence 21 solution. 22 Q And typically in the art, if 23 there's a coexistence solution, do people 24 of skill in the art refer to that as 25 switchable?	Page 173 1 DR. JACOB SHARONY 2 with reference to interference. That's, 3 you know, over -- maybe there is esoteric 4 cases. But I never heard -- I'm talking 5 also as a POSITA, it would never connect 6 between them. 7 Q So switchable implies that 8 where you have two states running at the 9 same time, but there's not a coexistence 10 problem? 11 MS. LIEBER: Object to form, 12 mischaracterizes, calls for a legal 13 conclusion, outside the scope. 14 A Say it again, please. 15 Q Is your testimony that the 16 term switchable implies that there is not 17 a coexistence problem? 18 MS. LIEBER: Same objection. 19 A I don't see the -- no, 20 unless you take some measures to avoid 21 the coexistence. There's no -- there's 22 no reference to switchable. 23 Q So I'm just trying to 24 understand why a mode, an RFID mode and a 25 voice call signal mode would be

Page 174 1 DR. JACOB SHARONY 2 considered switchable, but a device that 3 has a Bluetooth mode and a Wi-Fi mode 4 would not be considered switchable. Can 5 you explain why that's the case? 6 MS. LIEBER: Same objection. 7 A So in the patent, you know, 8 they operate on a different frequency. 9 So there is no coexistence issue. Here, 10 they operate in the same band. So you 11 have coexistence issue. 12 Q So it's that coexistence 13 issue that either makes a device 14 switchable or not? 15 MS. LIEBER: Objection, 16 mischaracterizes. 17 A I don't know how to answer 18 this question. Switchable and 19 coexistence are really foreign to each 20 other. It's not -- coexistence usually 21 as someone would understand it in the 22 art, there is a problem. There is 23 interference. You need to provide a 24 solution for coexistence. It appears a 25 lot in wireless networks. I'll give you	Page 176 1 DR. JACOB SHARONY 2 response." 3 Do you see that? 4 A Yeah. 5 Q So what do you mean that the 6 '947 patent as opposed to the '984 patent 7 focuses on the emulation aspect? 8 I'll withdraw that question 9 for a moment. 10 Did you write the sentence 11 in paragraph 42? 12 A Yeah. As I mentioned, it 13 was a collaborated effort. If we look at 14 the claim term in the other two patents, 15 the specification they are talking about 16 emulating a tag. But this is 947. 17 Q So your testimony is the 18 sentence in paragraph 42, you wrote in 19 the first instance, you typed it out? 20 MS. LIEBER: Objection, 21 mischaracterizes, asked and answered. 22 A I told you some of it based 23 on my discussion with counsel. I ask her 24 to transcribe. Some of it, I changed or 25 wrote myself. So it was a collaborated
Page 175 1 DR. JACOB SHARONY 2 an example even with the same system. 3 So that's why -- you know, 4 it's not like A and B, you know, it's 5 like you can take a tower on cellular, 6 and there is a nearby cellular. So it's 7 the same thing, you know, wireless LAN, 8 wireless LAN. Why we go so far, you put 9 two nearby wireless LAN Wi-Fies, you 10 usually want to put them on different 11 frequency so they coexist. No one is 12 talking about switchable or something 13 like that. 14 Q Can you turn to your 15 declaration, paragraph 42? It's on page 16 13. 17 A Okay. 18 Q So it says, "Although the 19 '947 patent shares a similar 20 specification with the '984 patent, the 21 invention of the '947 patent focuses on 22 the emulation aspect, determining the 23 mobile communications device is in 24 operational space of the RFID reader and 25 then presenting and emulated RFID tag in	Page 177 1 DR. JACOB SHARONY 2 effort. In any case, I stand behind it 3 because my signature is there. 4 Q Are you looking at the '947 5 patent at the moment? 6 A 947 is in front of me. 7 Q Why don't we look at both 8 Claim 13 of the '984 patent and Claim 16 9 of the '947 patent. That might inform 10 our discussion here. 11 A So 984, Claim 13. 12 Q Yes. 13 And let's talk about some of 14 the differences here. 15 Claim 13 has the term 16 switchable, but that claim limitation is 17 not in Claim 16; right? 18 A Please say it again. So we 19 are in the 947? 20 Q Correct. 21 A Okay. 22 Q So Claim 16 of the 947 does 23 not require a switchable mobile 24 communication device; right? 25 A Right. You are comparing it

Page 178 1 DR. JACOB SHARONY 2 with -- to the 984, which claim? 3 Q Claim 13. 4 A Claim 13, yeah. That's 5 correct. 6 Q So the switchable element 7 that we've talked a lot about today, 8 that's not required in Claim 16 of the 9 '947 patent; correct? 10 A Right. It doesn't appear 11 there, yeah. The switchable does not 12 appear here. 13 Q And the term transceiver is 14 not in Claim 16 of the '947 patent; 15 right? 16 A Are we always in the 16 or 17 we were in 1? 18 Q You have analyzed Claim 16. 19 A First. 20 Q First, starting at 21 paragraph 44 of your report. 22 A Okay. So we'll do it in 23 that order. Okay. So in 16, yes, there 24 is no -- the word switchable or 25 transceiver does not appear.	Page 180 1 DR. JACOB SHARONY 2 for transceiver. So the construction for 3 transceiver and communication circuitry 4 seems similar on both sides. 5 Q So you don't have an opinion 6 that communication circuitry is different 7 in scope than in Claim 16 of the '947 8 patent than the transceiver in Claim 13 9 of the '984 patent; right? 10 MS. LIEBER: Objection, 11 mischaracterizes, objection to the 12 extent it's outside the scope. We've 13 talked today about validity. Object 14 to form. 15 A So the construction for both 16 terms is the same. 17 Q Thank you. 18 MR. SCHARN: And I'll just 19 note for the record that Dr. Sharony 20 has offered opinions on claim 21 construction for these terms that 22 were the subject of the question that 23 I just asked. So I'll request 24 counsel that you keep your objections 25 succinct and non-argumentive.
Page 179 1 DR. JACOB SHARONY 2 Q But Claim 16 does use the 3 word communication circuitry. Do you see 4 that? 5 A Yes. 6 Q How is the communication 7 circuitry of Claim 16 different than the 8 transceiver of Claim 13 of the '984 9 patent? 10 MS. LIEBER: Object to form. 11 A The communication circuitry 12 is also the sum of all the components 13 that their function is to transmit and 14 receive. 15 Q So it sounds like that's in 16 your opinion the same as the transceiver 17 in Claim 13; right? 18 MS. LIEBER: Objection, 19 mischaracterizes. 20 A In that context, I think 21 also, we -- I give the same construction, 22 or this was -- yeah, same construction by 23 Varia and same construction by Apple, 24 different construction. But they 25 provided also similar to the construction	Page 181 1 DR. JACOB SHARONY 2 Q So going back to a question 3 I asked about your declaration a moment 4 ago, in paragraph 42, you say, "The 5 invention of the '947 patent focuses on 6 the emulation aspect." 7 Can you explain why Claim 8 16, for example, is focused on the 9 emulation aspect of RFID as compared to 10 Claim 13 of the '984 patent? 11 A Okay. So in the 947, there 12 is a specific -- there is a specific 13 phrase that mention the probing. All of 14 them deal with tag emulation. But here, 15 they say -- yes. 16 So in the last limitation on 17 the 947, it says, "Output RFID signal via 18 communication circuitry in response to 19 detection of a proximal presence of an 20 RFID reader external to the mobile 21 communication device based upon a 22 receiver RFID probing signal." 23 So the RFID probing signal 24 basically probes for something it's 25 expecting to get something in return.

Page 182 1 DR. JACOB SHARONY 2 Make sense? And that's why the reader 3 expect the mobile device to behave like a 4 tag by probing it; you know, there would 5 be an output signal. So this is clearly 6 emulation because the phone emulate the 7 tag. 8 Here, the claim, it's maybe 9 a little bit broader because there is no 10 specific requirement for the probing. 11 But you basically monitor for the 12 proximal RFID reader external. 13 Q So if you have a credit card 14 with an NFC chip in it and you hold it 15 next to an RFID reader or an NFC reader, 16 that's the right terminology, does the 17 chip on your credit card receive a 18 probing signal? 19 A Yes. Let me explain 20 something in general. This is like the 21 very low requirement because a reader 22 basically -- it doesn't know what's 23 outside. So it basically shouts, hey, 24 anyone out there? And then they would 25 basically respond. This is part of the	Page 184 1 DR. JACOB SHARONY 2 I can really read and write or do any 3 transaction with you. Of course, these 4 are the very low layers which you have 5 upper layers that basically orchestrate 6 these transaction. 7 Q If I'm using a credit card 8 with an NFC chip in it, I hold it up next 9 to a reader to make that transaction 10 happen, is my credit card outputting an 11 RFID signal in response to the detection 12 of a proximal presence of the RFID 13 reader? 14 MS. LIEBER: Objection, 15 outside the scope. 16 A So assuming, yeah, it has a 17 tag and assuming that it responds to the 18 reader. So it would basically send back. 19 If there is a reader that created the 20 field, it would see that there is a 21 command for a request. It's part of the 22 protocol, yeah. 23 Q So is that an emulated RFID 24 signal? 25 A No.
Page 183 1 DR. JACOB SHARONY 2 protocol. 3 So it is necessary because 4 in situation where you have multiple 5 devices in the field of view, you need to 6 select one tag, otherwise they will 7 collide with each other. So the first 8 step is really, hey, anyone out there? 9 They basically send sort of something 10 called UID. And assuming if there is a 11 collision, it goes to an anticollision 12 algorithm. You have to select a tag. A 13 tag doesn't become active if you don't 14 select it. 15 Let's say three tags respond 16 to the lead. I'm the lead. I want to 17 talk to you. I select you. The other 18 are not allowed to talk yet. So that's 19 how basically, you first power it. It 20 has no battery. So it's sort of in idle 21 state. And then it has to respond to the 22 reader back. So it's ready now. It is 23 being selected by the reader. So it 24 become active. 25 What does it mean? That now	Page 185 1 DR. JACOB SHARONY 2 Q Why not? 3 A Because this is the tag. 4 It's emulate -- the phone emulate a tag. 5 But the tag is the real thing. It 6 doesn't have to emulate anything. 7 Q So looking then at that 8 element of Claim 16 that says "output an 9 RFID signal via the communication 10 circuitry in response to detection of the 11 proximal presence of the RFID reader 12 external to the mobile communication 13 device based upon receipt of the RFID 14 probing signal," and then it says, "RFID 15 signal outputs in a second range," what 16 about that claim language makes clear 17 that this has to be an emulated RFID 18 signal as opposed to an actual RFID tag? 19 MS. LIEBER: Objection, 20 mischaracterizes. 21 A Okay. So here, it says 22 probing signal. In the other patent, the 23 phone basically -- basically, the mobile 24 device outputs an RFID signal in response 25 to determining that you are in the field

Page 186 1 DR. JACOB SHARONY 2 of an RFID reader. 3 Now, if this RFID reader was 4 off, nothing will happen; right? 5 Q Yes. 6 So my question is, what 7 about this claim language in Claim 16 of 8 the '947 patent tells you that the RFID 9 signal has to be an emulated one as 10 opposed to an actual RFID tag? What 11 language requires that from this Claim 16 12 in the '947 patent? 13 MS. LIEBER: Object to form, 14 calls for a legal conclusion. 15 A It's the outputting of an 16 RFID signal when the reader is nearby. 17 Here, it says specifically that it 18 basically send the probing signal. But 19 in the other claims, in the other two 20 patents, you have -- you determine that 21 you are within the field or within the 22 proximity for the proximal RFID reader 23 which is external. 24 Q I'm still not getting from 25 your answer what requires emulated RFID	Page 188 1 DR. JACOB SHARONY 2 that it's within the space of an RFID 3 reader. And does it emulate? Of course 4 not. 5 Q Right. 6 A And also in your previous 7 example, remember, each cover is 8 basically one tag. And basically, we 9 said -- we basically possibility 10 downloading something there. But here, 11 you have one entity, and the phone 12 emulates a tag. And it can do it with 13 multiple tags. It can each time, you 14 know, have many -- it can emulate 15 different tags or multiple tags. 16 Q I understand that that can 17 be done in the world. 18 What I'm asking is, what in 19 Claim 16 requires that the RFID signal 20 that's outputted from the device that's 21 emulated as opposed to an actual RFID 22 tag? What language imposes that 23 limitation on this claim? 24 A So we are talking about a 25 mobile communication device that has some
Page 187 1 DR. JACOB SHARONY 2 as opposed to a tag because just 3 receiving a signal and sending back RFID 4 data -- 5 A No -- 6 Q Hold on. 7 -- is what would happen with 8 a credit card with a chip in it; right? 9 A Yeah. But the credit card 10 has a tag. The mobile device behaves 11 like a tag. 12 Q Why can't the mobile device 13 have a tag in it? 14 MS. LIEBER: Object to form. 15 A Because we discussed this. 16 It violates the other situation with the 17 states and the switchable. And it's two 18 different entities. 19 Q Well, Claim 16 doesn't 20 require a switchable; right? 21 A So you don't need to put it 22 on a cover. I can just take -- you know, 23 label a sticker with RFID and just put it 24 here on the phone. And then you will 25 tell me, you know what, it's determined	Page 189 1 DR. JACOB SHARONY 2 circuitry. And it is configured to 3 output an RFID signal via the 4 communications circuitry in response to 5 detection of the proximal presence of an 6 RFID that sends a probing signal upon 7 receipt of a probing signal. It is 8 more -- there is an addition to -- I 9 didn't see the word determined, or maybe 10 I missed it. It is so small, output RFID 11 signal via the communications circuitry 12 in response to detection of the proximal 13 presence of an RFID reader to the 14 mobile -- upon receipt of an RFID probing 15 signal. 16 So we are talking here about 17 a mobile communication device. It 18 basically detect the proximal presence. 19 So how you detect the proximal presence, 20 you get a field that energize the tag, 21 and it respond. But here, they also 22 mention it is response upon receipt of an 23 RFID probing signal. 24 Q Well, my credit card 25 responds on receipt of an RFID probing

48 (Pages 186 - 189)

Page 190 1 DR. JACOB SHARONY 2 signal; right? 3 A Just one second. I'm trying 4 to explain. Here, it's maybe more 5 broader; you know, you detect the field, 6 the proximity of the reader, and you send 7 something, even though no one asked you 8 to send. You send. 9 Here, it's specific. It 10 tell you upon receipt of a probing 11 signal. So in the 947, the phone will 12 not -- will not output an RFID signal, 13 unless it got a probing, a probing 14 signal. Now, I'll give you an example, a 15 real-life example. 16 So a few years ago, my 17 previous car, my previous iPhone, I don't 18 know, some of the car, you can charge 19 them. And I would just put it there as 20 if there is a transaction to a payment 21 terminal. First, not scared me, but it 22 also annoyed me because why it's there, 23 you know. Today when you do it, it 24 doesn't happen. I don't know what 25 changed in the car in the phone.	Page 192 1 DR. JACOB SHARONY 2 example, the 984, the iPhone or the 3 mobile device does detect the proximal 4 presence because otherwise, nothing will 5 happen on the phone. It knows. When I 6 put it on the passenger side, nothing 7 will happen. So it happens. 8 This basically is more 9 specific. It tells the iPhone you don't 10 output an RFID signal unless you get a 11 probing signal. So here, maybe it was 12 just energized and sent something. So it 13 seems this is more specific, maybe a 14 little bit narrower than this. 15 Q Which one is narrower? 16 A I don't know if the word 17 narrower is correct. But here, you don't 18 send it, unless you get the probing 19 signal. 20 Q So the one that requires a 21 probing signal, iPhones that would just 22 pull up Apple Pay when you stick it on a 23 charger would not infringe? 24 MS. LIEBER: Objection, 25 mischaracterizes.
Page 191 1 DR. JACOB SHARONY 2 So going through the 947, 3 you need a probing signal. And the 4 probing signal maybe tell the iPhone, you 5 know, maybe it's something that the 6 iPhone doesn't want to deal with it. 7 There are so many readers. What every 8 reader that you would walk by, you have 9 to respond no. 10 So this is more kind -- so 11 this is basically describe like two or 12 three years ago, the iPhone with the car. 13 And this describe the situation today. I 14 hope I convey the message. 15 Q Well, we could come back to 16 it. 17 But that sparks another 18 question which is, are you saying that 19 the iPhones that would respond to the 20 charger in your car by trying to pull up 21 Apple Pay do not meet this claim because 22 they're not waiting for a probing signal? 23 MS. LIEBER: Objection, 24 mischaracterizes. 25 A I'm saying that in the, for	Page 193 1 DR. JACOB SHARONY 2 A Please, let's do it slowly. 3 You can ask any question. But please ask 4 again. 5 Q Sure. 6 So Claim 16 of the 947 7 requires an RFID probing signal; right? 8 A Right. It says before that 9 monitor for proximal presence external 10 via the communication circuitry, the 11 monitoring comprising, determining the 12 mobile device is in the operational space 13 of an RFID reader based on an RFID -- it 14 says based on an RFID probing signal. 15 Q Right. 16 So if you had an iPhone and 17 you set it on a charger and it pulls up 18 Apple Pay, then your point is, it's not 19 waiting for an RFID probing signal; it's 20 just waiting for any kind of induction; 21 right? And therefore, it wouldn't meet 22 this claim? 23 MS. LIEBER: Objection, 24 mischaracterizes. 25 A I didn't say that. I'll

Page 194 1 DR. JACOB SHARONY 2 explain to you slowly, what I think 3 happens here. In the plain-vanilla, I 4 saw 14443. There is always a signal. I 5 said the reader always goes to avoid the 6 collision, always ask for, you know, who 7 is out there. And the tag respond with a 8 UID. 9 I gave an example, the 10 request call REQA, and the response is 11 TAQA. So there is -- there is always, 12 this response; okay? A request. There 13 is always probing signal because probing, 14 I want something from you. So it send a 15 request, it answer. 16 So two years ago in my car, 17 older iPhone, I put it on the charger. 18 It's an RFID reader. It goes according 19 to 144 -- in this example, 14413, you see 20 the RFID QA. It answer with 80QA, the 21 answer to request. 22 So now remember that I 23 mentioned to you that there was extension 24 to the 14443 at the beginning of the day, 25 so they say why the phone would answer to	Page 196 1 DR. JACOB SHARONY 2 it doesn't is not within the scope of the 3 claim? 4 A They cover both. 5 Q Oh. It covers both? 6 A Yeah, because it depends how 7 you understand the probing because it 8 could be. 9 Q So this credit card with an 10 NFC chip, is it on detection of a 11 proximal presence of an RFID reader 12 external to this card? Would it transmit 13 an NFC tag to the reader? 14 A I don't know the specific 15 implementation. But if it's the 16 plain-vanilla 14443, yes. This is -- I 17 want to explain something. So the 14443 18 is really the physical layer. It's 19 really the lower layer. What it does, 20 you energize the tag, and you want to 21 avoid collisions. 22 So this is basically done 23 for the anticollision, who is out there, 24 people come back, I select one, one. So 25 I avoid this. So this always happen.
Page 195 1 DR. JACOB SHARONY 2 everyone because this is built in the 3 protocol, the REQA and the 80QA. So it 4 always happen. So how about now, the 5 iPhone would respond only to specific 6 terminals that we want the iPhone to 7 respond to because there could be a 8 payment terminal -- I'm just throwing 9 out, I don't know -- in Sweden that you 10 don't have any relation or something. We 11 don't want the iPhone to communicate with 12 it. 13 Does it send the REQA and 14 the 80QA? Yes. But you will not respond 15 with the extension or the input of the 16 protocol that basically put the type of 17 the terminal or the subtype of the 18 terminal. So this is all baked in 19 software that would tell it where to go 20 or not. So this is really the difference 21 because in both cases, we put the iPhone 22 in the field of view or a nearby reader. 23 One time, it answers, and one time not. 24 Q The time it answers is 25 within the scope of the claim; the time	Page 197 1 DR. JACOB SHARONY 2 But people probably recognize it's not 3 the best way. So sometime in the -- 4 there is an improved probing signal that 5 you provide the terminal type, the 6 subtype. 7 And here, in the phone, 8 it'll tell, look, the terminal -- I'm 9 just throwing out -- outside the U.S., 10 ignore or something like that. That's 11 what I meant. And it depends on the 12 implementation. 13 Q So I'll ask one more time 14 because I have not gotten an answer yet. 15 A Please. 16 Q What language in Claim 16 17 limits this claim to emulated RFID as 18 opposed to actual RFID? If you could 19 please point me to specific language in 20 the claim that imposes that limitation. 21 A It's a mobile device that is 22 configured to output an RFID signal. 23 It's not a tag. Is there a mention of a 24 tag here? No. It's a mobile device. 25 Q And what about for the '984

Page 198 1 DR. JACOB SHARONY 2 patent? What language limits it to 3 emulated RFID? 4 A It's the same. You have a 5 mobile device that output a signal on 6 detection of a proximity to an RFID 7 reader. 8 Q Because if I had a cell 9 phone that had an actual NFC chip in it 10 like my credit card, that would not be a 11 mobile device configured to output an 12 RFID signal; right? 13 MS. LIEBER: Objection, 14 incomplete hypothetical, calls for 15 speculation. 16 A I don't understand. Please 17 be more accurate when you say a chip 18 inside. What do you mean? 19 Q If I had this NFC chip in my 20 credit card, it was actually in my cell 21 phone, then would I have a mobile device 22 that is configured to output an RFID 23 signal? 24 MS. LIEBER: Calls for 25 speculation.	Page 200 1 DR. JACOB SHARONY 2 here; right? 3 A Yes. 4 Q And that is the components 5 responsible for transmitting and 6 receiving signals in a mobile 7 communications device; right? 8 A Yes. 9 Q Let's look at the '984 10 patent, Figure 4 again which is one we've 11 looked at before. 12 A Okay. 13 Q And, actually, sorry. I 14 should start with Figure 3. 15 And you see that Figure 3 16 has a Transceiver 308? 17 A Yes. 18 Q And a Processor 302? 19 A Yes. 20 Q A Memory 304? 21 A Right. 22 Q Other components, e.g. 23 Keyboard Display 310? 24 A Yes. 25 Q And then if we go to the
Page 199 1 DR. JACOB SHARONY 2 A If I understood you 3 correctly, if it's part of the guts of 4 the mobile device. 5 Q So in that case, an actual 6 RFID tag would fall within the scope of 7 the claims if the RFID tag is in the guts 8 of the device? 9 MS. LIEBER: Object to form. 10 A It's not RFID tag. It is -- 11 there is no RFID tag inside the phone. 12 You have an NFC. You have a controller 13 that is basically controlled to be in a 14 specific mode. It's not that you just 15 take this chip and put it inside the 16 phone. It's more involved, hardware and 17 software. I mean you have to be specific 18 about the implementation because 19 otherwise, it will just don't work. 20 Q Let's look at paragraph 46 21 of your declaration. 22 A Okay. 23 Q And you provide a 24 construction or identified various 25 construction of the term transceiver	Page 201 1 DR. JACOB SHARONY 2 part of the specification that talks 3 about Figure 4, which is Column 6, 4 starting about line 50. 5 A Column 6, line 50, okay. 6 Q And it says there, "Figure 4 7 illustrates Transceiver 308 of Figure 3." 8 You see that? 9 A Yeah. 10 Q So you understand that 11 Figure 4 is essentially a representation 12 of the Box 308 as the transceiver in the 13 prior figure we looked at; right? 14 A Yes. 15 Q Now, is this figure an 16 embodiment of the transceiver that is 17 claimed in Claim 13 of the '984 patent? 18 A Yes. It says in the 19 following sentence, in accordance with 20 one embodiment. 21 Q And the transceiver here has 22 a Switch 420; right? 23 A 420, you said? 24 Q Yes. 420. 25 A So what about the 420?

