EXHIBIT D

IN THE UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

ELAN MICROELECTRONICS CORPORATION,	)	
Plaintiff, and Counterclaim Defendant,	)	
-vs-	)	CASE NO. C-09-01531 RS
APPLE, INC.,	)	
Defendant, and Counterclaim Plaintiff,	)	

VIDEOTAPED DEPOSITION OF ROBERT DEZMELYK

DATE: April 9, 2010

TIME: 9:07 a.m.

LOCATION: WEIL, GOTSHAL & MANGES, LLP
201 Redwood Shores Parkway
Redwood Shores, California

REPORTED BY: Anne M. Torreano, CSR, RPR, CCRR
Certified Shorthand Reporter
License Number C-10520

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Also Present:

JAYNA WHITT, APPLE, INC.

THE VIDEOGRAPHER: Good morning. We are going on the record. The time on the screen is 9:07 a.m. Today's date is April 9th, 2010. We are located at Weil, Gotshal & Manges, 201 Redwood Shores Parkway, Redwood Shores, California.

This is tape No. 1 of the videotaped deposition of Robert Dezmelyk; case name, Elan Microelectronics, Incorporated versus Apple, venued in the U.S. District Court, Northern District of California, San Jose Division, Case No. C-09-01531-RS.

My name is David Manzo, a legal video specialist representing McMahon & Associates, LLC, 97 East Saint James Street, Suite 101, San Jose, California.

The court reporting firm is Pulone & Stromberg. The court reporter is Anne Torreano.

Counsel, please state your name, your office and whom you represent in this action.

MR. BOBROW: Good morning. This is Jared Bobrow of Weil, Gotshal & Manges, and I represent Apple, and with me is Jason Lang.

MR. DeBRUINE: I'm Sean DeBrune of Alston & Bird. I'm representing the witness and the plaintiff, Elan Microelectronics, and with me is George Medlock.

THE VIDEOGRAPHER: Would the court reporter

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--oOo--

please swear in the witness?

ROBERT DEZMELYK,

called as a witness, after having been duly sworn by the Certified Shorthand Reporter to tell the truth, the whole truth, and nothing but the truth, testified as follows:

EXAMINATION

BY MR. BOBROW:

Q. Good morning, sir.

A. Good morning.

Q. Can you please state your name for the record?

A. Certainly. My name is Robert Dezmelyk.

Q. Why don't you spell the last for us?

A. Sure. It's D-e-z-m-e-l-y-k.

Q. Where do you live?

A. I live in Newton, New Hampshire.

Q. Are you employed?

A. Yes, I am.

Q. By whom?

A. I work for Laboratory Computer Systems, Inc., which does business as LCS Telegraphics.

Q. How long have you worked for LCS?

A. I actually started the company in 1980, so I've worked continuously there since 1980.

Q. How many employees does LCS have?

A. At this time, just me.
Q. Back when it was founded it was just you as well?
A. No. Actually, when I first started I had -- before that I had a sole proprietorship, and at that time I think I had two or three employees, the date we formally incorporated, and then it grew in scale over time. I had at one point probably about fifteen employees, and as situations change and my own desires changed, we scaled back.
Q. The largest number of LCS has had is about fifteen employees?
A. Right.
Q. When was that?
A. About 1995, mid 1990s. 1996. Somewhere in there.
Q. How long have you been the sole employee since that time?
A. Good question. I don't recall exactly. In the order of four years or so. I'm not sure exactly.
Q. So over the last approximately four years what's been the business of LCS?
A. A couple of things. First, I do design consulting and development of software and firmware and the development of designs, in other words, circuit

designs, board designs and kind of overall product designs for customers.
The company also sells chips that have a particular specialized function for interfacing between input devices, certain kinds of input devices and USB systems. So I sell those chips.
And then I also do some consulting in matters like the one we're talking about today that relate to intellectual property.
Q. And over the last four years how much of your time in your business has been spent on consulting on intellectual property matters of the kind that bring us here today?
A. I don't -- you know, I don't know exactly. I don't track the two. I'd say the majority of my time is in product development, and it will vary from time to time depending on what the mix of customers at a point in time is.
Q. Do you have an estimate of how much time you spent on consulting as opposed to product design and chip sales?
A. By that you mean consulting of the intellectual property sort?
Q. Yes.
A. No.

Q. You mentioned that you did design consulting and circuit designs, I think you said, for certain customers.
What kind of designs do you do?
A. Well, it varied, but they focus on a couple of particular areas. One is input devices, and I have a group of customers that are involved in making input devices, and the other area kind of broadly characterized is systems or devices that utilize USB universal serial bus interfaces between a device and the computer.
Q. When you mentioned input devices, what types of input devices are you designing?
A. Well, I've designed a tremendous range, but most recently the devices I've worked on have been a touch screen or touchpad type of device, a -- well, several of those, different technologies, a mouse, an optical sensing mouse-type -- you know, mouse, a device that's -- it's like a mouse, but it uses a rotating cylinder that you rub your fingers across and then slide back and forth, and I think they call it a roller mouse, may be the trade name of the company that makes it.
There's other ones. It's hard for me to name, you know, all the products you've worked on at any one

point in time, but those would be in the input area. And then in the other area of the broader USB interface area I have a bunch of customers that -- I mean, since they share that common factor that it seems like the rest of their activity is a little separate. But one that I'm working on right now is a line of test equipment that's used in characterization of the behavior of like radio frequency devices. So there's attenuators, frequency synthesizers and similar, you know, waveform-generating devices.
I have another customer that I just completed a project for recently that makes a kind of a complicated piece of medical laboratory test equipment that has within it a board that uses a USB interface, and that particular product, that board has like a variety of control functions. And so they vary over time, and it's hard to characterize them other than they have that commonality in a hardware interface.
Q. You've been retained by Elan in this case; is that right?
A. I've been retained by, I guess, their counsel.
Q. All right. Alston & Bird?
A. Right.
Q. When were you retained?
A. You know, I don't recall exactly. Sometime

last year.
Q. Approximately when last year?
A. I don't recall at the moment.
Q. You don't know whether it was spring, summer, winter?
A. No.
Q. Do you have a written agreement that documents your retention?
A. Yes, although I should note that pretty typically the work I do in this type of consulting is -- I am placed by an organization which does placement in that area. So my agreement is with them, the placement --
Q. What's the name of that organization?
A. IMS Expert Systems.
Q. Where are they based?
A. Florida.
Q. Who's your contact there?
A. There's a couple of different ones. Depends on the case. I'm not -- I mean --
Q. For this case.
A. I think it's Bill Heuter, but I'm not sure.
Q. Can you --
A. Oh, can I spell it? Well, I'll take a crack at it. It's H-e-u-t-e-r, I think.

charging Elan more than $200 per hour for your services?
A. Right. I would assume that's the case.
Q. Is $200 an hour the typical rate at which you're compensated?
Is that your normal consulting rate?
A. Well, my consulting rate varies on different cases, on different projects depending on market conditions and so forth.
Q. What's the -- so since 2009 what's the low end of your consulting rate? Your rate being the amount that your paid per hour for your services on litigation in intellectual property matters.
A. Probably that amount, $200 or so.
Q. What's the high end?
A. Probably $250.
Q. If you -- let me ask a little different question.
When did you actually start working on this matter?
A. You know, I don't know exactly. I'd have to go back and look at something like my time sheets or something. I don't recall exactly when I first did something.
Q. Do you keep time sheets?

Q. And how is it you came to be retained on this matter?
A. I guess pretty much the same way that would happen in most instances, is that IMS contacts me and says there's a particular matter that they think might fit my range of expertise, and then normally they arrange some kind of discussion or conversation with the prospective client, and then they talk to me, and then I guess they reach a decision somehow whether or not they want to engage me for my services.
Q. So you have an agreement, as I understand it, with IMS pertaining to the Elan/Apple as a matter?
A. That's correct.
Q. At what rate are you being compensated for your time on the matter?
A. I don't recall exactly. I think it's probably $200 an hour.
Q. And is that the rate that Elan is being charged?
A. I doubt it.
Q. You assume that there's some markup involved?
A. Right. There's typically in the nature of those services, they have some business arrangement to compensate themselves.
Q. Right. So your understanding is that IMS is

A. Yes, I do.
Q. Do you then turn those time sheets into IMS?
A. I send them an invoice.
Q. Approximately how many hours have you spent on this retention for Elan?
A. I don't recall.
Q. Approximately?
A. I don't have an approximate number in my head.
Q. Now, I take it one of the things that you've been asked to do in this matter is to prepare a report, a summary of your expected testimony; is that right?
A. That's correct.
Q. What else have you been asked to do on the case besides that?
A. I'm not going to be able to say everything I've been asked to do. I'm not going to be able to memorize every single item, but I did -- I was asked at one point to locate some prior art or some references that may have been prior art to some of the patents at issue in the case.
Q. Anything else you've been asked to do?
A. I think that's pretty much it. I mean, there's been this work on claim construction and then locating those references. I think that's about it, the broad form.

Q. And did you actually go ahead and locate the prior art?

A. Well, I located some material I had which could be -- I mean, potentially or could be or is prior art and relevant to this case.

Q. I see. And what prior art is that?

A. Well, again, I can't recall all of it.

Q. Tell me what you can recall.

A. I'll try some of it.

There was a prior art patent to Schumer. There was some documentation in manuals regarding touch screens from a couple of vendors, some digitizing tablet, you know, documentation. I can't remember exactly what item was for each one, but related to some digitizing tablets.

There's probably others, but I can't, you know, recall the full set of them at the moment.

Q. I think you mentioned a patent with someone by the last name of Schumer?

A. Right.

Q. Can you spell the last name?

A. Schumer, like I guess a normal. S-c-h-u-m-e-r I think.

Q. Do you recall the person's first name?

A. I think it's Al or Albert or Alfred or

the coordinates reported by a device are subsequently -- or internally generated by a device are subsequently processed, filtered and otherwise manipulated to generate a new coordinate system that is, I guess, co-terminus in some ways with the original coordinate system but has a different scale or orientation or range of coordinate values.

Q. And what about the materials about -- I think you said the digitizing tablets? What tablet was that or tablets were those?

A. Again, it's hard to recall exactly. I think one of them was a Summagraphics tablet.

Q. How do you spell that?

A. Summagraphics is S-u-m-m-a and then the word "graphics." But it's all one continuous string. It's a trade name.

Q. All right. Have you ever been retained on any other matters on behalf of Elan?

A. No.

Q. Have you been asked by them to work on the matter now I guess instigated or instituted at the International Trade Commission?

A. But no, but I'd like to correct my prior answer, and I don't know if I've been formally retained per se, but I did take a quick look at the behavior in

something like that.

Q. Do you refer to that patent in the report that you prepared?

A. You know, I don't know. I can look.

Q. You don't recall doing so?

A. I don't think it's referenced in my report because my report is really about claim construction, not about, you know, prior art.

Q. Was the patent to Schumer a U.S. patent?

A. Yes.

Q. It was a patent about touchpads or touch screens?

A. It's actually about in general for input devices doing, you know, translations between device coordinates and logical coordinates and mapping sections of the surface of an input device like a touch screen or a digitizing tablet into logical coordinates.

Q. What do you mean by that, mapping the -- I think -- mapping into the logical coordinates?

What did you mean?

A. Well, I'm describing a patent, and I'm in essence describing what Schumer was talking about, and Schumer was talking about -- to the extent I can accurately reflect what he's trying to describe in a lengthy document, he's talking about a process whereby

an integrated circuit in a notebook computer that I was, I guess, manufactured by a competitor of Elan to answer some questions about its behavior.

I don't know. I don't think there's a case or anything related to that, but I was just given a particular device to look at and make some measurements and try to ascertain the nature of the function of that device.

Q. Okay. So let me go back.

So first of all, have you been retained on the International Trade Commission matter as between -- that was initiated by Elan in the last two weeks?

A. No.

Q. Have you been asked to work on that?

A. No.

Q. All right. Second matter you mentioned, you talked about doing some work on an integrated circuit in a notebook computer; is that right?

A. Right.

Q. And Elan asked to you do that?

A. Yes.

Q. Was it Elan or Elan's counsel?

A. Let me -- it was Elan's counsel.

Q. Alston & Bird?

A. Right.

Q. Did that work pertain to this matter, the Elan versus Apple matter?
A. No, no.
Q. The work that you were doing was on behalf of Elan, as you understood it?
A. That's correct.
Q. And which manufacturer of the notebook computer was that?
MR. DeBRUINE: At this point I'm going to object. We're getting into attorney-client privilege work product area on a matter that has nothing to do with this case and nothing to do with why this witness is here, and I'm going to instruct him not to answer.
BY MR. BOBROW:
Q. Does it have anything to do with Apple, as you understand it?
A. No.
Q. How much time did you spend on the matter?
A. Oh, I don't know exactly. I'd have to look at my time records on it.
Q. Approximately how much?
A. A couple days. I don't know exactly.
Q. Did you bill your time?
A. Yes, I did.
Q. At what rate?

A. I don't know. It's probably the same rate as the other work.
Q. Was it 200? Was it 250 or was it something else?
A. Probably 200.
Q. Have you done any other work for Elan besides, number one, your work on this case, and number two, your work on looking at an integrated circuit in a notebook computer on a consulting basis?
A. No.
Q. Have you done any other work with the Alston & Bird firm?
A. No.
Q. Did you spend any time preparing for your deposition today?
A. Yes.
Q. And approximately how much time did you spend in representation?
A. I guess I read documents on the plane ride out, which is probably four or five hours, kind of reading some of the material, and it kind of refreshed my memory a little bit.
Q. Anything besides that? Any other time you spent preparing besides the time on the plane?
A. I spoke with counsel regarding the matter

yesterday afternoon.
Q. Counsel being Mr. DeBruine?
A. Right.
Q. Anything else you did in preparation for the deposition?
A. No.
Q. I take it you've had your deposition taken before?
A. Yes.
Q. Approximately how many times?
A. Somewhere in the order of six or seven. I don't count those exactly.
Q. Were all of those intellectual property related matters?
A. In the broadest sense, yes. The first couple times I was deposed was actually in a case that was a litigation regarding some contract terms about some software. I wouldn't -- clearly it's intellectual property in the broadest sense, but it wasn't -- the issue at hand wasn't intellectual property the way we're talking about here. It was more, you know, were royalties getting paid at the right time and who owed who money and that kind of thing, like a contract case.
Q. The other ones were disputes over the validity or scope or infringement of intellectual property?

A. Right, I think that would be -- would characterize all of them.
Q. Have you testified at trial before?
A. Yes, I have.
Q. How many times?
A. I think four.
Q. Have you testified at any hearings before, a Markman hearing or preliminary injunction hearing or that kind of thing?
A. I'll say yes, I've answered questions at a Markman hearing. I'm not so sure it would be characterized as, you know, kind of formal testimony in that I was at a Markman hearing where the judge asked all sides to have their experts present, and he periodically posted questions to the experts in the room. But it wasn't as if -- I don't know whether you'd characterize that as formal testimony or just kind of answering a question. But it was -- that was the nature of it.
Q. All right. In all events, you understand that for the proceeding here today in this conference room in your deposition, you are under oath and sworn to tell the truth?
A. Yes, I understand.
Q. And you also understand that there's a court

reporter here who is taking down what you say and what I say and the objections that Mr. DeBruine or others might make during the course of the day?

Do you understand that?

A. Yes, I do.

Q. And do you understand that the transcript will be prepared, a written record of what is said, and you'll have an opportunity review that transcript?

Do you understand that?

A. Yes, I do.

Q. And in fact, we ask that you do that under Rule 30 of the Federal Rules of Civil Procedure, but I would just mention that if you make changes to the transcript, we'd have an opportunity to comment upon those changes to the court.

Do you understand that?

A. Yes.

Q. So you understand it's important to give your best testimony here today?

A. Yes.

Q. Now, I note that there's a package of Kleenex and some cough drops on the table, which might indicate that you have something of a cold.

Is that right?

A. That would be an accurate assessment, and I

term, so I took a term off, which is why my graduation date, you know, is one semester later than it would have otherwise been.

Q. And did you graduate from MIT?

A. Yes, I did.

Q. What degree did you get from MIT?

A. I have a kind of an interesting degree. I have an interdisciplinary degree, which from MIT means you're granted a Bachelor of Arts as recommended by the department that sponsored the interdisciplinary activity. In my case, that's the Department of Mechanical Engineering. I took an interdisciplinary program in the application of digital computers to control systems.

Q. Sorry. The application of?

A. Digital computers to control systems.

Q. The department that sponsored that work was the mechanical engineering department at MIT?

A. That's correct.

Q. And so I take it that the bachelor degree that I forgot was -- I think you said a Bachelor of Arts; is that right?

A. Right, because at that time when MIT granted an interdisciplinary degree, in other words, a degree that spanned departments, this one would have spanned

would say that's correct. I'll do my best to sound as well as I can, and I would encourage the court reporter to wave at me if for some reason I'm hard to understand, and I will beg the indulgence of those present if I need to to either take a brief to use a tissue or to grab a cough drop, if necessary.

Q. Is your cold such that it's going to hinder your ability to understand questions or to testify truthfully?

A. No.

Q. All right. So is there any reason that you can't give full and truthful and accurate testimony here today?

A. No.

Q. All right. I wanted to ask a few questions about your background.

Where did you go to college?

A. I went to Massachusetts Institute of Technology in Cambridge, Massachusetts.

Q. During what years did you attend MIT?

A. I started in 1974, and I graduated in January of 1979.

Q. Did you attend MIT continuously during that period?

A. No, I had the opportunity to work for one

mechanical engineering and electrical engineering computer science. That degree is granted as the institute as a whole, not the department, and they grant a Bachelor of Arts.

Q. So if I were to look at your diploma it would say Bachelor of Arts in mechanical engineering?

A. No, it would say -- I don't have it in front of me, but it would say something in the form of Bachelor of Arts, you know, as granted by the institute as recommended or sponsored by the Department of Mechanical Engineering. It would have kind of a lengthy description.

Q. All right. So as I understand it then, you don't have a bachelor's degree per se in mechanical engineering; is that right?

A. Right.

Q. And you don't have a bachelor's degree per se in computer science?

A. Right.

Q. And you don't have a bachelor's degree per se in electrical engineering; is that right?

A. Right.

Q. And if I understand what you're saying, you had course work that was sponsored by the mechanical engineering department in those three disciplines; is

that fair?
A. No.
Q. No?
A. When you're taking an interdisciplinary program of the sort I took, you have an advisor who's located -- by definition he's in one department because that's where his faculty appointment is. And in my case it was Forbes Dewey, who was in the mechanical engineering department.
Professor Dewey was involved in instrumentation and control, that was his area, and also ran the fluid mechanics lab in the department. And you took courses -- a mix of courses from a set of different departments.
So in any case, leaving out the humanities concentrations and that kind of thing, the courses I took were in the mechanical engineering department, things like control systems, various computer applications courses there, instrumentation design and some other core courses.
And then in the electrical computer science department courses related to digital circuit design, computer programming, programming languages and that series. And then I also took a course courses in the math department in mathematics related to control

systems, and then I took also courses that were offered by other departments that were relevant to that.
For instance, I took a course that was offered by the architecture department because most people don't know it, but the MIT architecture department is the home of what's now media lab. It originally was a part of the architecture department. And so I took a course that was under the group that Negraponte leads.
Q. At the time you attended MIT, was there a department that was called the Electrical Engineering and Computer Science Department?
A. That's correct. In MIT parlance, Course VI.
Q. So that was a department that combined those disciplines together?
A. That's correct. It's taught in a single Course VI.
Q. Did you pursue any graduate degrees?
A. No.
Q. So I take it you'd have neither a master's degree or a Ph.D; is that true?
A. Right.
Q. Did you apply for any advanced degree programs?
A. No.
Q. In 1979 after you graduated, did you then start up LCS?

A. Well, I actually started LCS -- well, not LCS per se, but I started doing consulting work and engineering work prior to that, and I had a pretty full platter of customers even before I got out of school, and as soon as I was out of school, I was doing full-time software development and consulting and so forth.
I did it at first as a proprietorship.
Q. All right. Have you applied for any patents during the course of your career?
A. No.
Q. I take it then you haven't gotten any patents either.
Fair enough?
A. Yeah, it would be hard to get one without applying for one, so no.
Q. Indeed it would.
Why is it that you haven't applied for any patents?
A. Well, there's a couple reasons. First one was in the point -- I have developed a lot of things over time that certainly could have been possibly subject to intellectual protection of that sort.
In the beginning of LCS's activities it was generally believed that a lot of software could not be

protected subsequently by patents. Subsequently that's proven to be incorrect. The opinion of counsel we had at the time that copyright protection of certain software programs is a better form of protection, I think, historically has shown not to be particularly good advice, but that was the advice we had at the time.
Subsequently -- and the company moved through several different phases, but subsequently a major part of the business success of LCS was based on being able to license technology to a variety of competitors in the field as a kind of a neutral or independent party, and in that circumstance I think it would have been counterproductive to try to file patents on particular technology because it put us in a different relationship to the customers, and it would have impeded our ability to license technology and generate revenue.
Q. Do you routinely publish papers in the fields in which you work?
A. No.
Q. Have you ever published any peer-reviewed-type papers for any journals or conferences or the like?
A. No, but I have been involved in the writing and promulgation of industry standards, and in a way

that's a publication that probably has more impact than someone just writing some paper in a journal in that it's actually a document that then goes on to affect the flow of technology and what people are actually doing.

Q. But in terms of research-oriented papers or papers that, you know, involving computer science or electrical engineering, that's not something that you do; is that right?

A. That's correct.

Q. And that's been true for the 30 years since your graduation?

A. Right.

Q. Have you ever given any keynote addresses at any computer science or electrical engineering-type conferences?

A. Well, I don't think I've given any keynote addresses, but I've certainly spoken at conferences related to the technology I'm involved with.

Q. No keynotes?

A. No.

Q. Turning to the -- I guess back to that subject of publications and the like, have you published anything in the area of touchpads?

A. Well, I think the specifications that I've

worked on, two of them are relevant to touchpads. First one would be the win tab specification, which was a standard for an interface to pointing devices that certainly incorporated touchpads as one of the devices it would cover.

And the second one would be the USB human interface device, typically said "hid," H-I-D, which covers input devices on personal computers, and clearly touchpads are in that category.

I've also worked -- just to get the whole list, I was one of the contributors to a specification which deals with the interfacing of PS2 devices to keyboard controllers and notebooks. The primary applicability of that specification is to touchpads in notebooks, although of course it also applies to the kind of track point devices and externally-connected mice.

Q. Now, you -- in the last answer you were describing touchpads.

Can you just tell us generally what a touchpad is?

A. Well, in a general sense, I mean, there's lots of -- without trying to define the term formally, there's -- in general the notion of a touchpad is a device that interacts with your fingers or some other,

you know, part of your body that's touching it. It's responsive in the sense that it provides coordinate information.

Usually those kinds of devices have additional function added to them which would incorporate detection of events. I'll characterize it that way. They may or may not have a display behind them depending on their context, and they may or may not have an ability to detect a device that's handheld, like a stylus, and act in the same way or be responsive in the same way or maybe in a slightly different way but in a similar way with a stylus with a finger.

Q. Is a touch screen the same thing as a touchpad?

A. Again, it's hard to give a definition out of context of a word like that, but there's a broad set of things it could be. Touch screens in general, there's a notion that there is a display associated with it. It doesn't have to be.

You'll see cases of people using that term to refer to a touch-sensitive device which may or may not have a display behind it, but in the most general sense of the word, perhaps the way it would be commonly used in some circumstances, it would be a touch-sensitive input with a display associated with it.

And usually that display -- there's usually a connotation but not a requirement that that display would be placed or viewed like from a back illumination as opposed to a projection. People use different terminology for a surface onto which a display is generated from a projection which is behind the viewpoint of the operator.

Q. Now, in the field, let's say back in the 1990s time frame, in that time period did people working in the field like yourself consider there to be differences between touchpads on the one hand and touch screens on the other?

A. Well, it's hard to say differences because people that are using terminology in the field use it in context, and they use it in ways that are particular to what they're talking about.

And so clearly people recognize -- in a general sense if you said what are the differences, they would -- maybe, I mean, they would identify certain characteristics they might think were differences, but I'm not sure there's an exhaustive set that's unique.

Q. But based upon your experience in the field, how did those in the field at that time talk about the two as being different one from the other?

What do they identify as the differences?

A. Probably the greatest or the most consistent distinguishing characteristic between what then in the '90s people would have called a touch screen versus a touchpad would have been the orientation in which it was used, and that may seem kind of counterintuitive today, but there would have been more of a notion of a pad if it was in general co-planar with the table or more likely to be in the same planar orientation as the table and a screen if it was in a significant angular orientation with respect to the table, much the same way that a display screen typically is at some positive angle relative to the table.

That would have been one way in which people would have tended to, but it's not a sort of guaranteed distinguishing factor, and it's not certainly a case where you can use to make an unambiguous choice between the two.

Q. What other distinctions did those in the field draw between touch screens on the one hand and touchpads on the other in the '90s?

A. There may have been some instances where people saw kind of a size differentiation, but again, it's not -- it's not dispositive.

Q. Okay. Others?

screen. Because it would be related to the screen of the device.

Q. All right. Any other differences that those in the field recognized as between touchpads and touch screens in the '90s?

A. That's all I can think of at this second.

Q. When you said size as being a potential differentiator, did those in the field generally recognize in the '90s that the touch screens would be of a larger size, have a greater surface area than a touchpad or the other way around?

A. It would -- in general larger would be more applied to screen. That is, that -- but there's -- it's kind of a large relative to where you are.

Q. All right. What about in the decade that we just finished up in the 2000s over the last ten years?

Do those in the field continue to draw distinctions between touchpads on the one hand and touch screens on the other?

A. I think so, and probably in some ways that are similar and some ways that are different.

Q. Okay. Tell us, if you would, the differences in the last ten years that those in the field have drawn as between touchpads on the one hand and touch screens on the other?

A. You wouldn't use the term necessarily "touch screen" for a -- if you had a screen and a pointing device, the two were in close association, you normally wouldn't use the term "touch screen" for a device which was not part of the screen that was present.

Q. What do you mean by that?

A. If you had a display and a -- if you had two -- let's say we have a sensing surface and a display. If we had a sensing surface in close physical association but not on the display, and so one has a display and one doesn't, then you normally wouldn't refer to the one that was not on the display as a touch screen. But that's only in that particular context.

Q. Where you have both present? You have a screen present and you have a -- something that's not a display present, you're saying that the one that's not a display would not be a touch screen?

A. No, that's not quite how I'm characterizing it.

You're asking me to kind of differentiate between the usage of the word "touch screen" and touchpad, and if you had a touch screen and a touchpad, let's say hypothetically, before we define what they are, in close proximity, you would be more likely to call the one that was the primary display the touch

A. I think there would be more tendency to kind of refer to devices just as like a touch-sensitive interface and not necessarily either one or the other. That might be a more common terminology than it was before. But otherwise, some of that same characterization probably still applies.

Q. I see.

The same differences that you described in terms of orientation and size and primary displays?

A. Yeah, to some extent. Yeah.

Q. Are there any other distinctions that those in the field draw between touchpads and touch screens in the last ten years?

A. I don't think so, except in particular context. And again, I have to reiterate that all of these discussions about what a term means, you can't really do it in the abstract without the context around it because people that are looking at a particular term and what it means look at it in context.

And so if you just asked in a very broad sense what a term means, you'll get a different take on it than given an actual sort of fact circumstance or an actual context that that usage has omitted.

