UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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META PLATFORMS, INC.,

Petitioner,

v.

EIGHT KHZ, LLC,

Patent Owner.

_____

Case IPR2023-01019

U.S. Patent No. 10,368,179 B1

Case IPR2023-01020

U.S. Patent No. 10,488,184 B1

_____

Deposition of DURAND RENÉ BEGAULT, PH.D.

Conducted Virtually

Friday, June,14, 2024

11:39 a.m. EDT

Meta
Exhibit 1147
Meta v. 8KHZ
IPR2023-01020
Ex. 1147-001

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Deposition of DURAND RENÉ BEGAULT, PH.D., conducted virtually.

Pursuant to notice, before Judith E. Bellinger, Registered Professional Reporter, Certified Realtime Reporter, and Notary Public in and for the State of Maryland.

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C O N T E N T S

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E X H I B I T S

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P R O C E E D I N G S

DURAND RENÉ BEGAULT, PH.D.,

Being first duly sworn, was examined and testified as follows:

EXAMINATION BY COUNSEL FOR THE PETITIONER

BY MS. OSMAN:

Q Good morning, Dr. Begault. My name is Inge Osman, I'm an attorney at Latham & Watkins, and I'm here today on behalf of Petitioner Meta.

How are you today?

A I am fine except I'm recovering from a cold.

Q I'm sorry to hear that. I hope you feel better soon.

MS. OSMAN: Can counsel from Eight KHZ introduce themselves, please.

MR. DUNN: This is Patrick Dunn from Spencer Fane.

MS. PARTRIDGE: I'm sorry, I didn't hear what you were saying. My name is Jayme

Partridge, I'm from Spencer Fane, and Patrick Dunn and I are here on behalf of Quantum, patent owner.

MS. OSMAN: Got it.

MR. DUNN: Eight KHZ.

MS. PARTRIDGE: I thought that might be the case. I'm doing great. Okay.

BY MS. OSMAN:

Q Dr. Begault, can you, please, state and spell your full name for the record.

A Yes. My name is Durand, D-U-R-A-N-D, René, R-E-N-E, with an accent mark on the final E, Begault, B-E-G-A-U-L-T.

Q Thank you, Dr. Begault.

And where are you right now?

A I am in my home office.

Q Okay. And where is your home office?

A It's located in Noir Beach, California.

Q Okay. Did you bring any materials with you to the deposition today?

A The only materials I have brought is a hard copy of my supplemental declaration, and I think it's referred to as a popper. So it's,

basically, a hard copy of my two declarations, pertinent to what we're talking about today, and they have not been marked or edited in any other way. So they're just literal printouts because sometimes it's easier for me to see them as they are, you know, in hard copy as opposed to trying to read on a screen.

Q I understand that, certainly.

Okay. So you have no notes with you and you have hard, clean copies of both of your declarations; is that correct?

A That's it.

Q Okay. Thank you.

I know you were previously deposed as part of the parallel District Court litigation.

Have you had any other depositions since that deposition in the parallel District Court litigation?

A So the parallel -- I'm not sure exactly what that is. I've been deposed in other matters, but I don't believe they have to do with the present case.

Q Okay. Let me ask my question again. I think that was a little confusing.

How many times have you been deposed over the past year?

A Over the past year?

Q Uh-huh.

A I have to look at my current CV to tell you that. I think it's four or five times. Maybe four times.

Q Okay. So fair to say you probably remember the rules of depositions?

A Oh, yes.

Q Okay. Now, I'm going to go over the rules, just for the record and to refresh your recollection, even though I understand you're a pro at this.

So you know, I'll be asking the questions and you'll be answering them, right?

A Yes.

Q Okay. And the court reporter, Judy, is writing down everything that's said. So, please, make sure that your answers are verbal, and that's

yes or no and not shaking your head or nodding your head.

Does that make sense?

A Yes, it does.