Page 202 1 DR. JACOB SHARONY 2 Q That's a switch that's 3 inside of this transceiver; right? 4 A 420, I think we discussed 5 it. It switches on the antenna. Let's 6 look again. Column 6. Okay. Switch 420 7 is employed to switch between transmit 8 and receiving RF signal. It's connected 9 to the antenna, yeah. 10 Q And it's located inside of 11 the Joint RF Transmit and Receive 12 Section 402; right? 13 A Yes, yeah. Joint RF, TX/RX. 14 Q In this embodiment, does the 15 Switch 420 make the mobile device that 16 it's inside of switchable? 17 A You took a word -- no. It's 18 different switch. It's different 19 switchable. Let me explain. 20 In every RF device, you 21 cannot -- differently from a wire, you 22 cannot talk and listen because you would 23 overwhelm -- the receiver would be 24 overwhelmed because the transmitter is 25 nearby. So it will be completely blind.	Page 204 1 DR. JACOB SHARONY 2 embodiment of Claim 13 of the '984 3 patent; right? 4 MS. LIEBER: Objection, 5 asked and answered. 6 A Yeah. It's one of the 7 embodiments. It's embodiments, you 8 know -- the embodiment and the claims 9 would keep them separate at the moment. 10 Q Well, I'm asking if it 11 embodies -- this example embodies the 12 claim, Claim 13 is an example of how 13 Claim 13 could be embodied. 14 A Could be, but not limiting. 15 Q So in this embodiment, do 16 you see that there are connections to and 17 from the processor on the left-hand side 18 of Figure 4? 19 A Yes. 20 Q So in this embodiment, is 21 the processor part of the transceiver? 22 MS. LIEBER: Object to form. 23 A It doesn't show it. It said 24 to from a processor. And the processor 25 in Figure 3 is 302. It looked like a
Page 203 1 DR. JACOB SHARONY 2 So you either do it on a 3 different frequency or you need -- and 4 then depends if you have antenna that 5 supports both band. But usually, you 6 either transmit or receive, sometimes 7 called time domain duplexing. That's how 8 like Wi-Fi work, for example, transmit, 9 receive; transmit, receive, also 10 Bluetooth. 11 Q So the Joint Transmit 12 Receive Section 402 has a couple of other 13 components inside of it; right? The 14 Amplifiers 414 and 424 and Filters 412 15 and 422. Do you see those? 16 A Yes. 17 Q And then there's a High 18 Frequency Signal Processing Section 410 19 and a Low Frequency Signal Processing 20 Section 408. You see that? 21 A Yes. 22 Q So these are all components 23 of the Transceiver 308; right? 24 A From Figure 3, yes. 25 Q And Figure 3 is an	Page 205 1 DR. JACOB SHARONY 2 different box. 3 Q So the processor here is not 4 part of the transceiver in this 5 embodiment; right? 6 A Depends which processor. 7 There is processing also inside. 8 Q Is the Processor 302 part of 9 the transceiver in this embodiment? 10 MS. LIEBER: Object to form 11 and to the extent it calls for a 12 legal conclusion. 13 A It looks in this figure as a 14 separate unit or block. 15 Q And that tells you that it's 16 not part of the transceiver; right? That 17 it's a separate unit or block? 18 MS. LIEBER: Asked and 19 answered. 20 A The processor? 21 Q Correct. 22 A Yeah. This could be, for 23 example, one of the processors. 24 Q Sorry. 25 My question is, in this

52 (Pages 202 - 205)

Page 206 1 DR. JACOB SHARONY 2 embodiment, the processor is not part of 3 the transceiver; correct? 4 A This Processor 302, yes. 5 Q Yes. 6 It is not part of the 7 transceiver? 8 A It doesn't seem that it is 9 because it shows 308. And there is to 10 and from processor. Assuming it's 11 Processor 302, it's not part of it. 12 Q And similarly in this 13 embodiment, the antenna is not part of 14 the transceiver; right? 15 A It doesn't show that it's 16 part of the transceiver. 17 Q In this embodiment, is the 18 processor responsible for transmitting 19 and receiving signals in the mobile 20 communication device? 21 MS. LIEBER: Object to form. 22 A Could be. Depends on the 23 implementation. 24 Q In this embodiment, is the 25 processor responsible for transmitting	Page 208 1 DR. JACOB SHARONY 2 operating system and the main processor. 3 Q So is the user interface one 4 of the components responsible for 5 transmitting and receiving signals in the 6 mobile communication device? 7 MS. LIEBER: Object to form. 8 A The processor basically sees 9 an input from the user interface. And 10 then it basically -- this could be, for 11 example, that you -- if it's a phone 12 call, you choose a phone call. So it 13 give a command to make a phone call. So 14 otherwise, the transceiver will not make 15 a phone call. 16 And regarding the RFID, 17 again through the user interface, for 18 example, you can choose different cards, 19 passes. So it would basically determine 20 what the transceiver would send, would 21 send as a response. So it is affecting 22 the operation of the voice and/or RFID. 23 Q So in that case, is it part 24 of the transceiver in this embodiment? 25 A We said no.
Page 207 1 DR. JACOB SHARONY 2 and receiving signals in the mobile 3 communication device? 4 MS. LIEBER: Same objection. 5 A Okay. So let's go back to 6 the specification. Your question, it is 7 not part of -- that is not related to the 8 RFID? 9 Q My question is whether the 10 processor in this embodiment in Figures 3 11 and 4 is one of the components 12 responsible for transmitting and 13 receiving signals in the mobile 14 communication device. 15 A So on Column 5, line 22, it 16 says, "Processor 302 is employed to 17 Execute Operating Logic 320, including 18 RFID Feature 322." 19 So it is affecting the RFID 20 function or the mobile device; for 21 example, if it's the central processor 22 and I want to make a phone call, I have 23 to use the user interface. So I have to 24 press on something so the user interface 25 is basically controlled likely by the	Page 209 1 DR. JACOB SHARONY 2 Q But you did say that it 3 meets your definition of transceiver 4 which is components responsible for the 5 transmitting and receiving of signals in 6 a mobile communication device; right? 7 A It's just sending a command. 8 But it's not the communication itself 9 which is in the radio frequency. The 10 transceiver here is a radio frequency. 11 If you go back, you see in 12 Figure 4, it's a joint RF, TR/RX. So the 13 transceiver is dealing with the RF 14 domain. The processor has nothing to do 15 with it. It just basically -- so you can 16 say the power switch on the iPhone is 17 part of the transceiver because I switch 18 it on. It affects the connection to the 19 tower. Is it part of the transceiver? 20 No. 21 Q So how do you draw that line 22 between what's part of the transceiver 23 and not? 24 MS. LIEBER: Object to form, 25 calls for a legal conclusion.

Page 210 1 DR. JACOB SHARONY 2 A I think the definition 3 capture it. Basically, it's responsible 4 for transmitting and receiving signal. 5 The components sort of emit or receive RF 6 signals to the air. 7 MR. SCHARN: Let's take a 8 break. 9 THE VIDEOGRAPHER: The time 10 on the video monitor is 5:06 p.m. 11 We're off the record. This ends 12 Media 4. 13 (A short recess was taken.) 14 THE VIDEOGRAPHER: We are 15 back on the record. The time on the 16 video monitor is 5:23 p.m. This 17 starts Media 5. 18 Q Good evening, Dr. Sharony. 19 A Good evening. 20 Q At any break today, did you 21 discuss the substance of your testimony 22 with counsel? 23 A No. Talk about dogs. 24 Q That is probably a slightly 25 more fun topic.	Page 212 1 DR. JACOB SHARONY 2 the air; right? 3 A Not directly, not directly. 4 Q And so to be responsible, to 5 be considered the transceiver, they have 6 to be directly responsible for 7 transmitting or receiving RF signals over 8 the air; right? 9 A Yes. Think about it that 10 you get from the processor, something 11 that you want to transmit. So then it 12 goes through the transceiver that 13 basically translated to an analog signal 14 because over the air, it's always analog. 15 So there is the processing 16 of the signal and basically sending it, 17 converting it from analog -- from digital 18 to analog on the transmit, digital -- 19 analog to digital on the receiver. And 20 you basically send it through the 21 antenna. 22 Q So the High Frequency Signal 23 Processing Unit 410 and the Low Frequency 24 Signal Processing Unit 408, those are 25 part of the transceiver; right?
Page 211 1 DR. JACOB SHARONY 2 A Yeah, to some. 3 Q So before the break, you 4 said that transceiver as you understand 5 that term in Claim 13 of the '984 patent 6 is the components that emit or receive RF 7 signals to the air. Do you recall that? 8 A Yes. 9 Q So are all of the components 10 in Figure 4 components that emit or 11 receive RF signals to the air? 12 A It's the sum total of the 13 components that are responsible for 14 transceiver. We are talking about RF 15 transceiver. So these are the 16 components -- I'm sorry. Which -- oh, 17 okay. Figure 4, yeah. So these are the 18 sum or collection of the components that 19 are responsible for transmitting, 20 receiving over the air. 21 Q If you flip over to 22 Figure 3, the other components like 23 keyboard and Display 310, those are not 24 components that are responsible for 25 transmitting or receiving RF signals over	Page 213 1 DR. JACOB SHARONY 2 A As it shows here, yeah. 3 Q But then the Processor 302 4 in Figure 3 is not part of the 5 transceiver; right? 6 A In this embodiment, how it's 7 described, yes. 8 Q And that's because the Items 9 410 and 408 are directly responsible for 10 transmitting and receiving signals over 11 the air, whereas the Processor 302 is 12 not; right? 13 A In this embodiment, yes. 14 But it depends so much on the 15 implementation because sometime you have 16 a multiple processor involved. And there 17 is a modem; there is a transceiver. So 18 it depends on the implementation. 19 Sometimes everything is in one chip, 20 system on a chip. So depends on the 21 implementation. 22 Q And, again, how would one of 23 skill in the art draw the line between 24 what counts as part of the transceiver 25 and what does not in interpreting this

Page 214 1 DR. JACOB SHARONY 2 claim? 3 A So the transceiver here is 4 the collection of all the components that 5 are responsible for transmitting and 6 receiving. It depend on the context, 7 even the examiner calling the whole 8 device transceiver. 9 Q Do you agree with that? 10 MS. LIEBER: Objection, 11 object to form. 12 A I can see where it come 13 from. For example, when you have 14 walkie-talkie, you tell me, give me the 15 radio. It's everything. But in this 16 context, it is not everything. It is the 17 more -- more direct responsibility for 18 sending it, you know, over the air to the 19 media. 20 Q The transceiver can't just 21 be all of the components in the mobile 22 communication device? 23 A The keyboards. Indirectly, 24 it affects, you know, because you choose 25 something. You end the phone call. This	Page 216 1 DR. JACOB SHARONY 2 is used in Claim 13 of the '984 patent? 3 MS. LIEBER: Object to form. 4 A It's outside the transceiver 5 in this embodiment. But depending on the 6 implementation, you have a memory. I 7 need to find the memory where it 8 mentioned the memory. 9 Q Well, I'm asking about Claim 10 13 of the '984 patent which does not 11 separately identify a memory. 12 So are you with me on Claim 13 13 of the '984 patent? 14 A Okay. So there is no memory 15 mentioned you say. 16 Q Well, I'll ask you. 17 Do you see a memory 18 mentioned in Claim 13? 19 A I don't see. I assume that 20 I'm correct. 21 Q But you do see a transceiver 22 mentioned in Claim 13? 23 A I do. 24 Q So as you understand the 25 term transceiver in Claim 13, would it
Page 215 1 DR. JACOB SHARONY 2 is not the transceiver. 3 Q Now, what about the Memory 4 304 which has Operating Logic 320 and 5 RFID Feature 322 in Figure 3? Do you see 6 that? 7 A Yeah. 8 Q Is that part of the 9 transceiver as you understand the term to 10 be used in Claim 13 of the '984 patent? 11 A So, again, depends so much 12 on the implementation. In the cellular, 13 you have some processing and memory. In 14 the NFC, you have some processing and 15 memory. And you have also some 16 processing and memory outside this. 17 For example, you have -- on 18 the main memory, you have all the 19 operating system that orchestrate 20 everything. So it seems that here, the 21 memory and the Operating Logic 320, they 22 basically housed in a different 23 component. 24 Q And so they are, therefore, 25 not part of the transceiver as that term	Page 217 1 DR. JACOB SHARONY 2 include the Memory 304 and the Operating 3 Logic 320 and the RFID Feature 322? 4 MS. LIEBER: Object to form, 5 calls for a legal conclusion. 6 A It's a method claim that 7 discuss monitoring in the outputting a 8 signal. So the memory could be involved. 9 But it's not -- we would not regard it as 10 part of the transceiver. 11 Q But you would agree that the 12 memory is at least indirectly responsible 13 for transmitting and receiving signals; 14 right? 15 MS. LIEBER: Object to form. 16 A The operating system -- 17 look, there could be something on the NFC 18 side controller that there is also memory 19 there. And there could be applets there 20 for a pass or for a specific credit card. 21 So in that implementation, it could have 22 been resided there. But it depends so 23 much on the implementation. 24 Q Well, what I'm trying to 25 understand is just looking at the

55 (Pages 214 - 217)

Page 218 1 DR. JACOB SHARONY 2 construction in your declaration for 3 transceiver, which says the components 4 responsible for transmitting and 5 receiving signals in a mobile 6 communication device, how I know that the 7 things inside Transceiver 308 are within 8 the scope of that claim and how I know 9 that the things inside the Memory 304 and 10 the Processor 302 are not part of the 11 transceiver. 12 So how do I know that or how 13 could I tell that? 14 MS. LIEBER: Object to form, 15 calls for a legal conclusion. 16 A The claim does not mention a 17 memory, only one -- the claim does not 18 mention memory. So why do you like to 19 tie the other claim terms to memory, I 20 don't understand. 21 Q Well, I'm just trying to 22 understand if the memory is part of the 23 transceiver or not. And you've said it's 24 not. And I'm just trying to understand 25 why.	Page 220 1 DR. JACOB SHARONY 2 Columbia -- not now, in the fall -- about 3 millimeter wave. Millimeter wave is like 4 around 30 gigahertz all the way up to 5 like 100 plus gigahertz. Usually, the 6 antenna is proportional to the size of 7 the wavelength. And as it sound, 8 millimeter waves, millimeter. 9 So sometimes, the antenna is 10 kind of printed on a chip or is 11 inseparable. In other places, they just 12 send you the transceiver with connector. 13 And you choose like in the two gigahertz, 14 the wavelength is like several 15 centimeter. So you choose, for example, 16 if you want high gain to go the extra 17 mile. So the user basically can buy them 18 separately and school them in. So 19 usually, it's not. But sometime it is 20 in. 21 Q The antenna in the accused 22 products, the iPhones and Apple Watches 23 is not inside the transceiver of the 24 iPhone and Apple Watch; right? 25 MS. LIEBER: Object to form.
Page 219 1 DR. JACOB SHARONY 2 A In the embodiments, in the 3 embodiments, it seems that it's outside. 4 But it depends on the implementation. 5 I'm telling you there is a memory inside 6 the NFC. There is a memory inside the 7 cellular. 8 Q So the memory inside the 9 transceiver -- 10 A And sorry. And also 11 processing, you know, there is a secure 12 element. There is processing there. So 13 it depends so much on the implementation. 14 So it's distributed, part here, part 15 here. So to say that the memory is 16 always outside the transceiver may not be 17 accurate. The main memory where the 18 operating system is, for example, is not 19 in the transceiver. 20 Q And then what about the 21 antennas? Is the antenna part of the 22 transceiver? 23 A Sometimes, the antenna is 24 embedded inside. Let me give you an 25 example. I teach now a course at	Page 221 1 DR. JACOB SHARONY 2 A I haven't seen -- you know, 3 I was relying only to -- on public 4 information. So I don't have all the 5 details, where it is exactly. I mean 6 there are some suggestion that are on top 7 of the phone. But, you know, if we see 8 more internal documents, maybe we can 9 answer this better. 10 Q If it's on top of a phone or 11 on the sides of the phone, then the 12 antenna would not be part of the 13 transceiver; right? 14 MS. LIEBER: Object to form. 15 A Remember, we said 16 transceiver is the collection of all the 17 parts that are responsible. 18 Q Well, isn't the antenna 19 responsible in Figure 4? 20 MS. LIEBER: Object to form. 21 A The antenna is basically 22 cutting out. It's similar processor from 23 the left to form and to form the antenna. 24 Antenna is a passive device. It doesn't 25 do anything on its own. So you basically

56 (Pages 218 - 221)

Page 222 1 DR. JACOB SHARONY 2 send electromagnetic wave there. And it 3 basically propagates. 4 Q So if the antenna is a 5 separate component from the transceiver, 6 then it would not be part of the 7 transceiver; is that what you're saying? 8 A Usually, you know, it 9 depends on the context. If you are 10 passive, can you be responsible to 11 something? 12 Q So if the antenna is 13 passive, it's not part of the 14 transceiver? 15 A In this embodiment, it looks 16 as if it's not part of the transceiver. 17 Q Does your iPhone have the 18 little antenna bands on the side of it, 19 one sitting over there by you? 20 A Antenna bands? 21 Q Yes. These little stripes 22 that are, I believe, the antenna. Do you 23 see that? 24 MS. LIEBER: Objection, 25 calls for speculation.	Page 224 1 DR. JACOB SHARONY 2 passive, then it's not part of the 3 transceiver, but if it's active, then it 4 could be part of the transceiver? 5 MS. LIEBER: Asked and 6 answered. 7 A You know what's active 8 antenna? An active antenna, all the 9 transceiver is -- I worked on this 10 system. It's inside the antenna. Inside 11 the bottom of the antenna, you have the 12 radio and everything. So we used to call 13 it active antenna. 14 So that's -- I don't know 15 how you can separate it. But the radio 16 is inside the antenna. Here, there are 17 separated. But sometime it is not. I 18 said like millimeter wave. It's so 19 small. So sometime they do it on the 20 chip; sometime not. It depends on the 21 implementation. 22 Q So an antenna that's passive 23 and not on the chip would not be part of 24 the transceiver; right? 25 MS. LIEBER: Asked and
Page 223 1 DR. JACOB SHARONY 2 A I do not, no. There is one 3 line. 4 Q Do you know if that's the 5 antenna or an antenna? 6 MS. LIEBER: Same objection. 7 A Make sense, could be. 8 Q If that is the antenna, is 9 it part of the transceiver on that phone? 10 MS. LIEBER: Objection, 11 assumes facts not in evidence. 12 A I have to see exactly, you 13 know, how everything is connected. But 14 as I said, you know, sometime it's kind 15 of inseparable. And I know that there is 16 a millimeter wave there for 5G. So 17 sometime it's inseparable. 18 But according what we see -- 19 it's usually -- it depends on the 20 context. It could be just the active 21 devices. Antenna is passive. So it will 22 not do something by its own. It has to 23 be driven by electromagnetic wave in 24 order to promulgate. 25 Q So if the antenna is	Page 225 1 DR. JACOB SHARONY 2 answered. 3 A In this context, it seems 4 that it's separate from the transceiver. 5 When you buy a chip from NXP or Qualcomm, 6 it is basically -- again, depending on 7 the implementation, the NXP chip has the 8 antenna inside. It's inseparable. It's 9 this coil. It's the coil that basically 10 generate the magnetic wave. 11 Q You're saying the NXP chip 12 in the accused products has its own 13 antenna? 14 A No. I don't know in the 15 accused product. 16 Q That's a different NXP 17 product? 18 A It depends on the 19 implementation. Maybe there is a chip 20 that would include this. But usually, 21 it's -- I saw from some picture that you 22 see the copper -- this is the antenna, 23 the copper. I meant to say the color 24 copper. It's a metal. This is the 25 antenna. So it's outside the NXP chip.

Page 226 1 DR. JACOB SHARONY 2 And with the cellular, we 3 know that it's outside. There could be 4 implementation. I haven't seen. But 5 there could be implementation that it's 6 maybe inside. I think in the Apple case, 7 it's outside. So it's not part of the 8 transceiver. 9 Q Let's look at the part of 10 your report that talks about the 11 transceiver. I'm at about paragraph 69. 12 I'll give you a page number to go with 13 that. 14 A Page 24. 15 Q You see that it's under 16 Heading 3 for Element 13C of the '984 17 patent that has the transceiver 18 configured to, and then it goes on? 19 A Yes. 20 Q And here, you state in 21 paragraph 69, looking at the second 22 sentence, "The accused products 23 transceiver is also configured to output 24 in a second stated voice call signal for 25 transmission, at least in part over	Page 228 1 DR. JACOB SHARONY 2 A The RFID is basically 3 outputted from the NXP controller. 4 Q And the NXP controller does 5 not output a voice call signal; right? 6 A That's correct. 7 Q So the two Qualcomm chips 8 and the Murata chip output voice call 9 signals and can receive voice call 10 signals, and the NXP chip outputs RFID 11 signals; right? 12 A Yeah. 13 Q And so just to clarify, 14 you're not accusing any one of these 15 chips individually as being a single 16 two-state switching required transceiver 17 for switching between voice signal 18 transmission and RFID; right? 19 MS. LIEBER: Object to form, 20 calls for a legal conclusion. 21 A I'm not sure I understood 22 your question. But the transceiver is 23 collectively these components that we 24 discussed, NXP and the Qualcomm and the 25 Murata. So this is the so-called
Page 227 1 DR. JACOB SHARONY 2 wireless network." 3 And the next sentence 4 says, "For example, the iPhone 7 has 5 internal circuitry and components 6 including an NXP67VS4 NFC controller, 7 Qualcomm WTR4905 transceiver, Qualcomm 8 WTR3925 transceiver and Murata 339S00199 9 Wi-Fi/Bluetooth module, collectively, 10 'transceiver.'" 11 You see that? 12 A Yes. 13 Q Which of those components is 14 responsible for outputting voice call 15 signals as you understand it? 16 A It says that Qualcomm 17 WTR4905 and the Qualcomm WTR3925 are for 18 the cellular. And the rest are the 19 Wi-Fi, for example. 20 Q So the two Qualcomm chips 21 listed and the Murata chip can all output 22 voice call signals; right? 23 A That's correct. 24 Q Do any of those output an 25 RFID signal?	Page 229 1 DR. JACOB SHARONY 2 transceiver. 3 Q So there's four 4 subcomponents in what you're calling the 5 transceiver; right? 6 MS. LIEBER: Object to form. 7 A There are, yeah. 8 Q And you're saying the two 9 Qualcomm transceivers are each, a 10 subcomponent of the transceiver; right? 11 MS. LIEBER: Object to form. 12 A Okay. 13 Q And the NXP, NFC controller 14 with secure element, this is a 15 subcomponent of the transceiver as you've 16 defined it; right? 17 MS. LIEBER: Object to form. 18 A You said secure element or 19 something. We said the NXP. 20 Q Yes. 21 So if you look at the chart 22 here, your diagram, it says, "NXPPN67V 23 NFC controller with secure element." 24 A Yes. In some 25 implementation, a secure element is in

58 (Pages 226 - 229)

Page 230 1 DR. JACOB SHARONY 2 the NFC chip. 3 Q So you're accusing that as 4 being one of the four components of the 5 transceiver; right? 6 MS. LIEBER: Object to form. 7 A This is not the accused 8 product. The accused product is a mobile 9 device or a watch that basically has a 10 transceiver that is capable in outputting 11 or receiving voice call and the RFID 12 signal. 13 So these are -- this 14 transceiver is a larger component. It's 15 not -- it's part of the accused product, 16 but it's not -- was not specified as an 17 accused product. 18 Q Right. 19 So you're not accusing the 20 NXP chip individually as being a single 21 two-state switching required transceiver 22 for switching between voice signal 23 transmission and RFID; right? 24 MS. LIEBER: Object to form, 25 calls for a legal conclusion.	Page 232 1 DR. JACOB SHARONY 2 that, responsible for that. It's like 3 you tell me, you know what, I have a 4 product composed or comprised of three 5 elements. Each element is not doing it. 6 So since the whole product 7 is comprised of three and each one of 8 them is not doing it. So let's say that 9 the combined chips also don't do it. So 10 basically, if you try to say that the 11 transceiver is not doing it, I don't 12 think it's accurate because the 13 transceiver is a collection of all these 14 components, and it's part of the mobile 15 device. It outputs the two type of 16 signals. 17 Q And the claim says the 18 mobile device having a transceiver. Do 19 you see that? 20 A I see. 21 Q So does that mean that the 22 mobile device of the claim has one 23 transceiver? 24 MS. LIEBER: Object to form, 25 calls for a legal conclusion.
Page 231 1 DR. JACOB SHARONY 2 A I'm not accusing anyone. 3 But my opinion here is that the NXP, just 4 the NXP, it is not a mobile device that 5 basically outputting two type of signals. 6 So it's part of a transceiver which is 7 the mobile device. Mobile communication 8 device is comprised of comprising, you 9 know, transceiver and more. My 10 understanding, these are the accused 11 products, not the specific component, 12 individual component inside. 13 Q Right. 14 The NXP chip by itself would 15 not meet all the requirements of the 16 transceiver; right? 17 A That's correct. 18 Q And the Qualcomm chips by 19 themselves would not meet all the 20 elements of the transceiver; right? They 21 would only output voice call signals? 22 MS. LIEBER: Objection, 23 vague, calls for a legal conclusion. 24 A You dissect the transceiver. 25 The transceiver is basically in charge of	Page 233 1 DR. JACOB SHARONY 2 A Well, the transceiver is the 3 collection of all the components that are 4 responsible for transmitting or 5 receiving. Could it be something else, 6 like ZigBee? So you would include it in 7 the transceiver. But no one is 8 interested in the ZigBee. We are 9 interested in the phone call and the 10 RFID. 11 Q And the transceiver in the 12 accused product, the iPhone 7 here that 13 you're examining, it actually has 14 components that are independently 15 transceivers on their own; right? 16 MS. LIEBER: Object to form, 17 vague, calls for a legal conclusion. 18 A Yeah. That's what I told 19 you before, that the transceiver is the 20 collection of all these component. If 21 you now pick up the phone and call 22 Broadcom and you tell them I need a Wi-Fi 23 radio, a Wi-Fi transceiver, so they know 24 what you want, they would send you this 25 component. Or if you call Qualcomm and

Page 234 1 DR. JACOB SHARONY 2 you want -- in fact, if you go to the 3 product guide of ordering, they would 4 call them transceiver. That's why it 5 says transceiver. In the teardown, they 6 call them transceiver. 7 But in the context of the 8 patent, all these components is the 9 transceiver. So I don't know what you 10 want to say that the transceiver in the 11 patent is comprised of several 12 transceivers. 13 Q So what I'm asking you is, 14 in the iPhone 7, the transceiver that you 15 accuse of infringing in your declaration 16 is made up of four independent 17 transceivers: Qualcomm LTE chip, the 18 Qualcomm RF transceiver, the Murata 19 transceiver and the NXP transceiver; 20 those four transceivers collectively make 21 up what you call the transceiver in the 22 iPhone; right? 23 A This is the four that 24 makes -- we are referring to this because 25 there could be again ZigBee or others.	Page 236 1 DR. JACOB SHARONY 2 switch in software also. So you either 3 go to this branch or this branch. So the 4 word switch is very general. And it's 5 based on the context. 6 Q My question is whether 7 you've identified one. 8 So do you know if you've 9 identified a switch that these four 10 transceivers share? 11 MS. LIEBER: Object to form, 12 calls for speculation, assumes facts 13 not in evidence. 14 A Based on the public 15 information that I had, I don't see 16 anything that mentions switch here. But 17 if I see more information, I would be 18 gladly answering it maybe differently. 19 Q Have you identified any 20 filters that these four transceivers 21 share? 22 MS. LIEBER: Object to form, 23 calls for speculation, assumes facts 24 not in evidence. 25 A I was not privy to the
Page 235 1 DR. JACOB SHARONY 2 But the transceiver has these four 3 components that when they stand by 4 themselves, you call them transceiver as 5 well. On the data sheet, it says 6 Qualcomm transceiver. But in the context 7 of the patent, the sum of all these 8 components would make the transceiver. 9 Q Have you identified any 10 common switch that these four components 11 share? 12 A Switch? 13 Q Yes. 14 A What do you mean switch? 15 Q Any sort of switch that all 16 four of these transceivers that make up 17 the accused transceiver share. 18 MS. LIEBER: Object to form. 19 A It's a little bit vague. 20 What do you mean by switch? 21 Q What do you understand the 22 term switch to mean? 23 A Depend on the context. It 24 would be a switch of a light. It could 25 be a switch in software. We use the word	Page 237 1 DR. JACOB SHARONY 2 internals of these chips. 3 Q Have you identified any 4 amplifiers that these four transceivers 5 share? 6 MS. LIEBER: Same objection. 7 A I haven't seen -- basically, 8 again, I'll repeat myself. Based on 9 public documents, there is no block 10 diagram or schematics or internal of the 11 chips that would suggest. 12 Q And separately, you I 13 believe discuss the M10 chip that is a 14 processor in iPhone 7. Do you recall 15 that? 16 A If you can direct me, 17 please. 18 Q So what I'm getting at for 19 you to keep in mind is whether that -- 20 and I'll take you where you talk about 21 the M10 chip -- M10 chip is part of the 22 transceiver here. 23 A I have to see the M10. 24 Q Sorry. I said M10. I meant 25 A10.