Q. Over the last ten years have you heard of a term called a touching mode monitor?

A. I'm not familiar with that term, no.
Q. In preparation for the deposition today, did you review the -- what's called the joint claims construction statement that the parties, attorneys prepared in this action?
A. Yes, briefly.
Q. Did you look at that yesterday or on the plane on the way out?
A. I actually looked at it here, but yeah, I have looked at it.
Q. "Here" meaning at these offices?
A. No, here being in -- not on the plane, in -- on the land in California, I guess.
Q. All right. And that was part of your preparation for the deposition here today?
A. Right. I wanted to review it because it's very closely related to my report.
Q. Did you go through the document in its entirety?
A. I did not read every sentence in it, but I generally looked it over.
Q. All right. And did you look at the Apple constructions and the Elan constructions that are being proposed?
A. Right. And the claim terms, of course.

Q. Did you review that document before the document was filed back in February?
A. You know, I don't recall. I've probably read it in that certainly there was references to some of the prior art things, and I may well have been asked to look it over and comment on it. I wouldn't be surprised if that's the case.
Q. Is that your best recollection, that you looked at the document --
A. I don't recall -- but it's likely I did.
Q. Let me finish my question. Because the court reporter, as you know from your prior testifying experience, can't take both of us when we're talking at the same time.
So is it your best recollection that you reviewed a draft of the joint claim construction statement before it was filed with the Court providing comments and the like?
A. I don't think you're necessarily characterizing my recollection of what happened. It is likely that I looked at it. I'm not sure I would say I commented on it or that I looked at a draft of it. I may have seen the version that was filed before it was filed or I may have seen a draft, but I don't recall.
Q. So prior to the time that the joint claim

construction statement was filed, had you already begun working on claim construction issues on this matter?
A. I don't know the dates. I'd have to look at the dates of the documents to see.
Q. The document was in February of this year. That's when it was filed. So had you already begun working on claim construction issues?
A. Well, it's, I guess, filed in -- when is the filing date on here? Do you know? It says 2/5. My report was done 2/22. Maybe. I mean, I was pretty busy in February, and I'm not sure exactly what time which particular event happened.
Q. All right. Now, as you read through the joint claim construction statement, were there any of Elan's claim constructions that you disagreed with?
A. Well, let me take a look if we're going to go through it.
MR. BOBROW: Actually, why don't we do this: Why don't we mark it as Exhibit 1, and that way we'll have a record of it.
(DEPOSITION EXHIBIT 1 MARKED.)
BY MR. BOBROW:
Q. Sir, you've been handed Exhibit 1. I assume it's the same as the document that you brought with you to the deposition, but --

A. It appears to be.
Q. All right.
A. Well, I think to answer your previous pending question before you handed me the document, I think just from a quick look, in general my thoughts are consistent with the claim constructions that Elan has listed here probably with a bit of a clarification on one of the sections regarding claim construction dealing with the '352, and in particular there's a claim term that relates to identifying a second maxima and a signal corresponding to a second finger following said minima.
I think that the construction Elan proposed there could be slightly clearer in that the terminology that's being used of "after" and so forth is really describing a spatial relationship, and perhaps a better choice of word might be "following," as opposed to -- if you look at the original text, I believe it says, "in a signal corresponding to a second finger following said maxima."
I think it would -- you know, a better construction might be to use that same terminology, the same terminology from the original claim.
Q. So you're talking about the construction of the element that begins "identify a second maxima"; is

that right?
A. Right.
Q. That starts at the bottom of page 3 of Exhibit 1; correct?
A. That's correct.
Q. Goes over to page 4; right?
A. Right. That's the section I'm talking about.
Q. And you're saying that Elan's proposed construction could be modified how?
A. I think it would be clearer if you -- to describe in detail if you struck the word "after" and said -- or following the identification of it or to remove the temporal nature of it, because it's really the description of a spatial relationship not a temporal relationship.
Q. So how in your view should the construction be revised to do that?
A. I think that, as I just said, that it's clearer if you use the actual claim term which says "corresponding to a second finger following said minima." So it would be -- in other words, the -- it would identify a -- let's see if I can -- it's hard to construct the phrase editing the fragment that's there, but you want to remove the notion of after.
It's like following or subsequent to or

following, not subsequent to in the temporal sense but following the -- the following term -- I guess -- let me back up and say it a little more clearly.
It would be that you want to identify a second peak following the minima. In other words, that you want to use it closer to the claim term because it's clearer than the after.
Q. And how is it clearer?
A. Well, because it more captures the spatial relationship, which is what the claim's really describing, and does not have an implication that some people could read the sort of after as a temporal after as opposed to an after the way we sometimes describe geometry or location using that terminology.
Q. All right. Anything else in your review of the joint claim construction statement where you disagreed with or wanted to correct, as it were, any of Elan's proposed constructions?
A. No, I don't think so. Although I'd have to -- you know, I'm not at this moment reviewing the whole document and going through item by item, but I think in a broad sense there's nothing that jumps out at me.
Q. All right. In a number of the columns of this chart, and I suppose also in the rows, I should say, there's a reference by Elan that you, Mr. Dezmelyk, are

expected to provide testimony regarding how one skilled in the field would understand certain terms.
Do you see what I'm referring to there?
A. Right.
Q. Prior to the filing of this document on February 5th, 2010, were you consulted about those?
A. Right. Where it indicates that, you know, I may be providing testimony, then I've certainly -- I'm aware of that, that particular topic, and certainly there's a reason that says that there.
Q. So prior to February 5th you would have been consulted about those particular terms where your name appears as a person who may provide testimony about that subject?
A. Right.
Q. There also are a number of terms where your name in that fashion does not appear. For example, on page 4 at the bottom for the term "identify," on page 5 for the term "in response to." There may be some others as well.
And for those, I take it that as of February 5th, 2010 you had not been asked to provide an opinion on what those terms mean; is that true?
A. No, I don't think that would necessarily be an accurate description. I think it may have just been a

decision by the counsel who created this or something that it wasn't -- he may have had an impression that it wasn't going to be necessary to provide testimony or that the term was sufficiently well defined that it would be unnecessary to do so.
I don't think that -- I wouldn't draw the conclusion from that that there was necessarily never any discussion of that topic or that I didn't have some opinion on it or something.
Q. All right. In terms of the report that you prepared for the terms where in the joint claim construction there's no indication that you may be providing testimony, you did not provide opinions on those terms or the meaning of those terms in your report; correct?
A. I don't know. I'd have to look term by term to see whether or not that's the case.
MR. BOBROW: Let's mark this Exhibit 2.
(DEPOSITION EXHIBIT 2 MARKED.)
BY MR. BOBROW:
Q. Sir, you've been handed Exhibit 2 to your deposition. Can you first confirm for me that this, indeed, is a copy of your report?
A. Yes.
Q. All right. Now, please turn, if you would, to

the section on the '352, which is on pages 11 and 12, and confirm for me that you did not offer an opinion there on the meaning of the claim term, quote, "identify," closed quote, identified at page 4, running over to page 5, original claim construction statement.

A. Well, in my first paragraph I set forth that -- I state, I expect to provide a description of the invention described and how that invention is an improvement over known touchpads and methods of using touchpads.

I also expect to testify that the constructions proposed by Apple for the claim elements identify a first maximum, and then three dots, and identify a second maximum, three dots, and identify a minima, three dots, and properly add a limitation not present in the claims themselves and not required by any reading of the patent's written description of the file history.

And to the extent that the word that we are calling out as "identify" and it appears in the beginning of those particular claim phrases, then it's likely that I'm -- I mean, I'm stating in my report that I'm going to -- I will be expected to testify on that topic.

Q. My question was, you did not offer an opinion

specifically on the meaning of the word "identify" as set forth on pages 4 and 5 of the joint claim construction statement; correct?

A. I didn't set forth a separate definition of it or a separate paragraph about it. I mean, I referred to it in the phrases.

Q. And you did not respond to Apple's proposed construction of "identify" that's in the joint claim construction statement in your report; correct?

A. Well, I would say that -- I'm saying that I'm going to testify how I believe there's this improperly added limitation. I would take that as a response.

Q. So you're saying that that phrase is a specific response to Apple's proposed construction of what the word "identify" means?

Is that your testimony?

A. My testimony is that if there's an adding of a limitation to that phrase of which maybe "identify" is a part of that or the construction of the word "identify" obviously affects the construction of the phrase, then yes, I have an opinion on that.

Q. But you didn't set that opinion forth, did you? Nothing in this report, Exhibit 2, tells me what you're going to say, if anything, on the subject of Apple's proposed construction of what the word, quote,

"identify," closed quote, means; correct?

A. I'm giving my opinion in context of the phrase. You're trying to say that I did not give an opinion of the word separately.

Q. Correct.

A. I think that giving the opinion of it in the context of the phrase simultaneously gives it an opinion of it if you try to take it out of the phrase.

Q. Again, I think the question is a simple one.

In your summary of testimony, you did not respond specifically to Apple's proposed construction of the word "identify" as set forth in pages 4 and 5 of the joint claim construction statement; true?

A. No, I think your characterization's false, and I'm going to explain it again, I guess.

What I'm saying, that the phrase, which includes the word "identify" as an improper limitation, that is, that your construction is incorrect with the phrase with that word in it, then I think that inherently comments on the construction of that word by itself.

Q. All right. So point out to me where it is that you say why it is that Apple's proposed construction of "identify," which is "recognize a value to be," where is it that you specify what's wrong with

that in your summary of testimony?

A. Well, I say it's improperly adding a limitation that's not present in the claim.

Q. That that specific word is adding that limitation? Is that your testimony?

A. It may be broader than that, but that's certainly true.

Q. All right. Now, where in your report do you provide your opinion on Apple's proposed construction of what the phrase "in response to" means?

Where would I find that?

A. I don't see where I've particularly called out an issue with the word "response," and it states here that the plain meaning -- in the claim construction that proposes the plain meaning of the term.

Q. When you referred to in paragraph 25 of your report about -- that the Apple constructions of identify first maxima and identify second maxima and identify minima, that those improperly add a limitation.

Is that the limitation about on an axis? Is that what you're referring to there?

A. Well, there are more than one -- it's possible to have more than one limitation added improperly, and I believe there are several limitations that should not

be -- that are not present in the original claim language that are present in Apple's proposed claim construction.

Q. And where in your report do you say what those added limitations are?

A. Well, there's several places.

Q. Tell me.

A. If we look to paragraph 27 and I'll say 26, paragraph 26. Well, paragraph 25, 26, 27 and to a broader sense -- I mean, obviously the rest of them deal in a way with what you consider as improper limitations, but to address the particular item you just identified, it seems that that's dealt with in 26 and 27, paragraphs 26 and 27.

Q. And does anything in paragraphs 26 and 27 state that Apple's construction of "identify," which is to recognize a value to be, that that's adding a limitation?

A. No, paragraph 26 and 27 are particularly focused on other aspects of the improper limitation.

Q. So where in your report does it say that Apple's construction of "identify," which is "recognize a value to be," is adding a limitation? Where can I find that in your report?

A. Well, you're attempting to find something that

you've kind of constructed a hypothetical "where can a find a," and I think that the idea is expressed in paragraph 25. You seem to be want to go find it in a only a certain way that you could see or that you would recognize, and I can't know what you would recognize or what you would see.

Q. Where do you expressly discuss Apple's proposed construction of "identify" as "recognize a value to be"? Where do you discuss that and identify that as being either A, wrong or B, an added limitation?

A. Well, again, back to paragraph 25.

I don't know how you can read -- I also expect to testify that the constructions proposed by Apple for the claim elements identify a first maxima, identify a second maxima and identify a minimum, then it goes on to say "improperly add an limitation," I don't know how you can read that and say that the word "identify" is not somehow encompassed by that. I mean, it's in the sentence.

Q. So where is it in paragraph 25 then, now that you've narrowed it to that, where does it say there that your objection is to the word that Apple has proposed for construction "identify" itself as opposed to any remaining parts of the construction?

In other words, how do I know that what you're commenting on in 25 is Apple's construction of the word "identify" as "recognize a value to be" as opposed to other parts of the constructions that have been proposed?

A. Well, I think the answer to that is very simple. I'm here to be deposed and to answer questions about my understanding and my construction of these claim terms of what would be appropriate meanings of those terms.

If you're looking at the report and you're unable to identify what that means or you have then -- I think you have an opportunity to ask questions about that. I mean, I think it's -- to me the report clearly says that that is one of the -- that word is encompassed by the -- the word "identify" as part of that phrase is encompassed along with the remainder of the phrase.

MR. DeBRUINE: Jared, we've been going over a little over an hour. Would you mind if we take just a quick break?

MR. BOBROW: Let me just finish up on this topic, and then we'll take a break.

MR. DeBRUINE: Sure.

BY MR. BOBROW:

Q. Did you review the deposition of Mr. Von Herzen?

A. I looked at it very briefly.

Q. When was that?

A. A few days ago. I don't know exactly.

Q. Before you came out to California?

A. Right.

Q. Was that in preparation for the deposition?

A. In the general sense it's work related to this client obviously.

Q. And when was it that -- when was the first time that you reviewed Elan's construction of "identify a second maxima" and determined in your mind that it can be clarified in the way that you described this morning?

When was the first time that that happened?

A. I've always believed that the description was purely a term describing a spatial structure, and I mean, I think -- I think it could have been clearer from day one. And sometimes, you know, the point in time to express that thought changes or comes out, and when you brought the question up, it seemed like an appropriate time to put my point of view forward.

Q. My question was a little bit different, which is, when was the first time that you read the

construction, thought that it might be ambiguous on the subject of time versus space and said to yourself it would be better to clarify this?

A. Well, I think it's the -- when I read the other gentleman's point of view, as I recall it, that it was somewhat temporal in nature, and I think that's a misreading of it. When I read it, it was spatial in nature always, and when it became apparent that maybe other people were interpreting that a different way, that it seems appropriate to clarify that that's not the correct way to look at it.

MR. BOBROW: Okay. Why don't we take a short break.

THE VIDEOGRAPHER: We're going off the record at 10:14 a.m.

(RECESS TAKEN.)

THE VIDEOGRAPHER: We're back on the record at 10:25 a.m.

BY MR. BOBROW:

Q. Couple of questions on some of the work that you've done on the case.

Have you looked at the infringement contentions that Elan has prepared in this case?

A. Yes.

Q. When was that?

A. Sometime ago. I don't recall exactly.

Q. Were you involved in preparing those?

A. You know, I don't really recall whether I was. I've had conversations back and forth with counsel. I'm not sure whether I was -- I don't know how you would characterize involved. I mean, I might have answered some questions that are relevant to that.

Q. Have you reviewed Apple's invalidity contentions?

A. Yes.

Q. Have you reviewed the prior art that was cited in those contentions?

A. Some of it. I think in a general sense. I don't recall much it at this point. I'd have to go back and look at it again.

Q. Can you recall any particular pieces of prior art that you reviewed?

A. From the Apple --

Q. Correct.

A. Not offhand, no.

Q. Were you involved in any way in the Elan versus Synaptics litigation?

A. No.

Q. Have you read materials from that proceeding?

A. Yes.

Q. You've read Judge Breyer's claim construction order?

A. That's correct.

Q. What else have you read from that case?

A. I think there were perhaps an expert report or so that was associated with that.

Q. Anything else?

A. Not that I recall at the moment.

Q. What expert report did you review?

A. I don't remember the title or the author.

Q. Whose side was it?

In other words, was it a --

A. Not sure.

Q. All right. Let me ask you to turn to, you still have it, Exhibit 2, which is your summary of testimony and opinions.

First of all, in paragraph 3 you mention and describe your opinion on the level of skill of one of ordinary skill in the art.

Do you see what I'm referring to there?

A. Paragraph 3, correct.

Q. And you provide a definition of one of ordinary skill both for the patents that are not the '929 and then one for one that is; correct?

A. Right.

Q. And for the definition of a person of ordinary skill for the patents other than the '929 patent, you set forth the definition of "a bachelor's degree in electrical engineering, or computer science with course work in electronic circuits, with three years of experience in the design and operation of touch-sensitive input devices."

Do you see that?

A. That's correct.

Q. All right. And do you continue to believe that that's an appropriate definition?

A. Well, that's a good representative way of discussing the type of person that does this work. I mean, you could finesse these definitions, and I think there's -- you know, you can always look at the case of maybe someone with higher education would have less experience, maybe someone that had particular work experience and a lesser or different education could meet that practitioner, but this is a good, clean sort of summary of the type of person that does this type of work.

Q. When you are referring in the next sentence to "one with a more advanced degree may have less practical experience," do you mean someone with a more advanced degree in computer science or electrical

engineering?
A. Right, or a technology that overlaps against that.
Q. All right. Take a look, if you would at paragraph 15.
You mention that for capacitance-sensing technologies that you expect that you'll describe the physical components of a exemplary device and explain the theory of operation.
Do you see what I'm referring to there?
A. Right.
Q. When you referred there to an exemplary device, do you have a particular device in mind that you intend to use in your discussion or in your testimony?
A. Not at this time, no.
Q. Please turn to paragraph 17. And also 18, and in those paragraphs you're describing in -- you're describing capacitive touch sensors.
Do you see what I'm referring to?
A. Yes.
Q. One of the things that you do there is you say that these capacitive touch sensors can be formed in patterns.
Do you see what I'm talking about?

A. Yes.
Q. One of the things you do in paragraph 18 is you say that a variety of different electrode patterns may be used.
Do you see that?
A. Yes.
Q. So a couple of questions about this.
So first of all, when you're talking about the sensors there for a capacitive touchpad or capacitive touch sensor, what do you mean by "a sensor" there?
A. Well, in this particular context the sensor would be the physical object which generates some form of electrical signal in response to a change in the physical environment around it.
Q. So in the context of a capacitive sensor, what is that signal?
A. Well, depends on the type of sensing you're doing and the type of capacitive sensing you're doing, but that signal might be, you know, a modulating AC waveform. It might be a -- in essence you're measuring capacitance, so the underlying sensor is going to be something that has the ability of changing capacitance, coupling capacitance spatially in response to the physical environment and in particular in this case your finger entering into the near field of the plate.

So what would the signal be is dependent upon exactly how you're designing that electronic sensing against that sensor.
Q. Okay. But the output is related to the capacitance. In other words, either the capacitance itself or the change in the capacitance that occurs when I bring an object like a finger into proximity to the surface; is that right?
A. In a general sense. Maybe a better way to say that would be that the presence of a finger changes the near space capacitance between some parts of the sensor, and then you detect that. And whether -- there's always some capacitance. Capacitance is a measured existing physical quantity. If you have a physical object, there's a capacitance between it and the world around it.
So we often talk of the change because there is some capacitance between any one of these sensors and the outside world always, and you're looking often at the change when this finger becomes present in the field.
You also in some instances are really looking at a coupling, not purely the capacitance itself, but you may be measuring in such a way that you're using the changing capacitance to affect the coupling between

two different signals.
Q. So in those contexts that you've just described, whether it's measuring the coupling or whether it's measuring the capacitance or the change in the capacitance, I'm trying to understand from you what is the signal that is generated by that sensor that goes off into the system and says, aha, this is what I've measured?
What is the signal?
A. Okay. Well, the signal that you generate depends on the rest of the sensing technique. In other words, there's a change in capacitance, but you don't immediately have a way of measuring a change in capacitance unless you impress some kind of signal on that capacitor and see how it affects that signal.
So typically you're either doing some kind of excitation or you're using -- you have a circuit of which that coupling capacitance is an element in the circuit. So as a simple example, you could have an oscillator circuit whose frequency depends upon an R and a C, and the C is the capacitance you're trying to measure here.
So in that instance the frequency of the oscillator would vary depending on the amount of capacitance that was present, so as the finger came

into close proximity to the particular part of the sensor that you were looking at at the moment, then the oscillating frequency of that circuit would change, and so in that particular example, what the signal would be would be the change -- the change in frequency output from that oscillator circuit.

But there's a variety of circuits that are connected to the actual sensor assembly that generate a signal.

Q. All right. And what I'm trying to understand is, in the context of this technology where we're talking about capacitive touch sensors, when those sensors generate some type of signal, I'm just trying to understand what it is at a basic level that that signal indicates.

Is it indicating capacitance? Is it indicating coupling? Is it indicating a change in capacitance or potentially all three of those?

A. Well, let me explain that again, is that the sensor by itself doesn't make any signal. The sensor combined with the rest of the circuitry that's associated with it then signals come into being. All right, that circuitry exists.

Q. Okay. So the sensors plus the associated circuitry are designed to indicate signals that

indicate capacitance or change in capacitance or capacitive coupling; is that right?

A. You're measuring one of the things you named. In other words, you're measuring capacitance -- you're -- intrinsically in many cases you're measuring capacitance. The change in capacitance is -- you're trying to avoid the stray capacitance, so you're interested in that aspect of it.

So what you're trying to measure, to actually get useful information, is often the change in capacitance, and in other circumstances you're measuring the capacitive coupling between one signal and another.

And so those phenomenon is what you're trying to measure with basically electronics, which is connected to the sensor.

Q. All right. So in the context of capacitive touch sensors, are these sensors then measuring and producing signals, along with the associated circuitry, that measure something other than and indicate something other than capacitance or change in capacitance or capacitive coupling?

A. Well, what you're fundamentally measuring is the capacitance, capacitive coupling or change in capacitance, but you're doing it at a location. And

the reason it's useful information for a -- you know, multidimensional plane device or even a linear, you know, actuator kind of a device is that you're correlating that information with location.

You can make a capacitive sensor that only has a single point sensing, and they're used for switches. That is, they detect the presence of a finger, but it's either on the device or not on the device. I mean, that's kind of the single-bit version maybe or the nondimensional version of this type of sensor.

Q. All right. Let me go back then.

So if I just am looking at the sensors themselves that are in the touchpad and I'm trying to figure out what signal that sensor produces itself, all right, as opposed to whatever downstream circuitry or whatever, but what the sensor is signaling, what is that?

Is that an AC waveform? Is it amps? I mean, what is the output that's being signaled?

A. Well, again, none of the above.

Q. Okay.

A. As I've explained previously, the sensor by itself doesn't generate a signal. A sensor's only going to generate a signal in response to some kind of, you know, surrounding excitation or surrounding

circuitry.

In other words, if we just took a, you know, hypothetical, you know, indium tin oxide grid and laid it on the table, nothing's going to come out of it. It will -- if we, you know, measure the voltage on it, it -- we'll see only the noise that we'd see on any conductor lying on the table.

Q. So if I look at paragraph 19, you mention that the capacitance that's measured at each sensor is converted from an analog signal into a digital value.

Do you see that?

A. Right.

Q. Okay. And so in these capacitive touch sensors, what is that analog signal?

What does it indicate?

A. Well, it normally indicates capacitance, change in capacitance or maybe the coupling.

In other words, you -- as a -- I gave one explanation how to do it, which is where you have a circuit whose property shifts as a result of the property that's present on the sensor.

So if we look again at an oscillator whose frequency depends on, say, a resistance in the capacitance, what would be called an RC oscillator, and the C, in fact, is the C that your finger forms between

some elements on this sensing sheet, then the frequency of that oscillator would vary depending on the presence or absence of the finger.

Similarly, you can determine the amount of that capacitance in other ways. You can see how long it takes to charge up or the amount of current it takes to bring it to a certain voltage, and in any instance, you'd have a signal there which ultimately you end up with analog signal of some sort whose either frequency, time, amplitude, phase, one of the above or all of the above combined in some sense tells you what is the effective capacitance at the point you're looking at in the sensor.

Q. Then you mention that it gets converted into a digital value. That's an analog-to-digital converter that does that?

A. Right, typically.

Q. Going back to paragraph 18, you mentioned that there were a variety of different electrode patterns that can be used, and the shape of the electrodes is an important aspect of the overall design of the sensor.

Do you see what I'm talking about?

A. Right.

Q. So if you can help me understand this, you're talking about different electrode patterns, and so the

electrodes that you're referring to are the electrodes that are in the touchpad or in the touchpad sensor array?

A. Right. The capacitance -- in order to detect the change in capacitance, in other words, to have a capacitor, you have to have plates, at least two plates, and you have to have some field in between or some field that's interacting between them.

So the way that's normally done in the type of sensor we're talking about here is to generate some pattern of conductors which -- to which you can detect the capacitance between them or amongst groups of them. And the shape, the physical shape of those conductors matters, and so for kind of practical engineering reasons, you want to have some shape patterns work better than others.

Q. You talk about different electrode patterns here.

Are you referring to, for example, a grid of electrodes that may be part of this capacitive sensor array?

A. Well, yes, but more than that, and as I explained and show in the diagram, figure 6, we conceptualize this, and let's -- for purposes of discussion here, let's stay with the simple case of

what would be an X-Y sensor.

We traditionally talk about that. It's an array of X and Y points that we're interested in, and I'm simplifying the X-Y case to exclude sensors for the moment that might have a radial sensing or some other arrangement of electrodes.

But for simplicity's sake, we'll talk about for a minute the example given here, where there is a grid, in essence, of locations you're trying -- you're trying to determine an XY Cartesian coordinate, and so therefore, you have electrodes -- you want to have sets of electrodes, but you want to have electrodes which can be isolated into the two axes. And if you just made a simple set of horizontal and vertical traces, you would find that the actual capacitive coupling of a real finger on there may be kind of low and hard to measure.

So by making different shapes of those electrodes, and this shows -- this diagram shows an array of kind of packed diamonds, that's one that works, you get a greater coupling and a better ability to measure it.

Q. But one aspect of the pattern, if I understood what you're saying, the pattern of electrodes in the touchpad would be a pattern, for example, in an XY kind

of domain where you have certain conductors going in one direction and then other conductors that are perpendicular to those; is that right?

A. Right. That's one common type of approach. Not the only way to do it, but it's one way to do it.

Q. So one pattern would be an XY grid of conductors; is that right?

A. That's correct.

Q. And another type of pattern I think you talked about might be what? A circular array where you have conductors going out in a radius but in circles one from the other, concentric circles?

A. Yes, that's one.

Q. Okay. Are there other patterns that you are aware of in the field in the 1990s, for example, that are patterns of these electrodes that are used for capacitive touch sensing?

A. Well, that's a kind of broad question. I don't have in my mind all the patterns that people may have used during that period of time or even that I may have seen in that period of time.

And I'll note that we're in particular talking about patterning of electrodes for this particular type of sensor. There's other patterning of electrodes that's used for other types of capacitive sensors that

we're not really talking about here at the moment. But if you look at the sheet type, they also have electrode pattern on them in a different way.

But if we limit ourselves to the most common kind of XY sensing, then the most typical you'll see sensing arrays that are either an array of points or that the grid constitutes all the points. You'll see collections of discrete kind of islands. In other words, where someone may make what amounts to what looks like a series of pads in arrangements, and there are multiple arrangements, and you'll see this kind of XY grid but with variations in shape.

So when you actually look at it, it doesn't necessarily look like a grid. It may look like a bunch of sawtooths or other patterns, but electronically it's a grid. And of course, we mention the radial ones.

I'll bet there's some other ones.

Q. At all events, you mention in paragraph 18 that there are a variety of different electrode patterns, and what you've just testified would support that view; correct?

A. Right.

Q. So when you have a different -- when you have a variety of different electrode patterns for the touchpad, then I take it that those different patterns,

whether they're, for example, XY or maybe they're concentric circles or something else, the different patterns would map that touchpad differently, wouldn't they?

A. Yes. And we have to be careful because we're now using the pattern two ways. The terminology of -- there's kind of an underlying geometry of the pattern, and then there's the pattern itself.

So the mapping -- if the underlying geometry of the mapping were, you know, radial, then the underlying coordinate sensing information is radial in nature.

If the underlying geometry is an XY Cartesian grid, then the underlying coordinate space or the resulting coordinate spacing from sensing would map to that, but the actual pattern when you look at it may be neither of the above.