Q Okay. If at any time during the deposition you don't understand one of my questions, please, tell me and I'll rephrase it.

Is that fair?

A Absolutely.

Q Great.

And additionally, especially because we are in a remote deposition today, only one of us can speak at a time.

So I ask that you pause and let me finish my questions and I will, likewise, pause and let you finish your answer.

Does that sound fair?

A Yes.

Q Thank you.

Now, during the deposition today, your lawyer may object to one of my questions. She's only doing that for the record. Unless she tells

you not to answer my question, you still have to answer.

Does that make sense?

A Yes, it does.

Q Okay. Now, during the deposition today, as I'm sure you know, you might give an answer and then later remember that you need to correct or clarify something.

If that happens, will you let me know and we'll stop and clarify your testimony?

A Yes, I will.

Q Thank you.

Is there -- now, I know you said you were not feeling well. Will that prevent you from giving truthful and accurate testimony here today?

A No, it just might mean that I might start coughing.

Q Okay. Well, we can certainly take a break if you need one.

Is there any other reason why you may not be able to give truthful and accurate testimony here today?

A None whatsoever.

Q Okay. Now, we're going to try to take a break about every hour during the deposition today. But of course if you need one earlier than that, please, let me know.

Does that sound fair?

A Yes, it does.

Q The only thing I'm going to ask you if we have a question pending, please, answer the question and then we'll stop and take a break after that, okay?

A That sounds reasonable.

Q All right. Great.

Now, because we are in a remote deposition today, I'm going to ask you a few questions about the room that you're sitting in and what's around you.

Is there anyone else in the room with you right now?

A No.

Q Do you have any -- so you told me you have your two declarations with you.

Are there any other documents or notes in the room with you?

A There are notes that have to do with a shopping list for the grocery store, but there's nothing pertinent to this case.

Q Okay. Can you agree with me that you will not open or reference any other documents or notes during the deposition today, other than the documents that we share as part of the deposition?

A Well, I will only reference those documents that are pertinent to today's deposition. So I don't know what documents you're going to be asking me about, but I will certainly restrict myself to documents that have to do with what we're talking about today.

Does that make sense?

Q I'm not sure you answered my question. I'm asking, can you, please, agree that you will not open any documents or notes that are either not your declarations, that you've told me are in front of you, or documents that I've shared with you?

So during the deposition today, I want to know if you're looking at any other notes or documents.

So can you agree with that?

A I'm not looking at any other notes or documents. If you were to ask me something, let's say, about the New York telephone book, which I don't know if it even exists anymore, but as a hypothetical, and I happen to have a copy of that there, then that would, of course, be something I would open up because you had brought it up.

Q Sure.

A So that's -- I'm sorry, I misheard.

Q My apologies I cut you off. Please continue.

A No, I think I was just basically saying that if you bring up a document, like the New York telephone book, and I happen to have a New York telephone book here, then, of course, I would look at that or see if I had a copy of a New York telephone book.

But I'm going to, basically, be looking

at what we already discussed, which is a hard copy, that's unmarked, of my two declarations that concern the, what I believe we'll refer to as the '179 and '184 patents, and I'm not referring to any notes.

Q So you said the '179 and '184 patents. So you understand that this deposition is related to two IPR proceedings involving Patent Number 10,368,179, which we will refer to as the '179.

Is that right?

A Let me confirm. 10,368,179, yeah, that's correct, suffix B1.

Q That's the 179 patent you were just referring to?

A Yes, to the best of my knowledge, that's what that is.

Q Okay. And then the second patent relevant to these proceedings is the 10,448,184 patent, correct?

A Yes. I can confirm that with suffix B1.

Q Great. And that's the '184 patent that you were just referring to, right?

A Yes.

Q And so if I refer to the '179 and '184 patents, you'll know what I'm talking about, right?

A Yes.

Q And so, you told me that if I ask you about the New York telephone book and you happen to have a copy, that you will go find that copy.