60 (Pages 234 - 237)

Page 238 1 DR. JACOB SHARONY 2 A Okay. 3 Q So page 59, paragraph 120. 4 A Page? 5 Q 59. 6 A 59. 7 Q Paragraph 120. 8 A Yes. 9 Q So you say, "The iPhone 7 10 has processing circuitry, e.g., A10 11 fusion chip NXP67V04 NFC controller as 12 shown below." 13 A Yes. 14 Q So is the A10 fusion chip in 15 iPhone 7 part of the transceiver? 16 A I believe this is the main 17 processor of the iPhone that basically 18 execute many things, including the 19 operating system. And the Claim 16 of 20 the 947, you said? 21 Q No. Claim 13 of the 984. 22 My question is whether the 23 A10 fusion chip is part of the 24 transceiver as you've accused it in Claim 25 13 of the '984 patent.	Page 240 1 DR. JACOB SHARONY 2 we say processing because there is also 3 processing in the NFC controller. So the 4 cellular will not use, you know, for the 5 voice call, the processing there. 6 Q So let me ask a question 7 here. 8 You have an opinion on what 9 components are the transceiver that meets 10 the claim element transceiver in Claim 13 11 that are in iPhone 7; right? 12 A Please say it again. 13 Q So we were looking at the 14 four transceivers that you said are the 15 transceiver within the meaning of Claim 16 13 of the '984 patent; right? 17 A Yes. 18 Q And my question is, is this 19 A10 chip also part of the transceiver as 20 that term is used in the '984 patent? 21 MS. LIEBER: Objection, 22 vague. 23 A Could you be specific? 24 Because we saw in the picture, in 25 picture --
Page 239 1 DR. JACOB SHARONY 2 MS. LIEBER: Object to form. 3 A Well, Claim 13 doesn't talk 4 about the processor, does it? 5 Q Right. 6 It has a transceiver. 7 So my question is whether 8 the A10 fusion chip is part of the 9 transceiver in your opinion. 10 MS. LIEBER: Object to form, 11 vague, calls for speculation, assumes 12 facts not in evidence. 13 A As I mentioned, the 14 transceiver itself has some processing in 15 it. But the A10 is something that is 16 shared by these components. I think 17 Figure 1 is -- describes it in a 18 pictorial way, Figure 1 of any of the 19 patents. So you have the 104, the 106 20 for the mobile communication and the 21 RFID. And they share some processing. 22 So this is one embodiment, for example. 23 Q So my question -- well, let 24 me first ask. 25 A We have to be accurate when	Page 241 1 DR. JACOB SHARONY 2 Q I do not know how I could be 3 any more specific than asking -- 4 A No. It could be, for 5 example, Processor 302 which is outside 6 the transceiver. 7 Q So I'm asking you -- 8 A In Figure 3. 9 Q I'm asking you about the 10 accused iPhone 7 product; okay? 11 A Okay. 12 Q So the accused iPhone 7 13 product has an A10 chip; right? 14 A Yes. 15 Q Is that A10 chip part of the 16 transceiver of Claim 13 of the '984 17 patent in your opinion? 18 A The A10 is not part of the 19 transceiver. 20 Q Is the A10 chip part of the 21 communication circuitry of Claim 16 of 22 the '947 patent? 23 A Claim 16 of the 947. So 24 this fall under the processing circuitry 25 which is a collection of all the

Page 242 1 DR. JACOB SHARONY 2 processing circuitry on the same thing 3 that we said on the communication 4 circuitry. Communication is all -- 5 similar construction to the transceiver. 6 So you are asking if the A10 is part of 7 the transceiver? 8 Q So now, I'm talking about 9 Claim 16 of the '947 patent. And I know 10 that you accuse the A10 chip being part 11 of the processing circuitry. 12 So my question is, is the 13 A10 chip also part of the communication 14 circuitry of Claim 16 of the '947 patent? 15 A It is separate. 16 MR. SCHARN: No further 17 questions. 18 MS. LIEBER: I just have a 19 brief follow-up. 20 EXAMINATION BY 21 MS. LIEBER: 22 Q Dr. Sharony, do you recall 23 earlier, Mr. Scharn asked you some 24 questions regarding the Zalewsky 25 reference?	Page 244 1 DR. JACOB SHARONY 2 read the file history to understand what 3 Zalewsky says in its four corners of the 4 document? 5 A I wanted to point you to the 6 very same decision that the examiner, the 7 PTO took as to why the cover -- I mean 8 this was discussed extensively just to 9 show you and point why it doesn't sort of 10 being a prior art for that. 11 So it was basically 12 originally submitted as a sort of a -- 13 they use the language of -- something 14 with the obvious or, you know, it appears 15 there. And then there was eventually, a 16 decision that it is not because of the 17 cover and what we discussed. So just to 18 emphasize this decision, why you 19 suggested that we take a tag separately 20 and we put it inside, why it is not. 21 Q You are a person of skill in 22 the art; right? 23 A Yes. 24 Q And you have a Ph.D. in 25 electrical engineering; right?
Page 243 1 DR. JACOB SHARONY 2 A Yes. 3 Q Do you recall he asked you a 4 series of questions regarding whether 5 embodiments in Zalewsky met the 6 limitations of Claim 13 of the '984 7 patent? Do you recall that discussion 8 generally? 9 A Yes. 10 Q In the course of that 11 discussion, did you ask to see any 12 materials? 13 A Yes. 14 Q Do you recall what you asked 15 to see? 16 A The file histories that 17 relates to the discussion on that topic. 18 Q And did he provide you with 19 the file histories that you asked to see? 20 A No. 21 MS. LIEBER: No further 22 questions. 23 FURTHER EXAMINATION BY 24 MR. SCHARN: 25 Q Dr. Sharony, do you need to	Page 245 1 DR. JACOB SHARONY 2 A Correct. 3 Q Do you know if the patent 4 examiner had a Ph.D. in electrical 5 engineering? 6 A I don't know. 7 MS. LIEBER: Objection, 8 calls for speculation. 9 Q So did you need to see what 10 the patent examiner said to understand 11 what Zalewsky itself says? 12 MS. LIEBER: Objection, 13 mischaracterizes the witness's 14 testimony. 15 A Yeah, but this is really 16 what really decides. I mean you, for 17 example, say -- I'll give you an example. 18 You say that the transceiver is one chip. 19 The other side said the transceiver could 20 be multiple chip. It doesn't matter what 21 we say. It's really the court decision; 22 right? So does the judge has a Ph.D. and 23 he knows better than -- it's a matter of 24 law. 25 So we have to follow what

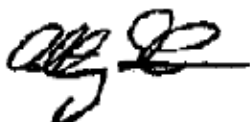
62 (Pages 242 - 245)

Page 246 1 DR. JACOB SHARONY 2 the PTO decide. I assume that we have to 3 follow what's the PTO, basically how it 4 construe it. And if it was -- again, I'm 5 not a lawyer. I'm a technical guy. But 6 if he made error, for example, so there 7 should be another office action or 8 something to correct it. But that's what 9 was decided. So I provided my opinion. 10 I wanted to emphasize also, the decision 11 of the PTO. 12 Q But the bottom line is you 13 have the technical prowess to understand 14 what the Zalewsky reference says without 15 relying on what the PTO said about 16 Zalewsky; right? 17 MS. LIEBER: Object to form, 18 argumentative. 19 A So why do we consider as 20 intrinsic record, the file histories, you 21 know. 22 Q Is that a yes or a no? 23 MS. LIEBER: Objection, 24 asked and answered. 25 A Please ask again.	Page 248 1 2 MS. LIEBER: No further 3 questions. 4 THE COURT REPORTER: Are you 5 ordering a copy of the transcript and 6 a rough? 7 MS. LIEBER: Yes. 8 THE VIDEOGRAPHER: We are 9 going off the record at 6:16 p.m. 10 This concludes today's testimony 11 given by Dr. Jacob Sharony. The 12 total number of media units used was 13 five and will be retained by Veritext 14 Legal Solutions. Thank you. We're 15 off the record. 16 (Time noted: 6:16 p.m.) 17 18 19 DR. JACOB SHARONY 20 21 Subscribed and sworn to 22 before me on this _____ day 23 of _____, 2024. 24 25 NOTARY PUBLIC
Page 247 1 DR. JACOB SHARONY 2 Q The question is, the bottom 3 line is you have the technical prowess to 4 understand what the Zalewsky reference 5 says without relying on what the PTO said 6 about Zalewsky; right? 7 MS. LIEBER: Object to form 8 and scope. 9 A I can refer to the technical 10 parts. But there are maybe other legal 11 issues of constructions that the 12 examiner -- I don't know if I can go and 13 be examiner tomorrow. Maybe I need to go 14 through some courses. I just don't know. 15 So I'm not saying that I know more than 16 the examiner. 17 Q But you know enough to 18 understand it? 19 MS. LIEBER: Objection, 20 vague. 21 A I consider everything, 22 including the file history and what the 23 PTO decides. 24 MR. SCHARN: Nothing 25 further.	Page 249 1 2 I N D E X 3 4 E X A M I N A T I O N 5 6 EXAMINATION FURTHER EXAMINATION 7 Mr. Scharn 5 243 8 Ms. Lieber 242 9 10 E X H I B I T S 11 Sharony Description Page 12 Sharony Exhibit 1 CV 22 13 Sharony Exhibit 2 Declaration 30 14 Sharony Exhibit 3 Patent 34 15 Sharony Exhibit 4 Patent 34 16 Sharony Exhibit 5 Patent 34 17 Sharony Exhibit 6 Patent 116 18 Sharony Exhibit 7 Patent 147 19 Sharony Exhibit 8 Patent 153 20 21 22 23 24 25

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CERTIFICATION

I, ANTHONY GIARRO, a Shorthand Reporter and a Notary Public, do hereby certify that the foregoing witness, DR. JACOB SHARONY, was duly sworn on the date indicated, and that the foregoing, to the best of my ability, is a true and accurate transcription of my stenographic notes. I further certify that I am not employed by nor related to any party to this action.



ANTHONY GIARRO

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

ERRATA SHEET VERITEXT/NEW YORK REPORTING, LLC 1-800-727-6396

330 Old Country Road 7 Times Square
Mineola, New York 11501 New York, New York 10036
NAME OF CASE: Varia Holdings versus Apple
DATE OF DEPOSITION: March 6, 2024
NAME OF DEPONENT: Dr. Jacob Sharony

PAGE	LINE (S)	CHANGE	REASON
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			

DR. JACOB SHARONY

SUBSCRIBED AND SWORN TO BEFORE ME
THIS ____ DAY OF _____, 20__.

(NOTARY PUBLIC) MY COMMISSION EXPIRES:

&	11501 251:4	239:3 240:10	17 8:14 149:7
& 1:15 2:4,9 4:25 5:7	116 249:17	240:16 241:16	170 168:18
1	11:14 53:9	243:6	180 119:19
1 4:5 22:20,23 53:11 88:17 90:9,19 97:19 150:20 154:4 160:19 161:23 162:3,4,6,19,22 163:11 167:24 178:17 239:17 239:18 249:12	11:27 53:15	130 163:5,16,23 168:18	121:5 126:3,8 168:18
1-800-727-6... 251:3	120 162:7 163:4,11,24 164:12 168:15 238:3,7	13c 226:16	190 168:18
100 31:5,12 119:22 120:16 144:3 162:20 162:22,24,24 163:3,10,22 164:3,22 168:25 169:11 220:5	12:48 103:22	14 11:9 14:17 17:10 28:6 32:3 161:24	1990s 61:8
10022 1:16 2:5	13 8:14 28:6 61:17 62:12,25 64:23,25 67:13 78:11,12 80:19 84:9,10 86:2,5 86:17 87:24 94:22 106:24 107:9,9,14,18 108:14 109:25 110:7,25 111:8 113:3,3 117:15 118:8 130:4 132:20 139:13 139:17 140:8 140:13,21,24 141:6 146:20 167:4 175:16 177:8,11,15 178:3,4 179:8 179:17 180:8 181:10 201:17 204:2,12,13 211:5 215:10 216:2,10,13,18 216:22,25 238:21,25	140 162:7 163:4 168:15	1997 40:9 41:7 48:7 59:22
10036 251:5		144 194:19	1999 59:17 66:9
104 239:19		14413 194:19	1:23-07477 1:3
106 88:22 89:3 90:8,14 239:19		14443 18:12 194:4,24 196:16,17	1:57 104:4
1099 24:3		147 249:18	2
10:02 1:10 4:4		14th 11:5,7	2 30:4,7 32:25 53:16 103:24 167:25 249:13
110 117:8,10 118:7 121:3 130:12 154:19 156:25 162:21 162:24 163:3		15 5:25 7:24 8:8,14	2.4 165:7,16 168:17,20
		150 163:6 168:18	20 5:25 7:24 8:9,14 13:19 36:15 37:11 55:6 154:20,21 158:17,18 168:14 251:23
		153 249:19	200 168:19
		16 177:8,17,22 178:8,14,16,18 178:23 179:2,7 180:7 181:8 185:8 186:7,11 187:19 188:19 193:6 197:16 238:19 241:21 241:23 242:9 242:14	2000 40:10,17 40:17 47:21 52:2,3 148:9 148:11 153:6,8
		160 168:18	2000s 40:18 46:24 52:4
			2001 148:3
			2002 153:18

2003 37:7,12,16 37:20 40:20 43:21 44:15 46:9,18 47:22 48:11,20 49:10 50:15 52:19 53:24 54:4,19 55:17,23 56:13 56:19 57:4,12 58:9 61:25 62:3 63:5,10 63:21 85:22 98:4 99:12 2004 23:18 24:18 2005 38:2 2006 153:18 2008 52:4 2009 52:5 2010 28:3 2014 24:20 2023 9:14 2024 1:10 4:4 32:3 248:23 251:6 21 32:20 133:5 210 157:13 158:4 159:2 168:19 211 157:13 159:2 212 157:13 158:4 159:2 22 144:2 148:6 207:15 249:12	24 226:14 242 249:7 243 249:7 2a 119:18,22 2b 117:5 119:13,19 126:3 3 3 33:25 34:7,11 34:14 35:4,7 35:11 37:4 61:13 104:5 155:9 200:14 200:15 201:7 203:24,25 204:25 207:10 211:22 213:4 215:5 226:16 241:8 249:14 30 13:19 148:8 148:10,10 154:6,21 158:17,19,24 160:22 168:15 220:4 249:13 302 200:18 204:25 205:8 206:4,11 207:16 213:3 213:11 218:10 241:5 304 200:20 215:4 217:2 218:9	308 200:16 201:7,12 203:23 206:9 218:7 31 162:4,9,11 162:16 310 200:23 211:23 3161 2:10 320 207:17 215:4,21 217:3 322 94:6 207:18 215:5 217:3 330 251:4 339s00199 227:8 34 249:14,15,16 35 77:7,8 36 93:25 37 168:10,12 3:25 155:7 3:39 155:13 3rd 1:16 2:5 42:13 4 4 34:18 35:7,11 76:7,14,20 119:21 155:14 200:10 201:3,6 201:11 204:18 207:11 209:12 210:12 211:10 211:17 221:19 249:15	40 119:13,17 402 202:12 203:12 408 203:20 212:24 213:9 41 94:5,16,20 410 203:18 212:23 213:9 412 203:14 414 203:14 42 175:15 176:11,18 181:4 420 76:14,20,21 76:24 201:22 201:23,24,25 202:4,6,15 422 203:15 424 203:14 44 178:21 45 94:17,20 46 199:20 5 5 34:11,22 35:4 35:7,12 37:4 207:15 210:17 249:7,16 50 31:7,9,11,16 201:4,5 50-50 8:23 5259 250:17 550 18:21 59 238:3,5,6 5:06 210:10
---	--	---	--

5:23 210:16 5g 28:22,23 223:16	80 8:12 801 151:12 802.11 25:17 164:14 165:8 166:5,11 168:14 802.11. 165:17 809 150:17 151:14,15 152:13 153:23 155:23 156:9 80qa 194:20 195:3,14 80s 46:11	984 35:10 61:14,21 62:13 62:25 70:5 77:10,15 81:19 82:12,20 83:20 87:7,9 88:14 89:4 90:12 92:20,22 93:5 93:19 94:17,20 95:18 96:9,21 97:13 100:7 101:4 102:3 103:8 104:14 105:19 106:24 107:19 140:9 167:4 172:18 175:20 176:6 177:8,11 178:2 179:8 180:9 181:10 192:2 197:25 200:9 201:17 204:2 211:5 215:10 216:2,10,13 226:16 238:21 238:25 240:16 240:20 241:16 243:6 9th 10:17 11:9 11:10	239:8,15 240:19 241:13 241:15,18,20 242:6,10,13 ability 6:19 7:21 39:2 44:22 68:13,14 81:2 250:10 able 6:9 17:22 44:12 54:20 56:14,20 57:4 83:7 87:25 92:13 98:5,15 98:25 101:15 126:16 130:6 135:20 166:20 168:25 above 22:18 30:2 34:12,16 34:20 65:20 116:7 147:9 153:13 abstracts 158:10 academia 29:18 access 54:15 152:25 157:11 157:12,12 159:20 168:14 accomplish 82:12 accordance 201:19
6			
6 1:10 116:6,9 162:4 201:3,5 202:6 249:17 251:6 60 31:11,14,16 60-40 9:10 61 133:3,4,5,8 69 226:11,21 6:16 248:9,16 6b 102:24 6th 4:4	90s 40:8,25 46:11 919 1:15 2:5 92612 2:11 94 31:24 947 35:12 68:9 175:19,21 176:6,16 177:4 177:6,9,19,22 178:9,14 180:7 181:5,11,17 186:8,12 190:11 191:2 193:6 238:20 241:22,23 242:9,14 974 35:11 77:10,16 981 116:15	a a.m. 1:10 4:4 53:9,15 a10 237:25 238:10,14,23	
7			
7 91:4 93:24 147:8,11 161:15 227:4 233:12 234:14 237:14 238:9 238:15 240:11 241:10,12 249:18 251:4 70-30 9:10 706 94:8 75 8:12			
8			
8 93:24 94:16 94:20 119:13 119:17 125:12 131:12 144:2 153:12,15 249:19			

account 15:16 accurate 27:13 33:24 198:17 219:17 232:12 239:25 250:10 accuse 234:15 242:10 accused 8:20 9:5 21:19 33:7 71:10 133:10 220:21 225:12 225:15 226:22 230:7,8,15,17 231:10 233:12 235:17 238:24 241:10,12 accusing 228:14 230:3 230:19 231:2 acquired 23:11 38:2 acquisition 40:4 43:7 acronym 36:11 action 246:7 250:14 active 152:19 158:23 183:13 183:24 223:20 224:3,7,8,13 activity 43:11 47:22 51:3 actual 106:21 106:22 110:2 185:18 186:10	188:21 197:18 198:9 199:5 actually 48:13 123:19 135:6 148:20 198:20 200:13 233:13 adaptive 165:14,18 166:22 add 87:7 90:3 126:14,21 addition 189:8 additional 13:11 14:18 16:3 17:12,14 address 156:23 158:22 161:11 166:6 addressed 157:6,25 160:13 adjunct 27:24 28:7 adverse 26:7,12 27:10 advisable 166:24 advisor 25:3,10 25:23,24 27:10 affecting 207:19 208:21 affects 209:18 214:24 affiliations 4:21	afterward 118:17 agnostic 26:17 ago 24:21 55:6 80:10 81:17 85:24 181:4 190:16 191:12 194:16 agree 63:23 128:18 169:25 169:25 214:9 217:11 agreed 3:4,9,13 115:25 ahead 167:21 air 171:2 210:6 211:7,11,20 212:2,8,14 213:11 214:18 alameh 59:9 algorithm 183:12 allow 6:9 119:19 147:5 168:6,7 170:6 172:12 allowed 88:4 93:3 95:6 183:18 allows 78:18 96:6,10,19 119:25 120:8 alter 7:20 altogether 13:16	amazon 20:25 154:7,14,15,16 156:12 amplifiers 203:14 237:4 analog 55:7 212:13,14,17 212:18,19 analogy 156:11 analysis 26:22 33:6,10 137:16 analyze 17:2 analyzed 22:4 33:9 178:18 angles 157:17 announced 43:14 annoyed 190:22 answer 6:17,25 7:7,7 15:18 16:10 18:3,4 54:9 56:6 72:12 82:17 93:16 98:12 105:3 107:17 124:19 142:14 165:4 174:17 186:25 194:15 194:20,21,25 197:14 221:9 answered 57:16 72:17 80:12,23 83:23 84:22 85:12
--	---	--	--

86:21 93:22 97:6 101:8 124:10 144:15 146:23 176:21 204:5 205:19 224:6 225:2 246:24 answering 236:18 answers 195:23 195:24 antenna 58:5 58:11,14,16 76:23,24 77:2 77:3 79:17 98:2 99:18 101:10,18 143:18 202:5,9 203:4 206:13 212:21 219:21 219:23 220:6,9 220:21 221:12 221:18,21,23 221:24 222:4 222:12,18,20 222:22 223:5,5 223:8,21,25 224:8,8,10,11 224:13,16,22 225:8,13,22,25 antennas 57:25 219:21 anthony 1:17 4:17 250:5,18	anticollision 183:11 196:23 anybody 53:21 apart 13:10 appear 178:10 178:12,25 appearances 4:21 appears 160:15 174:24 244:14 apple 1:7 2:25 4:9 5:3,4 26:5 33:6,22 34:5 35:14 126:11 126:15,22 179:23 191:21 192:22 193:18 220:22,24 226:6 251:6 applets 217:19 application 19:24 28:22 37:6 41:22,23 71:5 81:9 82:7 90:6 92:18 99:3 102:25 109:2,14 148:2 148:13 applications 41:10 47:24 81:13 82:9 105:7 applied 29:12 appreciate 15:8 17:24 51:13	approximately 10:22 12:20 40:6 arbitrate 165:11 166:21 arbitration 8:7 area 27:5 154:18 157:2,3 170:17,21 argumentive 125:3 146:10 180:25 246:18 arguments 34:4 arrival 157:18 arrived 169:24 art 36:6,12 37:15,19 61:24 61:25 62:2 77:19 99:11 144:5 145:12 167:7,16 171:22,24 174:22 213:23 244:10,22 aside 171:8 asked 10:13 11:7 32:22,25 57:16 72:17 80:12,23 83:23 84:22 85:12 86:21 93:22 97:6 101:7 124:10 144:15 146:23 176:21	180:23 181:3 190:7 204:5 205:18 224:5 224:25 242:23 243:3,14,19 246:24 asking 10:8 69:18 70:4 97:25 110:6 139:8 143:2 188:18 204:10 216:9 234:13 241:3,7,9 242:6 aspect 175:22 176:7 181:6,9 assert 22:14 asserted 33:17 35:14 37:5 62:9 75:9 148:14,15 153:20 asset 22:13,14 158:18 assignment 32:12,21 assignments 34:3 associate 29:13 assume 115:24 156:23 216:19 246:2 assumes 223:11 236:12,23 239:11
--	--	--	---

assuming 183:10 184:16 184:17 206:10 attach 146:7 attachable 144:9 146:21 attached 141:22 146:12 146:15 147:2 attaches 145:15 attorney 4:23 34:4 attorneys 2:4 2:10 automatically 15:23 available 14:24 100:12 avenue 1:16 2:5 avoid 19:10 173:20 194:5 196:21,25 aware 33:19,20 58:10 61:6	134:6,9,9,25 136:6,8,8,22,22 137:3,6 138:16 167:12,13,13 167:14,16,18 167:18,24 169:2,3 175:4 249:9 bachelor's 36:18 back 18:3 23:17 31:23 35:22,25,25 37:3 41:6 53:14,17 54:3 55:2 61:13,17 64:21 71:5 93:13 100:5 102:18 104:3,6 109:24 133:2 139:18 140:13 148:9 153:4 155:12,15 157:21 158:6 159:7,22 161:12,14,22 162:13 181:2 183:22 184:18 187:3 191:15 196:24 207:5 209:11 210:15 badly 172:10 baked 195:18 balance 9:3	band 165:7,16 165:25 174:10 203:5 bands 169:8 222:18,20 bar 38:12 40:24 45:18 47:6,12 49:20 50:25 51:6,10 based 42:17 44:7 82:19 98:6,16 107:21 124:19 129:20 133:8 148:23 157:17 176:22 181:21 185:13 193:13,14 236:5,14 237:8 basic 6:4 basically 11:16 14:21 15:5 16:6,11,19 17:5 24:17 26:18 32:20 38:7 41:2,3 42:3,17,19 44:2 45:22 50:2 54:6 55:4 55:9 64:15 68:4 70:6 71:24 72:4,5 72:19 73:3 74:9,15 78:2 78:20,22 79:14 79:20 84:6,24	85:2,25 87:13 87:24 88:9,17 89:18 90:23 91:21,23 92:14 93:13 94:4 97:8 98:22,25 99:4,9,20,21,25 100:5,12,18 101:11,13,19 102:17,23 103:3,16 104:25 105:5 105:10,24 106:5,13 109:5 109:8,10,21 110:24,25 111:17 115:20 116:20 118:19 121:11 126:3,7 127:4 135:10 135:15 137:19 137:22 141:16 141:18 143:22 145:24 147:2,4 151:19 156:22 161:8 170:22 181:24 182:11 182:22,23,25 183:9,19 184:5 184:18 185:23 185:23 186:18 188:8,8,9 189:18 191:11 192:8 195:16 196:22 199:13
b			
b 5:13 65:22,23 65:23,24 66:2 66:5,6 67:23 68:4 69:17 71:3,4 73:9 127:23,23 128:23,24 129:3,4,10 133:21,21,22 133:22,22,25			