Q. Are you familiar with a term in the field called self-capacitance?

A. In general, yeah.

Q. What's self-capacitance?

A. That's kind of a -- it's used a lot of different ways, but in general I would use it to refer to either the capacitance of an object, the environment around it, like body capacitance, or the capacitance of

a single, like, electrical element to the space around it.

Q. Okay. And have you heard the term -- familiar with the term in the field mutual capacitance?

A. Yeah, that's typically applied to more -- what I was using as the terminology of coupling. That is, the capacitance between two elements or shared between two elements.

Q. All right. We were talking earlier -- you mentioned that in a touchpad a common way to configure the pattern would be in an XY array.

Do you recall that?

A. Right, that the underlying grid geometry is an XY.

Q. Right. So I have conductors that would be laid out in the -- along an X axis and other conductors laid out along the Y axis; correct?

A. Right.

Q. And that's a common way to --

A. That's a one way to do it.

Q. Common; right?

A. Yes, that's a common -- very common in input devices, because we often work in Cartesian coordinates.

Q. Those conductors that are laid out in that

way, are those conductors sometimes called electrodes?

A. Oh, the conductors in general are called electrodes, so calling those conductors electrodes would just be a common use of the word "electrodes."

Q. Are they sometime called traces?

A. Yes, and because they're often implemented or can be implemented as traces on a printed circuit card. That is, the conductive etched -- the remainder of an etching process on a printed circuit card which deals -- a thin copper element which we traditionally call a trace.

Q. In this context of touchpads that we're discussing, is it common to refer to those conductors that are laid out in the XY axes, is it common to call those traces?

A. It's hard to ascertain whether usage of a word is common, but certainly if you were -- you could refer to them as traces. It would be probably more likely to use that terminology in some circumstances than others, depending on whether you were -- you know, how you were using it, I guess, the context.

Q. So in the context of your summary of testimony and opinions, what do you typically call those conductors that are laid out in that XY array?

A. Well --

Q. What do you call them? Traces or electrodes or -- I just want to find a word that I can use to talk about them.

A. Traces is fine. Electrodes is fine. Either one of those is suitable.

Q. Okay. So let's talk about -- I'll just talk about them as traces then.

So if we turn to page 9, figure 6, you have laid out there -- you show a diagram that lays out there traces in the X and Y directions; correct?

A. That's correct.

Q. Now, in the context of that term I asked you about earlier, self-capacitance, if I'm looking at any one of these traces, let's say the leftmost trace that's going up and down and I guess is in a red or orange color, okay, if I'm in a -- if the capacitive touch sensor is designed with -- as a self-capacitance touch sensor, and I bring an object near that trace, then the idea of that is I would get essentially one value that represents capacitance along that entire trace, correct, or a change in capacitance along that entire trace?

A. If you look -- if you connected, for instance, the end of the trace, using that terminology, to a capacitance-measuring circuit element and you brought

your finger in proximity with it, you would see -- your goal would be to measure the capacitance of that -- one way to do it would be to measure the capacitance present along that trace there.

Q. I would get essentially one value for that as opposed to different values at different points along that trace; correct?

A. Well, this gets into the design of the actual -- what you're trying to achieve in the design of the remainder of the electronics around the sensor.

If you simply measured, you know, bulk body capacitance as your reference with the person's kind of effective or virtual ground, then you would see a single capacitance measurement along there.

Q. All right. And that would be true for the remaining traces that are along that X axis.

I would get a single value for those if it were a self-capacitance touchpad sensor; correct?

A. You would get a value -- if we just plopped a finger down in the middle of this exemplary, you know, kind of diagram here, you would see values on each of the grid lines -- you could measure capacitance changes on each of the grid lines in both directions.

Q. And there are -- first of all, on the X axis I've got six traces; correct?

A. Sure.

Q. All right. And so what I'm asking simply is that for each trace I would get one capacitance value as opposed to a series of capacitance values for -- along each of the traces; is that true?

A. As long as you're taking, in essence, the virtual ground point the other side of that capacitor as being not an element in the sensing array.

Q. But when you said the other element, what did you mean? Did you mean along the Y direction or what?

A. Well, along anywhere in the sensing array.

In other words, if you're -- the model that you just described is the model where you're looking at a kind of a body bulk capacitance, would be a way to describe that, and so you're measuring the capacitance that is created.

But that's a little different than what's often done. You often are looking at the coupling between that finger and the adjacent electrode, and maybe you're holding them at ground temporarily to measure that coupling. And you would see the summation down a single scan line or trace, to use that terminology, you would see the summation of the capacitance along that line because you have a single conductor active at that point in time.

Q. So what I'm trying to understand is if I had that self-capacitance technology and I was using that and I brought a finger near the touchpad that was a self-capacitance design, then for each of the traces in the X direction typically I would get one value, not a series of values for each of those traces?

A. Right, but I think -- to make it clear, I'm not sure I would use the terminology "self-capacitance design" to necessarily have that distinguishing characteristic.

Q. What term would you use to describe the kind of sensor that is used where you bring an object near the touch sensor and you get one value per trace?

A. Well, I think that description you just made is just about the best description of it.

In other words, there's a number of sensing techniques where you measure the analog summation of the capacitance along a trace and work from that value, as opposed to a more complex kind of sensing or modulation technique where you control the drive of the remainder of the electrodes in such a way that you can isolate capacitance in the other axis.

Q. My question is, what word do you use to describe a touchpad sensor that works in the way such that when I bring an object near it, then for each of

the traces I'm essentially reading out one value as opposed to a multiplicity of values?

What do you call that? Self-capacitance?

A. No, I don't use that particular term. I would just say the term that you're doing -- we could say analog summation of capacitance along a trace.

Q. Okay. So in the -- I think in paragraph 19 you mention that in the simplest design the single line with the greatest capacitance change is used as the coordinate in each direction X or Y. "Such a sensor would only provide a very limited set of locations, e.g., no more," I think you meant to say "than the number of grid lines for each axis."

Do you see what I'm referring to there?

A. I do see the sentence, and I am characterizing there for purposes of understanding, I guess, the -- understanding this technology that you could construct such a device, that you really just pick the one of these traces that had the greatest value of capacitance and say, okay, that's where I am, or I'm close to there.

Q. In that technique that you describe in paragraph 19 that I just read into the record, would you call that an analog summation technique?

Is that the term that was used in the art to

describe that?

A. No, I'm not saying that's the term that was used in the art, and I think you're trying to apply that to a different case.

I'm not sure I can name -- and I don't know what people would have called that, that kind of -- that sort of simplest approach there, because I'm more describing the concept to try to explain the concept here than to try to characterize some existing base of products.

Q. What term was used back in the 1990s to describe a sensor which worked in a way such that when I brought an object near it, I would get one value for each trace?

A. I don't -- I don't have a particular term in my mind that would be used for that exact characterization of it.

Q. All right. So if I call that self-capacitance, would you object to that?

Is that a problem?

A. For purposes of our discussion today, if that makes it easier for you, I don't have an objection to it. But I'm not taking the position that that term necessarily is limited to that or, you know, necessarily that has that meaning.

Q. Okay.

MR. DeBRUINE: Jared?

MR. BOBROW: Yeah?

MR. DeBRUINE: It's about a minute to 11:00.

MR. BOBROW: Okay. So you need to take a break now?

MR. DeBRUINE: Yeah, my phone's going to ring.

MR. BOBROW: What do you think? Fifteen minutes?

MR. DeBRUINE: Yeah, we'll be done in 15 minutes.

THE VIDEOGRAPHER: We're going off the record at 10:59 a.m. This marks the end of tape No. 1.

(RECESS TAKEN.)

THE VIDEOGRAPHER: We're back on the record at 11:32 a.m. This marks the start of tape No. 2 in the deposition of Robert Dezmelyk.

BY MR. BOBROW:

Q. Before our break I was asking you some questions about a touchpad sensor in which the traces were designed so that they would essentially measure one value rather than a multiplicity of values along the -- along each of the traces.

Do you recall that?

A. Yes.

Q. And we agreed, at least for these purposes, we would call that a self-capacitance design.

Do you recall that we talked about that terminology?

A. Right.

Q. All right. Now, let me ask you a different question.

Let's suppose that in instead of that design I have an array of traces and the touchpad is designed so that I can measure capacitance at the intersections of those traces in the XY direction.

Okay?

A. Sure.

Q. Do you have that in mind?

A. I have, certainly.

Q. What do you call that kind of touchpad sensor? Does that have a name?

A. You know, I don't have a specific name to that call. I mean, there's different ways to describe that. You could talk about that being a kind of a capacitive coupling between the traces that are going in different directions. I mean, I don't personally have a specific term that I would apply, but I understand the distinction there's two different designs there.

Q. All right. Have you heard the type of design that I've just described where you are looking at capacitance at points along each of the traces, those intersections of the traces as being a mutual capacitance design?

A. Right. That's one way to talk about it, because you're looking at the capacitance between the two electrodes at the intersection.

Q. Right. Again, so would you have any objection if for these purposes for your deposition I call that design mutual capacitance design?

A. That's fine. We can use that term to describe that particular topology.

Q. All right.

MR. BOBROW: Let's mark this as Exhibit 3.

(DEPOSITION EXHIBIT 3 MARKED.)

BY MR. BOBROW:

Q. Sir, I've handed you Exhibit 3, which is obviously a schematic, and what I have tried to illustrate here is a touchpad bounded in that dark black line with three traces in each direction. In the -- along the X axis we have X1, X2 and X3, and along the Y axis Y1, Y2, Y3.

Okay? Do you understand what's depicted here?

A. I understand what's depicted. I wouldn't characterize that as a schematic. Maybe a diagram might be a better word.

Q. Better word. A diagram. All right.

For Exhibit 3 I wanted to ask you a question first about a self-capacitance design.

All right?

A. Sure.

Q. Now, if the diagram of a touchpad shown in Exhibit 3 were a self-capacitance design, if I understood what you said earlier, the maximum number of data values that I would get from such a design using this touchpad on Exhibit 3 would be essentially six values, three along the X axis and three along the Y axis; correct?

A. Right. Assuming you didn't do any kind of special driving or you didn't otherwise attempt to determine locations other than those caused by a summation along a trace, you would have three values in Y and three values in X.

Q. Now, if instead I used what we were talking about as a mutual capacitance design for the touchpad shown in diagram in Exhibit 3, instead of getting six values, I would get instead nine values, one at each of the -- one at each of the XY intersections; correct?

A. That's correct.

Q. All right. Now, taking a look at -- back at your report at what you've called figure 6 on page 9, can I tell just from looking at this whether this is a self-capacitance design as depicted here or a mutual capacitance design?

A. No.

Q. From which product or which specification was figure 6 on page 9 of your report taken?

A. Let me see where that -- I think that's a -- I think that's an example from a Cypress Semiconductor documentation of a particular example they're talking about.

Q. And do you know offhand whether it's a mutual capacitance design or instead whether it's a self-capacitance design?

A. Oh, their design?

Q. Yeah.

A. Not offhand. Probably -- no, I mean, but gauging by the fact that they're calling it a kind of, you know, sensing 101, it's probably the simple -- the simple case design, where you're summing the capacitance down into each of the trays in analog.

Q. And getting one value for each trace?

A. Right. That's probably the example, but the

actual grid pattern doesn't matter. It's more about the electronics that get connected to it.

MR. BOBROW: Let's mark this as Exhibit 4.

(DEPOSITION EXHIBIT 4 MARKED.)

BY MR. BOBROW:

Q. Is this the -- is Exhibit 4 the Capacitance Sensing 101 reference that you describe at the back of your summary of testimony?

A. Right. It appears to be the same document.

Q. All right. Now, in looking through this I may have missed this, but I didn't see what you've described as figure 6 on page 9 in here. Maybe you can help me with that.

A. Then this is probably not the same one. You're right. When I look through it, I don't see that figure, so it's probably not that one.

Q. Although when I look at page 8 of your report, I see that, indeed, there are figures that came straight from this.

A. Right.

Q. So do you have any idea then where you got the figure 6 that's at the top of page 9 of your report?

A. Looks like I got the wrong citation on it. Is it cited on the back side here? I'm not sure. Looks like it's a mis -- it's a miscitation.

I don't know off the top of my head where it's from. I just used it as an illustrative example to illustrate, you know, an example of a pattern.

Q. Take a look now, if you would, at paragraph 22 of your report in figure 7.

Do you see what I'm referring to?

A. Right.

Q. And this is something that you say is showing three simultaneous touches, and it looks like there are some hills or mounds, as it were, on a piece of graph paper.

Do you see what I'm referring to there?

A. Right. I see the picture.

Q. And I take it that from what you said earlier, that this graph figure 7 would have been generated using some type of what we were calling mutual capacitance technology, where you're looking at values of capacitance or change in capacitance at intersections along this XY grid?

A. Well, this particular illustration I found is -- I'm not trying to characterize how it was sensed, only that would be what would occur.

In other words, that would be the change in capacitance over each of the unit areas shown in the grid on the surface if you had three touches on the

surface. Not necessarily what you would measure or process for signals but what actually is happening in the capacitance space.

Q. But --

A. But in other words, the chart says change in capacitance. It doesn't -- it's not talking about a physical device that may be connected to that.

Q. But given what's shown here, I would not be able to generate this graphic if I were only generating one value for each trace in the X direction and one value for each trace in the Y direction, would I?

I couldn't generate what's depicted here?

A. No, because you have an overlap in one axis between the two touches. You would see -- well, you might be able to. I'd have to kind of think that one through carefully, because you're -- there's a little corner, I think, where they overlap.

So you're not going to be able to see one corner of one of the --

Q. Right.

A. So in general you're going to be able to ascertain here, I believe, if I'm -- you're going to see -- depending on how you sense this, you're going to see kind of different views of it, and again, this diagram's showing what three touches would generate in

the capacitive field change.

Q. But my question is simply that this graph shown in paragraph 22, figure 7 of your report, you would expect that this graph would have been generated using the mutual capacitance approach whereby you're looking at capacitance or changes therein at intersections of these XY electrodes.

That's what you'd expect; right?

MR. MEDLOCK: Object. Form.

THE WITNESS: If this -- this chart is not indicated to necessarily reflect a measurement, but if you were trying to make that measurement, then would you sense the capacitance at each of the grid locations or, you know, call them intersections, if you want, over the full array.

MR. BOBROW: Let's mark this next Exhibit 5.

(DEPOSITION EXHIBIT 5 MARKED.)

BY MR. BOBROW:

Q. Sir, you've been handed Exhibit 5 for identification. It's titled "Projected Capacitance Touch Screen Technology."

Is Exhibit 5 the document from which you got figure 7 in your report?

A. It appears to be, yes.

Q. All right. Now, Exhibit 5 is a document that

was generated in or after 2008 you think; right?

A. I don't see dating immediately. If there's a location in the document that has it, you could save us time by directing me to it.

Q. In the first paragraph there's the -- the second sentence says that, "in 2008 the market research firm iSupply forecast that the worldwide market," and then it talks about sometime in the future.

A. Sure.

Q. You see what I'm saying?

A. It appears that this document -- yeah, that makes sense.

Q. Okay. So your expectation and understanding is that Exhibit 5 would have been generated in or after 2008; right?

A. Right. I mean, that's likely to be the case, given that what's -- they're citing something in 2008.

Q. Now, were you aware of any touchpad technologies -- let me ask it a little bit differently.

Were you aware of any capacitive touchpads in existence in 1996 or earlier that worked in the way that we just talked about for measuring capacitance? That is, a mutual capacitance approach which looks at the capacitance or change therein at each intersection at the X and Y electrodes.

MR. MEDLOCK: Objection. Form.
THE WITNESS: Well, you're asking kind of a complicated question, which boils down to what I can remember of a broad field of technology in the mid 1900s -- 1990s.
MR. BOBROW: Correct.
THE WITNESS: So the answer is, I haven't looked at that. I don't recall at the moment. I haven't been asked in this matter to go research what technology was present at that point in time, so I can't give you an answer about that particular issue at this point in time.
BY MR. BOBROW:
Q. Now, from the standpoint of somebody trying to design a touchpad, is it more difficult to design a capacitive touchpad that would allow for the reporting of data as shown in figure 7 of your report whereby you have essentially a grid of traces and you're looking at each XY intersection, would that be more difficult to design than a touchpad design that worked in the single -- or the self-capacitance way that we talked about earlier, where you're getting essentially one value from each trace?
MR. MEDLOCK: Objection to form.
THE WITNESS: It's not more difficult to

design. That wouldn't be true. And there are examples of full XY sensing -- and I think there's a -- your description of it there kind of jogged my memory.
There's a mid '90s patent, I think, that's cited in one of these cases, the Boies, assigned to AT&T. It's B-o-i-e, no "S." I said "Boies," but it's -- I don't know how he says it. It's sort of "boy" or something.
That is an example of a full sensing on a full grid, and I think that the technique there is a form of coupling. You just lay out an interdigitated pattern of traces and you've got the data.
So I wouldn't characterize it as more difficult per se to make one or the other. They both have some engineering challenges, but I don't think there's a --
BY MR. BOBROW:
Q. Well, in paragraph 19 you mention that the simplest possible design would essentially involve getting one value per trace; right?
A. Right, but I'm giving an example here to try to -- a sort of tutorial or explanatory sense, and practitioner's, certainly by the point in time of the '90s, have dealt with all kinds of complicated cases even in the earlier sheet designs.

And so the notion that, you know, you're interpolating between scan lines or traces or you're sensing across a grid, that's pretty well-known across the breadth of XY input device technology.
Q. All right. So in your view, it would have been just as easy for a person of ordinary skill in 1995 to design a self-capacitance touchpad as it would be to design the mutual capacitance touchpad, where you're looking at the intersections and processing the data accordingly?
A. Right, right. I think that both are within the knowledge of a person of ordinary skill in the art at the time.
Q. And would it also have been just as easy at the time to identify in 1995 the number of fingers that a person was putting on the touchpad away at that time?
In other words, is it harder or easier depending on whether the case is self-capacitance or mutual capacitance?
MR. DeBRUINE: Objection to form.
THE WITNESS: I think they're different. I mean, I can't really give you an opinion on harder or easier, and at that point in time I'd have to kind of, you know, sit down and thinking about that.
Because a lot of these things there's no

simple metric of harder versus easier, and harder versus easier doesn't -- it's a variable that doesn't necessarily -- that's hard to -- you know, you can't really say what's harder versus easier in some cases.
BY MR. BOBROW:
Q. Take a look at page 4 of Exhibit 5, which is describing figure -- what's called there figure 3, the figure that you put into your report. And it talks about multi-touch and gesturing and those being accomplished in software, et cetera, and then it says that those are very math-intensive and are time-consuming.
Do you see what I'm referring to there?
A. Right.
Q. Would you agree with that statement that those sorts of features and processing those sorts of features are math-intensive and time-consuming?
A. Not necessarily, and in particular in light of what this guy's saying in 2008, I think that you've got to do a bunch of calculation in any of these cases.
And I think that, you know, he's kind of pushing it -- maybe he's selling a controller. I have to look at what the purpose is behind the document, but I don't see that that's necessarily, I mean, math-intensive again, do you have to do math? Sure.

Is that computation time-consuming in the context of a modern processor as of 2008? No.

Q. All right. But back in 1995 your testimony is that the processing and the math and the design for the mutual capacitance touchpad would be just as simple as the design and the math of the processing for the self-capacitance design?

MR. MEDLOCK: Objection to form.

THE WITNESS: That's not what I said.

BY MR. BOBROW:

Q. I'm asking you now.

A. Right. No. I think that there's a change across in processor throughput, of course, and in cost per amount of processor throughput that's happened between those two points in time.

I don't know that it's necessarily determinative of anything, but just taking those two statements as statements at that point in time and this point in time, processing's cheaper in 2008 than it was in 1998 or 1994 or 1993.

So there's been a kind of steady, you know, decrease in the costs of mbPs per second, in microcontrollers, that is, in the type of controllers that might be present in the device, and on host systems.

So, you know, there's no simple comparison, and, you know, I'd have to kind of think about it or dive into some particular fact cases to see how it worked out in the two points in time.

Q. Now, take a look again at Exhibit 5, which is again, the exhibit where you got the figure in your report, and you -- the paper points to these three -- what did you call them? Hills?

A. They descriptively could be called hills or bumps. They're -- it's hard to describe words for the written record, but they're extending upwards from the base, and so in a way it would be analogous to if we had three little hills or mountains standing out in a plain, that could be a way of describing that.

Q. So if we call them hills, that would be okay, as you did in your report?

A. Hills is fine. Right. I mean, that's a word that's a way to describe them.

Q. Now, is there anything in this paper, Exhibit 45, that describes those hills as finger profiles?

A. Well, I don't think so. I mean, I'd have to re-read it to see if he says anything about it, but I don't expect so.

I don't see him using -- he or she, the author of this particular document, using that terminology.

Q. Earlier you mentioned a kind of material. I think you said indium tin oxide?

Did I hear that correctly?

A. That's correct.

Q. Sometimes that's abbreviated ITO?

A. That's correct.

Q. Is that how it's abbreviated at least in the field of capacitive touch sensor?

A. Yeah, right. It's frequently just said ITO.

Q. And is ITO, or indium tin oxide, is that a common material from which to make the traces that we've been talking about in capacitive touch sensors?

MR. MEDLOCK: Objection to form.

THE WITNESS: Well, first off, I'm not a chemist, so in terms of its usage, if you are using transparent sensors, if you're trying to build a sensor which is transparent, then to the best of my knowledge, indium tin oxide is one of the -- sort of top preferred choice if not effectively the only choice for commercial reasons.

If you're building a nontransparent sensor, then you have a much wider choice of materials, of course, because the reason indium tin oxide's popular is because it's conductive and transparent, and it can be sputter-coated, I guess, or evaporation coated onto

the -- you know, in a vacuum onto glass or other materials.

But if you're making a -- you know, a touchpad, then the conductors could be, you know, etched copper traces on a printed circuit card, and that's probably way preferable than indium tin oxide. So which is more common kind of depends on which application area.

BY MR. BOBROW:

Q. All right. Just a couple questions about that.

Was it known in the art to use indium tin oxide as a -- to make these traces in capacitive touchpads in the mid 1990s?

A. Indium tin oxide was used in sheets way before that and, I believe, would be patterned also in that time frame. But again, I'm not -- I'd have to go look at who did exactly what. Nobody's asked me the question of go research the history of patterned indium tin oxide, ITO, layering, but it certainly exists in -- prior to that in -- you know, in sheet film for sure.

Q. But I'm asking now about the traces. So let me change the time frame.

What about the year 2000? Was it known by those skilled in this field that you could use indium

tin oxide to make traces of the type we've been discussing in capacitive touchpads?

A. I don't know off the top of my head what the historic evolution of use of ITO in pattern form is. I don't know.

Q. You mentioned that ITO was transparent.

A. In general.

Q. Was that something that was known to those of skill in the art in the -- say, in the mid 1990s?

A. Oh, sure.

Q. And by "transparent," that means I can see through it with the naked eye or something else?

A. Well, in general, transparent means light goes through it.

Q. And is the idea that with indium tin oxide a human being who is trying to interact with a touch surface can then essentially see through the conductors?

A. Right.

Q. Is that right?

A. Right. That's the idea of a transparent conductor, that you can place it in front of a display and see through it.

Q. Right. So if I have the indium tin oxide traces because indium tin oxide is transparent, I can see what's behind it?

A. Right.

Q. And the idea is that I could either have a display behind it or I could have print graphics behind it or I could have other things that are behind it, and the presence of those traces will still allow me to view visually what's behind it; is that right?

A. Well, the material the traces are made of needs to be transparent if you're going to see things that are behind it.

Q. And I'm simply saying that indium tin oxide is a material that you could make traces from that allows you to see either printed patterns or displays or other things that are behind those conductors; is that right?

A. Yes, because it's conductive -- I mean, it's conductive and transparent.

MR. BOBROW: Believe it or not, why don't we take another break. Why don't we take our lunch break now.

MR. DeBRUINE: Okay.

THE VIDEOGRAPHER: We're going off the record at 11:58 a.m.

(LUNCHEON RECESS TAKEN.)

A F T E R N O O N S E S S I O N

THE VIDEOGRAPHER: We're back on the record at 12:48 p.m.

MR. BOBROW: Let's mark this next in order, please.

(DEPOSITION EXHIBIT 6 MARKED.)

BY MR. BOBROW:

Q. You've been handed Exhibit 6 for identification, which is just an enlarged view of figure 7-F1 from the '352.

You're familiar with that patent, I take it?

A. Right.

Q. And you have even this figure before, albeit not as marked up; correct?

A. That's correct.

Q. And --

MR. DeBRUINE: Just so the record's clear, it appears to be a blown-up copy of figure 7-F1 with a number of additional markings on it.

MR. BOBROW: I'm getting there.

MR. DeBRUINE: Okay.

BY MR. BOBROW:

Q. So as you can see on Exhibit 6, there are various letters that have been put onto the figure.

Do you see that?

A. Yes, I do.

Q. All right.

A. They're circled -- written in red and circled.

Q. Indeed.

A. For the most part.

Q. Okay. So I wanted to ask you some questions about 7-F1 and add in some of these letters. In case we wanted to talk about particular features, we'd have a way to refer to them.

Is that all right with you?

A. Sure.

Q. Okay. So why don't we start with what's called the X profile on the patent.

Do you see that?

A. Yes, I do.

Q. All right. Now, in this X profile, this X profile is showing capacitance measurements along conductors arrayed along the X axis; is that right?

A. The conductors that would be represented by the X profile, I don't think they necessarily have to be conductors, but the measurements that are being represented are actual as seen from the X direction, but those -- if hypothetically they were, you know, kind of grid conductors exactly, they would be in the Y direction.

Q. Yes, they would be --

A. Perpendicular to the --

Q. To the X axis?

A. To the X axis.
Q. And so what this is showing is essentially the capacitance measurements on the traces or conductors or whatever the sensors are that are arrayed along the X axes and perpendicular to the X axis; is that correct?
A. That's correct, or the summation of values, if you had a full array of capacitance data, full array in X and Y, that would be the summation of one path with a constant X and a varying Y.
Q. Now, the patent for figure 7-F1 doesn't describe the X profile that way, does it, as being this summation along different points on the X axis?
A. I don't think so, but I'd have to read the text to look for -- you know, if you want me to go look for an exact description of it, I'd have to go look for it.
Q. Your understanding of what's shown in figure 7-F1 was essentially what we were calling earlier the self-capacitance case where you had essentially one value that was being read per trace along the X profile; isn't that right?
A. I don't see it that way. I think you're mischaracterizing my view of what they're describing here.
When we look at this picture, they're showing

that the profile in X has that character, but that doesn't necessarily mean to me as a practitioner that that particular profile could only be created or is solely representative of a particular way of determining. That's a given as an example in the patent, but it could also be done, as I said, just by summing over the values along a given thing to establish what that profile was.
Q. Let me make sure I understand.
For what is shown as the X profile in figure 7-F1, will you agree that what is shown here represents one value per trace along the X axis?
A. No.
Q. So you're saying that what is shown of the X profile portion of figure 7-F1 could either be that or it could be a summation of discrete different values taken along the -- one of the -- one more of the X traces; is that right?
A. It would be a summation of one or more values along -- when you're saying "X traces," it's hard to know whether you're trying to say the traces that are parallel to X or the traces that are perpendicular to X.
Q. The ones that are being -- the ones that are perpendicular as we discussed before. The ones that

are perpendicular to X and arrayed along X.
A. Right, but there's also not traces in the diagram. In other words, what this diagram is teaching or showing is not necessarily related to traces. Okay? We've talked about traces as a way of understanding these devices, but there's no traces in the picture, and when I -- just interpreting this profile, the profile is telling you more like what you would see if you took -- using the notion of when we say a profile of a person, if we took this kind of two-dimensional map -- so in other words, as a practitioner, I know this touchpad represents a two-dimensional map of hills, and the profile is representative of what it would look like looking up at those hills from one direction.
Q. Is the X profile shown in 7-F1 of the '352, is that a one-dimensional profile or a two-dimensional profile?
A. Well, looking at this diagram in front of me, and absent reading the whole patent to know if there's some comment made about this diagram, looking at the diagram you've presented to me that's on the table in front of us, the profile is a -- I mean, each -- there are two profiles, each of which represents capacitance along, you know, X and in one case in X in the others.