Can you commit that you will not open any documents or books other than the ones I share with you or that I specifically ask you to open during the deposition today?

A Yes, that's reasonable.

Q Wonderful, thank you.

How many computers or electronic devices do you have with you in the room today?

A I have never counted. As you might know, I'm very involved in technology, so there's quite a few computers and electronic devices all about me in my office.

Q How many computers or electronic devices are you using today, right now?

A One.

Q One.

A Okay, well, I guess you could count my smart watch, but -- as a computer. I should put it into airplane mode, so I think I will do that, just to make sure it doesn't disturb us.

Q That would be great, thank you.

A That is technically an electronic device, by today's definition.

So it is now in airplane mode. I believe I have silenced my two iPhones, yeah.

Q Wonderful.

So the only electronic devices that are currently open and in use is the computer that you're using right now?

A That is correct.

Q Wonderful.

How many applications do you have open on your computer?

A I have one called Zoom meeting. I have

the electronic versions of the declaration and the supplementary declaration, that are also both unmarked and appear to be the exact copies that I -- no, they are the exact copies that I did the printouts on. I just have them up as electronic versions.

I also brought up, just in case it was necessary on a web, what do you call this? Web browser. I have opened the Google Patents versions of the four patents that are mentioned in these, just for convenience sake, if we needed to refer to those.

Q Dr. Begault --

A So there's a total of three applications open on my computer right now. There's Zoom meeting, there's a program called Preview, which has my declaration and my supplementary declaration, unmarked, exactly the same copies I have the hard copy versions of. And I have a web browser with the Google Patents versions, mostly because it's just easier on my eyes, of four prior art patents that are mentioned

in my declaration, just for ease of our deposition, if you were to refer to those.

Q Which four prior art patents do you have open in Google Patents right now?

A I have opened Virtual/Augmented Reality Transition System and Method, and that is U.S. Patent 9,690,374, suffix B2. Inventors Christian Clement, Alexander Faaborg, F-A-A-B-O-R-G.

Q Dr. Begault, do you agree that during this proceeding we've been referring to prior art references by the last name of the inventor?

Is that something that's in your declaration?

A Well, I think that's a reasonable shorthand.

Q And you use that shorthand in your declarations?

A I believe I do. Let me check. I don't know if I used the number in addition to them. I think the first time they're called out, they might be called out more explicitly. But at some

point, yeah, I think we used one of the names of the inventors as a shorthand, like, Clement, for example, we might use the word Clement as a shorthand.

Q Okay. The first of the four prior art patents opened on your screen right now is the Clement prior art reference; is that right?

A Yes. This corresponds to the shorthand Clement.

Q Perfect.

Can you let me know what the other three prior art references are?

A Yes. So I also have pulled up here, on Google Patents, United States 7,876,903 B2. It is a patent titled Method and Apparatus for Creating a Multidimensional Communication Space for Use in a Binaural Audio System. And the inventor is Paul Sauk, S-A-U-K.

Q Thank you.

What's the third patent that you have open?

A The third patent I have opened up is

United States 9,037,468, and its title is Sound Localization for User in Motion, and the inventor is Steven Osman, O-S-M-A-N.

Q Thank you.

And what is the fourth patent you have open?

A It is Apparatus and Method for Sound Processing in a Virtual Reality System. Its patent number is U.S. 8,520,872 B2. The inventors are S-E-O-C-K dash W-O-O, Jang, S-A-N-G dash K-I, Kang, K-A-N-G, and K-E-U-N dash S-U-P Lee.

Q So if I refer to that patent as the Jang patent, you'll know what I'm talking about?

A Yes, I will.

Q Okay. And if I refer to each of these prior art references by the last name of the first inventor, you'll know what I'm talking about?

A Yes.

Q Thank you.

Could you, please, close that web browser, please.

A Okay. It's done.

Q Wonderful.