207:25 208:8 208:10,19 209:15 210:3 212:13,16,20 215:22 220:17 221:21,25 222:3 225:6,9 228:2 230:9 231:5,25 232:10 237:7 238:17 244:11 246:3 battery 122:3,5 143:17 183:20 beginning 4:22 10:19,24 23:16 47:4,14 126:19 194:24 behalf 5:2,8 8:20 9:4 18:22 21:15 behave 82:6 84:25 86:9,15 88:2,4 89:19 96:15,15,20 97:9,10,20 108:23 111:15 182:3 behaves 106:13 106:16 109:10 187:10 behaving 109:4 believe 45:19 45:20 91:13 110:22 130:13	148:4 222:22 237:13 238:16 belt 149:13 best 6:18 197:3 250:10 better 221:9 245:23 beyond 77:17 big 25:12 27:6 58:24 60:7 154:17 bit 8:25 43:15 92:9 108:6 182:9 192:14 235:19 blind 202:25 block 83:25 94:8 205:14,17 237:9 bluetooth 40:14,16 54:6 147:17 148:24 149:23 150:4 156:16,19 161:18 163:5 163:15,23 164:17,18,23 165:8,15,25 166:5,11 169:9 170:3,17,20,24 171:4,18,18 172:10 174:3 203:10 227:9 body 117:14	books 41:25 bottom 163:14 224:11 246:12 247:2 bought 57:23 box 88:22 89:3 90:8,13 201:12 205:2 branch 236:3,3 breach 8:6 break 6:21,23 7:2 53:6,19,25 103:20 104:10 104:12 108:5 155:2,21 210:8 210:20 211:3 breaks 155:17 brief 12:7 242:19 bring 73:3 85:17 123:16 bringing 73:4,5 95:24 broad 80:16 broadcom 151:9 233:22 broader 92:9 182:9 190:5 brook 43:24 brought 153:3 btms 168:17 btss 168:18 building 25:5 39:16 47:20	built 15:6 43:13 195:2 bullet 25:2 bunch 9:7 business 24:10 25:25 45:15 87:18 buy 20:25 42:14,15 112:7 112:7 149:23 220:17 225:5 buying 15:24
c			
c 2:2 5:13 250:2 250:2 california 2:11 call 23:17 39:12,13,15 44:25 46:2,16 46:23 47:5,13 50:6 52:21 54:22 55:11,19 55:25 63:13,13 65:5,10,14,17 65:22 66:9,11 66:19,20 67:16 67:21 68:15,20 69:10 70:22 71:7,25 72:2 74:13,14,15,17 74:23 75:3,11 75:17 78:19 81:11 83:18 84:8 85:16 86:12 87:14			

106:17 112:13 122:15,25 123:4 125:5,7 125:14,15 127:5,10,19,21 128:9,9,13,20 130:7,15 132:23 133:13 135:16,21,23 136:18 137:4 138:12,18 140:5 149:24 150:6 152:23 156:17 157:14 158:7 159:8 160:5 170:14 172:19 173:25 194:10 207:22 208:12,12,13 208:15 214:25 224:12 226:24 227:14,22 228:5,8,9 230:11 231:21 233:9,21,25 234:4,6,21 235:4 240:5 called 24:16 33:7 39:22 58:15 140:22 143:13 150:2 165:14 183:10 203:7 228:25 calling 39:12 39:20 46:23	54:25 55:16 69:20,23 106:19 214:7 229:4 calls 20:12,13 20:16,20 39:3 39:5,24 44:23 45:3 50:20,23 56:5,11 63:8 73:25 82:3 83:9 86:19,23 90:17 92:24 95:25 98:10 99:14 100:20 107:12 108:24 110:18 111:11 114:21 117:17 122:11,17 123:13 124:9 125:9 126:18 126:25 129:12 132:17 134:19 137:13 139:6 139:16 144:14 145:7 149:20 160:24 164:6 165:2 166:15 167:10,19 169:5,16 170:11 172:3 173:12 186:14 198:14,24 205:11 209:25 217:5 218:15 222:25 228:20	230:25 231:23 232:25 233:17 236:12,23 239:11 245:8 camera 144:21 cameraized 145:8 capabilities 38:15 40:12,15 102:20 106:20 capability 47:7 64:8 68:19,20 78:19,24 86:9 86:14 87:12 88:10,13 91:22 95:24 98:20 100:13 105:8,9 111:22 129:15 135:9 136:10 136:14,21 137:25 151:20 152:5,20 157:4 capable 66:11 69:2 92:12 112:4 132:21 133:12 134:11 150:21 151:4 159:15 230:10 capture 43:2,2 210:3 captured 105:14 car 16:18 102:25 190:17 190:18,25	191:12,20 194:16 card 60:17 78:13,25 79:15 79:25 80:3,9 80:18,21 81:24 82:22 87:18 93:12 102:22 109:20 126:15 126:21 131:8 136:18 182:13 182:17 184:7 184:10 187:8,9 189:24 196:9 196:12 198:10 198:20 217:20 cards 45:13 59:15,20,24 60:11,15,19,23 61:7 78:3,21 80:5,25 81:3 81:18 82:4 83:7 99:4 100:15,16 106:10,10 109:3 208:18 careful 130:8 138:8 carry 78:3 carryover 55:12 cartridge 19:10 20:24 21:2,4 case 1:3 4:10 8:10 9:13 10:3
---	---	---	--

10:4 11:14,18 17:3,7 18:22 21:5 22:15 24:13 26:19 27:17 30:14,19 32:16 33:3 35:15 36:6 46:17 54:12 69:22 91:24 116:19 120:6 174:5 177:2 199:5 208:23 226:6 251:6 cases 8:3,16 9:6 16:15 18:24 19:5,6,15 20:15,15,19 21:8,16 173:4 195:21 cash 60:21,21 79:25 114:16 cause 137:18 caution 32:14 cell 19:19,20 20:7,10 59:16 59:21,25 60:11 60:15,18,25 61:7 66:8 69:19,23 70:24 114:6 117:14 117:24 118:3,7 140:3 141:3 144:11,12 159:16,17 198:8,20	cellular 39:9 55:8 150:22 151:9 154:19 154:20 157:2,5 157:9,24 158:7 158:21 159:9 159:12,25 160:9,12 161:4 168:2 175:5,6 215:12 219:7 226:2 227:18 240:4 center 29:10 centimeter 220:15 central 207:21 certain 7:5 16:14 33:17,23 33:23 34:3 41:25 44:8,9 92:3 169:24 certification 3:7 certified 1:18 certify 250:7,12 chain 49:23 52:18 change 87:7 109:17 119:6 120:22 251:8 changed 88:3 176:24 190:25 changes 86:2,4 changing 67:19 128:12,19	133:12 charge 16:18 190:18 231:25 charger 191:20 192:23 193:17 194:17 chart 229:21 cheap 54:13 chip 165:21 182:14,17 184:8 187:8 196:10 198:9 198:17,19 199:15 213:19 213:20 220:10 224:20,23 225:5,7,11,19 225:25 227:21 228:8,10 230:2 230:20 231:14 234:17 237:13 237:21,21 238:11,14,23 239:8 240:19 241:13,15,20 242:10,13 245:18,20 chips 149:5 227:20 228:7 228:15 231:18 232:9 237:2,11 choose 170:4 208:12,18 214:24 220:13 220:15	chose 101:9 chris 12:18 circuit 54:17 65:25 66:2 89:11 98:5,15 circuitry 55:24 101:19 179:3,7 179:11 180:3,6 181:18 185:10 189:2,4,11 193:10 227:5 238:10 241:21 241:24 242:2,4 242:11,14 circuits 89:3 102:10 cited 11:24 14:6 18:16 150:18 claim 33:12,23 37:5 61:17 62:12,15,24,25 63:2 67:4,13 68:5,18 71:24 78:11,12,17,22 80:4,8,16,19 84:7,9,10,23 85:8 86:5,16 87:14,24 91:21 94:21 95:2 106:24 107:9,9 107:10,14,18 108:2,14 109:5 109:25 110:2,4 110:5,7,25
--	---	--	--

111:5,7,8,25 113:3,6 117:15 118:8,21 129:18 130:4 132:20 134:7 139:13,17 140:8,24 143:12 146:20 150:20 160:19 167:4 176:14 177:8,8,11,15 177:16,17,22 178:2,3,4,8,14 178:18 179:2,7 179:8,17 180:7 180:8,20 181:7 181:10 182:8 185:8,16 186:7 186:7,11 187:19 188:19 188:23 191:21 193:6,22 195:25 196:3 197:16,17,20 201:17 204:2 204:12,12,13 211:5 214:2 215:10 216:2,9 216:12,18,22 216:25 217:6 218:8,16,17,19 232:17,22 238:19,21,24 239:3 240:10 240:10,15	241:16,21,23 242:9,14 243:6 claimed 153:18 201:17 claims 33:4,9 33:17 62:8 70:14 76:5 77:15,23 79:3 79:3 81:7 105:18,22 114:19 148:8 172:17 186:19 199:7 204:8 clarification 49:9 clarify 12:6 26:12 46:15 69:7 167:2 228:13 class 28:13 clean 6:9 clear 48:24 110:2 127:6 152:10 185:16 clearer 154:5 clearly 7:16,21 182:5 client 26:3 clients 25:4,10 25:15 close 160:19 code 47:7,12 49:20 50:25 51:6,10	coded 120:20 codes 38:13 40:24 45:19 coexist 166:3 172:8,12,13,20 175:11 coexistence 161:17 166:6 168:5 170:5 171:20,23 172:7,7,25 173:9,17,21 174:9,11,12,19 174:20,24 coexistent 165:6 coffee 15:24 coil 99:18 225:9,9 coinventor 147:23 coinventors 147:19,21 coke 42:15 collaborated 30:16,22 176:13,25 collaboration 43:14 colleague 12:14 87:19 colleague's 12:16 colleagues 29:8 58:22	collection 211:18 214:4 221:16 232:13 233:3,20 241:25 collectively 227:9 228:23 234:20 collide 183:7 collision 183:11 194:6 collisions 196:21 color 225:23 columbia 27:23 28:8,10,14 29:3 220:2 column 93:24 94:16,20 119:13,17 125:11 131:12 144:2 201:3,5 202:6 207:15 combination 63:14 71:22 combined 232:9 come 35:18 52:2 71:7 82:21 151:8,9 165:6 172:25 191:15 196:24 214:12 comes 70:22 73:25 81:13
---	--	--	--

109:23 171:19 comfortable 31:16 coming 29:19 73:23 151:7 command 92:5 184:21 208:13 209:7 commission 251:25 common 77:10 136:16 235:10 communicate 123:8 124:6 151:22 160:8 160:10 195:11 communicated 157:20 communication 15:3 20:6,9 36:23 55:24 66:10 68:12,17 69:25 75:18 88:20 110:9,21 111:19 112:3,4 113:22 114:5 126:23 128:14 128:14,20,21 130:5 131:10 133:14,14 141:2 177:24 179:3,6,11 180:3,6 181:18 181:21 185:9 185:12 188:25	189:17 193:10 206:20 207:3 207:14 208:6 209:6,8 214:22 218:6 231:7 239:20 241:21 242:3,4,13 communicati... 28:22 32:15 54:9 63:18,20 77:12 175:23 189:4,11 200:7 companies 27:6 149:2,4 company 24:16 26:2,8,10 57:23 58:25 60:7 150:17 compare 33:6 85:21 compared 181:9 comparing 177:25 compatible 67:10 compensated 18:20 competing 36:21 completely 49:18 51:20 66:22 118:12 129:14 202:25	component 87:12 88:9,12 96:14 130:11 144:12 145:12 215:23 222:5 230:14 231:11 231:12 233:20 233:25 components 62:8 85:18 101:12 103:15 106:12 143:16 179:12 200:4 200:22 203:13 203:22 207:11 208:4 209:4 210:5 211:6,9 211:10,13,16 211:18,22,24 214:4,21 218:3 227:5,13 228:23 230:4 232:14 233:3 233:14 234:8 235:3,8,10 239:16 240:9 composed 232:4 comprised 231:8 232:4,7 234:11 comprising 111:20 160:20 193:11 231:8	computer 36:19,19 46:6 149:13 157:20 159:21 concerning 33:11,11 concert 20:3 74:6,17 concludes 248:10 conclusion 63:9 86:20 90:18 98:10 99:14 107:12 110:19 111:11 122:11 122:17 123:13 124:9 125:10 125:25 126:25 129:13 137:13 139:6,16 144:14 145:7 149:20 160:24 164:7 165:3 166:16 167:10 167:20 169:5 169:16 170:11 172:3 173:13 186:14 205:12 209:25 217:5 218:15 228:20 230:25 231:23 232:25 233:17 concurrently 132:25 135:15 138:11 168:3
---	--	--	---

169:9 170:6 confidential 32:15 configuration 89:11 configured 77:13 189:2 197:22 198:11 198:22 226:18 226:23 conflicted 27:19 conform 86:2 confuse 152:18 169:21 connect 38:16 170:22 173:5 connected 38:23 70:25 118:22 121:11 126:9 202:8 223:13 connection 9:13 59:16,21 115:10 121:3 121:15 145:3 209:18 connections 204:16 connector 220:12 consider 33:2 44:14 122:18 124:11 160:21 246:19 247:21	considered 29:5 98:11 99:16 111:2 114:24 117:20 137:14 174:2,4 212:5 construction 33:16 129:25 169:24 179:21 179:22,23,24 179:25 180:2 180:15,21 199:24,25 218:2 242:5 constructions 247:11 construe 246:4 construed 33:22 129:22 consultant 19:2 consulted 26:4 26:9,11,15 consulting 23:6 23:9,12,16,20 24:6,9,10,14,17 24:20,22 27:8 contact 18:6 126:2,8 contacted 9:13 9:17 contacts 119:19 121:5 contain 163:3 context 70:3,4 70:5,9,11	72:18 73:10 79:7 94:9 149:22 150:5 150:10,16 151:11 166:17 167:11,22 169:22 172:7 179:20 214:6 214:16 222:9 223:20 225:3 234:7 235:6,23 236:5 contexts 150:7 continue 107:25 continued 14:15 continuing 14:19 contract 8:6 contribute 81:19 contributed 83:10 control 121:16 130:20 131:11 controlled 86:10 130:23 130:25 199:13 207:25 controller 98:24 99:7,17 101:23 102:7 102:10 199:12 217:18 227:6	228:3,4 229:13 229:23 238:11 240:3 controllers 99:11 100:7,11 100:23 101:5 101:24 102:2 convenience 78:7 conventional 77:19 108:22 conversation 155:3 converting 212:17 convey 191:14 coordinate 166:2 copper 225:22 225:23,24 copy 248:5 corners 244:3 corporation 23:23 correct 18:23 21:21 30:25 32:4,10 34:8 36:8 37:8,13 58:20 60:24 61:4 64:22 76:22 108:9 133:17 134:2 137:10 148:7 148:11,17 177:20 178:5,9
---	--	--	---

192:17 205:21 206:3 216:20 227:23 228:6 231:17 245:2 246:8 correctly 68:8 91:17 136:2 199:3 counsel 3:5 4:7 4:19 5:4 7:4,6 9:18 10:2,5,5,6 10:7 12:21 30:17,23 31:18 104:9 155:18 176:23 180:24 210:22 count 9:8 42:5 counterfeiting 19:10 country 251:4 counts 213:24 couple 85:24 203:12 coupled 113:11 113:14,17 114:14 115:7,9 144:10 145:15 coupling 119:20 139:23 139:24 140:17 145:25 coupon 42:20 coupons 120:14 123:10	course 7:3 13:22 14:24 28:19,20 35:19 57:24 184:3 188:3 219:25 243:10 courses 247:14 court 1:2 3:17 4:12,16 5:11 6:7 245:21 248:4 courtroom 7:12 cover 50:4 77:16 107:6 108:3 110:11 110:12 112:6 112:16,17 116:2,16,20,21 117:3,13,24 118:15 119:22 120:2,16 121:10,13,17 121:24 123:5 125:23 136:24 136:25 138:20 140:3,16,20,24 141:8,21 142:18 143:6 143:21 144:2,3 144:7,10,17 145:15 146:4,6 146:20 147:25 187:22 188:7 196:4 244:7,17	cover's 124:4 coverage 157:2 covers 112:7,8 196:5 created 184:19 creating 82:13 credential 137:23 141:17 143:22 146:2 credit 78:3,13 78:21,25 79:15 80:5,9,18,20 81:18,24 82:4 82:22 83:7 93:12 100:15 102:21 109:20 126:15,21 182:13,17 184:7,10 187:8 187:9 189:24 196:9 198:10 198:20 217:20 criteria 37:12 crutcher 2:9 5:2 current 23:3 currently 10:6 24:4 33:20 140:5 144:5 customer 25:12 cutting 221:22 cv 23:2,3 249:12 cvs 71:6	d d 5:13 249:2 daily 71:5 dana 2:6 data 39:23,24 40:3 43:2 52:7 54:24 55:9,12 56:16,22 57:6 57:14 67:9 68:14 75:10 79:21 80:2 96:8 110:15,16 112:14 120:9 123:17 124:25 125:7,15 126:7 132:8,10,22 137:3 140:4 152:6,16 155:25 156:4,8 187:4 235:5 date 22:21 30:5 34:15,19,23 49:21 116:10 147:12 148:6 153:16 250:8 251:6 dated 11:5 32:2 day 12:25 13:2 13:3,3 35:19 77:25 194:24 248:22 251:23 days 12:22,24 13:6,7,8 16:19 54:13
---	--	--	---

deal 15:11 29:16 181:14 191:6 dealing 209:13 deals 15:5 dealt 55:22 dear 41:14 december 9:16 10:25 11:17 28:19 decide 246:2 decided 150:11 246:9 decides 245:16 247:23 decision 244:6 244:16,18 245:21 246:10 declaration 10:14 11:4,8 11:13,19,23,25 14:6,17 18:17 30:13 31:10,15 32:12,18 34:2 36:2 77:5 98:9 104:24 105:3 133:3 145:6 150:19 175:15 181:3 199:21 218:2 234:15 249:13 declarations 35:20 decline 27:7	dedicate 29:24 defendant 1:8 2:10 4:8,10 5:2 8:20,24 34:4 defendants 9:5 defending 21:18 defense 40:25 define 102:6 defined 229:16 definitely 45:12 46:4 86:2 definition 36:14 37:10,16 37:20 127:16 170:8 209:3 210:2 degree 36:18 145:21 demand 23:14 department 40:25 42:18 depend 82:18 150:15 214:6 235:23 dependent 80:16 depending 23:25 92:18 99:2 216:5 225:6 depends 79:18 84:15 113:16 149:21 151:10 161:2 166:17	167:11,22 196:6 197:11 203:4 205:6 206:22 213:14 213:18,20 215:11 217:22 219:4,13 222:9 223:19 224:20 225:18 depicted 117:4 162:18 depicts 162:6 deploy 25:16 deponent 251:7 deposed 5:21 7:23 21:7,13 deposition 1:13 3:7,14 4:6 11:21 12:12 13:12,18,23 14:3,7,13,15 251:6 depositions 8:9 8:15 describe 32:11 41:23 66:16 67:25 70:7 75:13 83:2 88:18 110:25 191:11,13 described 64:23,25 72:5 79:8 91:22 97:13 101:12 119:18 158:10	213:7 describes 83:3 93:25 121:2 239:17 describing 72:9 description 75:7 83:24 162:3,14 163:18 249:11 design 54:10,20 56:14,20,24,24 57:5,13,19 58:3,6 84:2 98:5,15 99:9 101:16 118:17 designed 55:24 57:19 84:5 168:16,19 designing 54:5 54:17 55:18 desire 92:18 detail 90:12 117:21 details 137:23 156:5 221:5 detect 189:18 189:19 190:5 192:3 detection 181:19 184:11 185:10 189:5 189:12 196:10 198:6 determine 157:18 158:4
---	--	--	--

159:19 160:4 186:20 208:19 determined 110:23 187:25 189:9 determines 94:7 determining 110:9,14 111:6 175:22 185:25 193:11 develop 47:24 deverell 2:24 4:14 device 15:17 20:22 44:17 48:19 49:11,14 49:19 50:3,6 51:20 52:13,21 52:23 54:16 63:18 65:3,3 65:10 66:10 68:13,17,25 69:25 75:18 77:12 78:2 79:25 81:25 82:2,5 83:17 91:2 92:6 93:14 95:25 97:9 103:16 105:7,22,23 106:6,13,19,20 108:21,22 109:6,13 110:9 110:12 111:17	111:18,20 112:3 113:19 113:19 114:12 115:24 116:2 116:16 118:25 119:8,21 120:3 121:20 122:15 125:22 126:23 129:2,9,15 130:6,16 132:21 135:22 136:10,20 137:7 138:19 139:24 140:2,7 140:14,15,17 140:18,20,22 141:6,11,11,13 141:20,23 142:2,10,11,20 142:21 143:7 143:13,14 144:8,16 145:4 145:17,20 146:13 147:5,6 163:5,22 164:2 164:21 166:9 168:25 169:11 169:13 170:3 170:21 174:2 174:13 175:23 177:24 181:21 182:3 185:13 185:24 187:10 187:12 188:20 188:25 189:17	192:3 193:12 197:21,24 198:5,11,21 199:4,8 200:7 202:15,20 206:20 207:3 207:14,20 208:6 209:6 214:8,22 218:6 221:24 230:9 231:4,7,8 232:15,18,22 devices 20:7,10 21:6 44:20,22 45:2 46:2,8,15 46:18,21 47:2 47:3,4 48:12 48:14,16 50:14 50:18,19,22 52:11 55:16 63:20 106:11 133:11 141:5,7 142:18 143:15 162:21 163:3 170:17 171:13 183:5 223:21 diagram 90:21 160:15 229:22 237:10 difference 139:11 140:6 140:23 143:21 157:18 195:20 differences 177:14	different 27:5 41:22 43:10 57:10 66:23,24 66:25 70:3 74:12 76:12 78:21 79:14,15 82:23 83:8,15 83:15 85:22 87:10 89:2,22 91:6 92:9 95:6 95:16 96:18 97:3 99:2,4 100:25 102:25 109:2,19,20 112:19 122:5 129:14 144:6 150:8,25 151:3 151:7,18,23 158:9 167:5 169:8 174:8 175:10 179:7 179:24 180:6 187:18 188:15 202:18,18 203:3 205:2 208:18 215:22 225:16 differently 202:21 236:18 digital 55:13 120:12,13 123:9,10 124:7 131:15,16,25 132:12 212:17 212:18,19
---	--	---	---

direct 214:17 237:16	display 200:23 211:23	134:11 157:13 232:5,8,11	64:1 65:1 66:1 67:1 68:1 69:1
directly 212:3,3 212:6 213:9	displayed 94:10	domain 203:7 209:14	70:1 71:1 72:1 73:1 74:1 75:1
disable 69:15 69:21,24	dispute 33:20 129:24	domestic 22:7	76:1 77:1 78:1 79:1 80:1 81:1
disagree 63:25	disputes 33:21	door 90:6 103:2 109:14	82:1 83:1 84:1 85:1 86:1 87:1
disclose 83:20	dissect 231:24	doubled 41:20	88:1 89:1 90:1 91:1 92:1 93:1
disclosed 82:19 89:13 91:15 93:3,18 153:23	distance 54:8	download 131:16,24,25 132:8 137:19	94:1 95:1 96:1 97:1 98:1 99:1
discloses 169:13	distributed 219:14	downloading 120:8 131:14 188:10	100:1 101:1 102:1 103:1
disclosure 98:16,18 164:11	district 1:2,2 4:12,13	dr 4:6 5:1,19 6:1 7:1 8:1 9:1	104:1,6 105:1 106:1 107:1
discuss 30:19 53:20 104:8 210:21 217:7 237:13	divide 27:19	10:1 11:1 12:1 13:1 14:1 15:1	108:1 109:1 110:1 111:1
discussed 30:17 84:25 105:2 127:3 166:18 187:15 202:4 228:24 244:8 244:17	document 22:19,25 30:3 30:10,15 31:18 32:8 34:13,17 34:21 116:8,12 147:10,14,25 148:13 153:14 244:4	16:1 17:1 18:1 19:1 20:1 21:1 22:1 23:1 24:1 25:1 26:1 27:1 28:1 29:1 30:1	112:1 113:1 114:1 115:1 116:1,12 117:1 118:1 119:1
discussing 152:21	documents 12:3 13:25 14:5,11,18 18:15 27:16 35:18 221:8 237:9	31:1 32:1 33:1 34:1 35:1,6 36:1 37:1 38:1 39:1 40:1 41:1 42:1 43:1 44:1	120:1 121:1 122:1 123:1 124:1 125:1 126:1 127:1
discussion 176:23 177:10 243:7,11,17	dogs 42:14 210:23	45:1 46:1 47:1 48:1 49:1 50:1 51:1 52:1 53:1	128:1 129:1 130:1 131:1 132:1 133:1 134:1 135:1
discussions 115:21	doing 24:24 56:10 65:17,18 67:21 69:3 74:15 92:12,15 128:10 134:6	53:17 54:1 55:1 56:1 57:1 58:1 59:1 60:1 61:1 62:1 63:1	136:1 137:1 138:1 139:1 140:1 141:1 142:1 143:1 144:1 145:1
dismiss 12:2 34:5			