Q. So I'm asking about the X profile that represents a one-dimensional view of capacitance along the X axis, doesn't it?
A. Well, the amplitude of capacitance along a single axis.
Q. And you would agree that that's -- that what's shown there is one-dimensional. In other words, the amplitude isn't being shown on a Y axis. This is a one-dimensional X profile; correct?
A. I'm not sure your terminology "dimensional" is entirely accurate. You have an X axis and you have for each -- or for a subset of elements along there you have a value. So in other words, we have a function or a relationship between the amplitude of capacitance and the position in X which is shown in this profile.
Q. And for any of these points in the X profile, let's take D, for example, do you see that one?
A. Mm-hmm, yes, I do.
Q. All right. Now, that is shown -- D is shown along this X profile with respect to its position along the X axis; correct?
A. That's correct.
Q. And the -- it is not shown with respect to its position along the Y axis of the touchpad; is that right?

A. Right. The X profile is the profile looking from the X axis upwards in Y.

Q. Well, so are you saying then -- let me make sure I understand.

For point D are you saying that the height of that is showing the height of a measurement along the Y axis of the touchpad? Is that what your testimony is?

A. It is showing -- what it's actually showing is the profile of the hills that are created by each of the fingers from the view of the X axis. So if we imagine for a second that these were real hills, there's a wave understanding what this graphics's representing, and we look -- the way they look on the horizon there through the window, their profile is what you would see as the line of the hill.

So in this particular case that's what that -- the X profile is the X profile. It's the view from X looking up across that array or two-dimensional set of data. There's no question data is two-dimensional. I mean, the fingers are two-dimensional intrinsically, and the touchpad clearly is a rectangular, you know, planar surface, so it has two dimensions.

Q. I don't think that answers my question, so please answer the question.

My question is, is the height of the data

shown in the X profile, is that a function of the Y axis or is the height a function of the capacitance being measured?

A. The height is the representation of the capacitance being measured.

Q. Okay. So the height of it, its position vertically in the X profile, is not a function of sensors or electrodes that are arrayed along the Y profile; correct?

A. It might be.

Q. Doesn't state --

A. This diagram doesn't tell you one way or the other about that.

Q. This diagram doesn't; is that true?

A. This diagram's not about that. I mean, this diagram doesn't show the particular sensing mechanism, and it doesn't show the arrangement of the electrodes per se.

Q. Let me ask --

A. Or how they're being driven.

Q. In your understanding, is the height of the data points, pick data point D in the X profile, is the height of it a function of the capacitance at that location along the X profile?

MR. DeBRUINE: Objection. Asked and answered.

THE WITNESS: Yes.

BY MR. BOBROW:

Q. Now, looking at point -- well, let me ask it a little bit differently.

Looking at 7-F1, what is the first maxima, as that term is used in claim 1 of the '352 patent?

MR. DeBRUINE: Object. Incomplete hypothetical.

THE WITNESS: Well, there's --

MR. DeBRUINE: Calling for a legal conclusion.

THE WITNESS: There's -- the claim is talking about maxima, and there could be -- depending on how you look at it, which one you identify as the first one, there could be, you know, four different ones could be the first one. The different things noted on here could be D, F, A or C.

BY MR. BOBROW:

Q. Okay. So looking at the X profile, you're saying that the first maxima could be D or F; is that right?

A. Right.

Q. And that's simply a function whether you choose to read from left to right or right to left; is that right?

A. Which of D or F would be characterized as the

first is which one, in essence, you choose to name as first.

Q. So if I choose to call D the first maxima --

A. Okay.

Q. -- then if I label it as that, then what is the minima following that first maxima according to the claim of the '352, claim 1?

A. Well, I don't think that the claim specifies what the minima is. The minima is what the minima is, which is if we look at this particular diagram you've notated, the minima following D would be E in that profile.

Q. Now, G is a -- represents a value that is lower than the value of E in terms of capacitance; correct?

A. Yes.

Q. And would you agree that D -- I'm sorry, that G follows D or does G not follow D?

A. G is -- again, depending on how we're describing this profile and where we start from --

Q. Well, we already started with D being the first minima, so with that in mind, would you please answer the question whether G is the minima following D or not?

MR. DeBRUINE: Objection. Argumentative,

incomplete hypothetical.
THE WITNESS: If we're using that terminology, G is not the minima following it, but if we started from D searching for minima, the first one we would find would be E, and then the second one we would find would be the beginning of G.
BY MR. BOBROW:
Q. All right. The beginning of G is -- has a lower value than E, does it not?
A. Yes, it does, but a minima doesn't have a connotation or a requirement that it be a global minimum.
Q. Well, let me ask you.
In this X profile, would you agree that G, the beginning of G, is the lowest value in the finger profile that occurs after D?
A. It appears to be.
Q. And doesn't -- isn't it true then that that makes it the minima following the first maxima?
A. No.
Q. Why not?
A. Because as I said, the notion of the word "minima" does not -- in a dataset doesn't mean it's the absolute minimum.
Q. So it needn't be the minimum? Is that your

testimony?
A. Right. It doesn't have to be a global minimum of a dataset.
Q. So why is it that your -- it seems as though you're describing it as a global dataset?
What do you mean by that?
A. Well, if you take -- the use of the word "global" there is over the entire dataset. So if we have a dataset of points and we're -- and the terminology people who do this type of work write software or write code that crawls through collections of data, there's a difference between finding the minimum from the whole set of data or the maximum from the whole set of data and finding minima and maxima within that set. And I would suggest that one way of appreciating that is we did the same thing in ordinary language when we talk about topography.
I mean, certainly we've all said "it's at the top of the hill," but there's only one top of the hill. Using the notion of a global, you know, maxima, if we're going to use it that way, there's only one top of the hill in the whole world.
Q. Let me ask it a little bit differently.
What is your basis for saying, if you are, that the beginning of G is not the local minimum with

respect to D being the first maximum?
A. Because when you're finding a minima in a dataset, you're looking for a place where there's a transition from decreasing data to increasing data. So by that test, if you look -- if I'm moving -- increasing X from D towards E, I see that each successive step I take I get a decrease in value of my dataset.
When I reach E, it looks like it stays constant perhaps for a little while, and then I now see an increase in value, and that algorithmically tells me I have passed the minima. The same way if you were driving or walking and you got to the bottom of a hill and then you started climbing back up the far side, you would know you reached the -- a valley or a minima point.
Q. So to be a minimum, as you understand it for purposes of the claim, there not only has to be a transition from sort of -- from higher to lower, but then it has to go from lower to higher again; is that right?
A. A minima in general in a dataset can have a transition -- it can remain constant. It can be from higher to -- you could have a dataset of which there was solely one value. Right? If we had a dataset that

only appoints a value of 50, then clearly there's no separate minima or maxima, or alternatively, the minima equals the maxima to achieve points globally.
However, if we have different combinations of profiles like we see here, or different sets of data, then you can identify a minima in my way, and again, I don't think this is part of the claim limitation per se, but just asking me to define a minima in a general sense as a practitioner would be when you're identifying in a dataset that you have either higher values proceeding and following you using this description of, you know, from left moving from left to right, or you might reach a minima like the situation as I said at the beginning of this section you've labeled G, where you see a decreasing set of data values and then you see a lower value that stays constant.
Q. So that latter that you just described, where it's low and then it stays constant to the end, that can also be a minima?
A. Right. That's analogous to a valley here and I'm looking out the window and enjoying the view of the flatlands around the bay, where if we came off the hills to the west, there's a lot flat section before it comes up back up again.

Q. Well, given that understanding of a minima, why is it that the beginning of point G can't be the minima as described in the claim? That is, a minima following the first maxima?

MR. DeBRUINE: Object. Mischaracterizes testimony, incomplete hypothetical.

THE WITNESS: Well, first off, I don't have the claim in my head, so you're asking me to kind of say in comparison to the claim, so if we're going to get into like the claim as a whole it probably would be helpful to look at the claim in front manufacture me because I don't memorize claims.

So if you want to ask me a question against the claim as a whole so it would be probably be a good idea that I could look at the claim.

Q. This was marked as Exhibit 4 to the Von Herzen deposition.

So you now have in front of you and you're leafing through the joint claim construction statement. The term from claim 1 that I'm interested in is the term identify a minima following the first maxima. And with figure 7-F1, please tell me whether G in the X profile shown in 7-F1, whether G is the minima following the first maxima.

A. In this particular diagram?

Q. Yes.

A. Okay.

MR. DeBRUINE: Objection. Incomplete hypothetical.

THE WITNESS: Based on my understanding of the claim language and the idea of following and the purpose and understanding of -- the overall purpose of this patent as a segmentation, you are looking at this dataset in relation to its spatial orientation. So you would take the first maxima, and then you are looking for the maxima following that.

So -- or the minima, pardon me. The minima following that. So G would not meet the requirement of following -- the minima following D because you would locate that minima. It would be the second minima, if you were following -- using that terminology following from the maxima at D.

BY MR. BOBROW:

Q. So based upon what you just said, E then is the minima that would correspond to the claimed minima following the first maxima; is that right?

A. In this particular example we're talking about, right.

Q. And that's because it's the one that you come to first, assuming that D is the first maxima?

A. Right. Since we're using the sort of order to describe the spatial relationship to it, then the first -- that is, we've identified D as the first maxima, and then continuing we would find that E is following that.

Q. Now, for --

A. As the minimum.

Q. Now for 7-F1, Exhibit 6, what's shown in the middle of the page are two fingers on the touchpad.

Do you see that?

A. Yes.

Q. The finger on the left is higher than the finger on the right; correct?

A. Higher in the sense that it's located further up in Y if the XY origin's in the lower left, right.

Q. Now, let's assume that I reverse the position of the fingers.

Okay?

So instead of the left finger being higher than the right, I literally just switch them so that now the right is higher than the left.

Okay? Do you have that in mind?

A. So for purposes of this kind of hypothetical we're saying that this -- do you mind if I mark it on here, your new hypothetical?

Q. Well, before we do that, let me see if you need to. So let me try to do through it again.

I've got two fingers on the touchpad; right?

A. Well, you don't. The pictures shows two diagrammatic fingers on the touchpad.

Q. The left one is higher than the right one; correct?

A. Yes.

Q. I'm simply asking you to assume that the position of those fingers is reversed so that the finger on the left is moved down --

A. Okay.

Q. -- and is now at the height of the finger on the right and then the finger on the right is moved up to the former position of the finger on the left.

A. Right.

Q. Do you understand that?

A. Right. And they've stayed otherwise in the same location, so in essence, if I was -- I have to use two hands because my fingers are not that geometrically, but -- and I don't know if you can see that in the video, but -- so we're saying that we're making this change, and maybe you can capture that in the video, that we're changing from this particular finger orientation to this finger orientation.

Q. Exactly.
A. We haven't changed anything else.
Q. That's correct. That's the only thing that we've changed?
A. All right.
Q. Now, in that case, based upon how 7-F1 is described in the patent, would you agree that the reading on the X profile and the reading on the Y profile would look the same in that case?
A. Well, I don't have in mind how 7-F1 is designed -- you know, described in detail in the patent, so I can't -- as to that part of your question, I'd have to go read the patent and see how they described it. But if you want me to characterize it, I'd be happy to do so, but if you want me to characterize what's in the patent, then we've got to go look at the patent.
Q. Well, I want you to answer the question based upon your understanding of the -- of what's described in the '352, and all I'm simply asking is if I reverse the position of the fingers, left one is lower, right one's higher, all else equal, the X profile will look the same as it does and the Y profile will look the same as it does.
Would you agree with that?

A. The X profile's unchanged because the X position of the fingers is unchanged. The Y profile, assuming that I then put them in the identical locations in Y but transposed, then the Y profile would remain essentially the same, too, at the first order of what we're talking about here.
Q. Now, if instead -- if instead I had a touchpad of the type shown in Exhibit 5, which you have in front of you, this was the article that was referenced in your report, if I were to generate something that looks like figure 3 of that article with these hills that we described, if I move the fingers, the hills would actually move as well, wouldn't they?
A. Well, the hills move here. It's just that the particular profiles of the hills in question, it appears from this kind of particular hypothetical, happen to be the same.
Q. My question is, looking at figure 3 of Exhibit 5, if I were to move the fingers where the touchpad is being touched, the three hills would move in figure 3 of Exhibit 5; correct?
A. Yes, in general.
Q. All right.
MR. BOBROW: Let's mark this next.
(DEPOSITION EXHIBIT 7 MARKED.)

BY MR. BOBROW:
Q. All right, sir. I have handed you Exhibit 7 for identification. Sticking with the nomenclature we used earlier, I'll call this a diagram of a touchpad with the black thick line around the edge representing the edges of the touchpad. And you can see down in the lower left what has been marked in terms of the Y axis and the X axis.
Okay?
A. Yeah.
Q. And what I'm asking you to assume here is that I have traces laid out along the X axis and traces laid out along the Y axis.
Okay?
A. Okay.
Q. And there appear to be nine traces laid out along the X axis and six traces laid out along the Y axis.
Do you have that understanding --
A. Yes.
Q. -- looking -- at this?
A. Yes.
Q. So if my math is any good, and of course it's not, that would suggest then, at least if I'm measuring the intersections of those, I'm going to get, nine

times six, 54 data points; right?
A. That's correct.
Q. All right. Now, what we have done here is at each of those intersections we have put a numerical value.
Do you see those numerical values at the intersections?
A. Yes, I do.
Q. And they range, it appears, from zero at the low end to 4 at the high end.
Do you see that?
A. Right.
Q. Okay. So to begin then, now that we're oriented with that, do you see the point labeled A and the point labeled C?
A. Well, there's an A and a C, and it's not exactly clear which one they're meant to identify, but --
Q. All right. Let me ask you to assume that the A is meant to identify the point that it's a little closer to, I think, which is that point labeled 4, with slightly larger red circle than the ones adjacent to it.
Do you see that?
A. For purposes of clarity, should we just draw

an arrow?

Q. Okay.

A. So A you're representing points to 4?

Q. Yes, and the record should reflect that you've drawn an arrow from the capital A to the dot that has the 4 next to it; correct?

A. Right, because that's the point that you're telling me -- yes, I'm drawing it in response to your identifying the point.

Q. And so there's -- to make sure that there's no confusion on your part, why don't you then draw an arrow from the C to the dot next to the 4 that's by it.

A. All right. So C refers to this point that has a value of 4 that's now indicated here it.

Q. Okay. So now, again, back to the '352 patent claim 1 and Elan's and, as I understand it, your constructions of claim 1, as between the values at A and C, which one of those is the first maximum?

MR. DeBRUINE: I'm going to object here on a number of grounds. It's incomplete hypothetical. It's calling for legal conclusion. This is well beyond any claim construction issue he's here to testify about.

You're now asking him to apply the claim to a hypothetical infringement situation on, as I said, an

incomplete hypothetical and something he has not seen, and frankly, I don't believe that that's what he's here to testify to. He's here to testify on what he was going to say in connection with claim construction, not some hypothetical infringement analysis.

And you know, quite frankly, if you want to ask him some questions on topic, he's happy to stay here, but I'm not going to sit here and have the witness continue to go on and make hypothetical infringement analysis without more of an opportunity -- well, I'm not going to have him do that at all because that's not what he's here to do.

MR. BOBROW: Well, it's certainly not what I'm doing. What I'm doing is I'm trying to understand what his opinions are, and I think I can do that graphically, and that's what I'm going to do.

BY MR. BOBROW:

Q. So I wanted to ask you then, looking at Exhibit 7 and what is laid out there, you have offered opinions on what these terms mean, including "identify a first maxima in a signal corresponding to a first finger."

As between A and C, which is that, according to your opinion and your understanding of that claim language?

MR. DeBRUINE: I raise the same objections. It's an incomplete hypothetical. You're asking him to do an infringement analysis here. You're not asking him a claim construction question, and quite frankly, again, if you want to ask him questions about what his opinion is and the basis, that's fine.

We're not here to, you know, take some abstract diagram that was created by counsel and decide, you know, whether or not without any of the necessary information that it would infringe the claim.

BY MR. BOBROW:

Q. Go ahead and answer the question, please.

A. Well, I think -- let's try reading the question back because there's a long break. So why don't we hear your question back.

If you can read the question back.

MR. BOBROW: I'll just --

THE WITNESS: Reask it?

MR. BOBROW: I'll reask it. Counsel's objections are preserved, too, so we can speed this up a little bit.

BY MR. BOBROW:

Q. I'm simply asking, as between point A and point C, according to your opinions on the meaning of claim 1 of the '352, which of those is the first

maxima?

A. Well, I don't think the claim language in any way relates really to that question directly. And let me explain my answer.

Point A or point C, or when we look at this entire dataset, they are two equal maxima in that dataset, but that's something we're inferring just by looking at it, and whether one or the other is the first maxima at some level doesn't matter.

Q. All right. Well, let me then ask you about your opinions on the second term then, which is identifying a minima following the first maxima, and I believe your testimony is that your opinion is that means identify the lowest value in the finger profile that occurs after the first peak value.

Okay?

A. Well, I'm not sure you're correctly characterizing my testimony, but go ahead.

Q. Well, that's the Elan proposed construction.

Do you agree with that construction?

A. I agree with the construction, but again, you're making a kind of a complicated hypothetical question. Maybe you're losing me on your hypothetical.

Q. No, my -- I'm not even asking hypothetical.

I'm asking is your opinion on the meaning of "identify the minima following the first maxima," is it your opinion that that means identify the lowest value in the finger profile that occurs after the first peak value?

A. Yeah, again, I don't -- now you're asking me -- if it is what it is in the joint claim construction, then yes, I agree with that phrase, and I'm going to check to see that you read the phrase. Right. "Identify the lowest value in the finger profile that occurs after the first peak value."

Q. Okay. So if we assume that A is the first maxima, what is the -- what is the minima following the first maxima according to your opinion on the proper construction of that term?

MR. DeBRUINE: Same objections.

THE WITNESS: Well, I think that part of the problem I have -- I have a problem with your hypothetical in that your hypothetical is trying to suggest that claim language is somehow applicable to data in the abstract. And let me try to explain my idea more fully first, because in a way, I don't think your question's answerable per se because I don't think the question is a fully logical question.

If you're writing a claim which is describing

correct?

A. No. And that's where your failure -- the failure of the logic of the questioning is, in that -- in an actual algorithm with real data there's many cases where you could imagine where you might not meet the limitations of a claim. Right? Because there might be not be any maximas. There might be any minimas.

There could be a completely empty touch screen, and you execute the method that -- which would be one which is as set forth in the claim, but you do not, for one reason or another, meet the conditions of the claim because of the instantaneous character of the data, but that doesn't mean you don't meet the claim limitation at another time or in another execution of that.

And so that's why the construction doesn't -- you're kind of putting the cart before the horse in your question.

Q. Let me ask it a little bit differently.

You have in front of you Exhibit 7. I've asked you to assume that this is a touchpad that is designed to detect the operative coupling of multiple fingers to it, and you can see from the readings and I've asked you to assume those that those readings are

an algorithm, that's not the same as the algorithm. The claim doesn't cause the behavior. The question is if there is an algorithm, does the algorithm meet the claim limitations. And again, we're a little far afield from construing the words in a claim, but even if we have a claim, say it's construed fully, the question isn't what does the claim do but does the -- an action taken by, say, a piece of software firm or hardware meet the limitations of the claim.

So you're trying to apply claim language to a set of data, so the answer has to be -- in other words, if -- the two don't go together. If you ask me to design an algorithm which searches through this data, it may or may not meet those claim limitations. Probably does. Let's say I choose to make one that meets that claim limitation.

But the test isn't -- the claim is not an action per se but a description of an invention.

BY MR. BOBROW:

Q. Well, the claim is a method; correct?

A. Yeah.

Q. And that's a series of steps; correct?

A. In general.

Q. And one of those steps is identifying a first maxima in a signal corresponding to a first finger;

essentially capacitance values, and you have the dataset in front of you.

Assuming that point A is a first maxima in a signal corresponding to a first finger, what is the minima following the first maxima?

Can you answer that question?

MR. DeBRUINE: Objection. Asked and answered. Same objections.

THE WITNESS: Well, again, taking -- this is a hypothetical set of data, and now I'm going to instruct construct a hypothetical algorithm that's similar to one disclosed in the patent. So the first thing I'm going to do is I'm going to sum over each column to generate a profile, just hypothetically.

And those profiles, when I get them, will have different values across the column. So I'm going to just -- for my own benefit, the first column would be 3 in this particular profile, 6, 9. 10 is the second column, and then 2, 3 is 5 plus 4 is 9 in the third column. And if someone sees a math error, please correct me.

1, 2, 3, 4 in this column. And then in this column we've got a 2 and a 1. And this doesn't have to be done this way, but I'm just -- I've made an algorithm.

And then 10 in this next one. 6 plus 5 would be 11 in this one. 8 in this one. 5 in this one.

And then we'll do the other way, which would be 5 in this one, 6, 9, 10, 11 in this one. 4, 6, 7, 9, 10, 11, 12, 13 in this one. 3, 4 and 2 is -- 6, 9, 13, 19, I think, in that one, if I'm right. 11 in this one, and 4 in this last one.

So -- and this is not an exhaustive means. In other words, we could have looked in angular directions or other directions, but I'm, for purposes of my own mental math, making it easy. And this is not necessarily a full explanation of it but an attempt to answer your question.

So if we look at this particular profile and we hypothesize that the maximum point is the 10, then the first minima you encounter after this would be this 4, which is in the -- I'll just mark it there as the indication. That's where the first minima would be or could be.

Q. Well, is it the first minima or is it not the first minima?

A. Well --

MR. DeBRUINE: I'm going to object again.

We're way off on the hypothetical. You're mischaracterizing his testimony. You're again trying

to apply claim language to an incomplete dataset. And I'm giving you some leeway here, but I am -- I'm just going to stop this line of questioning if we can't get to his opinions on -- as expressed in his summary of testimony --

MR. BOBROW: Mr. DeBruine, I'm --

MR. DeBRUINE: -- of what he means the claims mean. I'm not here to waste everybody's time.

MR. BOBROW: But you are.

MR. DeBRUINE: Well, I am not.

MR. BOBROW: So let's -- hold on. You've been going off -- hold on, hold on, hold on, hold on.

You've been putting long, lengthy speaking objections on the record. Okay? That's not permitted, number one. So please stop. Please stop.

Number two, I'm asking him questions designed so that I can get testimony on the record to understand the basis for his opinions which he's made here. I am not tied to the four corners of his report, period. And so I am asking him questions that are designed to get at his understanding of the claims on which he's opining, and I can do that through a graph. I can do it through any number of ways.

Now, I'm not going to sit here and have you burden the record with long, lengthy speaking

objections. If you have an objection to this line of questions, you can make it, but that's it, and otherwise, we're going to have to go to the magistrate judge and get some help on this, because it just can't keep up this way.

MR. DeBRUINE: Well, we might have to because -- let's just -- let's do that. Let's just stop this hypothetical. It's well beyond what we're here. This is not -- you're having him apply -- you're having him do an infringement analysis, not claim construction. And let's -- you know, let's get to what we're here to talk about.

MR. BOBROW: Well, I am doing that.

MR. DeBRUINE: When it comes time for him to opine on infringement, he will give that report and you can take his deposition on that.

MR. BOBROW: Well, that's -- I am asking him questions that are designed to understand the basis for his opinions and what he means by the words that he's chosen, and I think, therefore, that I'm certainly free to ask questions in this way and want to continue to do so.

So either -- let's either proceed -- and I'd like to ask some questions in that regard. If you've got some issue with it and you want to shut this

deposition down and allow us to then -- we'll move for sanctions for that, then we can do that. But I think you should permit me to go ahead and ask my questions on this exhibit, and if you have a problem with that at some later time and you don't think it's relevant, you can make those arguments. But right now this is an expert witness, and I'm asking for the basis for his opinions, and I'm allowed do that.

MR. DeBRUINE: No, you're asking him something completely unrelated to any of the bases he's stated anything to do with -- you're giving him an incomplete hypothetical and asking him to do infringement analysis.

MR. BOBROW: But an incomplete hypothetical --

MR. DeBRUINE: He didn't do any of this sort of analysis. There's no indication that this was the basis for anything that he's stated with regard to how the -- what the claims are.

MR. BOBROW: But that doesn't limit my ability to ask questions about it. I can ask him whatever questions that I want that are designed to lead to admissible evidence and that are related to his report.

This is related to his report.

MR. DeBRUINE: It's not related to his report. This is something you've created from whole

cloth that you're asking him here to come up with brand-new opinions on something he's never seen before.

MR. BOBROW: Regardless, that's something that I'm allowed to do. I don't need to simply put his report in front of him and ask him to parrot it back to me. I can ask him questions that are related to it, and this is. I'm trying to get his testimony on his opinion about what it means to identify a minima following the first maxima.

All right?

BY MR. BOBROW:

Q. So I've asked you to assume, as an expert, someone who's been proposed as an expert in this case, that there's a first maxima that's defined by that point A, that's defined by the intersection of those traces that define that point which has the 4 and the A next to it.

Okay? That's the first maxima.

Do you understand that?

A. Yes.

Q. Okay. And it's defined by -- and I've measured that according to the intersection of those traces?

Okay? In the X trace and the Y trace. Okay?

Do you have that?

A. You're asking me okay to what?

Q. I'm asking if you understand that.

Do you understand it?

A. I understand you perfectly well, sir. You don't need to be obnoxious.

Q. I'm not trying to be, and certainly you asking me that question is going in the wrong direction in obnoxiousness as well, so let's continue.

MR. DeBRUINE: Tell you what. Let's just take a break and cool down.

MR. BOBROW: No, no, no.

MR. DeBRUINE: Yes, because --

MR. MEDLOCK: No, the tempers are flaring.

MR. BOBROW: Please. You're not of record here, sir.

The question that I have is simply this: I wanted to know whether this witness understood what I'm saying by the number 4 as being a value that's being measured and sensed at that intersection of that X trace and Y trace. That's all I'm asking.

THE WITNESS: Well, the diagram shows in this hypothetical, and I think there's no question about that, that you've noted that it has a value or a red circle with a magnitude of 4, and for our hypothetical we're assuming that that reflects a capacitance

measurement taken at that location in this grid which somehow has a value of 4 equivalent hypothetical value.

BY MR. BOBROW:

Q. After all these objections, I was just trying to make sure that you and I are back on the same page.

Okay?

A. That value -- and we've designated that value, just to make it clear, A.

Q. Fine.

A. Letter A associated with it.

Q. Good. Thank you.

Now, what I'm trying to do is understand your opinion that this claim language in claim 1, the language about "identify a minima following a first maxima," means identify the lowest value in the finger profile that occurs after the first peak value.

So my question to you is, in this array I'd like you to do that for me and identify the lowest value in the finger profile that occurs after the first peak value.

A. Okay. And I think we're going back to my previous response that -- as I noted before, the claims per se don't specify an algorithm. So I made an algorithm, which I then executed as if I was the computer, which computed from this array of data

profiles. I made a profile. I chose to do that. It's not inherent in the claim necessarily, but I chose to make a profile a particular way, which was aligned with the axes.

And so I calculated a profile for X and I calculated a profile for Y, and hopefully my profile numbers are correct and I didn't make a math error, but assuming that I made the correct calculation and assuming the assignment or choice of the point A as the first maxima, then -- and assuming my algorithm works a certain way, a particular, you know, one of many ways it could work, then the following minima after the maxima, is my profile reads 3, 10, 9, 4, 5, 10, 11, 8, 5 and increasing X.