I'd like to keep your computer, during the course of this deposition, I'd like only open the Zoom platform so that you can speak -- so that we can speak over Zoom, and whatever documents I share.

If you want to keep open virtual copies of your declarations, that's fine, but, please, restrict it to your declarations, what other documents -- any other documents that I share.

Do you have a document share website open?

A No.

Q Okay.

A What is a document share website?

MS. OSMAN: Erin, can we get set up a document share website so that Dr. Begault can download references as we share them?

Is there a way for us to do that?

PLANET DEPOS TECHNICIAN: There is. I'll get that set up and I'll put the link in the chat.

MS. PARTRIDGE: I need that, too, but I assume -- I'll just pull it out of the chat.

PLANET DEPOS TECHNICIAN: Yes.

Q So, Dr. Begault, during the course of the deposition today, I would like you to only have open that document share website. Please don't open anything else on any web browser.

Do you agree?

A Is it okay to have my electronic version of my declaration and my supplementary declaration open?

Q Yeah. Those, I assume, are not in your web browser; is that right?

A Right. Those are just in a PDF reader.

Q Perfect. That's fine.

Do you have any messaging program open right now?

A No, I do not.

Q Any email program open?

A Maybe on a different window so that I could get set up here. I'll close it.

Q Thank you.

Do you have any other lines of communication with your attorneys open?

A I do not.

Q And I see that Erin just kindly inserted into the chat a link to the document share website.

A Okay. That will require me to reopen my web browser. Let me go -- how do I see the chat now? View, speaker, download. I'm looking to see how I can see the chat.

Okay. Hang on. Show chat. I see. Okay, there. All right.

I see a link. So I should click that and download this; is that what I'm supposed to do?

Q There's nothing to download right now. Just click the link, please.

A Okay. I see something that says, at the top, PD OneDrive Erin Schuppert, and I see something called test.pdf.

Q Great.

A Are those -- is this what you were

referring to earlier as a document share facility or device or software? I'm not sure what you're referring to it -- but anyway --

Q Yeah.

A -- is this what I'm supposed to have?

Q Yeah. Thank you.

A No problem.

Q Okay. So while we're on record, during the deposition today, I ask that you don't have any other screens in front of you and that you don't open any other applications on either your computer, your phone, or any other device.

Do you agree?

A I do agree.

Q Great.

And if some point during the deposition today your answers to any of these questions change, will you let me know?

A Yes.

Q Thank you.

So, for instance, if someone comes into the room, you'll let me know?

A Oh, I see what you're asking. I see. Yes, nobody will come into the room.

Q Okay. Great.

Dr. Begault, what did you do to prepare for your deposition today?

A Well, I printed out a hard copy of my declaration and my supplemental declaration.

I reviewed the patents that we discussed earlier, that you had me close the Google Patents versions of. Let's see.

I had a discussion with the attorneys, I think it was mostly over --

MS. PARTRIDGE: I'm sorry, I'm going to instruct you that you can talk to her about who you met with and for how long, but not our conversations, specifically. And I'll instruct you not to reveal that for attorney-client privilege purposes.

A Thank you, and I apologize.

So, there was a discussion. I'm trying to recall what else.

Oh, yes, I reviewed a declaration by

Agnieszka Roginska.

Q Did you do anything else?

A I'm trying to recall. I looked at the deposition notices. I'm not recalling anything other than that. It's, basically, review of the patents that are discussed in my declaration, or declarations, plural, and then the Roginska -- Dr. Roginska's declaration. I may have reviewed her deposition transcript as well, but I think that encompasses everything.

Q Okay. You said you met with attorneys. Which attorneys did you meet with?

A Well, this was a telephonic conversation, and I believe those are the two attorneys that are present.

Q Was it one telephone conversation?

A I'm trying to recall. I think it was one. There might have been a second one about meeting times or deposition times, or something of the sort. My schedule. I wasn't sure about my schedule at one point.