146:1 147:1,14	216:1 217:1	162:21 163:2	69:3,5,5 70:20
148:1 149:1	218:1 219:1	164:3,8,21	72:9,11,23
150:1 151:1	220:1 221:1	166:9 168:25	73:11 76:4
152:1 153:1	222:1 223:1	169:11,13	127:8,9 128:13
154:1 155:1,15	224:1 225:1	170:2	128:19,23
156:1 157:1	226:1 227:1	duly 5:14 250:8	133:13,19,21
158:1 159:1	228:1 229:1	dunn 2:9 4:25	134:6,15,24
160:1 161:1	230:1 231:1	duplexing	137:15 152:22
162:1 163:1	232:1 233:1	203:7	157:20 166:10
164:1 165:1	234:1 235:1	e	174:13 203:2,6
166:1 167:1	236:1 237:1	e 2:2,2 249:2,4	236:2
168:1 169:1	238:1 239:1	249:9 250:2	elected 150:6
170:1 171:1	240:1 241:1	e.g. 200:22	electrical 36:20
172:1 173:1	242:1,22 243:1	238:10	119:19 121:3
174:1 175:1	243:25 244:1	earlier 14:10	121:14 244:25
176:1 177:1	245:1 246:1	69:18 121:5	245:4
178:1 179:1	247:1 248:11	142:3 242:23	electrically
180:1,19 181:1	248:18 250:7	early 16:18	115:6,8 144:10
182:1 183:1	251:7,21	40:16,18 46:24	145:15
184:1 185:1	draft 30:21	47:20 50:21	electromagne...
186:1 187:1	draw 209:21	54:13 153:6,8	222:2 223:23
188:1 189:1	213:23	154:23	electronic 78:6
190:1 191:1	drawing	easier 136:7	113:21 114:4
192:1 193:1	162:14	eastern 1:2	116:16 119:20
194:1 195:1	dress 78:20	4:12	120:3
196:1 197:1	89:21 109:21	edit 30:23,25	electronically
198:1 199:1	123:17 130:22	education	111:16 113:10
200:1 201:1	131:19	36:24 38:9	113:13 114:9
202:1 203:1	dressing 126:4	effect 3:16	114:14 118:13
204:1 205:1	drive 2:10 42:3	effort 56:9	118:22 145:25
206:1 207:1	driven 223:23	176:13 177:2	electronics
208:1 209:1	driver's 103:2	eight 13:2	49:19 79:16
210:1,18 211:1	dsp 101:10	either 21:7	89:20 90:3
212:1 213:1	dual 151:20	49:12 51:6	113:18 114:11
214:1 215:1	152:4,19 157:4	65:17 66:4	119:11 126:10

element 62:14 63:16,17 67:3 68:24 69:9 71:13 97:2,4 129:18 132:24 135:25 178:6 185:8 219:12 226:16 229:14 229:18,23,25 232:5 240:10 elements 62:11 62:24 88:24 89:11 90:10 95:5 106:23 118:21 231:20 232:5 eliminate 133:19 embed 100:15 100:23 embedded 116:17 219:24 embodied 204:13 embodies 204:11,11 embodiment 75:13,15 76:11 76:15,16 122:23 146:8 146:19 168:14 168:24 201:16 201:20 202:14 204:2,8,15,20 205:5,9 206:2	206:13,17,24 207:10 208:24 213:6,13 216:5 222:15 239:22 embodiments 90:22 204:7,7 219:2,3 243:5 emit 210:5 211:6,10 emphasize 244:18 246:10 employed 202:7 207:16 250:13 employee 23:24 100:15 employees 23:21 24:5 31:20 emulate 49:2 65:7 83:14,14 83:21 84:11,20 91:11,15 92:13 92:21 93:20 95:23 98:6 182:6 185:4,4 185:6 188:3,14 emulated 49:13 106:22 108:10 108:13 110:4 110:16 111:8 175:25 184:23 185:17 186:9 186:25 188:21 197:17 198:3	emulates 188:12 emulating 107:10 109:11 176:16 emulation 45:13 77:14 79:10 83:16 85:10 88:18,23 89:9,12,16 90:10,14,25 91:3 92:2,10 93:4,5 95:7 96:10,17 103:9 105:14,18 106:3,4,5,5,17 107:7,19 108:7 108:12,16,17 109:23 113:2,5 175:22 176:7 181:6,9,14 182:6 emulations 79:10 emv 18:6 enable 69:14,15 69:20,24 72:21 83:5 84:5 85:9 enabled 69:16 78:16 enables 87:14 enabling 105:6 encompass 125:22	ended 28:19 endless 82:7 ends 53:10 103:23 155:8 210:11 energize 64:16 100:17 189:20 196:20 energized 92:4 99:5,22 192:12 energizing 64:17 engaged 11:16 engineering 36:20,20 244:25 245:5 engines 42:16 enter 74:8,16 76:8 entered 39:25 41:5 enterprises 23:15,19 25:4 entertain 167:23 entire 104:22 entities 140:19 144:19,22 147:3 187:18 entity 9:22 21:17 140:21 143:12 144:7 144:17 188:11 entry 23:5 27:23
---	---	---	--

environment 51:14	221:5 223:12	143:20 154:15	153:12,15
envision 38:19 39:14	examination 5:17 242:20 243:23 249:6,6	167:14 175:2 181:8 188:7 190:14,15	161:15 249:12 249:13,14,15 249:16,17,18
equipment 112:20	examined 5:16	192:2 194:9,19	249:19
equipped 120:16	examiner 68:9 110:23 214:7 244:6 245:4,10	203:8 204:11 204:12 205:23 207:21 208:11	exhibits 34:11 35:4,7 37:4
equivalent 36:24 60:21 129:16	247:12,13,16 examining 233:13	208:18 214:13 215:17 219:18 219:25 220:15	exist 82:10 102:2
equivalents 120:13 123:10 132:2 144:6	example 9:6 10:9 15:8 16:5 16:13 17:20	227:4,19 239:22 241:5 245:17,17	existed 63:21 89:3 95:17 96:20 102:13
eric 59:7	24:12 25:11,16 38:11,17,20	246:6	existence 147:17 172:12
errata 251:2	44:3,10 46:24 48:7 50:24	examples 52:10 75:8 90:23	existing 90:7 98:20
error 246:6	52:6 60:20 62:12 70:21	exceeded 37:22	expect 182:3
esoteric 173:3	71:4,6,11 72:25 74:9	except 3:10	expecting 181:25
esq 2:6,12,25	76:6 81:3 86:11 87:11,23	exchange 16:8 120:15	experience 16:17 17:6 36:22,25 53:24
essentially 201:11	88:11 89:9 91:4 93:11,23	exchanging 87:18	54:5 55:18 133:9
estimate 9:2 11:6	94:5,18,25 95:14 99:3	exclude 78:23 79:20	expert 18:25 19:2 21:10
evening 210:18 210:19	102:21 108:19 108:20 112:17	exclusive 68:7 68:11 72:11 74:18	24:16,19,22,22
eventually 244:15	113:20 114:17 119:3,4 122:12	execute 207:17 238:18	expertise 54:20 56:14,20 57:4 57:12,13
evidence 223:11 236:13 236:24 239:12	123:8,9 127:7 131:7 132:17 136:12 141:13	exhibit 22:20 22:23 30:4,7 34:14,18,22 61:13 116:6,9 147:8,11	expires 251:25 explain 17:17 117:20 125:20 154:2 156:3,11 156:12 174:5
evolved 100:22			
evolves 29:23			
exactly 102:24 115:12 117:19 119:10 154:9			

181:7 182:19 190:4 194:2 196:17 202:19 explained 137:17 extended 14:22 15:7 extension 18:11 194:23 195:15 extensions 18:16 extensively 244:8 extent 32:16 63:8 86:19 125:9 180:12 205:11 external 79:23 92:6 93:14 135:14 150:24 150:25 152:3,3 181:20 182:12 185:12 186:23 193:9 196:12 extra 220:16	facts 223:11 236:12,23 239:12 fair 60:9 fall 28:18 81:14 108:3 114:18 199:6 220:2 241:24 familiar 57:7 57:17 58:7 59:6,11,14,19 62:2,7 63:3 family 29:19 far 95:3 157:8 159:24 175:8 feasible 115:14 feature 207:18 215:5 217:3 february 10:17 11:5 14:17 32:3 fed 79:18 fedex 51:15 feed 98:25 103:5 feeds 99:20 fi 25:17 38:17 38:18 39:6,9 39:10,12,12,17 39:20 46:23 48:7 50:24 54:11,25 55:10 55:16,20 56:2 149:23 152:25 156:17,20	157:10,12 160:9 164:13 164:23 174:3 203:8 227:9,19 233:22,23 field 15:3,4 36:21 44:8 72:25 77:19 79:23 99:23 183:5 184:20 185:25 186:21 189:20 190:5 195:22 fies 175:9 figure 76:7,14 76:20 84:3 88:17 90:9,19 91:4 93:24 97:19 102:24 117:5 119:13 119:22 126:3 154:4 161:23 162:3,4,6,14,19 162:22 163:20 200:10,14,15 201:3,6,7,11,13 201:15 203:24 203:25 204:18 204:25 205:13 209:12 211:10 211:17,22 213:4 215:5 221:19 239:17 239:18 241:8	figures 119:18 207:10 file 11:23 53:3 68:9 122:20 124:14,18 243:16,19 244:2 246:20 247:22 filed 4:11 37:6 148:2 150:17 153:7,17 filing 3:6 148:6 148:12,14 153:19 filters 203:14 236:20 find 158:22 216:7 fine 11:10 firm 4:17,25 5:7 firmware 97:7 97:12 first 5:14 6:5 9:12 11:2 12:17,25 23:5 26:10 34:9 39:11,21 53:6 55:7 62:16 67:3,6,8,14,15 68:25 69:3,8 70:16 71:16,19 72:3,8,15 74:21 81:23 92:4 99:22
f			
f 250:2 facilities 154:18 facing 25:3,10 fact 56:7,10 57:23 107:3 126:20 143:24 144:18 164:2 166:4 234:2			

149:10 176:19 178:19,20 183:7,19 190:21 239:24 five 28:17 48:9 248:13 flavors 44:13 flexibility 89:23 flip 211:21 flipping 35:21 35:24 floor 38:21 flow 160:15 flowchart 91:5 focused 42:7,23 181:8 focuses 175:21 176:7 181:5 focusing 84:9 follow 242:19 245:25 246:3 following 69:13 201:19 follows 5:16 force 3:16 forefather 39:10 forefathers 38:18 foregoing 250:7,9 foreign 174:19 forget 74:14	forklift 42:3 form 3:10 16:4 17:4 44:18 45:4 54:23 56:3,23 63:22 66:13 70:2 71:23 72:16 76:17 78:14 79:5 81:21 84:14,22,25 85:12 86:20 91:18 94:23 97:21 100:9 101:7 102:5 105:20 121:14 122:17 125:2 125:24 126:24 127:12 137:12 139:16 172:21 173:11 179:10 180:14 186:13 187:14 199:9 204:22 205:10 206:21 208:7 209:24 214:11 216:3 217:4,15 218:14 220:25 221:14,20,23 221:23 228:19 229:6,11,17 230:6,24 232:24 233:16 235:18 236:11 236:22 239:2 239:10 246:17	247:7 format 67:10 85:5 formed 40:17 forth 34:4 35:22,25 162:13 forward 42:21 found 161:21 founded 23:12 24:20 four 33:3,8 41:16 229:3 230:4 234:16 234:20,23 235:2,10,16 236:9,20 237:4 240:14 244:3 fourth 149:7 fox 59:12 frame 17:18 francisco 160:6 frand 26:22 frequencies 76:12 frequency 44:9 99:19 108:10 161:2,5 165:14 165:18 166:22 174:8 175:11 203:3,18,19 209:9,10 212:22,23 friend 87:19	front 103:2 177:6 full 12:25 13:3 29:2 fun 210:25 function 106:8 179:13 207:20 functionality 103:17,17 109:12 112:23 113:11 115:23 150:13 functions 95:12 further 3:9,13 168:13 242:16 243:21,23 247:25 248:2 249:6 250:12 fusion 238:11 238:14,23 239:8 future 82:8 90:7
			g
			gain 220:16 garden 73:3,13 73:15,18 gateway 161:17 general 30:18 32:16 58:15 91:25 92:10 100:11 164:9 182:20 236:4 generally 6:3 19:15 77:11

165:4 243:8 generate 225:10 generation 28:24 55:8 geolocating 42:8,9 getting 109:8 155:22 186:24 237:18 giarro 1:17 4:17 250:5,18 gibson 2:9 4:25 gibsondunn.c... 2:12 gigahertz 165:7 168:17,20 220:4,5,13 gilman 10:10 give 15:7 17:18 25:25 36:14 49:20 51:19 72:24 73:21 78:6 88:9 91:5 108:19 122:19 136:11 141:13 150:3 174:25 179:21 190:14 208:13 214:14 219:24 226:12 245:17 given 44:3 112:10 248:11 gives 88:12 91:7	gladly 236:18 glue 25:22 go 6:5 7:2 20:3 35:25 38:19 54:3 55:2 61:13 63:16 74:5 77:17 78:5,17 90:19 93:24 98:5 100:3 140:13 150:19 154:4 156:5 159:25 161:14 167:21 168:9 175:8 195:19 200:25 207:5 209:11 220:16 226:12 234:2 236:3 247:12,13 goes 94:3 117:24 119:25 131:17 137:20 165:17 183:11 194:5,18 212:12 226:18 going 4:3 22:22 35:3 52:17 53:5 62:19 63:7 71:5 98:23 104:19 109:24 129:23 139:17 154:3 181:2 191:2 248:9	good 4:2 5:19 5:20 24:23 48:6 108:20 112:10 138:11 155:2,3 156:10 165:9 210:18 210:19 goods 154:10 154:12 gotten 197:14 government 25:5 38:9 granted 171:19 greater 37:18 ground 6:4 guess 165:20 166:6 guide 234:3 gun 47:6 51:5 guts 118:13,22 121:4 152:21 168:4 199:3,7 guy 166:7,8 246:5	happen 27:22 74:10 135:10 156:20 184:10 186:4 187:7 190:24 192:5,7 195:4 196:25 happened 157:8 happening 58:7 154:5 169:20 happens 192:7 194:3 happy 172:14 172:15 hard 39:15 hardware 82:14,21 83:2 83:20 84:4,11 84:17,19 85:6 85:8,23 86:3,4 86:14,16 87:3 87:5,8,10 88:4 88:19,20,23 90:10 91:14 93:2,18 94:3 95:5 96:9,14 96:19 97:2,3 97:25 101:17 148:19 199:16 head 27:19 heading 226:16 headquarters 156:21 hear 25:15,19 27:3 91:24
		h	
		h 5:13 249:9 half 6:22 halfway 162:8 hand 22:22 30:6 34:10 204:17 handheld 19:22 47:2 handy 35:21	

heard 172:6 173:4 held 1:14 help 6:5 26:19 26:20 62:17 helped 31:21 helpful 49:8 164:11 hereto 3:6 hey 18:2 182:23 183:8 hi 53:18 104:7 155:16 high 23:17 42:11,11 203:17 212:22 220:16 higher 61:25 hire 24:2 histories 11:24 243:16,19 246:20 history 55:3,5,5 68:9 122:20 124:14,18 244:2 247:22 hit 165:16 hold 47:6 182:14 184:8 187:6 holdings 1:4 4:9 9:22 251:6 homes 23:17 48:9	honestly 171:10 hop 165:24,25 hope 191:14 hopping 165:14 165:18 166:22 hops 165:15 hose 73:14,15 73:19 hoses 73:3 hospital 39:14 43:25 hot 42:14 hotel 78:5 hour 6:22,22 18:21 53:5 hours 12:23 13:2,4,20 31:4 31:9 house 5:4 housed 215:22 housing 118:4 118:7 149:12 149:17 hp 19:8,9 20:18 20:21 21:2,3,8 21:9 hypothetical 57:9 114:23 115:18 117:17 124:13,16 138:24 139:2,3 198:14	i idea 52:20 53:2 83:6 92:9,9 identification 22:20 30:4 34:14,18,22 42:25 45:16 108:11 116:9 147:11 153:15 158:25 159:5 161:2 identified 161:8 199:24 235:9 236:7,9 236:19 237:3 identify 35:3,7 49:16 161:6,10 216:11 identifying 157:6 identity 90:2 idle 183:20 ignore 197:10 illustrates 201:7 imager 50:25 implementati... 82:18,23 84:16 196:15 197:12 199:18 206:23 213:15,18,21 215:12 216:6 217:21,23 219:4,13 224:21 225:7	225:19 226:4,5 229:25 implemented 101:22 implies 169:8 173:7,16 important 6:6 25:14,19 49:22 83:16 imposes 188:22 197:20 impossible 27:4 improve 56:10 56:11 improved 197:4 improvement 77:24 78:13 79:2 80:9,21 81:16 82:12 86:16 improvements 77:16,22 81:5 incentives 42:20 include 51:18 80:17 86:8 127:14 135:15 156:16 217:2 225:20 233:6 included 134:4 includes 128:22 133:20 134:20 including 4:20 54:15 128:13
--	--	---	---

128:19 133:13 207:17 227:6 238:18 247:22 incomplete 115:18 117:17 198:14 incorporated 4:10 incorrect 49:4 95:10 independent 33:4 234:16 independently 66:2 70:16 71:18,19 73:14 73:17 233:14 indicated 250:9 indicating 75:16 indirectly 214:23 217:12 individual 59:7 59:12 231:12 individually 228:15 230:20 induction 44:8 193:20 industry 22:7 29:17,22 inference 42:16 inferior 129:16 influence 7:19 inform 177:9 information 14:23 16:12	17:19 27:14 38:23 51:19 58:4,10 87:22 89:22 90:5 92:17 98:7 99:6 146:2 153:24 221:4 236:15,17 infrastructure 38:16 77:13 158:3 infringe 22:9 133:25 134:3 134:21 135:3 136:11,16,19 136:22 192:23 infringement 33:12 infringer 8:21 infringing 9:5 21:20 127:25 234:15 innards 141:2 input 30:20 91:8 94:6,7,12 126:7 195:15 208:9 inputs 94:4 inseparable 220:11 223:15 223:17 225:8 inside 19:9 20:23 21:5 39:16 50:2 61:2 100:19,24	112:21 117:13 118:7,14 198:18 199:11 199:15 202:3 202:10,16 203:13 205:7 218:7,9 219:5 219:6,8,24 220:23 224:10 224:10,16 225:8 226:6 231:12 244:20 instance 176:19 instruct 120:21 instructs 7:6 integrate 87:2 100:23 integrated 47:15 51:3,23 64:6 105:9 109:2 111:22 112:17 113:18 114:10 119:11 144:23,25 147:4 integrating 61:2 integration 47:9,16 145:3 intellectual 8:3 8:9,15 intend 15:25 intent 172:15 interact 93:10 96:3	interacted 94:11 interested 96:17 233:8,9 interface 93:11 94:10 96:2,5 131:7 207:23 207:24 208:3,9 208:17 interfacing 120:7 interfere 76:13 172:10 interference 171:3 173:2 174:23 interfering 172:9,13 internal 27:14 221:8 227:5 237:10 internals 237:2 international 8:6 internet 159:23 interpret 113:17 interpreting 213:25 interrupt 154:22 intervention 126:6 intrinsic 246:20
--	--	---	---

introduce 135:9,13	iphone 16:24 17:2,9 71:10	247:11	72:1 73:1 74:1
invent 98:21 100:7,10 101:4	127:24 133:25 134:14 144:21	it'll 154:5 197:8	75:1 76:1 77:1
invented 40:23 61:21 81:9	190:17 191:4,6 191:12 192:2,9	itc 21:23,24 22:7,12	78:1 79:1 80:1
101:24 103:8 104:13,18	193:16 194:17 195:5,6,11,21	item 76:20,24 117:8,10 148:6	81:1 82:1 83:1
invention 175:21 181:5	209:16 220:24 222:17 227:4	148:8,10 163:9 164:12	84:1 85:1 86:1
inventor 155:24 161:16	233:12 234:14 234:22 237:14	items 162:20 213:8	87:1 88:1 89:1
169:12	238:9,15,17	j	90:1 91:1 92:1
inventors 61:20 81:18 82:11,20	240:11 241:10 241:12	j 5:13	93:1 94:1 95:1
83:19 87:7 100:6 101:4,22	iphones 191:19 192:21 220:22	jacob 1:13 4:7	96:1 97:1 98:1
101:24 103:8 104:13,18	ipr 9:7	5:1 6:1 7:1 8:1	99:1 100:1
142:6	iprs 9:8 21:13	9:1 10:1 11:1	101:1 102:1
inventory 15:12 20:3	irvine 2:11	12:1 13:1 14:1	103:1 104:1
38:12	iso1443 18:16	15:1 16:1 17:1	105:1 106:1
investment 8:7	iso14443 18:12	18:1 19:1 20:1	107:1 108:1
invoices 24:13	isolated 49:18	21:1 22:1 23:1	109:1 110:1
involve 19:2,18 21:6 41:4	51:20 79:11	24:1 25:1 26:1	111:1 112:1
involved 15:17 19:11,16 21:22	85:15 87:15	27:1 28:1 29:1	113:1 114:1
54:18 56:9	89:24,25 94:13	30:1 31:1 32:1	115:1 116:1
57:25 199:16	106:11 111:16	33:1 34:1 35:1	117:1 118:1
213:16 217:8	112:5 113:12	36:1 37:1 38:1	119:1 120:1
involving 131:6	114:9 118:12	39:1 40:1 41:1	121:1 122:1
ip 8:5	issue 19:15 174:9,11,13	42:1 43:1 44:1	123:1 124:1
	issued 24:13 153:5	45:1 46:1 47:1	125:1 126:1
	issues 17:2 25:15,20	48:1 49:1 50:1	127:1 128:1
		51:1 52:1 53:1	129:1 130:1
		54:1 55:1 56:1	131:1 132:1
		57:1 58:1 59:1	133:1 134:1
		60:1 61:1 62:1	135:1 136:1
		63:1 64:1 65:1	137:1 138:1
		66:1 67:1 68:1	139:1 140:1
		69:1 70:1 71:1	141:1 142:1
			143:1 144:1
			145:1 146:1
			147:1 148:1
			149:1 150:1

151:1 152:1	221:1 222:1	56:19 57:4,12	12:18 16:10
153:1 154:1	223:1 224:1	58:9 61:25	17:8,23 19:20
155:1 156:1	225:1 226:1	63:21 98:4	19:21 20:4
157:1 158:1	227:1 228:1	99:12	21:22 23:13
159:1 160:1	229:1 230:1	jury 7:13	24:3 26:17
161:1 162:1	231:1 232:1	k	27:2,15,20
163:1 164:1	233:1 234:1	keep 35:20 73:7	29:8,17,18,21
165:1 166:1	235:1 236:1	119:12 154:23	29:23,24 31:5
167:1 168:1	237:1 238:1	163:10 180:24	31:6 32:21
169:1 170:1	239:1 240:1	204:9 237:19	33:21 34:25
171:1 172:1	241:1 242:1	keeping 52:12	39:11 41:15,16
173:1 174:1	243:1 244:1	68:4	41:17,17,18,19
175:1 176:1	245:1 246:1	key 78:5,6	41:25 42:10,12
177:1 178:1	247:1 248:11	109:22	42:13,21 44:3
179:1 180:1	248:18 250:8	keyboard	44:4 46:5 48:2
181:1 182:1	251:7,21	200:23 211:23	48:8 49:15
183:1 184:1	january 10:18	keyboards	50:23 51:9,11
185:1 186:1	10:22 11:2,7	214:23	51:12 52:2
187:1 188:1	21:3	kind 7:20 15:7	55:14 60:6,8
189:1 190:1	jersey 154:8,15	15:19 16:22	62:14 71:3,4
191:1 192:1	154:16 159:25	22:2 25:21	72:20,23,24
193:1 194:1	join 170:22	29:18 38:4,5	73:5 76:3 78:6
195:1 196:1	joined 40:8	41:7 42:19	78:9,17 79:17
197:1 198:1	41:6	43:22 44:20	80:15,17 81:13
199:1 200:1	joint 202:11,13	45:23 57:20	82:5,7 83:3
201:1 202:1	203:11 209:12	72:21 80:14	84:16 85:19,24
203:1 204:1	judge 7:13	81:14 91:7	86:12 87:17
205:1 206:1	245:22	92:16 106:10	89:24 90:4,20
207:1 208:1	july 42:13	107:5 109:15	97:21,24 98:12
209:1 210:1	june 37:7,12,16	118:16 129:15	98:14,20 99:8
211:1 212:1	37:20 40:20	162:12,17	99:18 100:16
213:1 214:1	48:11,20 49:10	191:10 193:20	101:9,10 102:7
215:1 216:1	50:15 52:19	220:10 223:14	102:14,17
217:1 218:1	53:24 54:4,19	know 6:2,13	103:5 105:3,10
219:1 220:1	55:17,23 56:13	7:4 9:8 12:17	106:14 107:24