So if I start at the second value, which is 10, which corresponds to the point A, then the minima, the following minima is 4, which is -- the 9 is decreasing, the 4 is the minima, and then it starts increasing again.

Q. And why is that a minima? Why is the 4 the minima there?

A. Because as I described earlier, a minima means a value which is locally smaller than the values around it. So for this particular case, if we look at the value for this element that has a value of 4, the value

to the one side of it is 9 and to the other side of it is 5. So it's less than -- 4 is obviously less than 9, and it's obviously simultaneously less than 5.

So it would be a minima.

Q. All right. I think I understand. Thank you.

Now, let me ask you to -- let me ask a little bit differently then. Let me ask you to assume instead of doing an algorithm where you sum all the values, that you don't sum them, that you simply look at these different values and you read them out.

And so in that case, if I have 4 as my first maxima, what is the minima following the first maxima?

MR. DeBRUINE: Objection. Incomplete hypothetical, calls for a legal conclusion.

Again, you're sitting here asking the man to take your dataset and -- well, that's my objection, and if this continues longer, we are going to have to call the magistrate, because this is just a waste of everybody's time.

THE WITNESS: In order to answer your question, again, the claim language per se doesn't specify the algorithm, and there's lots of ways you can generate the profiles and you can generate a set of profiles. I mean, a practitioner would know how to do that.

So again, looking at this hypothetical, I'm not sure I can just come up with what would be the one, because I'd have to evaluate some algorithms, think about it and come up with a way to do that and then see if the claim met it.

I mean, it's not the -- claim language doesn't make algorithms. You compare algorithms to claim language.

BY MR. BOBROW:

Q. All right. So let me ask you to assume then that the algorithm consists of two parts. One part is that I'm not going to sum the traces, but I'm just going to look at the intersection of points. So I'm not going to do what you did by summing up those values that you've written along the different axes.

And the other part of it is that I'm going to identify the lowest value in the finger profile that occurs after the first peak value, which for purposes of the algorithm is point A.

So with that in mind, what would be the minima following the first maxima?

MR. DeBRUINE: Objection. Asked and answered, incomplete hypothetical.

THE WITNESS: It depends which way you go. It could be -- I mean, it could be a lot of ways,

depending which way you -- in other words, once you've taken out the specification of one particular way of doing it, then there would always be one, but in this example there would be a -- I mean, there could be a variety of them.

BY MR. BOBROW:

Q. All right. Let's take a look at the '352 patent.

Now, you have seen in the patent that there are any number of what the patent calls finger profiles; correct?

A. Yes.

Q. Including figures 3 and 4; correct?

A. Yes.

Q. All right. And then there are additional profiles in figure 7A, B, et cetera.

Do you see what I'm referring to there?

A. The finger profiles are -- yeah, there's 7 -- I don't know. I'm not sure there's one in 7A, but -- 7A just looks like fingers mostly, but 7B has some profiles. 7C has profiles. 7D has profiles. 7E has profiles. 7F-1 has profiles, and 7F-2 has profiles.

Q. All right. And would you agree with me that the profiles that are shown in the '352 are profiles that are taken along an axis, either the X axis or the

X axis of the touchpad?

A. Yes, the example profiles that are shown in the drawings are on the X and Y axis.

Q. And are there any profiles that are shown in the '352 patent that are shown in a sort of two-dimensional XY matrix of the type that we saw in Exhibit 5 to your deposition, which has figure 3 in it from your report?

A. Well, a profile is -- a profile is a profile. I think I've said that before. A profile is a -- in essence, a view of data from one -- like a slice almost through it or from one direction.

So the drawing we're referring to here, which is from --

Q. Exhibit 5.

A. Exhibit 5, is it? That has a two-dimensional diagram showing capacitance against a plane. That's not a profile.

Q. I see. Okay.

So the figure you have in front of you, this figure 3 with the hills, that's not a profile?

A. No, that's a prospective view of a kind of two-dimensional set of data. It's not a profile.

Q. I see. All right.

And so then if I've got this right, then the

figures in the '352 patent show finger profiles that are taken on an axis, correct, either the X or the Y axis?

A. The pictures that we've just discussed in the patent show a particular way of profiles that happen to be made with perpendicularity to the two axes of X and Y.

Q. And the patent says that you can also take those profiles along other axes or other angular directions; correct?

A. Right. Let me -- I should probably try to find the exact wording what it says.

Q. It's at column 11.

A. Thank you.

Q. At lines 11 to 15.

Do you see what I'm referring to there?

A. I do, but forgive me for a second here. I'll grab my glasses.

Right.

Q. And so that paragraph, column 11, lines 11 to 15 is saying that in the foregoing examples, we've identified maxes and mins in the X and Y directions.

You could also do it along a diagonal or some other angular direction; correct?

A. Correct.

Q. So I could take a profile, for example, instead of in the -- along an X axis or Y axis, perhaps I could do it along a diagonal -- or diagonals through the pad as well; is that right?

A. Right, or really any arbitrary angular orientation through the dataset.

Q. Now, you -- we were talking earlier, looking at Exhibit 6, which is figure 7-F1, and we talked about, for example, the X profile there.

Do you recall that?

A. Yes.

Q. Okay.

A. I was just trying to locate that exhibit here. It's somewhere in the --

Q. Looks like it's right here.

A. Ah. Thank you.

Q. And one of the things that I'm trying to understand in terms of your opinions in the case is what is being represented in these profiles.

Okay? Such as the one shown here in the X profile? Okay? So that's the topic I want to come back to.

All right?

MR. DeBRUINE: Could I have that question back?

MR. BOBROW: I'm just simply trying to orient the witness.

BY MR. BOBROW:

Q. I want to ask you some questions about what is being shown in the X profiles and the Y profiles, what's going on there.

And if I understand what you're saying, that in the X profile there are shown various capacitance values; is that right?

A. We're back to figure 7 and the other profiles, and these profiles are representative or describing the capacitance value along the axis of the profile, which in this particular case happens to be aligned with the coordinate axis of the Cartesian coordinate system that we're talking about.

Q. And that Cartesian coordinate system that we're talking about, that would include an array -- for the X profile that would include electrodes or traces, I think we were calling them, arrayed along the X axis; correct?

A. Well, they're arrayed perpendicular -- the X profile would be constructed from traces that were perpendicular to the X axis and potentially, potentially they're coupling to traces on the Y axis.

Q. So is there anything in the patent that

describes the values there being coupled to the ones on the Y axis, that that's what's being measured and shown here in the X profile?

A. I think the practitioners at the time were certainly aware that you could have that data as part of the dataset.

Q. That's not my question. My question is, is the patent describing the values in the X profile as being values that are dependent in some way on the Y values?

A. I didn't say dependent on the Y values, and you changed the question. So make sure --

Q. I'm asking -- I'm asking a new question.

A. Okay.

Q. I'm asking you whether there's anything in the patent that describes the values in the X profiles that are being shown as being in any way a function of or dependent upon the values of any of the traces in the Y axis.

A. I'd have to look.

Q. All right. Why don't you take a minute to look for that.

A. Okay. I'm not sure I can do it in a minute, but I'll do it as quick as I can.

Q. Let me ask you before you look.

Sitting here now after the preparation that you went through for the deposition and after preparing your report, do you recall any instances in the patent where the patent describes the values in the X profile as being in any way dependent upon or a function of any of the values on the traces in the Y profile?

Do you recall that?

A. No, but it may not be phrased the way you just phrased, and the -- I mean, the -- it's impossible when you're preparing for a depo to know every question the guy might ask. So you're not necessarily looking for the answer to that question.

Q. So let me ask another question, and then we'll see if you still need to look.

Would you agree that when the patent is describing the profiles being generated from the X direction conductors in the sensor array, that it describes one value per trace and not multiple values per trace?

A. Again, you're asking me a very specific question about what's in the contents in detail of the specification of this patent, and it runs for multiple pages, and I don't have it memorized. So the only way I can accurately answer that question is go look.

Q. So as you sit here now, do you recall anywhere

in the patent where it describes the values shown in the traces as being anything more than a single value from that trace? Do you recall that?

A. Again, you're asking me, you know, do I recall looking -- I don't recall the patents line by line, and if you want me to give you an accurate technical answer does the patent talk about that, then I'm going to look.

If the question is do -- off the top of my head do I think it talked about that, you know, that's kind of wild speculation, and I can't really give you a do I -- you know, I don't know. I wasn't thinking about that at the moment, you know, I looked at it.

Q. All right. Are you familiar generally with the algorithms in the '352 patent?

A. Yes.

Q. Okay. And would you agree with me that in the algorithms that are shown in the '352 patent for detecting fingers, that the algorithm begins with an algorithm that determines the first maxima?

Would you agree with that?

A. Again, you're asking me a line of, you know, questions about what exactly it says. You know, I'd be happy to look.

Q. But you can't answer that without looking; is

that true?

A. I imagine it does, but again, you're trying to ask me, you know, when it describes the algorithm, and I can locate here in minute where it starts describing the algorithm and how they talk about it in the description.

Q. All right. Why don't you take a moment and -- to see if you can answer that question based upon your review. And the question is whether the algorithm described as the first step identifying a first maximum before a minimum is being identified.

A. Okay. In the exemplary case, if we look a little bit about the algorithm in X, for instance, then -- in this example, then in fact, it starts looping an X, and if we turn to the flow chart, it tries to determine if the state is at a peak. That is, if we found a peak. And if so, then we set the state, and then we set the state next to looking for a valley.

And if you reference figure 9-1, which is the description of this kind of X compute process, the first state you go into is you're looking for a peak, and then the next state you go into is you're looking for a valley, and then if you found that, you go, "Are we looking for a peak again?"

Q. Are there any algorithms described in the '352

patent that do it other than looking for a peak and then a valley and then a peak?

A. There's -- I don't think so. I mean, I don't think there's a -- I mean, there may be a kind of a caveat that says then you can do it another way, but the actual set-forth algorithm is -- the example they're describing is that way of doing it.

Q. And is the idea behind peak, valley, peak, that sequence, to look for the first maximum and then the minimum and then the second maximum?

A. Right. That's the example they're giving. That's the way it's being done in that example.

Q. All right. Back to my other question.

Can you tell me whether there's any description in the patent of identifying multiple values along any single trace along the X axis?

Is there any description in there that that's what's being done in the patent?

A. Well, again, you're asking me anywhere, any way, and, you know, I haven't been asked to really look for that in a sense. So to the extent that, you know, somebody brought the question before me and said, you know, can I identify that, you know, if it was an enablement question or something, then I would go do analysis in a correct way.

I don't think it's productive to sit here and spend the time to read through the whole thing to ask me to form an opinion of whether or not there's a disclosure of that or whether or not there's a discussion of it. I mean, I can if you want.

Q. All right. Well, I guess we've been through this before, but let me just confirm.

So without looking at every word of the patent, you do not recall anywhere in the patent where it says that for any given X trace, multiple values are being derived from that trace?

A. Well, it's in the scope of the knowledge of a practitioner, so, you know, it's something that the people knew how to do at the time. And so to the extent that practitioners know about it, in other words, the guy doesn't have to explicitly say it's something that people already know how to do.

Q. Not my question, though. My question is whether it was said, and what I'm trying to understand is whether you'd need to read the entire patent to know that.

A. I don't recall offhand whether the guy says, you know, you can sum down a trace. I just don't recall.

Q. All right. Let me go back to the algorithms

again then.

Are there any algorithms that are described in the '352 patent that describe identifying two maxima and then after that identifying a minima?

A. Well, you can identify -- I think one of the things they say is you can do it simultaneously. That is, you can identify -- it notes that you can do this -- this process can be performed sequentially in either order or concurrently.

Again, I mean, the example they give is one particular example, and I haven't looked at this to think is there support for other ways of doing it. I mean, I think practitioners would know other ways to do at the time, but do they explicitly set an algorithm and say you can do it this way and do it that way? I don't know. I have to go looking.

Q. So my understanding --

A. We're not setting out an example like example -- first example, second example, where the second example is big, long description of that kind of scenario.

Q. My question simply is, is there a description in the patent that you're aware of that describes an algorithm whereby you identify a maximum and then you identify a maximum and then you identify a minimum?

Max, max, min.

A. Again, I haven't looked at it in that way to see is that being disclosed. So I'd have to go do that.

Q. All right. Well, why don't you review the algorithms and tell me whether or not based upon that review there's an algorithm described that -- for identifying a maximum and then identifying a maximum and then identifying a minimum.

A. Okay. In the case where -- there's a description in numerous places of multiple fingers, including three. Clearly in the case when you have three fingers down you're going to have a different pattern of maxima and minima. You're going to have three maxima and two minima. And so it's likely that you will have found the answer to your question the second maxima before you find the third minima.

Q. My question was whether or not there is an algorithm that describes identifying two maxima and then finding the minima. Max, max, min.

A. I don't think it's set forth, but I mean, I don't see that as a -- that it's necessary to set that forth.

Q. In the review that you did over the last few minutes, you didn't see that algorithm; is that true?

A. I didn't see them describing explicitly saying, look, you can go out and identify all the peaks and then -- except to the extent they're saying you can do it concurrently or in parallel, where of course you inherently identify all the peaks and all the minima in the single action.

Q. And where does it -- let's turn to that topic.

Where does it say that you can essentially concurrently identify all the maxes and all the mins at the same time?

A. Back up. Well, if you sense all the available points at once, then you know inherently you've detected all the maxima and minima at the same time.

Q. And by doing that, have you identified them all at the same time?

A. You could.

Q. No, my question is, is the mirror detection of all those values at the same time, is that the same thing as identifying some of those values as maxima and other of those values as minima at the same time?

A. Yeah, you could threshold them and do that, yeah, sure.

Q. What does that mean?

A. If you had a threshold level of the sort they talk about where they're looking at peaks and valleys,

again, you're asking me could you or does -- part of what a specification discloses to a practitioner is different maybe than what it states on the surface because you come to with a body of knowledge in your head about how these things work.

So clearly you could -- when you do the thresholding step, you could mark everybody above threshold and just call them peaks. Right? And anybody under is not a peak. I mean, you can certainly do that, and you'd have a sort of a flash of who all the peaks were.

Q. And by doing that, does that identify the areas of the peaks that are the maxima and the areas of the peaks that are the minima when you do that?

A. Well, it identifies the maxima. I think your question was on the -- and you could do the same thing for the minima. You could have knowledge instantaneously of all the maxima and all the minima.

Q. So where was it in the patent, by the way, that you said that it was describing identifying all the maxima and all the minima simultaneously?

A. Well, actually, what I --

MR. DeBRUINE: Objection. Mischaracterizes his testimony.

THE WITNESS: Yeah, I didn't say that.

What I was noting was that -- several things. First, a practitioner would know you could sense simultaneously, which means you would have the profiles for the purposes of the discussion instantaneously.

That is, they're not necessarily a process whereby you're doing that as a sequentially temporal process but just doing it.

And I think they note here that you can do the -- in this particular sort of algorithm example even, that you could do it sequentially in either order or concurrent. The Y compute loop is performed similarly as noted above. Depending on the particular arrangement desired and the associated --

THE REPORTER: Slow down.

THE WITNESS: Sorry.

-- and the associated hardware, the X and Y compute processes may be performed sequentially in either order or concurrently.

BY MR. BOBROW:

Q. All right. So you were reading at column 11, line 6 to 10?

A. That's correct.

Q. So is that paragraph that you just read, column 11, lines 6 to 10, is that saying that you identify the maxima and the minima all at the same time?

A. Well, it's saying that you can perform them concurrently, and again, a practitioner when you're describing an algorithm, you're describing it for purposes of the concept. The practitioner knows there's lots of ways to code that thing.

Q. And so is the answer yes, that that language in column 11, line 6 to 10 is saying that you can identify all of the maxima and all of the minima at the same instant in time?

A. Well, again, it says the X and Y compute processes may be performed sequentially in either order or concurrently, and so if we look at these two processes that, in essence, you're taking I could do it sequentially or concurrently, and I think that to a person who's writing one of these algorithms, they don't necessarily -- there's no necessary constraint. I mean, you describe it one way, but don't have to necessarily compute it in the same way that the description of it is.

Q. But the description of the X compute and Y compute processes that are being described in that sentence at column 11, lines 6 through 10, those processes describe a sequence whereby you first identify a max and then you identify a min and then you'd identify a max; right?

A. Right, but again, I think that the algorithm is explaining a relationship between the parts of this dataset, and it's not intended in the way it's described -- we often describe even as algorithms in a temporal sense, but you don't have to do it in the same order that it's being described there.

Q. But my question is, is that it in the patent it's described in the order I said; right? Max and then min and then max; correct?

A. Right, because the example they've chosen, that makes sense for the example they've chosen.

Q. And that's true for both the X compute and for the Y compute; right?

A. Right.

Q. So when it then says here that you can do the X compute and the Y compute, compute sequentially in either order or concurrently, that's still saying that you're going to first compute the max and then followed by the min and then followed by the next maximum; correct?

A. It's giving you an example of that's one way to do it, right.

See, I don't think that -- I think there's kind of a suggestion in the question that the algorithm

described in the patent only informs the practitioner, gee, I've got to do it the same way. But I think to a software engineer reading that, it's more like describing the result, not the fact that I got to execute it in the same way.

Q. So you're saying one of ordinary skill back in 1996 when this patent was filed would read that paragraph in the context of the rest of the patent and read that as being a disclosure that you could instantaneously at the same time identify the maxes and the mins; is that right?

A. No, my statement earlier was that a practitioner at the time would just flat know that already. He doesn't need to be taught anything by this patent to know that you could do that.

Q. And is it your testimony that this paragraph in column 6, lines -- sorry. Let me start again.

Is it your testimony that in column 11, lines 6 to 10, that that paragraph is a suggestion or a description of doing that?

In other words, is that saying to the practitioner, you should go ahead and calculate all the maxes and all the mins at the same time, at the same instant in time?

A. Again, I think the practitioner already knows

that he can do that, and so trying to characterize what this particular phrase meant, you know, this guy is just sort of describing another aspect of it, that you could do it in any order, could do it concurrently, you could do it in different orientations.

I mean, he's kind of giving you the -- I don't think he's saying it's the only way you could do it. He's just saying you could do it other ways, too.

Q. You mentioned a while ago that the patent was discussing how you could sense the values on the X traces and the Y traces simultaneously.

Did I get that right?

A. Well, I think my statement was that a practitioner would know you could and there's no inherent concept that you've got to, you know, sequentially read a set of data points off the surface, and I think there's a -- there's an example here that suggests if we have a multiplexor, that in fact you're sequentially reading them and selecting and reading them in a one-at-a-time kind of a fashion.

Q. You're referring to figure 2?

A. Figure 2 shows a multiplexor. But again, in the scope of what people know how to do this, there's no inherent reason you can't read this stuff in parallel.

Q. All right. So let me try to break this down into smaller bits.

So as you look at figure 2, you understand that to be a description of a situation where you would first do your sensing in the X direction and then do your sensing in the Y direction on -- is that right?

A. No, not necessarily.

Q. I thought you were saying that the presence of the multiplexor suggest that to you.

Did I misunderstand you?

A. Yes, you misunderstood me. A multiplexor suggests a -- a multiplexor is a device that selects from a variety of inputs to a single output. And so it's sort of schematically shown here by the fact that there's multiple lines coming in and one going out. And the idea being here that you have a single digital-to-analog converter and that you're, you know, converting one signal at a time.

So in this particular case the multiplexor is going to read either one of the Y direction conductors or one of the X direction conductors at a time. Right? So you're -- and whether you go XYXYXY or YYY, XXX, or some arbitrary pattern is not relevant.

Q. Is there some description in the patent which says that you would, as you were just saying, read

these conductors at the same time and, you know, sense at the same time?

A. Well, again, I mean, I'd have to go looking in detail to see if they're kind of saying you could do it that way or there's another -- the particular exemplary case they're showing, at least in this diagram if we look at it that way, is a case where you've got a multiplexor. And that was kind of a common choice because it cuts down on the number of circuit components you're having to do the conversion.

So it's not an uncommon idea to multiplex, and you might multiplex over some subset of the traces because you might identify the region that was of interest.

Q. But the presence of the multiplexor is then suggesting to you that you're reading these things out in sequence as opposed to doing them all at one time?

A. Well, this drawing is showing a multiplexor, so the design you're seeing, kind of this example sitting in this picture, is where you're reading them sequentially over time.

Q. And the question I have, and if you tell me that you need to read the whole patent to answer it, just tell me that, but the question I have for you is, is there a description in the '352 patent of sensing

all of the X conductors and all of the Y conductors at the same time?

A. No, I'm going to give you the same answer I said a couple of times, which is I'll go look if you want, but I don't memorize the details of every particular query you might make about a particular patent.

Q. Okay.

MR. DeBRUINE: Mind if we take a break? We've been going about an hour and a half.

MR. BOBROW: Sure. Let's just finish up on this one topic, if we may, and then we'll take a short break.

BY MR. BOBROW:

Q. You had earlier talked about the concept of sensing these various conductors simultaneously.

Do you recall a few minutes ago you talked about that subject?

A. No, but keep going.

Q. All right. Well, let's go at it this way then: Is sensing a conductor, is that the same thing as identifying whether there's a max or a min that corresponds to that conductor?

A. Not necessarily. Could be.

Q. And when you say "not necessarily," why do

you -- what do you mean?

A. Because you could -- there's lots of different ways you could implement this type of device, and you could, for instance -- for each of the conductors you could detect the capacitance, you know, was coupled to it, the multiplexor or whatever, measure this capacitance that's present on it and then put them in an array and then compute based computationally on that data.

Or you could, if you wanted to, build yourself a circuit where some number of inputs were processed in parallel, and you could, for instance, have a row of comparators that if the capacitance crossed the threshold on that trace, you say, okay, I'm below the threshold. And in that hypothetical design you'd have kind of an instantaneous detection of, you know, things that cross the peak threshold, say.

So there's different ways to do it. I guess I'm not -- we're kind of crossing between discussion of what ways could be done, what a practitioner might know looking at this, right, because a practitioner has a body of knowledge which is much greater than this patent. So they might look at that and say, "Oh, yeah, I can do it that way," or they would know a variety of design choices.

Q. Is there -- let's finish up on this topic, and then we can take our break.

Is there any description in the '352 patent of that type of technique that you described, where you're doing these things in parallel and you have these comparators and then you essentially at the same instant in time both measure the capacitance values and at that same time determine whether they're maxes or mins?

A. Again, he's not talking about that particular type of thing in his example here, so I doubt there's a direct kind of, you know, two paragraphs are saying, oh, you can do that way.

Q. "He" being --

A. "He" being the inventor -- "he" being Bissett or --

MR. BOBROW: Okay. Fair enough. Why don't take our break.

THE WITNESS: Or Kasser.

THE VIDEOGRAPHER: We're going off the record at 2:17 p.m. This marks the end of tape No. 2.

(RECESS TAKEN.)

THE VIDEOGRAPHER: We're back on the record at 2:33 p.m. This marks the start of tape No. 3 in the deposition of Robert Dezmelyk.

BY MR. BOBROW:

Q. Sir, in the summary of your testimony and opinions, Exhibit 2, you make reference in there in the context of the '352 patent to something called a data structure.

Do you recall that?

A. Right. Let me find it. If you know the location we're talking about here, that would probably be helpful.

Q. Paragraph 27 as it runs over to page 12. And you talked about having X values and Y values as sort of a data structure.

Do you see what I'm referring to there?

A. Okay.

Q. So can you tell us just in general terms what you mean by a data structure?

A. Well, the general ideas of a data structure, as software engineers we frequently have to organize data and memory. So we term that organized group of data a data structure. So for instance, an array is data structure, where you have a set of one-dimensional, two-dimensional, three-dimensional array.

Sometimes a data structure has a more complex form, but it's, you know, like a combination of --

might be a data structure could be the X value, the Y value, you know, the time you gathered that information and two other variables which are held and kind of considered together. That's the terminology behind it.

Q. Now, in the '352 patent, is there a data structure that stores the X values, the values associated with the traces along the X axis?

A. Yeah, I believe so. I think they actually describe it here. Forgive me. I need my glasses, but they actually name an array X, capital X, and there's -- I mean, there's a lot of data structures, but that's probably the one you're referring to.

Q. So tell me, you looked like you were looking at the column of bottom 8.

Is that right?

A. That's correct. Yeah, bottom of column 8 there's a little table that explains some of the variables they're using in this kind of example algorithm.

Q. And what there are you calling the data structure?

A. Well, the term "data structure" would apply to, you know, various combinations of this data, but as an example of what a data structure could be, it would be -- you know, it could be an array like this array of

X information there or it could be, you know, some other kind of data structure. I mean, collection of data elements.

Q. When you're referring to the array of X information, are you referring to the one labeled X, parentheses N, closed parentheses, which stores values in memory of the finger-induced portion of capacitance that's measured on each conductor?

A. Right. That's an example of a data structure.

Q. Are there described anywhere in the '352 patent a data structure that stores values for the X conductors and values of the Y conductors in the same data structure?

A. Well, again, I'd have to look all through the thing to see if there's some description of that, and I don't think there's necessarily -- you may have an array named X, but the data structure could just as well encompass the X array and the Y array.

Q. I'm asking is there any such data structure that encompasses values from the X conductors and the Y conductors at the same time?

A. Well, I think I just said that, but I'll say it again. There's no inherent reason that the array of Xs that's listed here and the obvious arrays of Ys that correspond to them wouldn't together form a data

structure.

Q. That's not my question. My question is, is there a description in the '352 patent of a data structure that stores X values and Y values in the same data structure? That's my question.

A. Oh, okay. But then again, we're going to be looking through, and I'll be happy to do so.

Q. Please do.

A. Well, if you direct your attention to figure 5, sheet 4 of the patent, if you look at the start of the algorithm, the first step 410 says, "scan conductors store in RAM," and at that point presumably the result of that scan is stored in a single data structure, and it says "store in RAM."

And then when it describes that, if we turn to the section of the patent which talks about that, it says, "Referring still to figure 5" --

Q. Where are you reading, please?

A. This would be column 7, line 34.

"Referring still to figure 5, the cyclical process begins at step 400 and continues at step 410 by scanning the conductor sensors. The sensors may be scanned sequentially or concurrently depending on the hardware implementation. The scan process measures the values of finger-induced capacitance for each of the

conductors and stores the values in RAM at step 420."

And then it goes on to do the X and Y compute loop on that data in RAM. And then, you know, subsequently the elements in there, of course, are identified. You've got the X portion of that data, and you've got the X portion, but to the extent that you would call that a common data structure, you know, the flow chart identifies it. It says go grab them and put them in RAM.

And the notion of a data structure and, you know, how connected they are is kind of a, you know, fluid and perhaps tenuous scope of discussion. You could say that, you know, they're next to each other, so they're together. They're part of the same data structure.

You might store them, you know, lots of different ways, but when you're talking about them or when you're describing them, it's probably not material to this whether or not they're stored in one array, two arrays, one-, two-dimensional array. They're all stored in memory together.

Q. Is there -- thank you.

And is there a description of the '352 patent of taking the X values and taking the Y values and then operating on those at the same time together to

identify maxes and mins?
A. Well, I guess that section that would touch on that is the part that we discussed previously. 11, starting at line 6, after a big description of the sort of X variation of this algorithm, the X part of it, it says, "The Y compute loop is performed similarly as noted above, and then depending on the particular arrangement desired and the associated hardware, the X and Y compute processes may be performed sequentially in either order or concurrently."
So you could then presumably operate in X and Y concurrently.
Q. But in the X compute that's described, that algorithm is only being performed -- that processing is only being performed on X values as described in the patent; correct?
A. Right. It's described first for one profile then the other.
Q. Right.
A. And it explains you can do them kind of in any order or concurrently.
Q. Right. And by "concurrently," that means I can run those -- I can run the X compute algorithm and the Y compute algorithm at the same time; right?
A. Well, that would be one form of concurrency.