Q Was it a Zoom conversation or a

telephone conversation?

A Telephonic, I think.

Q Telephonic?

A If it was Zoom, I probably had my camera off because I was suffering from a cold. Yeah, I think it was a Zoom conversation, so it was, essentially, like, a telephonic conversation because there was no camera.

Q And how long was that conversation, would you say?

A I don't really recall.

Q Was it eight hours?

A Definitely less than eight hours.

Q Was it less than four hours?

A Definitely less than four hours.

Q Was it less than two hours?

A Definitely less than two hours.

Q Was it less than one hour?

A I don't recall.

Q Okay. And was that -- when did that conversation take place? Was it yesterday?

A I don't recall that. I think it might

have been a couple days ago. I don't recall the exact date. It could have been last week. No, I think it was a couple days ago.

Q Okay. So other than that one less-than-two-hour phone conversation with your attorneys, did you meet with your attorneys at all to prepare for this deposition?

A Well, again, I'm thinking about telephonic conversations I've had. So, okay, there was one other individual that I did have a conversation with, that's correct.

Q Who is that other individual?

A That was Attorney Jayne. I'm not recalling Jayne's last name.

THE WITNESS: Can you help me?

MS. PARTRIDGE: I can. Piana.

THE WITNESS: Thank you. I apologize; I forgot her last name.

MS. PARTRIDGE: I'm going to tell her. But, go ahead.

Q When did you meet with Jayne Piana?

A Again, it was a telephonic conversation

with -- well, it was a voice conversation via Zoom. I believe that was a week ago. So you recall, I was recalling two conversations and, so, I think I had a conversation with her.

Q Okay. So you had two conversations with attorneys, one was with Jayne Piana.

Was anybody else present at that meeting?

A No, I don't think so.

Q And how long would you say that conversation was?

A I don't recall.

Q Was it longer than eight hours?

A Definitely not.

Q Was it longer than four hours?

A Definitely not.

Q Was it longer than one hour?

A I don't recall.

Q Was it longer than two hours?

A I don't think so.

Q Okay. So somewhere between -- somewhere less than two hours, you suspect?

A Yeah, that sounds good.

Q And you said, you had one meeting with Jayne Piana and then you had another meeting with the attorneys present today.

Was anybody else present at that second meeting with attorneys?

A I'm trying to recall.

I believe, perhaps, an attorney Homayoon Raf -- I can't say his last name. I want to pronounce it Spanish. H-A-O-M-A-Y-O-O-N [sic] Rafatijo, R-A-F-A-T-I-J-O.

THE WITNESS: Jayme, did I spell his last name correctly?

MS. PARTRIDGE: I don't know. But we can get the spelling for you.

A Okay. Okay. Yes.

Q Okay. And other than those two meetings, did you meet with any other attorneys, at any other time, to prepare for this deposition?

A No.

Q Okay. You named a few documents that you reviewed. You said you reviewed the four

patents, prior art patents that you already identified for me. And Dr. Roginska's declaration and Dr. Roginska's deposition transcript, and the two, '179 and '184, patents in this litigation -- in this proceeding.

Did you review any other documents to prepare for this deposition?

A I think I gave you an exhaustive list earlier of what I reviewed.

Do you want me to restate it?

Q I don't. I'm asking if there are any other additional documents that you reviewed to prepare for this deposition?

A Not that I'm recalling. I think I answered accurately earlier.

Q Okay. Did you review any materials other than what's cited in your declarations and other than what we've discussed already?

A For what purpose?

Q To prepare for this deposition today. So let me ask you the question again.

Did you review any other documents than

what's cited in your declaration, and then what we've discussed already today, to prepare for this deposition today?

A I'm not recalling any other documents that I reviewed to prepare for this deposition --

Q Okay.

A -- today.

Q Thanks.

So, other than counsel, did you discuss the substance of your declaration with anyone else?