108:24 109:7 109:17 112:6 115:11 119:14 126:8 129:22 129:23 130:22 135:11,14 137:16 138:10 138:13 139:7,8 139:20 149:25 151:6 153:4 154:8,10,13 156:12,23 157:24 158:2 159:4,19,23,24 160:5,12 161:4 161:9,9,23 165:21 167:12 168:10 169:25 170:7 171:11 171:11,12,20 173:3 174:7,17 175:3,4,7 182:4,22 187:22,25 188:14 190:5 190:18,23,24 191:5 192:16 194:6 195:9 196:14 204:8 214:18,24 218:6,8,12 219:11 221:2,7 222:8 223:4,13 223:14,15 224:7,14	225:14 226:3 231:9 232:3 233:23 234:9 236:8 240:4 241:2 242:9 244:14 245:3,6 246:21 247:12 247:14,15,17 knowledge 36:25 133:9 known 59:3 63:15 87:8 99:11 knows 192:5 245:23 krenz 59:7	110:6 111:5,7 113:4,6 121:5 185:16 186:7 186:11 188:22 197:16,19 198:2 244:13 lans 147:18 170:19,24 laptop 149:13 laptops 156:14 156:22 large 25:3,10 larger 230:14 latch 121:13 late 11:16 40:8 40:25 43:21 46:11 47:22 52:2 launched 40:7 law 4:25 5:7 245:24 lawyer 246:5 lawyers 13:22 lay 6:3 layer 196:18,19 layers 184:4,5 le 59:7 lead 183:16,16 learn 16:2 23:23 82:8 led 32:12 left 44:5 73:5 73:18 204:17 221:23	legacy 105:8 136:13 legal 63:9 86:19 90:17 98:10 99:14 107:12 110:19 111:11 122:11 122:17 123:13 124:9 125:9,25 126:25 129:13 137:13 139:6 139:16 144:14 145:7 149:20 160:24 164:6 165:2 166:15 167:10,20 169:5,16 170:11 172:3 173:12 186:14 205:12 209:25 217:5 218:15 228:20 230:25 231:23 232:25 233:17 247:10 248:14 lengthy 111:2 level 50:13 library 41:24 license 103:2 lieber 2:6 5:6,6 10:9 12:10 16:4 17:4 27:11 32:13 34:24 44:18 45:4 50:10
	I		
	I 3:2 label 51:21 109:3 118:18 187:23 lan 148:24 149:5 150:3,24 150:25 151:5,8 152:3,22 157:5 157:10,25 159:10,13 160:11 165:23 169:10 170:4 170:25 171:18 172:11 175:7,8 175:9 language 62:15 63:2 107:9 109:25,25		

52:24 53:7	132:13 134:18	230:6,24	213:23 223:3
54:23 56:3,23	135:4 136:3	231:22 232:24	246:12 247:3
57:15 58:12	137:11 138:6	233:16 235:18	251:8
61:9 62:4 63:7	138:22 139:5	236:11,22	lines 14:25
63:22 66:13,21	139:14 140:10	237:6 239:2,10	15:20
70:2 71:23	141:4,9 144:13	240:21 242:18	lisa 87:22
72:16 76:17	145:5,22 146:9	242:21 243:21	list 18:6 91:6
78:14 79:5	146:22 148:21	245:7,12	listed 147:22
80:11,22 81:21	149:19 160:23	246:17,23	227:21
82:15,24 83:11	164:5,25	247:7,19 248:2	listen 85:20
83:22 84:13,21	166:14 167:9	248:7 249:7	202:22
85:11 86:6,18	167:19 169:4	life 54:7 71:5	literally 49:12
88:6 89:5,14	169:15 170:10	190:15	litigation 21:14
90:16 91:18	172:2,21	light 79:2	24:8 26:14,23
93:7,21 94:23	173:11,18	133:18 235:24	26:24 27:8
95:8,19 96:11	174:6,15	likely 61:24	little 8:25 43:15
97:5,15 98:8	176:20 179:10	207:25	92:8 102:9
98:17 99:13	179:18 180:10	limit 15:16 76:3	163:10 182:9
100:8 101:6	184:14 185:19	limitation 33:8	192:14 222:18
102:4 103:11	186:13 187:14	177:16 181:16	222:21 235:19
104:19 105:20	191:23 192:24	188:23 197:20	llc 1:4 4:9
107:11 110:17	193:23 198:13	limitations	251:2
111:10 114:20	198:24 199:9	243:6	llp 1:15 2:4,9
115:17 117:16	204:4,22	limited 82:4	loaded 120:14
118:10 119:9	205:10,18	102:21 110:15	132:10
121:7,22 122:6	206:21 207:4	limiting 204:14	local 43:25
122:10,16	208:7 209:24	limits 107:10	locate 42:6
123:2,12 124:8	214:10 216:3	111:8 197:17	159:6 160:13
125:2,8,24	217:4,15	198:2	located 1:15
126:17,24	218:14 220:25	line 51:9 81:14	158:2 202:10
127:12 128:4	221:14,20	93:24,25 94:16	location 41:21
128:15 129:5	222:24 223:6	94:20 104:22	42:2,17 74:13
129:12,19	223:10 224:5	119:13,17	157:22 158:3,4
130:17 131:4	224:25 228:19	144:2 201:4,5	159:19 161:7
131:22 132:5	229:6,11,17	207:15 209:21	

logic 94:6 95:11,17,17 96:5,6 97:18 99:24 101:13 207:17 215:4 215:21 217:3 logistics 38:10 long 12:20 154:2 158:21 longer 48:4 look 14:19 18:14 32:24 77:4 81:8 84:3 91:4 97:24 106:15 108:21 108:22 116:4 124:11 133:2 163:9 164:10 171:5 176:13 177:7 197:8 199:20 200:9 202:6 217:17 226:9 229:21 looked 14:21 16:25 43:6,9 43:19 54:16 69:12 101:13 200:11 201:13 204:25 looking 18:7 37:3 42:21 62:13 75:24 76:6 78:11 80:14 90:20 107:8 126:2	133:7 154:12 156:21 162:8 163:20 172:18 177:4 185:7 217:25 226:21 240:13 looks 108:25 126:5 205:13 222:15 loose 144:24 lot 29:6 30:17 35:18 41:20 54:25 174:25 178:7 lots 40:22 41:9 43:11 low 182:21 184:4 203:19 212:23 lower 196:19 lte 55:10 234:17 lunch 103:20 103:25	246:6 magnetic 44:8 225:10 main 161:6 208:2 215:18 219:17 238:16 maintain 132:16 140:15 141:10,25 142:9,19 maintained 142:4 143:5 majority 8:11 make 15:15 16:20 20:12,15 20:19 38:5 39:2,15 46:16 50:6,19,23 52:21 62:23 65:10 74:13 81:10,19 87:9 107:15 122:15 122:25 123:4 128:9 131:2,2 143:20 152:11 172:15 182:2 184:9 202:15 207:22 208:13 208:14 223:7 234:20 235:8 235:16 makes 57:24 76:15 82:22 85:16 86:23 90:14 110:2	145:19 174:13 185:16 234:24 making 6:8 46:20 66:18,20 81:24 82:5 100:22 108:24 128:8 130:15 manage 43:3 94:4 166:23 mandated 41:2 manno 2:25 5:5 manual 126:5 manually 126:15,21 manufactured 49:23 51:12 148:25 manufacturer 54:14 manufacturers 57:21 manufacturing 49:21 57:22 march 1:10 4:4 251:6 mark 116:5 147:7 153:12 marked 22:19 22:23 30:3,7 34:11,13,17,21 116:8 147:10 153:14 market 38:8 47:18,23 51:25 100:12,21
	m		
	m 249:4 m10 237:13,21 237:21,23,24 made 39:2,5,11 46:8,17 66:9 83:21 89:12 90:25 91:10,14 92:20 93:19 103:9 106:13 148:20 234:16		

markets 38:11 48:8 master 121:16 131:10 163:5 163:15 170:23 material 11:18 11:22,25 13:14 materials 139:20 243:12 matter 4:8 9:23 10:14 145:21 245:20,23 matters 32:23 mc 46:5 mcu 120:21 121:15 144:11 mean 12:6 25:9 26:13 45:6 48:21 54:24 60:18 65:16,25 68:4 71:7,15 72:6,13 73:16 75:12,12 79:6 79:7,8 84:2,3 106:3 112:11 113:17 115:12 126:22 129:21 144:20 160:14 161:6 166:18 167:16 171:12 171:15 172:7 172:14 176:5 183:25 198:18 199:17 221:5 232:21 235:14	235:20,22 244:7 245:16 meaning 61:2 65:21 68:17 89:17 113:10 133:22 138:16 139:12 140:8 167:6 240:15 means 70:15 71:14,17 74:21 106:5 125:21 128:12,19 135:19,20 136:8 146:5 164:3 167:17 meant 62:15 142:24 197:11 225:23 237:24 measures 173:20 meat 42:18 mechanism 168:6 media 4:5 53:11,16 103:24 104:5 155:9,14 210:12,17 214:19 248:12 medication 7:20 meet 12:11 25:14 33:8 68:23 106:23 117:15 118:8	118:21 127:16 132:20,24 134:7 135:25 146:19 191:21 193:21 231:15 231:19 meeting 166:5 meetings 12:21 13:10 meets 37:11 170:8 209:3 240:9 memory 109:18 120:2 121:12 121:16 123:16 130:22 131:14 131:17,18,21 132:9 137:21 137:21 144:11 153:10,25 156:2 200:20 215:3,13,15,16 215:18,21 216:6,7,8,11,14 216:17 217:2,8 217:12,18 218:9,17,18,19 218:22 219:5,6 219:8,15,17 mention 20:12 98:19 150:9,10 181:13 189:22 197:23 218:16 218:18	mentioned 16:8 20:22 37:21 38:8 39:8 44:19,24 50:22 52:12 63:10 65:13 80:10 102:8 105:2,15 130:21 143:25 176:12 194:23 216:8,15,18,22 239:13 mentions 236:16 message 191:14 met 10:11 12:9 12:22 13:14 243:5 metal 225:24 method 83:4 112:2 116:17 217:6 michael 59:12 micelson 2:10 mile 220:17 millimeter 28:21 102:16 220:3,3,8,8 223:16 224:18 millisecond 138:10 mind 39:19 137:5 237:19 mineola 251:4 minutes 116:25
---	--	--	---

mischaracteri...	81:25 82:2,5	197:21,24	module 227:9
121:8	83:17 88:19	198:5,11,21	moment 24:7
mischaracteri...	91:2 95:24	199:4 200:6	76:6 80:10
27:12 50:11	103:16 105:7	202:15 206:19	81:17 176:9
83:12 95:9	105:22 106:13	207:2,13,20	177:5 181:3
96:12 103:12	106:18,20	208:6 209:6	204:9
110:18 111:12	109:6,13 110:8	214:21 218:5	mona 87:22
127:13 128:5	110:12,21	230:8 231:4,7	monday 13:9
128:16 129:6	111:17,18,19	231:7 232:14	money 120:12
131:5 135:5	112:3 113:19	232:18,22	123:9 124:7
136:4 137:12	114:11 118:24	239:20	131:15,16,19
138:7,23	119:8,21 120:6	mobius 23:6,9	131:20,25
139:15 140:11	120:7,21	23:12,20 24:5	132:12
144:15 146:24	121:19 122:14	24:9,14,18	monitor 53:9
166:16 167:21	122:23 125:22	modalities 45:7	53:15 103:22
169:17 170:12	126:23 130:5	mode 120:22	104:4 155:7,13
173:12 174:16	135:7 136:9	127:5,18,19,20	182:11 193:9
176:21 179:19	139:24 140:14	162:21 163:2	210:10,16
180:11 185:20	140:15,17,18	164:3,8,12,16	monitoring
191:24 192:25	140:20,22	164:21 166:9	85:2 111:14
193:24 245:13	141:11,14,20	168:25 169:11	193:11 217:7
missed 189:10	141:23 142:2	169:13 170:2	month 10:15,23
missing 65:8	142:10,20	171:14,16	11:11,11,12
mobile 15:17	143:7,13,13,15	172:19,19	months 10:16
20:6,9,21 21:6	144:16 145:4	173:24,24,25	morning 4:3
40:24 44:16,20	145:17,20	174:3,3 199:14	5:19,20
44:21 45:2	162:7 163:3,11	model 17:8	motion 12:2
46:6 48:12,14	163:23 168:2	45:21 46:4,7	34:5
48:19 49:11	168:15 175:23	modem 213:17	motorola 23:12
50:19,22 52:11	177:23 181:20	modes 96:16	37:24 38:2
52:20,23 54:16	182:3 185:12	127:15 160:8	40:4 58:22,24
63:18,20 65:3	185:23 187:10	164:4	59:25 60:2,3
66:10 68:12,16	187:12 188:25	modified 14:23	60:10 148:20
69:25 75:18	189:14,17	modify 109:15	motorola's
77:12 79:25	192:3 193:12		59:15,20

mounted 149:11,17 move 41:3 43:3 moved 23:10 55:9 multiple 9:7,9 78:3,12,25 79:12,12 80:5 80:9,20 81:3 81:17,24 82:22 83:7 102:23,23 143:16 183:4 188:13,15 213:16 245:20 murata 227:8 227:21 228:8 228:25 234:18 museum 87:21 mustard 42:15 mutually 68:7 68:10 72:11 74:18	narrower 192:14,15,17 narrowing 80:15 natalie 2:6 5:6 9:20 12:4 natalie.lieber 2:7 nathan 4:24 nathaniel 2:12 nature 94:7 near 15:3,4 42:18 nearby 157:20 175:6,9 186:16 195:22 202:25 necessarily 80:8,20 81:6 103:13 146:3 necessary 16:7 183:3 need 6:24 38:11 51:10 54:7 57:21 58:16 75:4 80:5 85:5 86:8,13,22 87:3,4 92:13 94:2 95:2 96:3 96:13 98:21 99:7 124:12 133:17 145:3 149:25 161:10 174:23 183:5 187:21 191:3 203:3 216:7	233:22 243:25 245:9 247:13 needs 69:2 160:12 net 39:22,23 40:2,3,11 52:6 52:7 network 25:17 131:15,17 132:9 137:20 150:23 227:2 networks 36:23 38:17 39:6,6 120:9 161:19 174:25 never 10:11 29:14,14 57:19 59:25 85:9 94:12 172:6,22 172:23 173:4,5 new 1:2,16,16 1:20 2:5,5 4:13 5:15 17:16 28:23,24 82:13 82:21 83:2,20 84:17 87:4 95:5,23 96:9 100:20 102:20 103:8,13 105:6 105:6 131:19 154:7,14,16 159:25 251:2,4 251:4,4 nfc 17:24 19:2 19:5,12,17,18	43:11,18 44:7 44:16 45:23 46:3 47:12,19 48:13,15 182:14,15 184:8 196:10 196:13 198:9 198:19 199:12 215:14 217:17 219:6 227:6 229:13,23 230:2 238:11 240:3 nimble 35:21 nine 13:2 non 13:22 112:17 180:25 normally 167:15 notary 1:19 3:15 5:14 248:25 250:6 251:25 note 180:19 noted 248:16 notes 250:11 noticing 4:23 novel 84:11,19 85:8 november 9:15 9:16 10:12,18 11:17 148:9 nph 20:15 nscharn 2:12
n			
n 2:2 3:2 5:13 249:2,4,4 250:2 name 4:14 12:16,17,19 17:11,13 147:15 251:6,7 named 59:7,12 names 43:9 45:25 narrow 76:3 80:14			

number 23:22 31:8 45:21 46:4,7 49:21 56:11 80:17,24 156:24 161:20 226:12 248:12 nutshell 105:11 nxp 225:5,7,11 225:16,25 228:3,4,10,24 229:13,19 230:20 231:3,4 231:14 234:19 nxp67v04 238:11 nxp67vs4 227:6 nxppn67v 229:22	109:22 112:19 125:2,8,24 126:24 127:12 172:21 173:11 179:10 180:13 186:13 187:14 199:9 204:22 205:10 206:21 208:7 209:24 214:11 216:3 217:4,15 218:14 220:25 221:14,20 228:19 229:6 229:11,17 230:6,24 232:24 233:16 235:18 236:11 236:22 239:2 239:10 246:17 247:7 objection 27:11 50:10 52:24 57:15 58:12 61:9 62:4 66:21 80:11,22 82:24 83:11,22 84:13,21 85:11 86:6 88:6 89:5 89:14 90:16,17 93:7,21 95:8 96:11 97:5,15 98:8,17 99:13 100:8 101:6 102:4,5 103:11	104:21 107:11 110:17 111:10 114:20 115:17 117:16 118:10 119:9 121:7,22 122:6,10,16 123:2,12 124:8 126:17 128:4 128:15 129:5 129:19 130:17 131:4,22 132:5 132:13 134:18 135:4 136:3 137:11 138:6 138:22 139:5 139:14 140:10 141:4,9 144:13 145:5,22 146:9 146:22 148:21 149:19 160:23 164:5,25 166:14 167:9 169:4,15 170:10 172:2 173:18 174:6 174:15 176:20 179:18 180:10 180:11 184:14 185:19 191:23 192:24 193:23 198:13 204:4 207:4 214:10 222:24 223:6 223:10 231:22 237:6 240:21	245:7,12 246:23 247:19 objections 3:10 180:24 obvious 244:14 obviously 85:5 offer 38:6 42:14,19 offered 33:15 36:4 180:20 office 142:6 246:7 officer 103:2 offices 1:14 oh 100:18 134:5 165:22 196:5 211:16 okay 6:10,15 6:19 7:2,8 11:9 55:2 61:21 62:21 63:6 77:6,8 85:22 107:25 123:21 123:24 124:17 133:6 135:8,9 136:8 139:22 149:8,21 152:17 154:3 156:18 161:25 162:5,16 168:12 170:18 171:11 175:17 177:21 178:22 178:23 181:11 185:21 194:12
o			
o 3:2 5:13,13 249:4 250:2 oath 7:11 object 7:5 16:4 17:4 44:18 45:4 54:23 56:3,23 63:8 63:22 66:13 70:2 71:23 72:16 76:17 78:14 79:5 81:21 82:15 86:18,20 91:18 94:23 95:19 104:20 105:20 106:7 108:18			

199:22 200:12 201:5 202:6 207:5 211:17 216:14 229:12 238:2 241:10 241:11 old 96:2 251:4 older 194:17 ones 18:15 ongoing 24:19 26:2 open 73:8,8 90:6 opens 109:13 operate 97:22 164:4,9 166:25 168:16,19 169:7,9 170:3 170:6,18 171:13,19 172:8 174:8,10 operating 165:13 207:17 208:2 215:4,19 215:21 217:2 217:16 219:18 238:19 operation 123:14 208:22 operational 175:24 193:12 operations 44:5 opinion 36:4,17 37:9 68:16 71:14 72:7,14	105:17 107:18 111:9 119:7 127:24 132:20 138:5 143:8,11 179:16 180:5 231:3 239:9 240:8 241:17 246:9 opinions 32:23 33:10,16 180:20 opposed 48:14 176:6 185:18 186:10 187:2 188:21 197:18 opposition 12:7 optical 143:23 144:4,4 optimal 159:20 options 91:6,7 165:10 orchestrate 184:5 215:19 order 8:14 16:10 27:15 29:5 94:3 134:21 166:5 178:23 223:24 ordering 234:3 248:5 ordinary 36:6 36:11 37:15,19 61:24 167:6 originally 244:12	originate 158:6 originated 159:8 originator 161:12 outfitted 151:19 outlined 32:21 output 54:21 55:19,25 56:15 56:21 57:5,14 64:5 68:13,15 69:11 79:21 80:2 94:12 96:7 99:5 112:13 130:6 137:2,4 140:4 140:5 181:17 182:5 185:8 189:3,10 190:12 192:10 197:22 198:5 198:11,22 226:23 227:21 227:24 228:5,8 231:21 outputs 94:4 185:15,24 228:10 232:15 outputted 188:20 228:3 outputting 63:14 64:11 65:6 66:11 67:9 85:4	112:25 127:18 127:19,20 132:17 138:17 138:17 184:10 186:15 217:7 227:14 230:10 231:5 outside 15:13 32:17 52:25 82:16 85:3 86:7,20 89:15 96:12 98:9 99:14 102:5 103:12 104:20 104:23 121:8 121:23 139:15 140:11 145:6 145:23 150:22 164:6 165:2,25 166:15 169:5 173:13 180:12 182:23 184:15 197:9 215:16 216:4 219:3,16 225:25 226:3,7 241:5 overwhelm 202:23 overwhelmed 202:24 own 90:2 104:17 150:17 221:25 223:22 225:12 233:15
---	---	--	---

owned 21:17	52:3,4 60:2	237:21 238:15	82:12,20,21
owner 23:24	69:8 79:16	238:23 239:8	83:20 87:7,9
p	91:25 111:18	240:19 241:15	88:14 89:4,13
p 2:2,2 3:2	111:22 112:18	241:18,20	90:13,25 91:10
p.m. 103:22	112:22 113:8,9	242:6,10,13	91:16 92:20,22
104:4 155:7,13	113:14,24	particular	93:5,19 94:17
210:10,16	114:22 115:2,5	39:18 89:10	94:21 95:18
248:9,16	115:15,25	147:25 156:22	96:9,21 97:14
packets 172:11	118:24 119:7	parties 3:6	98:3,7,16
page 31:24,24	121:10,18,19	parts 30:22	100:7 101:4
32:20 133:5	139:23 140:16	221:17 247:10	102:3 103:8
149:7 161:24	141:19,20,23	party 26:13,14	104:14 105:19
162:4 175:15	142:2 143:6	27:10 250:13	106:24 107:19
226:12,14	145:4,8,12,13	pass 20:4 74:9	108:8 124:20
238:3,4 249:11	145:16,19	78:4 80:18	140:9 142:6
251:8	146:15 152:6	102:22 217:20	147:16,21
pallet 154:9	165:23 167:24	passenger	148:18 150:9
156:14	182:25 184:21	192:6	150:17,18
pan 29:10	199:3 201:2	passes 109:20	151:12,15
paragraph	204:21 205:4,8	208:19	152:13,14
32:25 33:25	205:16 206:2,6	passive 105:23	153:17,24
34:7 36:15	206:11,13,16	120:22 221:24	155:23 156:9
37:11 77:7,8	207:7 208:23	222:10,13	161:16,20,23
133:3,4,8	209:17,19,22	223:21 224:2	167:4,17,23
143:24 149:7	212:25 213:4	224:22	168:4 169:12
162:4,9,11	213:24 215:8	past 26:21 29:7	169:23 172:18
168:10 175:15	215:25 217:10	pasta 42:18	174:7 175:19
176:11,18	218:10,22	patent 19:8	175:20,21
178:21 181:4	219:14,14,21	20:23 21:17	176:6,6 177:5
199:20 226:11	221:12 222:6	34:25 35:10	177:8,9 178:9
226:21 238:3,7	222:13,16	37:6 48:3,3	178:14 179:9
paraphrasing	223:9 224:2,4	53:3 61:14,21	180:8,9 181:5
163:19	224:23 226:7,9	62:13,25 68:2	181:10 185:22
part 24:9 26:22	226:25 230:15	70:6,14 74:20	186:8,12 198:2
26:23 45:22	231:6 232:14	79:9 81:19	200:10 201:17

204:3 211:5 215:10 216:2 216:10,13 226:17 234:8 234:11 235:7 238:25 240:16 240:20 241:17 241:22 242:9 242:14 243:7 245:3,10 249:14,15,16 249:17,18,19 patentee 21:16 patentees 9:4 patents 11:18 11:23,24 22:6 22:10,15 26:23 32:22 33:2,13 35:8,13 37:4,5 41:7 62:9 75:9 77:10,16 116:15 148:14 148:15 150:8,9 153:20 165:9 167:12 176:14 186:20 239:19 pathology 44:6 pay 71:6 126:12,15,22 191:21 192:22 193:18 payment 15:23 16:13 43:5,8 87:24 190:20 195:8	payments 15:10 pda 149:13 pdas 19:23 peer 49:3,3 penalty 32:8 pending 6:25 pent 23:13 people 15:24 18:2 24:3 38:21 59:2 78:8,9 157:14 161:3 171:23 196:24 197:2 percent 8:12,12 perform 77:14 performed 112:2 perjury 32:9 permission 140:12 person 36:5,11 37:11,14,18 61:23 158:6 159:7 244:21 personal 16:16 perspective 145:11 ph.d. 1:14 244:24 245:4 245:22 philips 43:14 phone 15:22 16:9,14,17,22 17:22 19:19,20	19:25 28:23 39:13,15,22,23 40:2,3 50:23 52:7 55:4 56:4 56:5,11 59:16 59:21 60:18 61:2,3,8 64:7 65:7,10,22 66:8,9,20 69:19,23 70:9 70:22,22,25 71:6,25 73:25 74:2,13,14,14 74:17 75:3 78:4,19 81:4 81:11 82:3 83:4,8,18 84:6 84:6,8 85:15 85:16,19,21,23 86:12,23,23 87:14,25 88:4 88:10,13 89:18 92:2,12,15,23 92:24 93:10 95:25 98:20 100:19,20 102:19 107:6 107:22 108:24 109:4,19,21 111:14,23 112:7,21 113:12 114:6 114:15 116:20 117:14,25 118:3,8,14,17	118:23 120:15 121:4,10,14,17 121:18 122:15 122:23,25 123:3,4,6 124:5 125:14 126:10 127:5 128:3,7,9,9 130:10 132:17 135:7,12,16 136:9,14,18,23 138:12 140:3 141:3,15,22 144:11,12,21 145:9,13,13 146:7,15,16 147:4 168:2 182:6 185:4,23 187:24 188:11 190:11,25 192:5 194:25 197:7 198:9,21 199:11,16 207:22 208:11 208:12,13,15 214:25 221:7 221:10,11 223:9 233:9,21 phones 20:7,10 40:12 59:25 60:11,15 100:24 phrase 36:9 75:6 181:13
--	---	---	---

physical 196:18 picc 170:22 pick 112:12 155:3 159:4 233:21 picked 157:11 pictorial 239:18 picture 87:21 225:21 240:24 240:25 piece 96:14,19 pinpointing 42:10,23 place 150:25 151:24 placed 123:5 124:4 places 220:11 plain 165:15 194:3 196:16 plaintiff 1:5 2:4 4:9 5:8 8:23,25 9:22 plaintiffs 9:4 play 136:21 played 43:22 45:22 please 5:11 6:13,17 35:7 36:2 50:12 56:17 107:13 107:25 152:11 161:15 173:14 177:18 193:2,3	197:15,19 198:16 237:17 240:12 246:25 plenty 59:2 plethora 47:3 plus 220:5 point 44:3 45:20 52:15 54:15 88:15 141:12 142:11 152:25 156:9 157:11,12,12 159:20 193:18 197:19 244:5,9 pointed 95:4 points 168:14 portion 94:9 168:16,20 posita 36:10,18 63:4 99:8 101:15 108:15 133:9 173:5 possibilities 66:7 134:8,12 possibility 79:13 188:9 possible 79:2 81:20 82:23 83:21 87:9 89:12 90:15 91:2,10,12,14 91:16 92:20,22 93:6,19 103:10 power 120:22 157:17 183:19	209:16 practiced 22:5 pre 85:22 preclude 78:23 predate 40:3 predates 148:14 153:19 preloaded 60:20 79:25 80:3 prep 12:4 prepare 11:7 11:20 12:12 preparing 12:24 13:11,17 13:22 14:2,7 14:12,14 presence 110:10,14 111:7 181:19 184:12 185:11 189:5,13,18,19 192:4 193:9 196:11 present 2:24 4:19 81:6 presenting 175:25 press 207:24 presumably 118:4 presume 6:14 previous 17:5 188:6 190:17 190:17	previously 26:8 27:9 93:4 principle 57:18 printed 220:10 printer 20:24 21:2 prior 55:3,5 201:13 244:10 priority 37:5 148:9,11,13 153:6,18 privy 27:14 236:25 probably 159:5 159:21 197:2 210:24 probes 181:24 probing 79:22 92:7 102:12 105:24,25 109:8 112:15 112:24 181:13 181:22,23 182:4,10,18 185:14,22 186:18 189:6,7 189:14,23,25 190:10,13,13 191:3,4,22 192:11,18,21 193:7,14,19 194:13,13 196:7 197:4 problem 173:10,17
---	--	---	--