You could also algorithmically execute it by -- concurrently. I mean, that is, you could have an algorithm that looped in X and Y. I mean, there's no inherent reason that you -- concurrency can mean -- maybe I'm making too fine of point of it.
Concurrency can mean concurrency in execution instruction, meaning I have a dual-core processor, for instance. Or it could mean concurrency in the sense of a software algorithm which does some process which intermixes the both of them.
Q. And does the X compute algorithm that's described in the patent, does that intermix the X and Y values or instead just using the X values?
A. No, the example given for X does X.
Q. I understand.
And when you read that part that says that the Y compute works similarly, did you understand that to mean that for that algorithm that that's an algorithm that's operating on the Y values and not on the X values?
A. Right. In other words, that once you've described the nature of this algorithm, you can clearly apply it to the other profile, and you can understand also that you could arrange your profiles differently and then operate in a similar fashion on other

profiles.
Q. And are you then saying that that phrase that says that you can -- that the X and Y compute processes may be performed sequentially in either order or concurrently, where it says "concurrently" there, that one of ordinary skill in the art in 1996 would understand that to mean that you can put these X and Y values essentially together and operate on them together to identify maximums and minimums?
A. Well, putting it together is a kind of a vague term, but you have the X values and the Y values, and whether you had -- let's take the case of the examples here of the profiles.
You could, kind of using the software terminology, chew through both datasets simultaneously if you wanted to, but there would be no inherent reason not to do that. Or you could intermix them, or there might be reasons why you wanted to do that.
So, I mean, I don't see -- and now applying, you know, a 1996 mind-set, there is no reason that you could not do them in some kind of intermixed concurrent fashion.
Q. And in that intermixed concurrent fashion, would you be operating on values -- we were looking at grids before -- where you'd have, you know, X1, Y1, X1,

Y2, X1, Y3, as it were, are you saying that that would be the kind of concurrent operation that you do such that you would take X values and Y values and operate on them so that you would find values at the intersections of those?
A. Well, that's kind of a difficult question to answer in that you're asking me to sort of characterize a hypothetical algorithm from the past, which -- I mean, there could be a lot of them, and it's certainly possible that a programmer seeing development at that point in time would say, okay, I want to go through, and assuming we're going to stay with this kind of profile case, that I'm going to work on one profile at a time or I'm going to work on both profiles at once so I come out with an answer in one pass-through as opposed to, you know one pass at X and one pass at Y.
But how you do this or -- it's hard to characterize that as mixing them or combining them because you might be doing it in a lot of different ways. You might -- depending on what you're starting with.
If you were starting with a full set of points, that is, an XY array, there would be a lot of ways that you could slice profiles through there, and you'd be more likely, given that dataset, to look at a

broader set of, you know, profiling choices and maybe more likely to do them together.

Q. And is that described in here, or are you saying that one of ordinary skill might know that you'd be able to do that?

A. Well, what I was saying is that one of ordinary skill in the art would know that you could do a variety of algorithms of that sort.

This particular one doesn't go into those particular algorithms. It only sets forth a kind of simplistic case that's sufficient, I think, to explain the idea but doesn't try to say all the possible variations of how you could implement it.

Q. When you said "this one" in your last answer, you meant the '352 patent?

A. I think -- I'm sorry. I don't recall my exact sentence, but I think that the "this" I was referring to would be the particular example algorithm that was used in the '352 patent.

Q. Let me ask you to turn back to figure 2. You testified briefly about this before. There is a box there that's labeled "analog multiplexor," and it's labeled 45.

Can you tell me what the function is of that analog multiplexor 45 in this patent?

A. Well, yeah, let me find where they cite to it first and see what the context of how they're talking about it is.

Okay. I would direct you to -- probably the best place to explain it would be column 5. Let's see. It goes to, like, maybe line 27 after the business about the other patent with the simultaneous sensing, and it says the rows and columns are connected to an analog multiplexor 45 through a plurality of X direction conductors and a plurality of Y column direction conductors 55, one conductor for each row and each column.

"Under the control of a microcontroller 60, the analog multiplexor selects which traces of the matrix will be sampled, and the output of those traces is then provided to a capacitance measuring circuit."

And then they go on to describe some other ways in which people, you know, measure capacitance or cite to, I guess, a patent which describes that.

So the analog multiplexor's role here is to select which of the conductors you're measuring the capacitance along that trace in this particular implementation.

Q. All right. Any other functions that that multiplexor 45 performs besides that one?

A. I have to take a quick scan.

I don't see any at the moment. I mean, that's its principal role certainly.

Q. Can you think of any other function that it performs besides that principal function?

A. That is set forth here?

Q. In the patent, yeah.

A. I mean, I don't see one.

Q. There's another part of figure 2. It's labeled 70. It's called "Circuit to measure changes in capacitance of sensor conductors."

Do you see that?

A. Right.

Q. What is the function of that circuit, circuit 70 in figure 2?

A. Well, 70 is basically, as it's set forth -- again, I direct you to column 5 and about 45. It converts capacitance values from a circuit 70 -- well, the output of 70 is the input -- 70's basically giving you, you know, kind of capacitance to voltage. In this case it looks from A to D it's capacitance to voltage.

And as we talked about before, there's circuits -- there's a variety of circuits which will give you a measured signal based on the amount of capacitance that's presented on a conductor connected

to that.

This particular one, I was using the RC oscillator example before. Since this is, you know, being connected to an A to D converter, more likely it's some circuit which gives you an analog voltage level output that's proportional to the capacitance present on its input conductor.

Q. And are there any other functions that measuring circuit performs besides that one?

A. Well, it's -- I mean, in the broad sense all of these components are part of the total functionality of the device. In other words, their presence and their operation is how you determine if you have contact at all. Ultimately they give the data that lets you determine location of the fingers, you know, how many you have, whether they're touching.

So in the broadest description of their function, they're necessary for the operation of the device. In particular definition of what does it do, that's -- it serves the purpose. As it says, it measures the changes in capacitance in the sensor converters.

Q. And what about the analog-to-digital converter box 80? What's the function of that?

A. Well, again, in the narrow sense it does what

it says it does. It takes an analog signal and converts it to a digital value so you can then process that in firmware in the microcontroller.

Q. What values are those that it's converting from analog to digital?

A. It's converting, in this example here, the value of capacitance of the selected conductor -- the value generated -- the analog value generated by 70, this capacitance measuring circuit, for the particular selected conductor or trace that you've selected with analog multiplexor at that point in time, and it's converting that value into a digital representation.

Q. And then --

A. In the broad sense, again, it's part of the whole functionality of the sensing chain. Without it you're not going to have a functional device.

Q. Take a look, please, at column 11. Around line 16 there's a paragraph that begins by saying in effect that the preceding part of the patent was describing ways of detecting a plurality of fingers, et cetera.

Do you see what I'm referring to there?

A. I see the paragraph, yes.

Q. All right. And then it then says that there's a second portion of the invention.

and 13 and the like, I mean, that's focusing on various kinds of cursor control functions like tapping and dragging, and there was one called "ink."

Do you understand that?

MR. DeBRUINE: I object to the fact you're using claim language from another patent to describe what's in this patent, but ...

BY MR. BOBROW:

Q. Go ahead.

A. Well, I guess it's not simple to try to characterize the remaining body of the patent. I mean, obviously the claims are at the end of it, but apart from the claims, which are also part of the specification, there is -- there's a whole section of text in here, and I don't think I can give you a two-sentence summary of what this section's about. It's part of the whole description of the invention, and it may -- you have to read the whole thing in kind of totality.

Q. Sure. But you've read it in totality?

A. Yes.

Q. And I'm simply asking you whether described in this part of the patent are various kinds of cursor control operations like tapping and dragging and double tapping and three-finger tapping --

Do you see what I'm referring to there?

A. In the second half of the paragraph.

Q. Yeah. And then you've read the remainder of the patent, have you not?

A. Yeah, I've read the entire patent. I mean, obviously I don't memorize it, so let me see what this paragraph's about.

Okay. I understand what the second half -- the second half, just to make it clear, says, "A second portion of the invention involves using the previously" -- there's a typo in the patent. It really means using the previously described or previous detection methodology. It says "previously detection methodology to perform various cursor moment and control functions similar to those well known to users of electronic mice and trackballs."

Q. And then the remainder of the patent there are discussions of things like dragging and tapping and two finger taps and three finger taps and that sort of thing; correct?

A. Right. That's not -- probably not the soul of it, but there's a significant discussion of that type of thing.

Q. Right. And so what that part of the patent is focused on, the remainder of column 11 and column 12

MR. DeBRUINE: Same objection.

BY MR. BOBROW:

Q. -- as part of what's described.

A. Well, again, if you want me to go through the list of every single one of those and check that it's there, I can. In general, one of the things that's covered in this section of the patent is gesture mapping and things of the sort of drag or multiple-finger gestures.

But that's not what -- probably the sole amount of what's in there.

MR. BOBROW: Let's mark this next.

(DEPOSITION EXHIBIT 8 MARKED.)

BY MR. BOBROW:

Q. Sir, you've been handed an article from Robotics Research. We've marked that as Exhibit 8, and first of all, if you can take a quick look at this just to let me know whether you've ever seen this article by R.S. Fearing in Robotics Research from June of 1990 before.

A. I've seen it. I only took a kind of cursory look at it.

Q. Did you take a look at it in connection with your work on this matter?

A. Yes.

Q. I'd like you to take a look at -- it's internal page 9, which is -- has a production number on it, APEL0007549.

Do you see what I'm referring to there? There's a figure that's called "Figure 9 superposition of two loads on finger."

A. Yes, I see the figure.

Q. All right. And as part of your review you saw this figure before; is that true?

A. Yes, but I'm going to have to kind of look at it a bit to see what it's referring to at this point.

Q. All right. Why don't you take a moment. I think that there's a discussion of it that begins on page 8 under 3.2, "Superposition," and goes on to -- goes on from there, onto page 9.

A. Okay. I've had a chance to look it over quickly.

Q. All right. Thanks.

So in this graph on page 9 there appear to be two axes, one called deflection and one called tactel position.

Do you see that?

A. Yes, I do.

Q. And there appear to be -- from this figure there appear to be two probes, is that right, probe No.

1 and probe No. 2?

A. That's correct.

Q. All right. And in the figure there appears to be a graph here, a -- two hills like we talked about before, or two peaks. There's a first peak on the left, and then moving toward the right there looks like there's a valley and then another peak.

Do you see what I'm referring to?

A. Yes, I do. There's actually three -- there's three different sets of data graphed together there.

Q. And one set of data is looking at both the probes; correct?

A. Right. I believe it's the -- it's a little hard to tell, but it looks like kind of a dashed line represents the combined data that you get when you push both probes down against the sensor.

Q. And moving left to right, that combined line that looks like it's somewhat dashed appears to have a first maximum, and then there's a trough or a valley at the low point, and then there's another maximum at the second peak; correct?

A. That's correct.

Q. All right. Now, when you look at this figure, now, by virtue of the fact that I've graphed this, the data here in this way in this article, by doing this

graphing and plotting it in this way, is that identifying a first maximum followed by a minimum followed by a second maximum?

MR. DeBRUINE: I'm going to object that it speaks for itself. Again, you're asking him to apply claim language to a hypothetical device, one he's said he's not familiar with, one that has not formed any basis of his claim construction position. And again, we're getting well off the reservation as far as what we're here to talk about, and it is getting late on a Friday afternoon.

MR. BOBROW: Go ahead.

THE WITNESS: Well, and assuming I could -- assuming I fully understand your question, let me try to explain first a little bit what this is.

This is a graph that shows deflection. It's a force sensor. It's a device that detects the pressure on a set of locations along it. It's got a deformable material, and underneath that -- and it's measuring the deformation of, in essence, a spring when a force is applied to it.

Due to the nature of this compressible material, there's going to be a spreading of the force in that it's not like we're pressing down on a row of pins next to each other, but we're pressing down on

like the table top. So we get a force spreading.

So what they're graphing is deflection versus position. When they poke into the top -- and sorry for gesturing, but there's no other way to indicate the structure.

If this is the top of the sensor and we poke it here and we poke it here, we poke both, then there's an expectation that the summation of the forces would appear in the both case if the force sensor is working correctly.

And this graph shows, to some extent at least, it's a little hard to characterize it in a mathematical or accurate sense, but in a general sense at least it shows the summation of the two forces. And like any line that has -- you know, that moves from left to right that has a certain shape to it, the mountains in the background have that, the papers on the desk probably have that, you can look at it as a human and say, okay, you know, I see a couple peaks, and I see a valley in between.

And so this particular graph does have two peaks and a valley in between them.

BY MR. BOBROW:

Q. And the peaks in terms of the Y direction, that's measuring the deflection; correct?

A. Right, it's measuring the -- it seems to be some kind of percentage deflection. It's probably normalized against the original or something, but in a general sense it's the amount of deflection underneath.

Q. So the higher the peak, the more the deflection?

A. Right, right.

Q. And so by virtue of plotting deflection versus position in this way, is doing that identifying the maximum deflection and then the minimum deflection and then the maximum deflection?

A. Well, the act of plotting it per se doesn't.

Q. Well, does the act of generating the data that is then going to be put onto a plot, is that an identification -- or does that identify the maximum and then the minimum that follows and then the maximum that follows that?

A. No. I mean, you could do that as a part of the collecting of data or you could not do that. I mean, the act of collecting the data alone doesn't necessarily constitute a step of identification or -- it's kind of almost a metaphysical question, but you probably could not identify the peak without gathering the data. I think it would be logical to assume that without the data there's no dataset.

So if we're trying to ascertain the contribution of kind of each step towards a final result, then before you have some information to process or otherwise search through or try to identify features in, you have to have the data.

Q. Well, looking at this figure 9 on page 9 of Exhibit 8, in looking at this plot, can you explain why it is that the graph of deflection versus position here with the peaks and valleys that are shown, why is it that that does not identify a first maximum followed by a minimum followed by a second maximum?

Why isn't this an identification of the points?

A. Again, that's kind of a metaphysical question. The graph itself -- let's make it very clear.

The graph itself was an image on paper, and in and of itself without us looking at it, of course, it's meaningless. But when we look at it as humans and particularly technically-trained humans with a certain terminology in mind, then we can, using our mental processing power, say, look, that's a -- you know, that's a peak, that's a valley and that's a peak.

The same thing is true in -- you know, now we're going to sound like our questioning is going off into philosophy or metaphysics or something, but the same thing is true with topology in general.

I mean, you know, it sounds silly to even say this, but, you know, does a hill or a valley exist if you're not observing it? Right? And clearly in these cases you have to gather the data, and then you have to make some analysis of the data. It just so happens we as humans can look at this picture and say, "Oh, yeah, I see a peak and I see a valley."

Human vision's exceptionally well skilled at detecting features.

Q. In the context of the '352 patent, which has a method whereby you identify a first maximum and then you identify a minimum and then you identify a second maximum, and obviously I'm paraphrasing there, but in the context of identifying those three things, would you agree with me that this figure 9 on page 9 of Exhibit 8, by virtue of having measured, collected the data and then graphed the data in the way that it does identifies a first maximum point of deflection, and then it's followed by a minimum point of deflection and then a maximum point of deflection thereafter?

A. No.

Q. Why not?

A. Because again, the graph doesn't identify anything. The graph sets forth a set of data, and that identification process is something that we can do looking at it or a software algorithm could do faced with the set of data. If it was given that set of data and applying a signal processing procedure on it, you could, in fact, make that type of determination, but the graph in and of itself doesn't do anything of the sort.

Q. So what would you need to do to the data that has been graphed in figure 9 of Exhibit 8 in order to identify the first maximum and the minimum thereafter and the next maximum as you've interpreted the words of claim 1 of the '352 patent?

A. Okay. That kind of a complicated hypothetical.

If we -- the best way for me to answer that is say that this profile from a completely different type of sensor has an amplitude corresponding to position, and as such, it has the same general character as a function as the X profile that we talked about earlier. And so you could apply the disclosures of the '352 patent, and you could apply the same type of algorithm disclosed there to any series of data, and you would then locate -- you would have a result of finding the peaks and the minimums.

You would -- you could -- if you used the same algorithm that's disclosed in the patent and fed it data from other sources, then like most algorithms, it would be expected to have similar behavior. In this case, this particular example data is very similar to the profile data we talked about earlier.

So if we fed in the same numerical quantities into the algorithm, we would get a very similar result, probably an identical result if the numerical values were identical to the ones fed in the example case.

Q. When you say "the example case," you mean, for example, figure 7-F1 where -- looking at the X profile with the two peaks and the valley in between?

A. Right, right. But that's simply true with any set of numerical data which has the same shape, although, of course, what it meant would be completely different, but -- or perhaps it would be completely different.

Q. Well, back to the '352 patent then.

For the X profile case where you've got shown graphically along the X profile a first peak and then there's a valley thereafter and then another peak, isn't it true that the patent tells us that very peak structure by itself is identifying and indicating the presence of two fingers?

A. Well, I think the patent is telling us how we can apply techniques or a set of techniques or a technique to ascertain how many fingers are present given that nature of type data. In other words, a method for doing so.

I mean, the exemplary example is a particular example of how to determine in this instance if you have two fingers being present.

Q. So if I have the data that's shown in figure 9 of Exhibit 8, why is it that I need to run some sort of algorithm on that to determine the first maximum followed by the second minimum followed by the second maximum to identify those maxes and mins?

Why do I need to do that --

A. Well --

Q. -- for purposes of claim 1?

MR. DeBRUINE: Vague, incomplete hypothetical.

THE WITNESS: Yeah, I'm not sure that question makes an awful lot of sense, but --

BY MR. BOBROW:

Q. Well, let me try again.

We have figure 9 of claim 1. It has a particular shape. It's plotted on certain axes. As you described, it has a shape that's similar to, say, profile X -- X profile in figure 1 of the '352 patent.

Is it your testimony that I need to put this data through some sort of algorithm and process it further in order to, quote/unquote, identify the first maximum, identify the minimum and identify the maximum in order to meet claim 1 of the '352 patent?

MR. DeBRUINE: I've got to go back to the objection that we got into earlier. You're now asking him to take some incomplete hypothetical, some research paper and say whether or not it meets the claim limitations of the '352 patent.

Again, that is not why we're here. All right? He did not rely on this particular article in arriving at any of the opinions that he's expressed.

Whether or not you can read the '352 patent on this or that you can use the '352 patent in some way in this data is completely irrelevant to his understanding of what the claim terms mean, and if we continue down this path, we are going to have to talk to the magistrate. Because again, I've given you a lot of latitude here, but if you have questions about his claim construction opinions, you've got three more patents we haven't even talked about, and it's getting late.

BY MR. BOBROW:

Q. Go ahead.

A. Well, I'm going to try to summarize the question as I understand it, because it was kind of complicated question and I think it's -- if I'm wrong, then I'm sure I'll get corrected.

But you're asking me in a way to apply claim 1 of the '352 patent to the scenario described in page 9 of Fearing, this superimposition of loads diagram. And I guess I've got to say for starters that Fearing is not a touch sensor of the same sort. This is kind of a completely different contraption.

What it is is a robot gripper, and here the sensors on the fingers and the loads are external physical objects. So we're kind of in a completely different world where claim 1 has nothing do with this graph, because when we start here, we've got -- I mean, the claim says, "a method for detecting the operative coupling of multiple fingers to a touch sensor," but in this case the sensor, this pressure sensor contraption, is part of the finger, and the finger belongs to the robot.

Q. But that isn't my question.

A. Well, no, you asked me to apply the claim to it, so I guess what I --

Q. No, I didn't. No, I didn't.

What I'm trying to do is understand what your

interpretation of the word "identify" means in the '352 patent, and I'm trying to understand your testimony about why it is that a graph of the type shown on page 9 of Exhibit 8, figure 9 on page 9 of Exhibit 8, why that doesn't identify maxima and minima. That's what I'm trying to understand.

A. Okay.

Q. So earlier you had talked about processing algorithms and things like that, and I'm trying to explore that.

So what I'm trying to understand is, when you're talking about what it means to identify a first maxima, for example, in the '352 patent, what specific things do I need to do to identify something as a first maxima?

And related to that is, why isn't the graph and the data shown in figure 9 of Exhibit 8, why haven't I identified a first maxima by graphing the plot in that way? That's what I'm trying to understand.

So with all of that, my question to you, sir, is, what do I need to do beyond collecting and graphing touch data in order to, quote/unquote, identify a first maxima?

What more do I need to do?

skill is looking at graphed data, and there's a description of what the data is and a description of what is being graphed and there's a peak and there's a valley, why doesn't that identify, in your understanding, for purposes of claim 1?

Why isn't that an identification?

MR. DeBRUINE: Jared, one more time. Please don't stop the witness from answering. Please don't criticize in the middle of his answer. If he says something that you don't agree with or would like more information, let him finish his answer and ask a follow-up question.

MR. BOBROW: Well, I'm not going to do that because --

MR. DeBRUINE: Don't tell him how to answer.

MR. BOBROW: Stop. No, I'm going to, because the problem is we're wasting time. You've already said it's late. I'm trying to get an answer to a question about what this claim means in your understanding, and I'm told about a dog and showing something to a dog.

MR. DeBRUINE: That --

BY MR. BOBROW:

Q. I'm trying to understand the question that I've asked now several times.

If I have data, the data's described, it's

A. Okay.

MR. DeBRUINE: Objection. Incomplete hypothetical, hopelessly compound, and I also would ask you not to cut the witness off. Let him finish. Your last speech started before his answer was complete.

THE WITNESS: Okay. So hypothetically you have a graph, and to put it in more particular terms, there's a drawing on a piece of paper. That drawing by itself does not identify anything. As a matter of fact, that drawing is meaningless until someone or something perceives it.

So if we -- this drawing had never been shown to a human being, then it probably serves no purpose whatsoever, and I would suggest if we hold the graph up in front of my pet dog, it has no effect whatsoever. He certainly doesn't know where the peaks are. Or if he does, he cannot communicate it to the rest of us.

BY MR. BOBROW:

Q. Okay. But I assume your dog doesn't have ordinary skill in the art.

A. May I continue my --

Q. Yeah, but I don't want us to get sidetracked on dogs and showing things to dogs and trees falling in the forest.

I want to understand if a person of ordinary

described how it's been captured, it's plotted and it's shown, and it shows graphically a peak and a valley and another peak, why is that not identifying a first max followed by a minimum, followed by a second maximum?

That's what I'm asking.

A. Okay. And I'll try again.

MR. DeBRUINE: And I will object that that's asked and answered. This is probably about the third time he's explained it to you. You may like his answer or not, but at some point we have to stop asking the same question.

And the other thing, the witness is here to give testimony. I'm not sure how he's supposed to answer a question that takes several minutes to ask.

But if you understand the question, one more time, please try and answer it.

THE WITNESS: Identifying is an act. It's something that has to happen. That is, a static presentation of information does not meet the act of identifying it. When I look at the graph, I can identify the peaks, but I'm in my head executing an algorithm, just as you are and everyone else in this room does.

And so we may look at the graph instantaneously go, "I know where the peaks are." The

same way when I look out the windows and see the mountains I don't have to sit here for ten minutes and figure out where the top of the mountain is, because my brain instantaneously executes to my perception an algorithm which finds that peak.

In the case of data, whether it's data from some kind of robot contraption or from the type of touchpads we're talking about, that process of identifying the peaks is normally done by hardware or software or a machine, certainly the same way we can look at these charts that show a drawing or a diagram of hills where fingers are, and those of us in the room can say, "Ah, look, there's three peaks there." That's because, again, we're processing that information ourselves.

So the reason that there's a step that has to be done to identify it is because we're doing it when we look at the graph. But in the type of systems we're talking about, there's a machine doing it, and that machine that has to actively take steps to process that data to determine where are the maximum and minimum.

Q. Okay. Thank you.

So in your opinion then, when the patent says that something -- that I identify a first max, I identify a min, I identify a second max, that what that

means is that there's some hardware or software or machine that is making a determination that that is the case?

MR. DeBRUINE: Objection. Compound.

THE WITNESS: Right. There has to be -- any of these systems it's talking about a machine of some sort or a set of steps executing. It's not a person necessarily looking at a graph or something.

So that process, let's use the term generally process, or sequence of steps being executed by this machine, is going to make a determination or identification. So it is the one who's doing this, who's actually doing something.

BY MR. BOBROW:

Q. And can a human being perform that step of doing the identification of the first maximum and the minimum that follows it and the second maximum?

Can that be accomplished even by observation?

A. Humans can, yeah, sure, do similar things by their observation powers and thinking powers.

Q. All right. Let me ask you to turn to claim 19 of the '352 patent, and you'll see that's a claim that's dependent on claim 18; correct?

A. Right.

Q. And one of the things it talks about in that

claim, it says that there's a means for selecting an appropriate control function based upon a combination of a number of fingers detected, number of times that fingers are detected and any movement of said fingers.

Do you see what I'm referring to there?

A. Right, I do.

Q. Now, when it's referring to that function of selecting an appropriate control function, is that a function that is implemented by a computer?

A. Well, it could be implemented by a computer or a microcontroller, I believe, or potentially in hardware.

I think if we look back on the structure set forth -- I mean, I'd have to go look it up exactly, but I believe the structure that's set forth for that is this kind of sensing chain, the microcontroller and the firmware in it. There may be -- and forgive me for not having this thing memorized, but there may be also a disclosure to the extent that you might be able to do it on the other side. That is, there's -- where you perform that process is not necessarily limited to the -- this microcontroller.

Q. Is that function of selecting an appropriate control function that's performed by, in your view, software with hardware, hardware by itself or something

else?

A. Well, as I said, it's kind of a mix. You can't do the things like the number of fingers detected or the amount of time the fingers are detected or movement without hardware. The rest of that sensing chain has to work and has to be a part of that process.

And I don't think it's really -- and the claim language per se I don't think necessarily has an indication of whether or not -- if you could do something in a software process, how much of that software could be hardware and software is kind of a flexible boundary.

Q. In your view, is that function of selecting an appropriate control function, do you need to have software to perform some part of that function, or can it just be done exclusively by hardware as described in the patent?

A. Well, I'm not sure that characterization of being done exclusively by hardware is described in the patent. So to the extent that characterization is part of your question, that's going to be incorrect -- I don't agree with that.

Q. So to perform this function, you need to have at least some software; is that right?

A. Well, you -- not in a theoretical sense, but I

think from the description of this as a whole there's a combination of, you know, hardware obviously and firmware operating at a minimum in this microcontroller. And I believe, and again, I can go look, there may be a kind of expanding case that says or, you know, software on the host side. But I need to go look for that to cite to a particular case.

So to the extent you're saying that somewhere along the way in this process there's an algorithm executing which presumably is in firmware or software, yes, that's true. That would be a way one would normally implement that functionality.

Q. And is that what the patent describes as the thing that is actually performing that function? That is, that there is either some -- that there is some algorithm that is being followed in firmware or software to do that?

A. Well, let me go look.

Q. Okay.

A. Again, I'm looking for a citation back into the document.

Okay. So let me direct your attention to a couple places. There's a kind of lengthy description of how firmware, in essence, could be performing this type of functionality. If we look starting at column

13, let me see if I can re-find it. Sorry. I had it a minute ago.

Right. At the top of 13 it says, "While the foregoing sequence," which is referring back to column 12, "can be programmed to define any number of cursor movement and control functions, an exemplary definition of the functions associated with such sequences can be the following." And then it goes on to talking about a particular way of using selection and so on with fingers.