A No.

Q Have you spoken to any other experts about the contents of your declaration?

A No.

Q How much time would you say you've put into this case so far? And when I say "this case," I mean the IPR proceedings and the related District Court litigation.

A How much time? First off, I don't know -- I've been involved in several declarations related to various matters that seem to come under

the general subject area.

Then there seems to be different parts of those. And, honestly, I can't tell you how many hours I put into any subpart of any of those.

Q How many hours would you say you've put into these IPR proceedings, these two specific declarations and the preparation for your deposition today?

A I believe to prepare for the deposition today, it's probably more than two and less than 12 hours. And as far as anything else before that, I really have no recollection.

Q So, you have no recollection as to how many hours you've spent preparing the declarations that you submitted in this proceeding -- in these two proceedings?

A I could tell you it's probably less than 150 and more than 40.

Q Okay. Is it less than a hundred hours?

A I think I just answered you. I can estimate that it's somewhere between more than 40 and less than 150. Everything else would be total

speculation. And even those limits I'm giving you, I'm just guessing.

Q Okay. Are you being compensated for your time?

A Do you mean am I working for free?

Q I'm asking you, are you being compensated for your time working on this -- in this proceeding?

A Well, yes.

Q Okay. And what is your hourly rate?

A My hourly rate, for this particular matter, is $400 an hour for consultation, and, I believe it's 580 for deposition, trial testimony, per hour.

Q Okay. Dr. Begault, who wrote your declarations?

A I wrote my declarations.

Q Okay. Did you work with counsel in writing your declarations?

A Counsel provides a sort of general outline. Counsel provides editing. In other words, I'm not capable of producing the formatting

that these documents have. There might have been a minor edit or word change or, perhaps, a legal phrase that I might have used a more layperson way of saying something. I don't recall exactly. But, otherwise, I am the author of these two declarations.

Q And when you say counsel provides a general outline, what does that outline look like?

MS. PARTRIDGE: And I want to caution you not to provide any attorney-client privileged information. You can tell her -- basically, at a very high level, you can answer her question.

A So, could you answer -- I'm sorry, could you answer. Could you ask your question again.

Q Dr. Begault, you told me the attorneys provided you with an outline. What does that outline look like?

MS. PARTRIDGE: Same objection.

A Well, you can see the outline as shown in the table of contents of the supplemental declaration on page ii, I think it's called Roman,

you know, small double I. So there's a kind of outline there, you know, reading very -- you know, various topic areas.

And when I say they provided this, it was interactive, and there are subsections to this that I produced because I'm interested in making my opinion coherent and to flow correctly.

So, that's what it is on the supplemental deck --

Q Could you --

A We're talking over each other.

Q Dr. Begault, can I just jump in for a second. I don't want you to waste your time. Let's confine our discussion today to just your supplemental declaration; that's what we're going to focus on.

So it sounds like what you're saying is they provided an outline that looks a lot like the table of contents, and you typed up all the words in the declaration; is that correct?

A Well, the way you're describing, that's a little linear. I would say it was more of an

iterative process. So, for instance, we probably started off with something like there needs to be an introduction, a qualification.

MS. PARTRIDGE: Dr. Begault, please, be careful not to disclose any attorney-client privileged information, and keep your comments at a very high level, please.

I do not want you to discuss any attorney-client privileged conversations or communications.

THE WITNESS: Very good.

A So, as I said, as the author of this, and when I said an outline was given, it was on a very high level, just having to do with what you can glean from the table of contents there.

And, basically, this is a way of organizing thoughts and opinions that, ultimately, are my decision.

Q Okay. So it sounds like you're saying the attorneys provided you with an outline that looks like the table of contents, and then you went ahead and provided the first draft, the

attorneys provided input, but, ultimately, every word in this declaration is yours.

Is that fair?

A No.

MS. PARTRIDGE: Object to form.