174:22 process 86:10 processing 89:21 96:5 101:11 203:18 203:19 205:7 212:15,23,24 215:13,14,16 219:11,12 238:10 239:14 239:21 240:2,3 240:5 241:24 242:2,11 processor 99:20,21 100:4 101:10,20 103:4,9,14,14 113:22 114:5 114:15 115:7 119:3,6 130:20 130:21 131:2 132:4 135:14 143:17 200:18 204:17,21,24 204:24 205:3,6 205:8,20 206:2 206:4,10,11,18 206:25 207:10 207:16,21 208:2,8 209:14 212:10 213:3 213:11,16 218:10 221:22 237:14 238:17 239:4 241:5	processors 205:23 produced 38:14 product 39:19 42:4 48:4,5 50:2 71:10 148:19 225:15 225:17 230:8,8 230:15,17 232:4,6 233:12 234:3 241:10 241:13 products 22:5 33:6,7,11,13 38:4 40:7 49:16 51:8 52:16 106:12 133:11 154:10 220:22 225:12 226:22 231:11 professional 1:18 professor 27:24 28:7 29:3,13 project 24:2 promulgate 223:24 prong 21:25 22:6 propagates 222:3 proper 33:16 property 8:3,10 8:15	proportional 220:6 prosecution 107:4 protective 27:15 protocol 164:14,18 183:2 184:22 195:3,16 provide 30:20 32:22 86:14 161:7 174:23 197:5 199:23 243:18 provided 23:15 37:10 179:25 246:9 provides 78:12 provisional 37:6 prowess 246:13 247:3 proximal 110:10,14 111:6 160:4 181:19 182:12 184:12 185:11 186:22 189:5 189:12,18,19 192:3 193:9 196:11 proximity 186:22 190:6 198:6	pto 111:3 112:10 115:21 130:2 142:24 143:3,5 150:11 244:7 246:2,3 246:11,15 247:5,23 public 1:19 3:15 5:15 14:23 221:3 236:14 237:9 248:25 250:6 251:25 publish 29:6 published 43:21 47:21 pull 191:20 192:22 pulls 193:17 puncture 165:8 172:11 purpose 51:18 151:18 161:6 put 17:19 19:9 21:4 51:21 70:8 98:23 100:19 102:19 107:6 109:3 118:6,14,19 121:25 154:7 175:8,10 187:21,23 190:19 192:6 194:17 195:16 195:21 199:15
---	--	--	--

244:20	176:8 180:22	range 158:21	185:11 186:2,3
q	181:2 186:6	160:4 185:15	186:16,22
qa 194:20	191:18 193:3	rate 18:21	188:3 189:13
qualcomm	205:25 207:6,9	54:18	190:6 191:8
151:10 225:5	228:22 236:6	rather 29:24	193:13 194:5
227:7,7,16,17	238:22 239:7	ratified 43:21	194:18 195:22
227:20 228:7	239:23 240:6	read 11:25 46:3	196:11,13
228:24 229:9	240:18 242:12	46:16,22,22	198:7
231:18 233:25	247:2	48:14,17,25	readers 45:12
234:17,18	question's	49:13 50:4,8	45:18 47:12
235:6	93:17	51:6 62:18	191:7
qualifications	questioning	65:11 68:21	reading 45:15
36:5	104:22	86:25 87:20,21	65:5,6 67:13
question 3:11	questions 6:18	89:8 95:2 98:3	74:16 94:16
6:13,25 7:8	7:5 41:16	130:13 184:2	96:23 101:17
14:9,10 16:11	242:17,24	244:2	139:19 163:7
20:17 57:9,11	243:4,22 248:3	reader 15:19	163:17
62:22 67:17	quick 47:10,17	15:22 16:7,12	reads 64:9
68:22 69:8	quickly 51:4,24	17:25 18:5	ready 51:25
72:13 85:7	quite 63:23	40:24 45:10	155:22 183:22
91:21 93:16	quoting 115:21	50:9 56:25	real 185:5
98:13 100:25	r	58:8 64:9,13	190:15
101:3,21,23	r 2:2,12 5:13,13	64:14,17,18	really 27:17
104:20 105:4	250:2	67:10 79:23	65:7 81:24
107:16 114:3	r&d 25:14	85:3,5,14	89:25 107:7
122:13,22	41:13	86:24 89:7	110:11 116:3
123:19,23	rachid 59:9	94:14 97:10,22	156:6 157:23
124:2,13,16	radio 98:2	102:9 109:10	158:21 159:8
125:13 129:8	103:6 108:10	130:14 135:10	166:3 174:19
135:17 137:5	149:10,10,23	135:14 175:24	183:8 184:2
137:15 139:21	149:24,25	181:20 182:2	195:20 196:18
139:25 140:2	160:25 162:6	182:12,15,15	196:19 245:15
142:15,17	209:9,10	182:21 183:22	245:16,21
152:10 153:22	214:15 224:12	183:23 184:9	realtime 1:18
156:6 174:18	224:15 233:23	184:13,18,19	

reason 7:15 24:23 76:7 118:20 130:12 146:18 251:8 reasons 111:4 112:10 recall 18:19,19 19:8 31:13 43:7,9 45:11 45:11 52:18 53:25 68:8 104:14 113:23 153:8 168:3 211:7 237:14 242:22 243:3,7 243:14 recalling 91:17 receipt 94:5 185:13 189:7 189:14,22,25 190:10 receive 55:25 56:5 74:3,4 77:2 79:17 92:14 102:11 102:18 125:6 125:15 157:9 160:11 164:23 166:10 179:14 182:17 202:11 203:6,9,9,12 210:5 211:6,11 228:9 received 92:5	receiver 181:22 202:23 212:19 receives 92:3 105:24 159:9 receiving 58:18 64:6,12,20 85:2 92:7 112:15,24 115:24 150:14 157:24 159:12 159:17 164:13 164:17 187:3 200:6 202:8 206:19 207:2 207:13 208:5 209:5 210:4 211:20,25 212:7 213:10 214:6 217:13 218:5 230:11 233:5 recess 53:12 103:25 155:10 210:13 recited 62:8 94:15,19 108:13 recognize 22:24 30:9 116:11 147:13 147:16 197:2 recognized 19:25 recognizing 6:2	recollection 148:23 record 4:3,22 35:5,9 53:10 53:14 103:23 104:3 155:8,12 180:19 210:11 210:15 246:20 248:9,15 recorded 4:6 refer 67:6 72:18 136:7 144:18,20 171:24 247:9 reference 116:24 173:2 173:22 242:25 246:14 247:4 referred 22:18 30:2 34:12,16 34:20 72:22 81:17 116:7 147:9 153:13 referring 46:13 56:25 70:12 77:23 116:24 117:4,22 125:11 142:23 169:2 234:24 refers 143:12 refresh 153:9 153:25 156:2 regard 217:9 regarding 32:15 208:16	242:24 243:4 registered 1:17 registers 120:20 rejecting 110:23 relate 43:5,17 77:11 related 8:5,9 36:21 54:11 61:7 148:18 160:3 207:7 250:13 relates 243:17 relation 195:10 relationship 26:2 relationships 25:6 relative 9:3 relatively 54:8 relays 144:5 relevance 146:10 reload 114:16 rely 145:24 relying 122:20 221:3 246:15 247:5 remember 8:19 9:19 10:21 12:15 17:11,15 20:22 41:15 45:25 47:19 58:23 59:4
--	--	---	---

79:11 150:20 153:5 188:7 194:22 221:15 remind 142:7 remote 151:21 remotely 4:20 removable 140:25 141:8 142:19 146:21 repeat 136:5 137:15 237:8 rephrase 45:5 50:12 56:17 107:13 128:17 129:7 replace 121:25 122:4 replacing 45:18 reply 12:2,5 report 11:4 18:17,18 21:10 36:15 171:5 178:21 226:10 reporter 1:18 1:19 4:16 5:11 6:7 248:4 250:6 reporting 251:2 represent 11:3 representation 163:8 201:11 representing 4:15	reqa 194:10 195:3,13 request 6:23 94:6,8 156:25 180:23 184:21 194:10,12,15 194:21 require 69:9 84:10,17,19 85:13 177:23 187:20 required 68:24 79:3 86:5,16 94:21 105:18 178:8 228:16 230:21 requirement 182:10,21 requirements 231:15 requires 85:8 87:24 107:19 113:5 126:5 130:5 186:11 186:25 188:19 192:20 193:7 research 14:16 14:20 16:3 17:13,14 29:21 36:24 56:10 reserved 3:11 resided 217:22 residents 23:14 resolution 42:11,12	respective 3:5 respond 34:3 64:16 81:12 84:7 92:14 100:18 102:12 161:12 182:25 183:15,21 189:21 191:9 191:19 194:7 195:5,7,14 respondent 22:11 responding 101:18 109:9 responds 105:25 184:17 189:25 response 64:5 64:12 79:21 92:8 100:2,3,5 112:14 159:11 176:2 181:18 184:11 185:10 185:24 189:4 189:12,22 194:10,12 208:21 responsibility 214:17 responsible 200:5 206:18 206:25 207:12 208:4 209:4 210:3 211:13 211:19,24	212:4,6 213:9 214:5 217:12 218:4 221:17 221:19 222:10 227:14 232:2 233:4 rest 126:9 227:18 result 80:20 81:6 results 80:8 retained 18:25 21:15 26:13 248:13 return 181:25 reveal 32:14 review 11:17 13:25 14:5,11 32:22 168:7 reviewed 11:22 12:3 13:14 41:8 reviewing 26:22 rf 54:8 58:15 58:15 156:17 158:18,24,25 159:11 160:7 160:22 161:5 202:8,11,13,20 209:12,13 210:5 211:6,11 211:14,25 212:7 234:18
---	--	--	--

rfid 15:5,22 17:25 19:5,5 19:11,16,17,18 36:23 40:12,21 40:23 41:3,5,9 41:9,11 42:8 42:22,23,24 43:4,5,12,13 44:16 45:3,8 45:23 46:3,16 46:22 47:5,20 48:13,15,17,20 48:22,23 49:5 49:12 50:7,8 51:2,6 52:8,11 52:22 56:15,21 57:5,13,14 58:4,10 59:15 59:20,24 60:14 60:19 63:12,12 64:4,9,10,10,13 64:14,18,18,20 65:5,6,11,14,17 65:22 67:9,10 67:15,21 68:13 68:21 69:10 72:3 73:25 74:22 75:5,10 75:16 77:14,17 78:18,20 79:21 81:5,11 82:13 83:8 84:11,20 85:10 86:9,14 87:12,16 88:8 88:12,17,18,23	89:12 90:9,14 90:25 91:3,7 91:11,15,22,25 92:10,21 93:3 93:5,20 95:6 95:22 96:7,10 96:14 98:6,22 98:22,24,25 99:7,10,17 100:7,10 101:4 101:22,24 102:2,15 103:5 103:9 105:8,12 106:3,21,22 107:10,20 110:3,4,15,16 111:8,21 112:4 112:14 113:15 113:21 114:3 114:13,17 115:5 116:17 116:21 117:3,7 117:10,13 118:6 120:16 121:2 123:6,8 124:5,7,23,25 125:22 127:6,9 127:19,20 128:14,21 130:6,11,14 132:8,11,22 133:14 135:21 135:23 136:14 136:24 137:2 138:17 140:4	140:20,25 151:17 152:8 152:15 153:24 155:25 156:8 156:15,17 158:11,14,20 160:18,20,22 160:25 161:4 167:25 172:19 173:24 175:24 175:25 181:9 181:17,20,22 181:23 182:12 182:15 184:11 184:12,23 185:9,11,13,14 185:17,18,24 186:2,3,8,10,16 186:22,25 187:3,23 188:2 188:19,21 189:3,6,10,13 189:14,23,25 190:12 192:10 193:7,13,13,14 193:19 194:18 194:20 196:11 197:17,18,22 198:3,6,12,22 199:6,7,10,11 207:8,18,19 208:16,22 215:5 217:3 227:25 228:2 228:10,18	230:11,23 233:10 239:21 rfids 38:13 right 7:24 12:7 15:21 16:9 18:22 20:11 27:10 28:4 32:9,19 33:18 34:5 36:7,15 36:25 37:7,12 37:24 42:2 44:17 46:18 49:14 50:9,20 58:19 59:5 60:2,6,11,16,25 61:8 62:3,6,9 62:15 63:21 64:21 66:12 67:2,5,11 69:4 69:11 70:18 71:22 72:8 73:12,15 74:24 75:7 79:4 80:10,21 83:10 84:12 88:21,24 91:2 92:10,22 94:17 95:7 96:10 100:16 107:20 108:8 108:14 113:23 114:6 116:25 117:5,8,25 118:4,5 121:6 122:5,15 123:11,25
---	--	---	---

124:7,16,24	213:5,12	s	193:14 201:6
125:7,16	217:14 220:24	s 2:2 3:2,2 5:13	201:18 207:16
128:25 130:7	221:13 224:24	23:23 249:9	218:3 227:4,16
131:11 132:12	227:22 228:5	251:8	229:22 232:17
132:19,24	228:11,18	san 160:5	234:5 235:5
134:13,23	229:5,10,16	satisfy 113:3	244:3 245:11
135:3 138:2,5	230:5,18,23	116:3 124:22	246:14 247:5
138:21 139:2	231:13,16,20	143:10	scan 20:4 44:19
139:13 140:9	233:15 234:22	satisfying	74:9
141:3 143:16	239:5 240:11	111:24,24	scanned 45:3
146:8,21	240:16 241:13	saw 88:16	scanner 50:25
147:21 148:3,9	244:22,25	102:15 194:4	scanning 38:12
148:16 152:9	245:22 246:16	225:21 240:24	38:13,14
152:16 153:20	247:6	saying 20:16	scared 190:21
158:11,12	road 251:4	55:5 72:10	scenario 73:21
159:2,13 160:8	role 25:3,10	134:14 135:11	115:3 136:11
162:8,21 163:6	27:8 29:13	135:19 142:3	scharn 2:12
163:25 164:4	106:7	145:16 158:15	4:24,24 5:18
164:14,15,19	root 137:18	191:18,25	35:2 53:4
166:13 169:14	roth 1:15 2:4	222:7 225:11	103:19 116:5
177:17,24,25	5:7	229:8 247:15	129:7 147:7
178:10,15	rough 248:6	says 25:2 66:4	153:11 180:18
179:17 180:9	routine 77:18	71:24 75:21,22	210:7 242:16
182:16 186:4	roy 59:7	75:25 77:9	242:23 243:24
187:8,20 188:5	rpk 1:3	79:20 84:23	247:24 249:7
190:2 193:7,8	ruggedize	89:16 94:5	schematic
193:15,21	51:14	110:8 111:18	90:21
198:12 200:2,7	rules 6:4	119:18 131:24	schematics
200:21 201:13	run 99:24	133:8 140:13	83:25 237:10
201:22 202:3	running 173:8	140:17 149:9	school 220:18
202:12 203:13	rx 202:13	154:21 160:19	schulte 1:15 2:4
203:23 204:3	209:12	168:13 175:18	5:7
205:5,16		181:17 185:8	science 36:19
206:14 209:6		185:14,21	scope 32:17
212:2,8,25		186:17 193:8	52:25 58:13

61:10 62:5	sealing 3:6	153:9 154:21	183:14,17
66:14 78:15	second 13:3	158:16 163:12	196:24
80:4 81:22	25:2 67:4,7,16	163:21 165:22	selected 183:23
82:16,16 83:23	69:2,4 70:17	168:22 173:19	selection 96:7
84:14,22 85:12	71:17,20 72:2	176:3 179:3	semester 28:10
86:7,21 88:7	72:8,15 74:22	184:20 189:9	28:14,17,18
89:6,15 90:17	149:10 163:22	194:19 200:15	semiconductor
91:19 93:8,22	185:15 190:3	201:8 203:15	149:2,3
94:24 95:9,20	226:21,24	203:20 204:16	send 79:17 90:4
96:12 97:6,16	section 202:12	209:11 214:12	90:4 92:16
98:9 99:15	203:12,18,20	215:5 216:17	95:23 100:5
100:9 101:7	secure 219:11	216:19,21	102:18 120:20
102:5,8 103:12	229:14,18,23	221:7 222:23	143:22 146:5
104:21,23	229:25	223:12,18	156:24 157:25
110:3,5 114:18	securely 141:22	225:22 226:15	158:6 159:7
121:8,23	see 23:6 25:7	227:11 232:19	160:14 183:9
122:11 123:13	25:15 27:16,25	232:20 236:15	184:18 186:18
124:9 125:10	29:23 32:2	236:17 237:23	190:6,8,8
125:25 129:18	33:7 34:6 42:4	243:11,15,19	192:18 194:14
130:18 131:23	42:12,13 49:23	245:9	195:13 208:20
132:6,14	62:18 76:5,7	seeing 23:13	208:21 212:20
137:12 138:7	76:18,19 77:9	seem 206:8	220:12 222:2
138:23 139:6	77:20,25 78:9	seems 145:20	233:24
139:15 140:11	82:25 83:25	180:4 192:13	sending 64:19
144:14 145:6	88:18 89:17	215:20 219:3	92:8 187:3
145:23 146:10	90:8,9 91:5	225:3	209:7 212:16
146:24 148:22	105:11,21	seen 14:2,12	214:18
164:6 165:2	111:24 119:10	81:25 130:19	sends 157:21
166:15 169:6	119:23 120:4	137:25 221:2	158:24 159:3
173:13 180:7	120:10,17,24	226:4 237:7	189:6
180:12 184:15	124:14,17	sees 100:4	sense 15:15
195:25 196:2	133:15,23	208:8	16:21 105:23
199:6 218:8	138:14 147:15	select 16:9	136:16 152:11
247:8	147:24 148:5	93:11,12 95:22	182:2 223:7
	149:14 150:20	131:8 183:6,12	

sent 15:23 159:22 192:12	193:17	45:1 46:1 47:1	131:1 132:1
sentence 34:9 133:8 142:13 176:10,18 201:19 226:22 227:3	settlement 21:11	48:1 49:1 50:1 51:1 52:1 53:1	133:1 134:1 135:1 136:1
separate 112:25 204:9 205:14,17 222:5 224:15 225:4 242:15	seven 13:5 several 21:13 45:7 48:6,6 115:21 148:15 220:14 234:11	53:17 54:1 55:1 56:1 57:1 58:1 59:1 60:1 61:1 62:1 63:1 64:1 65:1 66:1 67:1 68:1 69:1	137:1 138:1 139:1 140:1 141:1 142:1 143:1 144:1 145:1 146:1 147:1,10,14
separated 47:14 224:17	shaded 157:3	70:1 71:1 72:1 73:1 74:1 75:1 76:1 77:1 78:1 79:1 80:1 81:1 82:1 83:1 84:1	148:1 149:1 150:1 151:1 152:1 153:1,14 154:1 155:1,15
separately 50:8 51:2 135:23 216:11 220:18 237:12 244:19	share 77:10 120:2 165:6 235:11,17 236:10,21 237:5 239:21	85:1 86:1 87:1 88:1 89:1 90:1 91:1 92:1 93:1 94:1 95:1 96:1 97:1 98:1 99:1 100:1 101:1 102:1 103:1 104:1,6 105:1 106:1 107:1 108:1 109:1 110:1 111:1 112:1 113:1 114:1 115:1 116:1,8,12 117:1 118:1 119:1 120:1 121:1 122:1 123:1 124:1 125:1 126:1 127:1 128:1 129:1 130:1	156:1 157:1 158:1 159:1 160:1 161:1 162:1 163:1 164:1 165:1 166:1 167:1 168:1 169:1 170:1 171:1 172:1 173:1 174:1 175:1 176:1 177:1 178:1 179:1 180:1,19 181:1 182:1 183:1 184:1 185:1 186:1 187:1 188:1 189:1 190:1 191:1 192:1 193:1 194:1 195:1 196:1 197:1 198:1 199:1
separating 76:11	shared 103:15 131:18 239:16		
september 148:2	shares 131:14 175:19		
sequence 165:17	sharony 1:14 4:7 5:1,19 6:1 7:1 8:1 9:1 10:1 11:1 12:1 13:1 14:1 15:1 16:1 17:1 18:1 19:1 20:1 21:1 22:1,19 23:1 24:1 25:1 26:1 27:1 28:1 29:1 30:1,3 31:1 32:1 33:1 34:1 34:13,17,21 35:1,6,11,11,12 36:1 37:1 38:1 39:1 40:1 41:1 42:1 43:1 44:1		
serial 49:21 156:24			
series 243:4			
served 19:4 27:9 38:7			
serviced 49:24 52:13			
services 38:6 81:14			
set 34:4 50:13 105:6,6 171:8			