And it's in these cases talking about doing multiple scans, and it ties back here in 12, if we look back to 12, showing some examples in 7A and 7B. And it's talking about having a few scans, you detect the first and second, so -- I mean, that section in general, I'm trying to not to take the time to parse out every single sentence, but sets forth ways in which to do it in firmware and the way that you could identify multiple firmware -- you know, multiple touches and then map that into functionality.

It also in the beginning sets forth how you can return information to an application which then does some of that functional mapping. If we looked at column 3, for example, detection -- this is at line 20 approximately.

For example, detection and location of two fingers will permit the touchpad to report to a host system the distance between the two fingers. This can be used, for example, in Paint or other programs to determine line width or other spacing functions or any other variable value function.

Similarly, tapping with both fingers at the same time may be defined as an alternate shorthand method for a double tap or may be defined as a special function similar to the right button functions of a mouse, and then it goes on to talk some more about what those functions could be or how they could be supplied and so forth.

So I would say at a minimum, I mean, there's maybe more places, but at a minimum there's two places that identify use of either firmware or software to do that mapping from some of the information presented in 19 into an appropriate control function.

Q. When you used that term "firmware" in your last answer, what specifically were you referring to as firmware?

A. Well, I'm characterizing software operating on a microcontroller as firmware, and I don't think there's really a distinction at some level between -- the term software and firmware can certainly overlap.

In other words, software that in certain circumstances is -- I characterize as firmware, but the overlap is so great between those two that I don't think there's a necessary distinction between software and firmware.

Q. So if I understand what you're saying, this function of selecting an appropriate control function, you're saying the patent is describing that there can be firmware that's running on this microcontroller that's labeled element 60 in figure 2 that would perform that function?

A. Right.

Q. All right. Let me ask you to turn to claim 30 of the '352 patent that refers to a means for calculating the first and second centroids corresponding to a first and second fingers.

Do you see that?

A. Mm-hmm.

Q. Once again, is that a function that is implemented by a computer?

A. Typically, yes.

Q. Now, is there any algorithm described for performing that function of calculating first and second centroids corresponding to said first and second fingers?

A. Well, there's an algorithm that explains how to calculate -- a certain example of calculating a centroid across the pair, but practitioners at the time would have known how to compute a centroid on a single peak as opposed to the whole set.

Q. And what I'm asking is whether there is an algorithm in the '352 patent that says here's how you calculate the centroid for each of the two fingers as opposed to one centroid across the pair.

A. No, because the design people would have known exactly how to do that. You don't need to disclose that at the time.

Q. All right. And take a look at claim 24, if you would. It talks about a means for detecting a distance between said first and second maxima.

Do you see what I'm referring to there?

A. Right.

Q. And I think you had made references to this a little bit earlier in answering another question, but is that function of detecting those distances, is that a -- or detecting the distance, I should say, between the first and second maxima, is that a function that's going to be implemented by a computer?

A. It would be implemented by some computational process either on a microcontroller or potentially on a

computer.

Q. You're drawing a distinction between a microcontroller and a computer?

A. Only to make sure that my answer of "computer" isn't misinterpreted to mean it can only be done on a computer or it couldn't be done on a microcontroller. It can be done on any computational engine regardless of its packaging or location.

Q. And what is the structure that -- in the '352 patent that performs this specific function of detecting a distance between the first and the second maxima?

A. Well, again, the structure is the sensing chain, you know, the sensor, the analog digital, the conversion, the microcontroller, and then you've got the data structures which tell you -- that allow you to -- teach you how to locate these or identify them, and once you've done that, you know their distance.

Q. When you say "the data structures," you're talking about the data structures in the X compute algorithm and the Y compute algorithm?

A. Right. To a practitioner, once you identify the peaks, then you know their distance --

Q. And is there --

A. -- apart.

Q. I couldn't hear that last part.

A. Apart. You know their distance apart.

Q. And can you point out to me which algorithm it is that tells you how it is in, say, X compute or Y compute that you determine the distance between the first and the second maxima?

A. Well, I don't think they need to tell you because you already know -- they're telling you -- you know, if you want to know the distance between two points, you can get the delta X, delta Y by subtracting the differences, and I think every engineer at the time would know the distance between, you know, if I had Xa, Ya and Xb and Yb and said what's the distance between those points, I think that's a kind of a question that every practitioner I know knows exactly how to calculate that.

Q. And as part of these flow charts and descriptions, is there any algorithm here that says I'm going to take this set of numbers, and I'm going to perform this calculation in this way to come up with these distances between these two points?

A. No, because the practitioners already know how to do that.

Q. In claim 26 there's some language that talks about a means for providing a click function in

response to the removal and reappearance of said second maxima within a predetermined period of time.

Do you see what I'm talking about there?

A. Yes, I do.

Q. Now, is that a function, that is, providing a click function in response to the removal and reappearance of said second maxima within a predetermined period of time, is that a function that's going to be performed and implemented by a computer?

A. Normally. I mean, either by the microcontroller or the host computer.

Q. Is there -- to perform that sort of processing there's going to be some sort of algorithm that's going to be processed; is that right?

A. There are steps you would take, right. You would write software to do that.

Q. Is there a description of that software algorithm in the '352 patent for how to do that?

A. Well, there's a whole section about dealing with and processing and understanding how many fingers are touching and being removed and how you do scans and know how many fingers are on the surface.

I think if we -- basically the entire section of -- you know, going down, starting at 11 and continuing through 13 talks about examples of how you

would determine, you know, multiple fingers and then what -- you know, how you would scan repeatedly and look at whether you had one fingers, two fingers, et cetera.

So that is sufficient to explain the process of doing that, particularly in light of what people already know how to do.

Q. And is that description a description of an algorithm that's going to tell you how to provide that click function in response to the removal and reappearance of the second maxima within a predetermined period of time?

A. Well, I think the description there is more than sufficient for a practitioner at the time to know what to do. It may not be expressed in like a flow chart, but it's set forth, you know, in description in a way that would be sufficient so someone knew what to do.

Q. There's a functional description in there, correct, in those columns, 12, 13?

A. I don't know how you use the word "functional." There's a description of what to do in essence.

Q. Yeah, what functions to perform, what to do, as you just said.

What I'm asking is, is there some sort of description of software algorithm that would say this is the way to do that and this is how you would process that in order to accomplish that function?

A. Well, I think the description here does give the information to the person who's the practitioner that they need to have.

Q. To do what?

A. To do -- to make that determination. In other words, to say if -- the process of -- say we're taking the click events in the simple case of a button up, button down. Practitioners at the time definitely know, you know, how to make a packet that's button up or button down. That's a long-known understood concept in mouse design.

So the person who's reading this already knows about that background and knows about, you know, I generate a down packet, I generate an up packet. I mean, they know about that part of it.

And so when look at, to me, reading the sections that I pointed out, and I can try to get you the more detailed lines by, you know, picking them out for you, it tells you what you need to do to do that.

Q. When you say "it tells you what you need to do to do that," are you saying that with this description

of the operations in terms of putting fingers down and lifting them up, that someone could go ahead and write some sort of an algorithm that would do that?

A. Right. And, I mean, there's also a set of things in, you know, figures 8-2, 9-1, et cetera, that relate to that process.

Q. But the algorithms that are described in figures 8 and 9 and 5 and 6 and all, those aren't setting forth in an algorithm how you would perform that function of providing a click function in response to the removal and reappearance of a second maxima within a predetermined period of time; correct?

A. Well, I don't agree with your characterization.

Q. So point out to me in figure 8 or figure 9 or --

A. Let's turn to --

Q. -- or figure 5 or 6 where that's described.

A. Let's look just for figure 8-1 in a minute. And look at the bottom of figure 8-1 where there's been some processing. There's an X compute and Y compute. There's been some determination of the number of fingers that are present, and then it turns the page onto the remainder of figure 8-2, which is on sheet 15 of the patent.

And then it -- just as an exemplary example here, I won't to try to say exhaustively, but if you look at decision point 905, if the test is that the button was previously up and we have finger 2, then we're going to take the step of reporting button equals down, and we're going to set button previous equal to down.

And then at a later scan we're going to come back through here again, and perhaps we're going to find that we were in -- the case listed as 910 in that decision block, if we fall into that decision block, button previous would be down, in other words, if that, and, you know, we have one of these cases, and then we're going to, of course, report button up.

The process of reporting a button down to the host system followed by a button up report would constitute a click to the host processor. In other words, the event of a button down and a button up.

A practitioner at the time, once you tell them report button equals down, they understand what that means. In other words, that says make the serial output bytes in the packet that match up with a button down event on a mouse, which is a kind of standardized known operation.

So I think they've set forth here a

description of how to do it.

Q. So where in figure 8-1 and figure 8-2 say that it is the second maxima that is being removed and reappearing within a predetermined period of time?

A. Well, first I'll note that I don't think that it has to say that, but notice that if you look at decision block 905, it's making two tests. The first tests is the button previous is up, meaning that we're not reporting a button down. In the second test, and finger equals 2, and if we look back to see what the X finger is, if I dig into the document here, I believe X finger will be a count of fingers.

Q. Right. So what tells you in this algorithm, this flow chart figures 8-1 and 8-2, that it is the second finger that is the second maxima as opposed to the first maxima?

A. I would generally interpret that if I had a count of fingers and it went zero, one and two, that two would be the second one.

Q. So where it says finger equals two in figure 8-1 and figure 8-2, your testimony is that that is a reference to the second finger as opposed to the total number of fingers being detected?

A. No, I think it's the count of fingers, but since we're scanning repeatedly, the -- notice you have

the previous finger count -- okay. And the state of whether I'm generating a button depends later on whether I have finger equals zero or finger equals one.

But again, see, I think that it's an erroneous way of looking at this claim to say I have to see a algorithm that in the absence of any knowledge about process teaches, you know, a beginner how to do it.

Q. I'm just asking a question. I'm just trying to understand whether there is something set out in figure 8-1 or figure 8-2 or anywhere else in the patent that tells you specifically that it is the second maximum that appears and is removed and reappears, whether that is described in any of these algorithms, how you would determine that it's the removal and reappearance of the second maxima.

A. Okay. Well, let me try to explain that. If we look at column 12, let me just see if I can go back to this. Let me just review it for a moment here.

Okay. Look at the bottom of column 13. I direct you to that. And again, this has to be taken in a totality. So it's not like you find one exact spot. You have to read the entire document to understand it as a practitioner, and that gives you the understanding of it.

But if we look at this paragraph starting at

approximately line 59, referring next to figures 8 and 9, the generalized case associated with figures 7-F1 and 2 but also applicable to the remaining functions may be better appreciated.

In the exemplary algorithms shown in figures 8 and 9 -- and 8, of course, is what? 8-1 is what we've been looking at. "A determination is made whether zero, one or two fingers are in contact with the touchpad. Depending on how many fingers are identified, various operations are permitted.

"It will be appreciated that figure 8 is an analogous to figure 5" and so on. For convenience, steps unchanged are left in, and then it describes how that process goes. And when you look at that and looking at the number of fingers, that explains to you, to me at least as a practitioner, what you would do, the type of steps would you do to do this determination of providing a click function in response to the removal and reappearance.

Q. All right. And where in the portions that you just referred us to or anywhere else in the patent does it tell you how you can determine that a click function is being provided in response to the removal and reappearance of the second maxima as opposed to the first maxima?

Where is that set forth?

A. Well, at the point in time where you only have a first maxima at the point in time when there's not two fingers on the touchpad. So to the extent that -- in other words, you don't need a disclosure in the way you're describing it because if you're scanning repeatedly and you see one finger, you've got a first maxima.

When the moment comes when you see the second finger down, you get a first and a second, and when you see the second one gone or, for that matter, the first one gone, you only have a single maxima.

So --

Q. So where is the algorithm then that tells you that if I've got, you know, two fingers down and I remove specifically the second one and then it reappears within a predetermined period of time, that that corresponds to a click function?

Where's the algorithm that tells you specifically how to look at that second maxima within a predetermined period of time and say, aha, that is going to be the indicator for a click function?

A. Well, again, I think your question indicates a misunderstanding perhaps of the terminology. When you have one finger on the touchpad, you have one maxima.

When you have two, you may have a first and a second. And at any point in time when you only have one, you only have one maxima.

So I don't see that the question makes sense in the light of the way the patent describes it, the way it's understood by the practitioners.

Q. In the claim language we've been focused on in claim 26 it's referring to said second maxima; correct?

A. Right.

Q. So I've got then two maxima, right, that have been identified?

A. In the scans during which there are two fingers in contact with the touch sensor.

Q. Then the second maxima is removed and it reappears, according to this claim; correct?

A. Right. The claim language requires that the second maxima would be removed and then reappear.

Q. As opposed to the first maxima being removed and reappearing?

A. No, because, see, you can't have a second one without a first one.

In other words, if we look at all the possible combinations of two fingers down on the surface of the touchpad, if both are there, I have a first maxima and second maxima. If none of them are there, I have no

maxima. If I have one finger, I have a first maxima. Doesn't matter which finger it is.

Q. No, I understand.

So I have two fingers down, and this is saying there's a means for providing a click function in response to the removal and reappearance of the second maxima, not the first maxima but the second maxima, within a predetermined period of time.

So where is it that it describes an algorithm for doing precisely that, with the second maxima and within a predetermined period of time?

MR. DeBRUINE: Objection. Asked and answered.

THE WITNESS: Yeah, I've already -- I mean, I'll try again.

If you look, as an example, figure 8, second page, then it is telling you how to generate reports based on the presence and the number of fingers and some other things about motion and so on. The number of fingers tell you whether or not you have a second maxima. The two are inextricably put together. In other words, if you have one finger, you don't have a second maxima.

So if N fingers is one, there is no second maxima. So the second maxima is not present. If there are -- if there is, then -- that is, you have a

reappearance, now you have two fingers, then you have a second maxima.

To the practitioner reading that, it's entirely clear. I'm not sure whether you're just trying to pressure me or you just don't get it, but to the practitioner at hand it would be clear what that meant in the light in the number of fingers because you're scanning it repetitively.

Q. So claim 26 is dependent on claim 18; correct?

A. Right.

Q. And claim 18 says that identify a first maxima corresponding to a first finger and a minima following the first maxima and then identify a second maxima corresponding to the second finger following said minima; correct?

A. Right.

Q. And in claim 26 where it's referring to said second maxima, it's referring to that clause that begins with little C, "identify a second maxima in a signal corresponding to a second finger following said minima"; correct?

A. Right, and whether the presence or absence of that second maxima is ...

Q. Is what?

A. Is present.

In other words, the case of -- the second maxima that's being referred to, the said second maxima is the second maxima that would be present in the situation where you're going to indicate that you have two fingers present.

Q. And where in the algorithms that you've pointed to or in the patent does it discuss what that -- how you determine what that predetermined period of time is for providing this click function?

A. I don't think you need to -- well, I can go looking, but I don't see that there's a need to determine a predetermined period of time.

Q. So the claim calls for -- sorry. Go ahead.

A. To me, the within a predetermined time period and -- to me the within a predetermined time period is kind of a descriptive limitation in that there is some period of time, but intrinsically you're doing this in scanning in time, and the practitioners know you're counting and timing these things, and they're doing that when they're generating reports because reports have kind of a time basis associated with them.

Q. So where is that described that -- what that predetermined period of time is for the removal and the reappearance of the second maxima?

A. Well, I don't think there's a statement that

it says it has to be a fixed value or make it 50 milliseconds seconds or whatever. I don't think that's present. But if you want me to go looking, I can go look to see if they, you know, teach that somewhere in the course of the entire patent.

Q. In the materials that you've just been reading in responding to these questions about claim 26, you haven't seen that so far, have you?

A. I wasn't looking for it.

Q. All right. And so in what you were looking at, you didn't see it, did you?

A. I was not looking to see anywhere in this entire document did they, you know, say okay, what does that time interval have to be or does it have to be a fixed value other than maybe predetermined.

MR. BOBROW: All right. Why don't we take a short break.

THE VIDEOGRAPHER: We're going off the record at 4:01 p.m. This mark the end of tape No. 3.

(RECESS TAKEN.)

THE VIDEOGRAPHER: We're back on the record at 4:13 p.m. This marks the start of tape No. 4 in the deposition of Robert Dezmelyk.

BY MR. BOBROW:

Q. Let me hand you what was marked already as Von

Herzen Exhibit 8, which is a copy of the '353 patent.

I take it you've had an opportunity to study this patent?

A. Yes, I have.

Q. Take a look, if you would, at claim 1 of the '353 patent, which begins at the bottom of column 3, runs over to the top of column 4, and it refers in there to a panel for touch inputting.

Do you see that?

A. Yes, I do.

Q. It goes on to -- at the end have what's called wherein clause.

Do you see that? It says, "wherein said panel comprises"?

A. Yes.

Q. And it says that it comprises a substrate that's selected from the group consisting of PCB membrane and transparent plate and a conductor wiring on said substrate and an insulator covered on said conducting wiring.

Do you see that?

A. Yes.

Q. Now, focusing on the panel that's referred to here in the claim, was it known back in 2003 when this patent was filed in the United States that a substrate

that was a membrane could be such that you could print graphics on the membrane?

A. Yes.

Q. And was it known back in 2003 when this patent was filed that patterns, graphics could be printed on a transparent plate that was serving as a substrate for a panel?

A. Yes.

Q. And was it known back in 2003 that one could print patterns on a membrane that was serving as the substrate for the panel?

A. Well, you can print on just about anything you want. So I guess in this period in time it was possible to print on printed circuit card, it was possible to print on a membrane, or it was possible to print on a window or other transparent material.

Q. And people of ordinary skill in the art knew how to do that at that time; right?

A. Right.

Q. Those of ordinary skill in the art understood at the time that -- the time being 2003, that an insulator that was covered on the conductor wiring, that that insulator could be clear material, transparent material, such as glass; right?

A. Right, or it could be a clear coating of some

sort.

Q. And those of skill in the art also understood in 2003 that the conductor wiring that was on the substrate could be transparent, see-through, such as the indium tin oxide, or ITO, that we were talking about earlier?

A. That's correct.

Q. Take a look with me, if you would, at figure 1 of the '353 patent, and you'll see that there are -- I'll just call them four diagrams.

I don't know if you have a better word for it than that, but you see what I'm referring to?

A. Right.

Q. So there are three across and then there's one in the middle beneath it.

Okay?

A. Right.

Q. And that figure that is in the center but furthest to the bottom of the page, wish they were labeled, it has an arrow pointing to it, No. 10, on the right.

Do you see what I'm referring to?

A. That's correct.

Q. Okay. So focusing on that one for a second, there's an element there called LCD.

Do you see that?
A. Yeah, I think it's called out as 22.
Q. And LCD is what, liquid crystal display?
Is that what that stands for --
A. Yeah.
Q. -- in this field?
A. Yeah.
Q. The LCD is described in the patent as -- at column 2 as being used to display the input data from said virtual key region 16, 18 and 20.
Do you see what I'm referring to at around line 46, 47 of column 2?
A. Right, I see what you're referring to.
Q. All right. Now, is there any description in the patent of having the LCD not just in that portion that's labeled 22 but also underneath that other section, panel 12, that has that -- the numeric input and the dial input and the correct input, et cetera?
A. There's no explicit, you know, text or diagram that shows it -- you know, that calls out an LCD under it, but there's nothing that I'm aware of that excludes it either.
Q. All right. Now, again, sticking with figure 1, looking at the -- actually, what I'd like you to do, just so we can talk about this in an intelligent way,

maybe Mr. DeBruine can loan you his pen. I just want him to --
A. No, I have a pen.
Q. Oh, great. Then we don't even have to bother Mr. DeBruine.
MR. DeBRUINE: I'll just stay asleep then.
BY MR. BOBROW:
Q. In the -- next to the figure -- the portion of figure 1 that has the 10 pointing to it, that box, as it were, why don't you circle it, and let's call it A.
A. I guess -- I don't want --
Q. Just so it's clear, I'd like you to simply circle the lowest figure on the page, the lowest portion of figure 1, which has the 10 pointing to it and just label that with an "A" so we know what we're talking about.
A. Okay. So I've drawn around the area you indicated on your drawing to the best of my ability and indicated that as A.
Q. Perfect. Thank you very much.
Now, with respect to what is shown in the portion that you have called A of figure 1, are the graphics, the patterns that are on there, dial, input, correct, arrow up, font, arrow down, choose, the numbers one through nine, are those patterns printed on

that panel No. 12?
A. Well, you're calling out 12 within 10?
Q. So within A in figure 1, the area that you've circled, I'm asking you about everything except LCD that's labeled 22, and I'm asking you whether all of the graphic information there, the various patterns, the number 1, the number 2, the number 3, the word dial, et cetera, whether those are printed onto the panel in that figure.
A. Well, I'm not sure exactly how to parse your question. If you're saying literally in this figure, then obviously this is a printed document, but if you're trying to ask are they printed -- you know, does the patent say that they have to be presented or that they are presented, that's a different question.
Q. So let's back up.
What you've circled and put an A around at my request in figure 1, that is a -- that is a depiction of a touchpad; correct?
A. That's not how I take it. I think that to me it's a depiction of the way in which the various component patterns would be in sort of the same spots or would appear in the same spots on the touchpad.
Because it's not a literal -- there's four parts to this diagram. There's three parts that show a

kind of a -- what might actually appear on the touchpad, and then there's one which shows how they're overlapped together in some kind of schematic form.
Q. So what you've circled as A you're saying is not actually a touchpad that would be an embodiment of the '353 patent?
In other words, the touchpad wouldn't look that way or be configured that way per se; is that right.
MR. DeBRUINE: Objection. Compound, mischaracterizes the witness's testimony.
THE WITNESS: My understanding of this drawing is that it's showing three views of what the touchpad might look like in the top, and it's explaining the reason there's an arrow that goes from the lower pictures upwards is that that's the three ways it might look, and it's showing that there -- these patterns that appear in each of these three modes are -- it's not necessarily they're, in fact, in a sense overlapping. In other words, they're in similar spots.
They're not exactly overlapped, because you can see that they don't exactly line up, but that you're kind of recycling these regions for another purpose.
BY MR. BOBROW:

Q. So in your view, does the touchpad as shown in A, does that in your view physically exist, or instead, do just the top three ones exist as a user would interact with it?

A. Well, I mean, I guess it could be both. In other words, if you had a static presentation of some of this information, then it would be present and there would be kind of an overlap, and if you dynamically changed it in some way, then they would appear differently at different times.

Q. So in what mode would the touchpad appear as it's depicted in the portion of figure 1 that you've drawn or circled as A?

In what mode would it look like that?

A. If the markings or patterns were kind of static in nature, then it would appear -- it could appear in some ways similar to that at any time, but if they were dynamically generated, then they will be different at different times.

Q. So in what you've drawn as A, if I understand what you're saying, the portion of figure 1 that you've circled with an A, I should say, that's depicting what the touchpad would look like if I had statically printed the various graphics onto those portions of the touchpad; is that right?

A. It could look that way, yes. If they were statistically printed, you could choose to print some combination of stuff like that and it would look in a composite like that.

I still suspect that -- I mean, there's dotted lines and stuff in this drawing that wouldn't be there, but in general that's is one way of looking at that portion of the diagram.

Q. So one way of looking at the portion that you've circled and labeled with an A is that these bits that are referred to as dial and input and correct and, you know, the 1, 2, 3, 4, 5, 6, that that information would be sort of physically printed onto the touchpad and would remain there even when it was working in different modes?

A. Right. That's one way to look at it.

Q. And then up above there are three more pictures of touchpads, and I believe the one on the left is a depiction of -- I think it was called key -- well, actually, let me try to ask it again.

There it is.

So there's a reference to No. 24; right? And you see over to the left-hand side of figure 1 there is a No. 24 with an arrow extending downward and to the left pointing at a touchpad screen.

Do you see that?

A. Right. Just to make it clear, at the bottom of column 2 starting at about line 60 it says, "When the touchpad 10 is switched to the key mode, the numbers and '#' and '*' key patterns on the virtual key region 16, the 'Dial'" -- I believe they meant to say "Connect." It says "correct," but I think he meant to say "'Connect' and up/down function key patterns on the key region 18, and the 'Resume,' 'Redial' and 'Reserve' function keys patterns on the virtual key region 20 are shown as numeric reference 24."

Q. So I've got a No. 24 that's pointing to this particular key mode; is that right? In figure 1.

A. Right. I mean, yeah, 24 is identifying that mode of operation.

Q. 26 is identifying the handwriting mode; is that right?

A. Right, and it could be showing and I believe it is showing in one sense what it would look like in each of those modes. In other words, that you would display the necessary markings in the particular mode that were consistent with the mode you were in.

Q. And 28 is describing -- referring to the mouse mode; correct?

A. Right.

Q. Now, let's just take a look at the key mode to begin with.

What is the basis for your testimony that the touchpad would actually look like what is shown in figure 1, the element referred to as 24?

What tells you that that's what the key pad would actually look like as opposed to what it would do?

A. Well, we have a picture here that while it may be subject to interpretation a couple different ways, does show, for instance, what would be very logical patterns to display on there if it was in that mode. And at one level it's inconsistent when they're combined, because if you actually said that the images of each of these three modes were simply combined, then there would be a kind of a different overlap of stuff.

Right? Some of the words would be right on top of one another and so on.

Q. And if instead what's depicted here in 24 and 26 and 28 were simply the functions that would be performed as opposed to what the touchpad actually looked like to the user, then the inconsistency that you just described wouldn't be there, would it?

A. I don't see it that way in that -- I think it could be interpreted either way. I don't think the

picture has a -- by itself makes a determination one way or the other.

Q. Well, would you agree with me that one way that a person of skill in the field could look at figure 1 is to say that the touchpad as shown in what you've described as A, the specification calls No. 10 a touchpad, and that the three figures above it in figure 1 are essentially functionally what the device would be doing in those regions as opposed to what it would look like to the user?

A. That is not an irrational interpretation.

Q. Take a look at figure 5, if you would, please. Figure 5 is showing something --

MR. LANG: Do you want me to answer?

MR. BOBROW: Why don't you go ahead.

Let me start over.

BY MR. BOBROW:

Q. I just wanted to make sure that I'm reading this correctly. There's an element in figure 5 called 36, and it says it consists of a ground plate 36.

Do you see what I'm referring to?

A. Just give me a moment, please, to kind of catch up. Element 36.

Q. So take a look at column 1, which is where figure 5 is discussed.

A. Okay.

Q. And is 36 in effect in this figure 5, is that essentially the substrate or the schematic view, as it were, of the substrate of this touch-sensitive region?

A. It could be. I mean, a ground layer per se doesn't have to be the substrate. It could be simply a layer that you're holding at ground. I mean, it could be a conductive layer or clear conductive layer that you're holding at ground. That diagram really by itself doesn't say when it is or it isn't.

Q. Let me show you Exhibit 6 from the Von Herzen deposition. This is the '659 patent.

You've had a chance to study this patent?

A. Yes, I'm familiar with it.

Q. Let me ask you to turn to column 7, and specifically I'd like you to read the paragraph that begins at line 49 and runs to line 58 to yourself, and let me know when you have.

A. Okay. This is column 7, line 49 to the end of that paragraph?

Q. Yes, the paragraph that begins "although not shown" and ends with the word "coordinates."

A. Let me just pick up some of the context it's in. Okay. I think I have a general idea. I mean, I certainly read the paragraph, and I have a general idea

of the context it's being used in.

Q. There's a reference to a touchpad program containing virtual actuation zone profiles that describe how the virtual actuation zones are distributed around the touchpad relative to the data sensor coordinates.

You see what I'm referring to?

A. Yes.

Q. So the idea there is that I can have a program that stores not just one but potentially multiple virtual actuation zone profiles; correct?