Q Not every word in this declaration is yours?

A I agree with the second part of your statement there, your characterization. The first part of your characterization you that -- you described this very linear process, they handed me an outline and then I typed in all the words.

I developed that outline being, you know, interactively, if you will. And, again, sometimes this doesn't have anything more to do than where, in the document, I'm going to express one of my opinions or in what order.

So, for instance, in the supplemental, it occurred to me that I wanted to describe, with some great detail, the technical means by which certain things are implemented. So, that was an outline that only I could provide, you see?

So, that's why I said the first part of your characterization was incorrect, because that's a little too linear.

I certainly have formed this, but every word in this outline -- I'm sorry, not in the outline. Every word in this declaration is, ultimately, mine because I read it thoroughly and signed off on it.

Q Understood.

So you said you wanted to describe, with great detail, the technical means by which certain things are implemented.

Which certain things did you think it was very important to describe in great detail?

MS. PARTRIDGE: And, again, I caution you not to reveal any attorney-client privileged information, Dr. Begault.

MS. OSMAN: Ms. Partridge I'm not asking him any attorney-client privileged --

MS. PARTRIDGE: I understand. But I have to keep the objection, Ms. Osman.

MS. OSMAN: Understood.

Q Dr. Begault, you can answer the question.

Do you need me to repeat it?

A Yes.

Q You said you wanted to describe, with great detail, the technical means by which certain things are implemented.

Which certain things did you think it was very important to describe in great detail?

MS. PARTRIDGE: Same objection.

A I wanted to describe, in great detail, those things that are in my supplemental declaration, oh, I would say, beginning around page 37, paragraph 65, subsection B, Methods of Creating Alerts in the Claims.

So this is the section where I wanted to give some detail, I might have used the word "great detail," but some specific details about the way that a POSA would understand. And when I say "POSA," I'm using that as my shorthand for a person of skill in the art. Would understand the meaning of how these various claims or things in

the patent would be implemented.

Q Okay. So that starts at, you said, page 37, paragraph 65, right?

A And this is not an exclusive list; this is just one section where I wanted to focus in specifically on -- well, let's put it this way: I want to offer what a POSA would understand, in order to be able to better explain it to a layperson what some of these technological means involve.

Q Okay. And this is -- these are the methods of creating alerts in the claims; is that right?

MS. PARTRIDGE: Objection. Form.

A This is page 37, Section B, amongst other places, I think there's a kind of -- other places in the declaration, I think this is a -- I guess I would call it a detail of some of those methods.

Q Okay. And you thought it was very important to explain how a person of ordinary skill would have understood the methods of

creating alerts in the claim?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A I think my answer was I wanted to provide a layperson with an understanding of what a POSA would understand.

Q Why was it important to provide that understanding?

A I believe that these declarations are, ultimately, intended for nonexperts.

Q Why was it especially important to provide that understanding with regard to Section B, which is entitled "Methods of Creating Alerts in the Claims"?

MS. PARTRIDGE: Objection. Asked and answered.

A I'm sorry. Why was it -- with emphasis on the word "especially"? Or, I'm sorry, I mean I -- can you repeat your question or just ask it again? I think I can answer it pretty easily.

Q I'm happy to ask it again.

Why was it important to provide an

understanding with regard to what methods of alerting -- creating alerts in the claims meant?

MS. PARTRIDGE: Objection. Asked and answered.

A I believe a nonexpert might not have the understanding that an expert would have.

So, in a declaration such as this, I think it's a duty, if you will, to bring forth an understanding of technical concepts.

Q Dr. Begault, what percent of your income is generated by your expert consulting work?

A It's been a while since I've looked. I think -- so, are you referring to my income from what?

Q From any consulting work that you do.

A Oh, from any consulting work that I do? Well, a hundred percent of my income from consulting for just one firm.

Q That's not my --

A I don't do any other consulting on any other work, other than through Charles Salter

Associates.