200:1 201:1	shine 64:15	84:7 85:3,4	203:19 210:4
202:1 203:1	short 53:12	92:8,14 99:23	212:13,16,22
204:1 205:1	54:8 155:10	100:2,3 101:11	212:24 217:8
206:1 207:1	210:13	102:11,12	226:24 227:25
208:1 209:1	shorthand	105:25 109:9	228:5,17
210:1,18 211:1	250:5	112:14,15,24	230:12,22
212:1 213:1	shortly 12:13	112:25 119:20	signals 54:11
214:1 215:1	shouts 182:23	120:20 132:18	56:2 74:23
216:1 217:1	show 16:19	132:23 137:4	75:17 92:3
218:1 219:1	21:24,25 22:9	138:17,18	127:20,21
220:1 221:1	127:2,4,8	144:4 154:20	130:7 140:6
222:1 223:1	132:15 153:3	157:2,9,11,19	164:14,18,24
224:1 225:1	204:23 206:15	157:19,21,24	200:6 206:19
226:1 227:1	244:9	158:2 159:3,4	207:2,13 208:5
228:1 229:1	shown 238:12	159:6,9,10,12	209:5 210:6
230:1 231:1	shows 102:24	159:13,16,17	211:7,11,25
232:1 233:1	206:9 213:2	160:14 173:25	212:7 213:10
234:1 235:1	shut 72:20	181:17,22,23	217:13 218:5
236:1 237:1	side 17:22	182:5,18	227:15,22
238:1 239:1	58:18 62:18	184:11,24	228:9,10,11
240:1 241:1	73:5,6 86:24	185:9,14,15,18	231:5,21
242:1,22 243:1	87:13,13 99:6	185:22,24	232:16
243:25 244:1	146:4 192:6	186:9,16,18	signature 32:5
245:1 246:1	204:17 217:18	187:3 188:19	177:3 250:17
247:1 248:11	222:18 245:19	189:3,6,7,11,15	signed 3:14,16
248:18 249:11	sides 22:3	189:23 190:2	similar 175:19
249:12,13,14	180:4 221:11	190:11,12,14	179:25 180:4
249:15,16,17	sight 51:10	191:3,4,22	221:22 242:5
249:18,19	sign 27:15	192:10,11,19	similarly
250:8 251:7,21	signal 54:22	192:21 193:7	206:12
sheet 235:5	55:19 63:14	193:14,19	simple 156:7
251:2	64:5,6,11,12,19	194:4,13 197:4	simpler 163:10
shellhammer	64:20 66:12	197:22 198:5	single 143:12
166:7	68:15 69:11	198:12,23	228:15 230:20
	75:11 79:21,22	202:8 203:18	

site 25:17 29:18 sites 25:18 sitting 222:19 situation 30:20 75:14 134:4 183:4 187:16 191:13 six 13:4,5 size 220:6 skill 36:6,11 37:15,19 61:24 61:25 145:12 167:7,15 171:24 213:23 244:21 skipped 28:16 slightly 210:24 slowly 193:2 194:2 small 62:17 99:20 102:16 189:10 224:19 smart 23:17 59:15,20,24 60:11,14,17,19 60:22 61:7 87:20 106:10 152:19 smarts 102:17 smoothly 6:5 snapshot 138:14 software 88:19 88:20,23 90:10 93:2,18 94:2	97:8,13,18 99:22 195:19 199:17 235:25 236:2 solution 170:5 171:21,23 174:24 solutions 248:14 somebody 130:15 sony 43:14 soon 41:6 sorry 14:8 20:8 46:14 67:12 93:15 107:23 114:2 117:9 123:22 125:13 142:15 148:10 200:13 205:24 211:16 219:10 237:24 sort 18:11 21:10 25:21 27:18 35:21 40:23 41:2 42:16 43:12 45:18 50:13 54:8 72:20 99:24 105:22 109:15 143:20 151:25 183:9 183:20 210:5 235:15 244:9 244:12	sound 220:7 sounds 179:15 space 175:24 188:2 193:12 sparks 191:17 speak 13:21 special 167:7 specialized 43:12 specific 52:15 57:21 77:16,22 78:22 81:4 84:4,10,19 86:13 95:15,22 105:13 106:6 110:6 164:10 181:12,12 182:10 190:9 192:9,13 195:5 196:14 197:19 199:14,17 217:20 231:11 240:23 241:3 specifically 7:6 17:6 86:5 87:6 107:8 108:13 186:17 specification 68:6 75:9 76:5 77:11 79:7 88:14 98:4,7 175:20 176:15 201:2 207:6 specified 230:16	specimen 44:4 spectrum 165:24 168:17 168:21 speculation 114:21 117:18 126:18 134:19 198:15,25 222:25 236:12 236:23 239:11 245:8 spend 12:24 13:11 31:3 spent 13:17 31:9 sphere 74:6 spoken 155:18 square 102:15 251:4 srz.com 2:7 stand 177:2 235:3 standard 17:16 17:18 18:7,9 18:10 43:20 47:21 standards 14:22 15:2,5 17:12 28:24 40:19 43:15 48:5 166:8 standing 104:21 stands 160:25
---	--	--	--

start 11:17 35:24 46:5,20 63:17 200:14 started 21:22 24:18,23 47:19 149:4 156:11 starting 93:25 178:20 201:4 starts 53:16 104:5 155:14 210:17 state 1:19 4:20 5:15 62:2 65:4 65:14,15 66:16 66:18,19,25 67:4,4,7,7,8,14 67:15,16,20,24 68:3 69:2,4,13 69:14,20,23 70:7,16,17 71:16,17,19,20 72:2,8,8,15,15 74:21,23 122:14,24 123:7 124:6,24 125:6,14 135:21,21,23 135:24 167:24 167:24 183:21 226:20 228:16 230:21 stated 33:25 226:24 statement 32:8 75:16	states 1:2 4:11 67:19 72:4 125:20 128:12 128:19 133:12 173:8 187:17 station 119:21 120:7,8,21 status 41:19 stenographic 250:11 step 110:13 160:16 172:16 183:8 steps 94:15,19 94:21 steven 166:7 stick 192:22 sticker 51:22 109:4 110:11 118:18 187:23 stipulated 3:4,9 3:13 stony 43:24 stop 158:8 stripes 222:21 structurally 97:4 students 31:21 subcomponent 229:10,15 subcompone... 229:4 subject 180:22 submit 10:14	submitted 10:17 11:14 14:16 244:12 submitting 94:11 subscribed 248:21 251:23 subsequent 160:16 subset 43:12 substance 53:20 104:9 155:19 210:21 subtype 195:17 197:6 succinct 180:25 suddenly 89:12 90:14 suggest 123:15 237:11 suggested 29:9 244:19 suggesting 73:11 suggestion 221:6 suggests 84:7 suitable 149:12 sum 115:22 150:12 179:12 211:12,18 235:7 supplier 41:4 supply 49:22 52:17	support 84:8 87:3 90:6 94:6 103:4,16 supported 100:13 supporting 86:11 92:23 supports 80:24 127:5 203:5 supposed 27:18 123:4 sure 6:16 12:18 43:8 46:25 47:11 48:3 53:7 56:18 57:2 58:23,24 61:22 62:20,23 93:15 107:15 117:23 155:5 156:4 168:9 193:5 228:21 susceptible 171:3 swear 5:11 sweden 195:9 switch 21:23 65:4 68:25 70:7,8,10,10,15 70:19,23 71:16 71:18,19 73:6 76:14,19,25 112:8 134:25 201:22 202:2,6 202:7,15,18 209:16,17
---	--	---	--

235:10,12,14 235:15,20,22 235:24,25 236:2,4,9,16 switchable 63:18,20 66:2 66:10,15 68:16 68:23 69:9,25 70:15 71:13 72:6,13 74:21 76:16 84:24 110:20,22 111:6,19 112:3 122:8,9 123:15 123:20,24 124:22 125:19 125:21 126:23 127:3,11,17 128:12,18,22 129:4,11,18,21 130:24 131:3 132:24 133:11 134:10,17,20 135:18,20,25 136:6,7 137:7 137:8,9 138:4 138:20 139:4 139:12 140:7 140:14 143:10 147:5 166:12 166:18,19 167:3,6,17 169:13,19,22 169:23 170:8 170:14 171:25	173:7,16,22 174:2,4,14,18 175:12 177:16 177:23 178:6 178:11,24 187:17,20 202:16,19 switches 202:5 switching 65:13,19 69:10 70:17 72:7,14 167:16 228:16 228:17 230:21 230:22 sworn 3:16 5:14 32:7 248:21 250:8 251:23 symbol 23:11 25:13 37:25 38:5,7,17 39:2 40:23 41:12 45:14 46:9,10 46:17,20 50:15 60:14,16 148:19 system 28:11 38:24 55:21 58:3 158:11 175:2 208:2 213:20 215:19 217:16 219:18 224:10 238:19 systems 36:23	t t 3:2,2 249:4,9 250:2,2 table 86:25 94:14 109:16 tag 16:9 19:9 20:23 21:4 44:12 46:17 48:13,15,23 49:2,12,16,25 51:18 52:22 56:24 57:5,13 57:19 58:4,8 58:10 64:10,15 64:15,16 65:7 65:11,22 77:14 79:9,14 81:25 82:6,23 83:16 83:25 84:11,20 85:2,10,14,17 86:10,15,25 88:2,5 89:8,8 89:12,16,17,19 90:2 91:11,15 92:2,13,21 94:14 95:22,22 96:7,10,15,17 96:20,23 97:11 97:21 102:9,9 102:14,14,15 105:14,18 106:3,14,15,16 106:17,21,23 107:7,22,23,24 107:25 108:17	108:23,23,25 109:5,7,11,12 109:16,16,19 109:19 110:3,4 110:10 111:15 111:15,21 112:6,25 113:2 113:5,15,21 114:4,12,13,17 115:5 116:22 117:4,7,10,13 118:6 121:3 123:6 124:5 125:23 126:4 130:11 131:9 131:18,19 132:11 136:24 137:18,22 140:25 141:15 141:19 146:3 151:3,3,17,19 152:9,17,18,19 153:24 154:6,6 154:7,20 155:25 156:5,8 156:13,15,23 157:3,5,7,9,23 158:16,18,23 158:24 159:11 160:3,7,20,21 160:22,22 161:10,11,11 175:25 176:16 181:14 182:4,7 183:6,12,13
--	---	---	---

184:17 185:3,4 185:5,18 186:10 187:2 187:10,11,13 188:8,12,22 189:20 194:7 196:13,20 197:23,24 199:6,7,10,11 244:19 tags 15:13 42:8 42:23 43:20,22 44:6,9,13,20 45:12,23,23 46:3 52:8,11 57:10,20,24 79:11,12 83:8 83:14,14,15,21 93:20 98:23 100:14 106:10 183:15 188:13 188:15,15 take 6:6,21 15:12,16 19:24 20:2 25:11 26:19 38:12 48:4 51:15 53:5 64:14 74:8 86:23 98:22,24 103:19 106:7 122:4 135:6 136:13 138:13 163:8 173:20 175:5 187:22	199:15 210:7 237:20 244:19 taken 4:7 53:12 103:25 155:10 210:13 takes 47:23,25 48:5 talk 16:6 17:23 29:8 74:2,3,4 92:3 97:17 119:2,5 130:9 135:12 144:7,8 151:21,22 152:5,20 162:2 177:13 183:17 183:18 202:22 210:23 237:20 239:3 talked 55:15 178:7 180:13 talkie 214:14 talking 6:7 39:19 50:14 53:23 65:2 66:24 67:18 71:9 74:7 75:3 95:11 104:13 112:2 122:24 150:22 151:4 154:24 158:13 168:5 173:4 175:12 176:15 188:24 189:16 211:14 242:8	talks 109:5 112:12 152:24 201:2 226:10 tanya 2:25 5:4 taqa 194:11 taught 28:13 28:18 teach 28:17 219:25 teacher's 29:19 teaching 29:25 team 56:9 teardown 234:5 technical 12:3 22:6 32:23 33:10 246:5,13 247:3,9 techniques 161:17 technologies 19:13 23:11 25:13 37:25 38:5 46:9 57:18 technology 19:3,14 21:25 26:17 27:5 29:23 36:21 40:21 42:6 57:8 77:17 81:5 82:13 telecom 25:4 telephone 39:6 108:24 130:15	telephony 77:15 tell 16:16 23:8 25:22 35:17 45:8 46:6 95:3 97:20 102:11 104:17 106:2 107:17 115:12 155:22 165:19 168:8 169:19 187:25 190:10 191:4 195:19 197:8 214:14 218:13 232:3 233:22 telling 81:10 219:5 tells 71:2 90:13 90:21 97:8,19 99:24 106:6 110:14 146:12 186:8 192:9 205:15 ten 24:21 tens 31:4 tenure 29:2,4 term 137:9 164:9 167:3 173:16 176:14 177:15 178:13 199:25 211:5 215:9,25 216:25 235:22 240:20
--	---	---	--

terminal 16:13 17:21 19:21 20:2,12 39:20 45:17 46:12 51:15 190:21 195:8,17,18 197:5,8	248:14 thanks 18:13 theater 44:5 themselves 235:4 theory 57:8 thing 65:12 83:17 94:13 175:7 185:5 242:2	212:9 226:6 232:12 239:16 third 67:24 68:3 thomas 59:12 thought 11:9 33:24 thousands 25:18 three 33:2 134:8,11 136:21 152:2 169:23 183:15 191:12 232:4,7	130:14 132:23 135:2 137:6,25 138:4,9,19 140:5 149:3 154:2,25 155:2 155:6,12 157:17 164:22 165:12 166:12 166:21,23,25 167:18 168:3 173:9 188:13 195:23,23,24 195:25 197:13 203:7 210:9,15 248:16
terminals 16:15 19:22,23 20:14,18 38:14 38:22,22,25 39:25 46:10 51:4 195:6	things 6:5 52:16 93:12 143:11 218:7,9 238:18 think 7:16,21 19:8 22:16,17 25:18 26:11,16 26:21,24 27:22 30:24 32:25 39:11,21 40:17 43:13 47:10 49:19 51:8,17 51:25 52:16 60:3 61:11 66:6 68:7 73:2 75:6 77:25 78:8 88:17 95:10 107:5,16 115:13 118:16 124:21 128:11 130:4 135:19 137:24 143:9 155:21 156:10 160:15,17 179:20 194:2 202:4 210:2	throw 51:15 throwing 195:8 197:9 thumb 119:13 tie 218:19 tight 145:2 tightly 144:24 147:3 time 3:11 9:15 13:11,16 15:21 25:12 29:2,20 31:2 37:23 43:10,13 45:9 47:23 53:8,14 60:4 65:18 67:22 71:8 74:11 75:4,11 75:19 83:15 92:24 103:21 104:3 123:18 124:12 130:7,9	times 5:23,24 7:24 8:19 115:22 146:23 251:4 title 79:9 83:13 105:15 108:8 116:16 today 5:3 7:11 7:16 13:8 20:25 24:18 39:13 82:10 85:23,23 155:17 178:7 180:13 190:23 191:13 210:20 today's 11:21 13:12,18 248:10 together 46:25 47:9,11,15

64:7 83:17	128:2,7,8,10	213:5,17,24	149:18 151:13
87:2,13 100:19	130:10 135:8	214:3,8,20	151:16 152:7,8
105:9 128:24	135:16 141:18	215:2,9,25	152:15 153:23
136:20 144:24	184:3,6,9	216:4,21,25	155:24 156:8
149:11,17	190:20	217:10 218:3,7	159:2 162:7
165:21	transactions	218:11,23	229:9 233:15
toggling 162:13	15:15 135:13	219:9,16,19,22	234:12,17,20
told 176:22	transceiver	220:12,23	235:16 236:10
233:18	77:13 112:13	221:13,16	236:20 237:4
tomorrow	112:19,22,23	222:5,7,14,16	240:14
247:13	113:9,9,14,25	223:9 224:3,4	transcribe
took 202:17	114:23 115:3,6	224:9,24 225:4	176:24
244:7	115:16,20	226:8,11,17,23	transcribed
top 163:10	149:10,11,18	227:7,8,10	30:23
166:7 221:6,10	149:25 150:2,7	228:16,22	transcript 6:8
topic 210:25	150:10,21,23	229:2,5,10,15	248:5
243:17	151:2,4,20,21	230:5,10,14,21	transcription
total 101:25	151:23 152:2,3	231:6,9,16,20	250:11
115:22 150:12	152:4,4,24	231:24,25	transfer 141:16
211:12 248:12	157:4 163:4,11	232:11,13,18	144:4 145:25
touching 27:20	163:15 178:13	232:23 233:2,7	translated
toward 161:22	178:25 179:8	233:11,19,23	212:13
towards 8:25	179:16 180:2,3	234:4,5,6,9,10	transmission
tower 70:25	180:8 199:25	234:14,18,19	226:25 228:18
75:3 152:25	200:16 201:7	234:19,21	230:23
154:19 156:25	201:12,16,21	235:2,4,6,8,17	transmit 48:19
175:5 209:19	202:3 203:23	237:22 238:15	48:21,23 49:5
tr 209:12	204:21 205:4,9	238:24 239:6,9	56:5 74:3,4
track 29:2,4	205:16 206:3,7	239:14 240:9	77:2 93:13
44:11 52:12	206:14,16	240:10,15,19	124:24 125:6
tracking 41:21	208:14,20,24	241:6,16,19	125:15 153:2
158:11	209:3,10,13,17	242:5,7 245:18	153:24 154:19
traffic 171:2	209:19,22	245:19	155:25 156:4,8
transaction	211:4,14,15	transceivers	156:25 157:10
15:18 16:20	212:5,12,25	54:5,11 149:16	159:9 164:23

166:10 179:13 196:12 202:7 202:11 203:6,8 203:9,11 212:11,18 transmits 157:7 159:13 transmitted 48:13 58:4,11 75:17 152:8,15 160:18 transmitter 54:21 55:18 56:15,21 202:24 transmitting 58:18 75:10 115:23 132:22 150:13 151:13 151:16 159:16 164:13,17 200:5 206:18 206:25 207:12 208:5 209:5 210:4 211:19 211:25 212:7 213:10 214:5 217:13 218:4 233:4 transponder 50:7 56:16,22 57:6,14 64:11 64:18,19,20 67:9 68:14 75:10 96:8	110:15,16 116:17,21 120:16,19 124:25 132:22 137:3 140:4 152:15 transportation 38:10 trial 3:12 triangulation 157:15,15 tried 28:25 29:7,7 trigger 51:5 trilateration 157:16 158:5 truck 51:16 true 58:17 60:13 250:10 trust 25:5 trusted 25:3,9 25:23,24 27:9 truthfully 7:17 try 6:4,21 232:10 trying 15:9 49:4 56:10 71:12 91:9 92:25 135:18 145:10,18 173:23 190:3 191:20 217:24 218:21,24 tuesday 13:9	turn 31:23 61:16 73:18 74:22,23,25 119:12 149:6 175:14 turning 75:2,6 turns 6:6 two 10:16,25 12:22 13:7,8 15:14 36:22 65:4 72:4 73:2 135:2 140:19 141:5,7 142:18 144:19,19,22 147:3 149:16 149:18 150:8 160:8 164:4 165:10 173:8 175:9 176:14 186:19 187:17 191:11 194:16 220:13 227:20 228:7,16 229:8 230:21 231:5 232:15 tx 202:13 type 17:21 42:4 44:7 46:12 89:22 167:8 195:16 197:5 231:5 232:15 typed 176:19 typical 106:20 typically 171:22	u u 3:2 u.s. 197:9 u2 74:6 uid 183:10 194:8 ultimately 11:13 unable 7:16 under 7:11,19 32:8 37:16,19 81:15 166:10 226:15 241:24 understand 6:12,15 7:10 36:10 63:2 71:13 91:9,20 96:24 107:15 108:16 127:17 129:21 130:3 133:10 135:18 137:9 145:11 145:19 167:5 173:24 174:21 188:16 196:7 198:16 201:10 211:4 215:9 216:24 217:25 218:20,22,24 227:15 235:21 244:2 245:10 246:13 247:4 247:18 understanding 33:22 61:20
--	---	---	---

136:2 167:3 231:10 understood 18:13 77:18 130:2 199:2 228:21 unit 4:5 121:16 131:11 136:25 163:4,11 205:14,17 212:23,24 united 1:2 4:11 units 162:7 168:15 248:12 university 27:24 43:24 uploading 120:8 upper 184:5 ups 51:14 use 16:17 36:9 39:17 45:10 49:5 71:3 77:3 78:8,9,10 83:7 87:23 120:15 121:4 126:16 136:6 172:22 179:2 207:23 235:25 240:4 244:13 used 42:24,25 63:15 85:9 126:11,13 132:11 144:3 146:11 167:4	215:10 216:2 224:12 240:20 248:12 user 93:11 94:6 94:9,11 96:2,3 96:5 131:7 207:23,24 208:3,9,17 220:17 uses 139:22 using 42:5 43:5 58:5,11 98:19 116:18 120:15 123:8,9 124:7 126:22 132:4 144:4 158:25 164:12,14,18 165:23 184:7 usually 15:10 15:13 27:2 30:18 38:11 47:25 77:2 107:24 148:25 174:20 175:10 203:5 220:5,19 222:8 223:19 225:20	vanilla 165:15 194:3 196:16 varia 1:4 4:8 9:22 10:7 18:22 35:14 179:23 251:6 varia's 9:25 10:6 12:6 31:18 varies 8:22 23:25 various 14:22 199:24 vendor 149:24 151:7 veritext 4:15,18 248:13 251:2 versus 4:9 9:4 251:6 vertical 19:24 25:4 38:8 48:8 vial 44:10 video 4:6 53:9 53:15 103:22 104:4 155:7,13 210:10,16 videographer 2:24 4:2,16 5:10 53:8,13 103:21 104:2 155:6,11 210:9 210:14 248:8 videotape 154:25	videotaped 1:13 view 183:5 195:22 violates 187:16 vision 39:22,23 40:2,3,11 52:7 52:7 vms 1:3 voice 20:13,16 20:19 39:3,5 44:22,24 45:3 45:20 46:2,16 46:23 47:13 50:6,19 52:21 54:21 55:11,14 55:19,25 63:13 63:13 64:7 65:5,14,17 66:11 67:16,21 68:15,20 69:10 69:19,23 74:23 75:11,17 83:9 105:8 106:19 112:5,13 122:25 125:5,7 125:14,15 127:10,19,21 128:13,20 130:6 132:23 133:13 135:21 135:23 137:4 138:18 140:5 172:19 173:25 208:22 226:24
	v		
	vague 100:9 101:7 231:23 233:17 235:19 239:11 240:22 247:20 validity 180:13		

227:14,22 228:5,8,9,17 230:11,22 231:21 240:5	196:20 207:22 212:11 220:16 233:24 234:2 234:10	we've 53:4 116:24 169:2 172:17 178:7 180:12 200:10	wired 159:21 wireless 23:14 24:16,19 29:9 36:22 120:9
w	wanted 42:10 44:2 51:11,16 62:23 76:2 154:8,10,13 244:5 246:10	wearing 149:12 web 14:24 wednesday 13:8 week 10:25 11:2 weekend 13:13 weeks 10:25 welcome 53:17 104:6 155:15 went 44:5 102:13 wi 25:17 38:17 38:18 39:6,9 39:10,12,12,17 39:20 40:23 46:23 48:7 50:24 54:11,25 55:10,16,20 56:2 149:23 152:25 156:17 156:20 157:10 157:12 160:9 164:13,23 174:3 175:9 203:8 227:9,19 233:22,23	147:18 148:24 149:5 150:3,24 150:25 151:5,8 152:2,22,23 157:5,10,25 159:10,13 160:9,11 161:18 165:23 169:10 170:4 170:18,24,25 171:17 172:11 174:25 175:7,8 175:9 227:2
wait 99:25 waiting 191:22 193:19,20 waived 3:8 walk 162:17 191:8 walked 15:22 walkie 214:14 walmart 25:13 38:20 41:2 wan 152:23 want 6:8 16:6,9 17:23 18:3 25:16 27:3 29:20 32:13,24 35:20 41:3,24 44:11 58:21 61:19 63:17 73:7 77:4 93:13 95:23 98:19 124:17 149:22 154:22 154:23 158:16 160:13 161:8,9 162:2,17 163:21 169:20 171:12 175:10 183:16 191:6 194:14 195:6 195:11 196:17	wants 170:21 warehouse 15:12 42:2 154:7,14,14,16 156:13 waste 15:19 watch 220:24 230:9 watches 220:22 water 73:3 wave 28:21 98:2 220:3,3 222:2 223:16 223:23 224:18 225:10 wavelength 220:7,14 waves 158:25 220:8 way 6:10 33:23 69:12 98:8 129:20 130:2 145:5,22 158:9 197:3 220:4 239:18	we've 53:4 116:24 169:2 172:17 178:7 180:12 200:10 wearing 149:12 web 14:24 wednesday 13:8 week 10:25 11:2 weekend 13:13 weeks 10:25 welcome 53:17 104:6 155:15 went 44:5 102:13 wi 25:17 38:17 38:18 39:6,9 39:10,12,12,17 39:20 40:23 46:23 48:7 50:24 54:11,25 55:10,16,20 56:2 149:23 152:25 156:17 156:20 157:10 157:12 160:9 164:13,23 174:3 175:9 203:8 227:9,19 233:22,23 wide 154:18 wider 150:23 wire 121:11 202:21	wired 159:21 wireless 23:14 24:16,19 29:9 36:22 120:9 147:18 148:24 149:5 150:3,24 150:25 151:5,8 152:2,22,23 157:5,10,25 159:10,13 160:9,11 161:18 165:23 169:10 170:4 170:18,24,25 171:17 172:11 174:25 175:7,8 175:9 227:2 withdraw 122:13 176:8 witness 5:9,12 19:2 24:22 32:14,19 250:7 witness's 170:12 245:13 wlan 151:22 160:9 161:18 wondering 90:11 104:16 word 49:5 70:7 72:19 73:10 106:4 108:7,12 112:11 123:20 123:24 138:11 139:22 145:25 146:11 169:18

178:24 179:3 189:9 192:16 202:17 235:25 236:4 words 90:9 104:17 work 8:23,24 11:12 16:14 18:21 24:3,9 24:21 25:24 26:21 27:3 29:22 30:16,22 31:18 40:21,22 41:9,11 42:22 43:4,17 44:9 44:16 59:15,20 60:2,10,14 61:7 85:18 87:13 158:9 199:19 203:8 worked 9:21,25 10:5,9 37:23 43:24 48:12,18 49:11 50:5,15 51:13 60:15,24 224:9 workers 38:22 working 31:10 168:2 works 6:3 58:2 99:19 100:16 156:3 world 188:17 wow 100:18	write 2:24 4:14 30:18 48:25 76:4 99:21 176:10 184:2 writing 30:21 96:23 wrong 62:18 95:4 wrote 21:9 30:15 176:18 176:25 wtr3925 227:8 227:17 wtr4905 227:7 227:17 wwan 150:23 151:5,21 152:3 152:24	91:3 94:18 104:25 107:21 108:15 111:18 114:12 121:9 125:4 132:25 138:8 143:4 146:25 147:2 147:16,18,19 149:2 157:12 158:8,15 161:21,21 162:24 164:8 171:10 176:4 176:12 178:4 178:11 179:22 184:16,22 187:9 196:6 201:9 202:9,13 204:6 205:22 211:2,17 213:2 215:7 228:12 229:7 233:18 245:15 year 10:19 40:9 52:3 years 24:21 28:6,16,17 36:22 48:6,6 48:10 55:6 85:24 148:16 190:16 191:12 194:16 york 1:2,16,16 1:20 2:5,5 4:13 5:15 251:2,4,4	251:5 z zabel 1:15 2:4 5:8 zalewsky 107:5 110:24,24 113:20 114:4,7 114:12,14,15 116:4,23 122:24 124:20 130:12 131:10 136:23 138:19 139:18 140:3,7 141:23 142:6 143:6,7 146:8 146:19 242:24 243:5 244:3 245:11 246:14 246:16 247:4,6 zebra 19:12,22 20:15,19 21:5 21:8,12,18,19 22:15 zebra's 22:5,5 zero 80:6 zigbee 233:6,8 234:25
	x		
	x 1:3,9 249:2,4 249:9		
	y		
	y 5:13 yeah 5:23 9:20 11:10 13:15 17:10,24 20:11 20:13 21:5,12 22:2 24:15 30:25 31:16 32:24,24 33:5 34:8,8 39:13 43:19 45:24 46:23 55:21,22 65:6 67:6 87:4		

Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

fashion to authenticated parties who are permitted to access the material. Our data is hosted in a Tier 4 SSAE 16 certified facility.

Veritext Legal Solutions complies with all federal and State regulations with respect to the provision of court reporting services, and maintains its neutrality and independence regardless of relationship or the financial outcome of any litigation. Veritext requires adherence to the foregoing professional and ethical standards from all of its subcontractors in their independent contractor agreements.

Inquiries about Veritext Legal Solutions' confidentiality and security policies and practices should be directed to Veritext's Client Services Associates indicated on the cover of this document or at www.veritext.com.