A. Right. The idea -- I mean, 38 is shown back in figure 2. It's a -- like a microcontroller. And it notes that it may store this idea of a touchpad program which is related to the user interface, the user interface is shown sort of the whole device, and it seems that yes -- I don't see that there's a necessary construct in that paragraph -- I mean, it says profiles, but it seems that there may be one set of them.

I mean, I don't know if it's important, but just sort of parsing that paragraph by itself it says that the touch paid may store a touchpad program. So that would be a single program, for controlling different aspects of the user interface. For example,

the touchpad program may continue virtual actuation zone profiles that describe how the virtual actuation zones are distributed.

I take "profile" there to mean that you may have multiple actuation zone, in essence, data structures to describe the zones. Not necessarily that you have different sets of them, right, but that you have, say, five zones and therefore, you would have five profiles, one per zone, as the data structures that represent that.

Q. Five profiles that -- all set in one particular region, or can those profiles come and go in different regions at different times?

A. Well, again, I'm just saying in terms of the way I -- are you asking me to sort of interpret that paragraph? The way I read that paragraph, that there may be a set of more than one zone. In other words, that these virtual actuation zones have a location that is distributed around the touchpad relative to the native sensor coordinates, and it also says what type of value to output.

So my, you know, quick kind of interpretation of that is that there's a data structure, maybe we'll call it a profile, that's associated with one of these actuation zones, and it has some set of characteristics

related to that actuation zone, and it may be, you know, the output it sends. It might be some kind of other data and that there are a set of them, because of course there's more than one zone.

I don't take it from that paragraph alone that there's necessarily multiples of those, but there may be just one sort of set.

Q. Right. And in your view, in the 2003 time frame would it be unreasonable for a person of ordinary skill in the art to read that paragraph in the context of the '659 patent to say that the program can store essentially different profiles at different times, of course, that would be displayed at different times, I should say, that would -- whereby the zones would be different at different times?

A. Well, in the time frame of this patent in -- as of its filing date, there are prior art patents that describe at length how to construct and maintain sets of what could equally well be called profiles for an actuation zone, sure.

Q. So that was something that in your view was known, was that you can have actuation zone profiles, they get stored, those profiles can be different, and they can divide up a touchpad or a touch screen in different ways at different times?

A. Sure. In probably the first instance, just going back historically, would be the core and subsequent GKS. Maybe not core, but GKS graphic spec, and probably also programmer's hierarchical interactive graphic system, the ANSI specs and ISO specs on those are probably some of the earliest cases of publications that describe in detail how you can take the surface of an input device and segment it into a bunch of, you know, regions which have different behavior.

Q. All right. And those different zones at different times, those different behaviors may overlap with each other but at different times?

In other words, I could have one region that occupies a particular state of the touchpad with one profile, and then I can change the profile and I can have -- that same region physically could map to a different actuation zone in a different profile?

A. In prior art you'll see similar things, yes, or exactly that idea, yes.

Q. Now take a look at paragraph 41 of your report, Exhibit 2.

Do you have that, sir?

A. Yes, I do.

Q. Why don't you read that paragraph to yourself and let me know when you have.

A. This is paragraph 41 of my report?

Q. Yes.

A. Okay. Yeah, I'm familiar with this paragraph.

Q. All right. Do you also have in front of you a page from joint claim construction statement?

A. That's correct. It's page 31, which has the particular section that I'm talking about in the paragraph in the native sensor coordinates.

Q. In the second sentence there you write that those coordinates, parentheses, x, y, r theta, et cetera, are calculated from the data acquired from the sensors and reflect a point on the touchpad -- on the surface of the touchpad, and then you cite column 5, lines 38 to 48 for that.

Do you see what I'm referring to there?

A. Right. Let me go and look and see what that citation in the patent says.

Right.

Q. Okay. Now, are you aware of any other portion of the patent, or are you relying, I should say, on any other portion of the patent besides that one, namely column 5, lines 38 to 48, to support the notion that the native sensor coordinates are calculated from the data acquired from the sensors?

A. There may be other citations in places that

relate to this, and I think there's some set forth in this claim construction. I can go through them if you want. I think that -- that statement that's cited in my report is sufficient, and it indicates what those coordinates are.

Q. So when you say that the -- that the native sensor coordinates are calculated from the data acquired from the sensors, does that mean that the sensor is actually outputting coordinate information?

A. No.

Q. What does it mean?

A. Well, it's a point which you ascertain by obtaining, measuring measurements from the sensor that is the -- I'm going to use some other terminology, kind of the raw coordinate that you obtain. That is, it's the value that you get before you do any of the -- kind of ancillary processing people typically do in these kind of devices.

So it's representative of what we call the native resolution or the native coordinate system.

Q. But when you're referring there to the coordinate system, are you referring to sort of signal values of voltage or of amps or frequency or what-have-you of the type you talked about earlier?

A. No, I'm referring to coordinates.

Q. So you're saying then that the sensors themselves actually output coordinate information?
A. No.
Q. So instead, the coordinates are calculated from the data that's acquired from the sensors; is that right?
A. Right.
Q. And what is it about the data that's acquired from the sensors that gives the native coordinate information?
A. What is it about the data?
Q. Yeah. In other words, earlier you were talking about how sensors will produce things like a voltage or a current or a frequency or what-have-you.
So what is it about that information that gives you native coordinate information?
A. Well, it depends on every sensor type. In other words, for different types of sensors, different excitation schemes, different design schemes, you're going to get a different low-level signal that you're going to then process to determine the object location that the sensor is sensing.
Q. But the object location wouldn't be determined just from the amps or volts or frequency that was being detected by the sensor, would it, the signal from the

sensor?
A. Well, it certainly couldn't be detected without that and the -- there's some process that goes between, you know, a sensor which outputs some signal, if we're perhaps being excited, and turning into a coordinate.
And there's an in-between process there, but you don't have coordinates until you have coordinates.
Q. And so there's some processing that goes on by a chip or a computer or software or something that then takes those raw values of amps or volts or current or whatever and then says for each of the sensors, aha, this is where that sensor is located?
A. No, this is not where the sensor's located, but this is where the object's located that you're trying to sense the position of.
Q. Which object? A finger or a stylus or something like that?
A. Right. In other words, there's -- there are sensors that can tell you where they're located. That is, you can obtain the location of the sensor. But the type of sensing devices that are, you know, we're discussing here today are devices that are intended to identify the location of an object usually in close proximity to.

Q. Such as a finger or a stylus --
A. Right, right.
Q. -- or what-have-you?
A. You want to know where the finger is on the touchpad, touch screen, whatever. You don't want to know where is the touchpad relative to the room boundaries or relative, you know, to its place on the planet.
Q. I understand.
A. That's another kind of sensing.
Q. Got it.
All right. Paragraph 42 you say, "I may also testify that, 'Sensors configured to map the touchpad surface into native sensor coordinates' means sensors configured to produce signals indicating native sensor coordinates."
Do you see that?
A. Yes, I do.
Q. And what are you relying on as support for that proposition in the specification?
A. Well, the same citation and probably other places, and I think this -- the real point I'm trying to make here is that the coordinates in question are the coordinates of the object, not what might be seen as the coordinates of the sensor itself.

Q. All right. So I'm looking at the language in paragraph 42 of your report, the claim language "sensors configured to map the touchpad surface into native sensor coordinates," and it appears that that language is found in the first element under the preamble of claim 1; is that right?
A. Let's go find it.
Q. That's on column 20. Or am I looking at the wrong section of the claim?
A. Right, that phrase, "sensors configured to map the touchpad surface into native sensor coordinates," appears in the first -- in claim 1, for instance, it says, "a touchpad having a surface and one or more sensors configured to map the touchpad surface into native sensor coordinates."
Q. And you have offered the opinion that what that means is that the sensors that are described in that element there of claim 1 are configured to produce signals that indicate native sensor coordinates; right?
A. Right. That's what I'm saying, that the sensors are producing signals that indicate or can be used to determine the coordinates of the object.
Q. And --
A. In other words -- I'm sorry. Sorry for a long break there. But if we look at column 5 in the patent,

roughly 37 or so, line 37, says, "the sensor of the touchpad 36 are configured" -- it literally reads "produce signals," but I believe he means to say "configured to produce signals associated with the absolute position of an object on or near the touchpad.

"In most cases, the sensors of the touchpad 36 map the touchpad plane into native or physical sensor coordinates 40. The native sensor coordinates 40 may be based on Cartesian coordinates or Polar coordinates as shown."

Then it goes on to explain that "when Cartesian, the native sensor coordinates 40 typically include" -- I'm sorry, my mistake in reading -- "typically correspond to X and Y coordinates and then a corresponding Polar, as shown, the native sensor coordinates typically correspond to radial and angular coordinates r theta."

And then it says that you can have a bunch of different types of, you know, resistive optical, et cetera.

Q. So under your interpretation, how is it that one of these signals that is produced by a sensor, quote/unquote, indicates a native sensor coordinate?

How does a sensor do that?

A. Well, the outputs of the sensor -- the sensor

is designed so that the signals it generates, potentially when it's excited by some excitation, but the signals it generates are correlated to position.

So, for instance, to give kind of an example of this in a literal sense, if you were to make a capacitive, well, sensing grid of the type we've been talking about, it's typical that you put the grid lines down in a known spot so that when you get signals from them you can calculate the position of the object that's causing the capacitance.

If you put the capacitive pass down randomly, you know, in some hypothetical, then you wouldn't be able to calculate where the object was. You'd see a bunch of varying capacitance, but you wouldn't know, you know, where it came from. Right?

I mean, so you're configuring the sensors such that the signals it generates are indicative or actually relate to position.

Q. Right. The signals that are being generated by the sensors don't themselves carry with them positional information, do they?

The frequency or the amps or whatever, there's no positional information in there, is there?

A. It may. They may. Depends on the sensor type.

Q. So you're saying that at the time of the '659 patent there were sensor types that sense, for example, capacitance, and then the signal would just put some sort of Cartesian coordinate information or r theta Polar coordinate information?

A. Well, if we look at some of the examples given here, "By way of example, the sensors may be based on resistance sensing, surface acoustic wave sensing, pressure sensing, strain gauge, optical sensing, capacitive sensing and the like." And of those sensors, some of them generate output data which is awful close to what -- you know, it may be a linear proportion to position.

So there's no question that the native or the fundamental design of the sensors in some places outputs a signal which is very close to coordinate data.

Q. But it's not the coordinate data itself, is it? There's a computer that then correlates the signal to positional information; right?

A. Well, but the two may be so close together that you can call them the same. And let's take an example.

If we have a -- you know, a time to apply acoustic position sensing, which surface acoustic wave

is a variation of, then the time of flight that we measure is if we're measuring right on the axis, that time of flight is exactly proportional to position. And so the signal you get, which might be, you know, a time, a flight time, is -- you know, divide by a constant and you've got the position.

So I think it would be accurate to say that signal is representative of a position. So it could be. In other words, depending on the nature of the sensor, you could have signals that were effectively the X and Y coordinates.

Q. And what about for a capacitance sensor?

A. Well, interestingly, it depends on the type. If we go back to the kind of -- the sheet style, then you're awful close. That is, you do one -- you have four measured variables. You do one equation with those four variables and you have X and Y.

In the case of patterned couple capacitance-type sensors of the sort we've been discussing mostly today, then the signal you get you do quite a bit of processing on before you determine the native coordinates.

Q. Now, if you would turn back in your report to paragraph 36, this is in regards to the '218 patent, and in the second sentence there you say that one of

ordinary skill in the art would understand that term, the term being "cursor control operation," on its face to involve the control, i.e., movement of the cursor on a display screen.

Do you see what I'm referring to there?

A. Yes.

Q. All right. So if I understand what you're saying there, those three words there together, cursor control operation, those words standing alone in your opinion would mean to one of ordinary skill in the art movement of the cursor on a screen; is that right?

A. That's correct.

Q. And tell me what it is about those words, "cursor control operation," that in and of themselves connote movement to one of ordinary skill?

A. Sure. The cursor is in a modern machine, of course. We're used to a little arrow on the screen that moves around or another indicative, like a caret or something that moves to indicate a position on the screen.

Its motion is decoupled from activity or operations that happen at the place where it is. So if you said to -- you know, to control the cursor given the operations you can do to control a cursor, you can move it.

I mean, there is no other operation you as a user can perform with the little arrow on the screen other than move it. Once you put it in a particular location, then you can indicate operations based on other activities. I mean, we have, you know, the cursor control keys on a keyboard. Move the cursor. They don't have any other function per se about the cursor than that.

So the idea of cursor control is controlling the cursor, and the cursor, the only thing you can do with it is move it.

Q. Can I change the size of the cursor in computers?

A. Well, okay. You can make it go away by turning the power off, too, yeah.

In other words, if we go outside the scope of the kind of the thing we're talking about here today, I can write software to change a cursor; I can write a display driver that draws it a different way; I can shadow behind it; I can draw trails behind it; I can do a thousand things that, quote, control the cursor, but I don't think they're what you would call a cursor control operation remotely like we're talking about today.

Q. So you would say that a cursor control

operation would not include an operation to change the size or the dimensions or the speed or other attributes of the cursor? Is that your testimony?

A. Right, right. I would not use the terminology -- if I was talking to an engineer and I'm, you know, working on one of the LCS control panels and I said to the guy, you know, I want you to implement, you know, cursor sizing, which we did, or mouse trails, which we did, or innumerable other things like that, I would never have said that's a cursor control operation. And if I had, the guy would have thought I was kind of talking in a strange way.

Q. Let me ask you to take a look at -- this is Von Herzen Exhibit 7, which is the '218 patent.

Why don't we take a look at claim 1, which has that phrase "cursor control operation" in it. It's in column 13.

Do you have that?

A. Right.

Q. Element C refers to distinguishing between a first cursor control operation and a second cursor control operation and a third cursor control operation based on the duration of said contact and gap intervals.

Do you see what I'm referring to there?

A. Right.

Q. All right. And I think what you said in your report at paragraph 36 is that a cursor control operation means providing cursor positioning data to effect movement of the cursor; is that right?

A. Well, I said that it's a cursor tracking operation that controls the movement of the cursor on the screen.

Q. Where did you say that? I didn't see that word "tracking," so maybe you can point that out to me.

A. Well, we're talking about my paragraph 36, and I note that, you know, at 6:9-13, "The '218 patent expressly states that a cursor control operation is a cursor tracking operation. That is, an operation that controls the movement of the cursor on the screen."

Q. Right. And what I'm trying to understand, first of all, is we have some claim language, "cursor control operation," and I first of all wanted to get your opinion then on what you believe that term means, how it should be construed by one of ordinary skill in the art.

I thought you had construed it to mean providing cursor positioning data to affect movement of the cursor, but I may have that wrong.

A. Well, I mean, I guess you're asking sort of

two parallel questions at once. Let's look up the claim construction. And you're reading two different parts of my paragraph that I think are consistent, and I don't see any inconsistency between them.

Q. I'm not saying there's an inconsistency. I just want to know what word you believe should be used to define the words "cursor control operation."

A. As I said in 36, I believe it means -- you know, the first sentence says, "I may provide my opinion that the term 'cursor control operation' means providing cursor positioning data to affect movement of the cursor."

Q. All right. And those words are somewhat different than the words in the joint claim construction statement at page 22; correct?

A. Well, I think that construction says, "providing of positional data to affect movement of the cursor." And I guess -- I don't see any substantive or meaningful difference between "providing cursor positioning data" and "providing of positional data."

Q. All right. "Positional data" referring to the cursor position?

A. To affect the movement of the cursor. Right. I mean, I don't see any difference between those two phrases.

Q. All right. So now, with that construction in mind that you've provided there of what a cursor control operation is, can you point out to me where in the specification there are described three cursor control operations, a first one, a second one and a third one that are based on the duration of contact and gap intervals?

A. Okay. And I'll direct your attention back again to 6 to 9 to 13 where it explains column 6, lines 9 to 13 where it says, "As shown in part A of figure 5" --

THE REPORTER: Slow down.

THE WITNESS: I'll just read the -- "if the first contact interval lasts longer than the maximum tap interval," and then there's an example here in parentheses, "i.e., if T subscript T1 is greater than T subscript max, the operation of the touch-sensitive cursor controlling input device during the first contact interval is identified as a cursor control operation, i.e., a cursor tracking operation."

And then it goes on to, "Thus, positional data relating to user's contact with a touch-sensitive input device is supplied to the computer system in order to effectuate cursor movement on the computer screen."

Now, going back to understand the context of

this to column 5, there's a section which deals with -- I'll just read the whole paragraph beginning at column 5, line 5.

"Consequently, touchpad 200 generates x, y and z data pertaining to the user's contact with the touchpad, e.g., pertaining to the position of the operator's finger on the touchpad, over some region in the x, y and z directions.

"Velocities, accelerations, timing differentials and signal strengths may be determined from this data string. As mentioned below, when these parameters are considered along with prior events, it is possible to discern between cursor manipulation, click, multi-click, drag, click-and-drag, and multi-click and drag operations."

And if we look about what some of these operations are, cursor manipulation would be just simply positioning the cursor. Click would be a button press and release, multi-click would be some set of those in close proximity, drag is the operation wherein the button is down and then there's motion.

Click-and-drag as described here would be a click immediately followed by a drag. So it would be down, up, back down, and then motion. And then the next one there would be a multi-click-and-drag

operation, which would be something on the order of down, up, down, up, down, drag.

So to the extent that there's three cursor control operations you asked me to identify, certainly a cursor positioning would be one, dragging would be two, click-and-drag would be three, and multi-click and dragging would be four.

Q. There is in figure 2 of this patent, I believe, an element called 215.

A. Right.

Q. And I believe that that's called a balance-measuring circuit in the patent.

A. Counsel, do you perchance know what the relative section is just to speed us up here?

Q. Column 4 is what I was focused on, but I didn't want to limit you there.

A. I'll start there. Thank you.

Okay. I mean, in the interest of time, I'm generally familiar with that paragraph.

Go ahead, please.

Q. All right. My question is, what is the function of the balance-measuring circuit 215?

A. In general, this is a kind of top-level description of this particular sensing means. In general, there's a technique to determine, I guess,

capacitive coupling or electrostatic coupling where you do charge balancing.

That is, you look at the relative amount of charge that you need to inject to get to a fixed voltage level from one coupled source into the finger and then maybe the other coupled source. Or into the object in the general sense, but let's say finger for sort of a simplistic explanation

So if we had electrodes -- and this is a very kind of top-level description they're making here, so they may end being slightly different. But the -- if you have two traces and we have -- you know, and I'm sorry I'm using any fingers for traces, but if I have -- I'll turn this way so that they look like --

THE REPORTER: Try to slow down a little bit, too. It's been a long day.

THE WITNESS: I'm sorry. Okay.

So I'm trying to make kind of a three-dimensional description in midair, which is hard to do, but assume we have some traces and then we have a finger which is coupled capacitively to them.

If I can determine the amount of charge I need to place the balance of voltage on the two traces, then I have determined the relative capacitance coupling between the finger and the two traces.

appropriate electrodes for balance measurement and ratio determination."

So it looks like the ratio thing is kind of calculating a ratio of the two, and again, in the kind of a -- not necessarily this exact implementation, but other implementations I've seen in that type of thing, you might look at the ratio because that tells you where you are between the lines.

In other words, if you're interpolating your position between two conductors, the ratio of the capacitance is proportional to the ratio of your position between the two lines.

Q. In paragraph 35 of your report you state that you may provide a general technical overview of the systems described in Apple's '218 patent.

Do you see that?

A. Right.

Q. Now, have you prepared such a general technical overview at this point?

A. Well, not other than the technical overview that's presented here.

Q. "Here" being Exhibit 2? Exhibit 2, your summary --

A. Yeah, I'm sorry. In my -- in my report.

Q. Let me ask you to turn to paragraph 40.

So one kind of capacitance sensing technique is that type of balancing. So from the explanation it appears that in this circuit that element 215 is, in fact, being used to do that type of electrode-to-electrode balance sensing. And then from there it looks like they're doing something with this successive ratio of the balance measurement.

So again, I'm not sure I, without thinking about it a lot and, you know, doing more detailed kind of analysis of it, can say exactly how that sensing process works, but it's -- 215 is one of the elements in generating positional data from this particular input device.

Q. Toward the end of your answer you alluded to the balance ration determination in circuit 220, which is also depicted in figure 2, and what is the function of that circuit?

A. Well, they note that it's balance ratio -- let me just back up and read it for clarity.

"The virtual electrodes are connected to electronic circuitry capable of measuring the electrical balance between selected top and bottom virtual electrodes. Balance ratio determination circuit 220 determines the ratio of one balance measurement to another. Microcontroller 225 selects

This refers to the 659 patent, and you say in paragraph 40 something similar. You say that you may provide a general technical overview of the systems described in Apple's '659 patent, and my question is, have you prepared such a general technical overview as of today?

A. Not other than what's here.

Q. "Here" being, again, just for clarity of the record, Exhibit 2?

A. Yeah, in my report, Exhibit 2.

MR. BOBROW: All right. Why don't we take a short break. I think we're just about ready to wrap up.

MR. DeBRUINE: Perfect.

THE VIDEOGRAPHER: We're going off the record at 5:11 p.m.

(RECESS TAKEN.)

THE VIDEOGRAPHER: We're back on the record at 5:18 p.m.

BY MR. BOBROW:

Q. Just a handful more questions, really, on two topics. One was housekeeping.

At the beginning of the deposition Mr. DeBruine, at least to my recollection, mentioned that he was not only representing Elan but also

representing you as the witness.
Do you recall that?
A. Yes, he made that statement.
Q. All right. And is that the case, that Mr. DeBruine or his firm are representing you as counsel?
A. I mean, he made that statement and I presume that's the position they're taking.
Q. All right. And is that your understanding of the relationship that you have with Mr. DeBruine's firm, that he's representing you?
A. Well, okay. I don't -- I'm working as an expert witness for Alston & Bird, and I've been hired to do certain things. You know, I don't -- I have not solicited on a personal level his representation. And perhaps he was just -- I mean, it might be better to ask him than me, but perhaps he was commenting on his role in the deposition or something of the sort.
Q. You're not compensating or paying --
A. No.
Q. -- Mr. DeBruine's firm for representation of you?
A. No, no, no, no.
Q. Second subject I had has to do with paragraph 20 of your report, which is Exhibit 2, I hope still in

front of you.
The court reporter made things difficult by making things neat. They were otherwise --
MR. DeBRUINE: My wife does that a lot.
THE WITNESS: There's one neat person in this room. That's a good thing.
BY MR. BOBROW:
Q. Take a look, please, at paragraph 20, and there was a mention in paragraph 20 of a centroid, and I see that appears about two-thirds of the way down that paragraph on page 9. You talk about a centroid for an axis being calculated in a certain way.
Do you see what I'm referring to?
A. Right.
Q. So now, if I have, let's say, a touchpad and I have two fingers on the touchpad, I can calculate -- one thing I could do is potentially calculate a centroid for those two fingers combined, one centroid for the two; is that right?
A. You could, yes.
Q. And I think you were saying earlier that that was a fairly common technique even in the 1990s; correct?
A. Well, I'm not sure I can recollect my testimony exactly to a degree to comment on this, but

people knew how to compute centroids, and if you compute the centroid over the whole dataset, then you will end up with a centroid, which is the centroid of all of the areas of coupling.
So in the example you gave of two fingers, if you just simply did it over the whole dataset, you would calculate a centroid which would be in general between the two fingers, and that's where it would be basically. Depending on how much coupling you had on each finger, it wouldn't exactly be central, but it would be between them.
Q. And in calculating that centroid where I'm looking at the -- I think what you said, the entire dataset of points for -- in the case of two fingers, let's say that I'm taking all of the measurements for the conductors that are arrayed along, say, an X axis of the touchpad.
When I'm calculating the centroid, do I use all of those capacitance measurements that I've made on each of the conductors in that region?
A. Well, in a practical sense, no. We're focusing on some particular aspects of, you know, claims and claim construction terms, but there's also a whole process of thresholding, of zero balance or zero state removal, background removal, and so what you

actually would tend to do is something that's more like if I'm above a kind of first threshold. Right?
That is, determining whether I'm out of the noise floor at all. And then I'm going to segment down and I'm going to look at sensed, you know, values in that subset. Right? Because they've gotten out of the noise, I've already -- let's assume I've already corrected for baseline drift and I'm now looking at just what would be good data, but there's, you know, some other characters.
It might also be, I would say, and again, it's hard to know exactly what other people were doing, it would not be uncommon to have a very low-level what I'll call a kind of sanity filter. Because you pretty typically see a lot of noise events in this kind of sensing, and so if you saw a single line which had stratospheric coupling or stratospheric value, it would be unlikely that that was really a finger coupling, because you normally see some increasing range around it like a slope.
So you probably would ditch that kind of data. Otherwise, you'd have noisy, you know, poor performance.
Q. Fair enough. I should have been more precise.
So let's assume that I have a touchpad. I am

trying to determine, you know, the presence of two fingers. Two fingers are on the pad. There are certain capacitance values that are generated. Let's assume I'm sensing the X conductors along the X axis. I weed out the noise. I weed out whacky extraneous or the kind of events that you were describing, that kind of data. Filtering is done.

When I'm calculating the centroid, do I include in determining the centroid the values that correspond to the maximum capacitance? In other words, the maximum values associated with those fingers.

A. Well, if you're trying to compute one centroid across both of them, then you would include the maximum of both. If you were trying to compute two centroids, one for each, you would include the maximum value for each in its own calculation, and then you would -- the range of calculation would be limited -- you'd make some tests, of which there are many, to determine which -- you know, what part of the waveform was associated with the first hill and what part was associated with the second.

MR. BOBROW: All right. That's all I have.

Thank you.

THE VIDEOGRAPHER: This ends today's deposition of Robert Dezmelyk on April 9th, 2010. The

total number of tapes used was four. The master videotapes of today's deposition will remain in the custody of McMahon & Associates McMahon & Associates, LLC.

We're now off the record. The time is 5:25 p.m.

(The deposition of ROBERT DEZMELYK was adjourned at 5:25 p.m. this date.)

--- oOo ---

I certify under penalty of perjury that the foregoing is true and correct.

Date _____ _____

ROBERT DEZMELYK

REPORTER'S CERTIFICATE

The undersigned Certified Shorthand Reporter licensed in the State of California does hereby certify:

I am authorized to administer oaths or affirmations pursuant to Code of Civil Procedure, Section 2093(b), and prior to being examined, the witness was duly administered an oath by me.

I am not a relative or employee or attorney or counsel of any of the parties, nor am I a relative or employee of such attorney or counsel, nor am I financially interested in the outcome of this action.

I am the deposition officer who stenographically recorded the testimony in the foregoing deposition, and the foregoing transcript is a true record of the testimony given by the witness.

Before completion of the deposition, review of the transcript [x] was [ ] was not requested. If requested, any changes made by the deponent (and provided to the reporter) during the period allowed are appended hereto.

In witness whereof, I have subscribed my name this ____ day of _____, 2010.

_____

ANNE M. TORREANO, CSR No. 10520

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The undersigned Certified Shorthand Reporter licensed in the State of California does hereby certify:

I am authorized to administer oaths or affirmations pursuant to Code of Civil Procedure, Section 2093(b), and prior to being examined, the witness was duly administered an oath by me.

I am not a relative or employee or attorney or counsel of any of the parties, nor am I a relative or employee of such attorney or counsel, nor am I financially interested in the outcome of this action.

I am the deposition officer who stenographically recorded the testimony in the foregoing deposition, and the foregoing transcript is a true record of the testimony given by the witness.

Before completion of the deposition, review of the transcript [x] was [ ] was not requested. If requested, any changes made by the deponent (and provided to the reporter) during the period allowed are appended hereto.

In witness whereof, I have subscribed my name this 12th day of April, 2010.

ANNE M. TORREANO, CSR No. 10520