Q Let me re-ask my question.

What percent of your income is generated by your expert consulting work?

A Percentage of income? You mean any money I make from anything?

Q Yes.

A I haven't analyzed that, really. I mean, I think I make a certain income from investments. I have another job. I have my consulting work.

So, I'll just tell you, roughly, if -- well, so I'm just asking for a little more specificity, I guess, in your question.

Q I can re-ask my question. I think it's fairly clear.

I'm asking what percent or what proportion of your income do you earn from doing consulting work?

MS. PARTRIDGE: Objection. Form.

A It's been a while since I've looked, so I'll guess 30 to 40 percent, something of that

sort.

Q Okay. And is that consistent year over year?

A No. I think it varies. Depends on the year. Depends on what I'm doing.

Q Is it this year you'd guess 30 to 40 percent?

A Yeah, that sounds like a good guess.

Q How about last year? What percent was it last year?

A I guess I would guess the same thing. I guess I would guess. I would guess the same thing. Sorry.

Q And the year before?

A Same answer.

Q So it's a pretty consistent stream of income for you?

MS. PARTRIDGE: Objection.

THE WITNESS: I'm sorry, I interrupted you.

MS. PARTRIDGE: Objection. Form.

THE WITNESS: Okay.

A I think there have been years where I've been busier in my consulting work and less busy. But I'm on a salary for my consulting work.

Q Okay.

A So it's more -- so it's not always transparent.

Q What do you mean when you say "It's not always transparent"?

A I meant how busy I am and percentage of income.

Q Okay. About what percent of your working time is spent on your expert consulting work?

A Well, that can vary week to week. Sometimes it's as little as zero. Sometimes it might be 60 hours in a week, on very rare occasions.

Q If you were to tell me what percent of your working time, on a yearly basis, is spent on expert consulting work, what would you estimate that percent would be?

A I think I'd have to come back to that.

Year to year it changes, estimates. You know, it really -- boy, it kind of depends on how busy a year it's been. So it's hard to answer your question.

But, it never -- I don't know. On average, I think it's something like, you know, maybe 20 hours a month. It depends, I mean, really, on particularly what's my caseload or if anybody's -- if I have any caseload at that particular moment.

Q So this year, what would you say, what percent of your working time have you spent on expert consulting work?

A This year? Oh, boy. I'd be guessing, again, maybe 30 to 40 percent.

Q And a similar percent last year?

A Yeah, that sounds about right.

Q Okay. Dr. Begault, do you consider yourself an expert in the field of virtual reality?

A I consider myself an expert in acoustics and virtual reality, with regards, in

particular, to three-dimensional audio. I have a better-than-layperson's expertise in virtual reality.

Q But you are -- you would consider yourself an expert in the virtual audio or the 3-D audio domain; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, I definitely consider myself an expert in the field of 3-D audio and virtual reality as regard sound. And then, if we use the definition of an expert as somebody who has greater knowledge than a layperson in a particular field, then I suppose that qualifies me as an expert in virtual reality. So, you know, again, it has to do with when you say the word "expert," I'm trying to think of the particular context, et cetera.

But for today's purposes, I'm certainly an expert in the topics that we're covering.

Q Okay. So you are an expert in the field of virtual reality; is that right?

MS. PARTRIDGE: Objection. Form.

A By the definition that I have greater knowledge than a layperson. As an example, I also have expertise in the field of human factors. I don't generally write expert reports on human factors --

Q Okay.

A -- for legal matters. But I usually write expert reports having to do with audio and audio technology, video.

Q Would you be comfortable writing an expert report in the field of virtual reality?

MS. PARTRIDGE: Objection. Form.

A I would say that this report is an expert report having to do with virtual reality.

Q Okay. Are you an expert in the field of virtual reality games?

MS. PARTRIDGE: Objection. Form.

A Only to the degree that the acoustics and acoustic rendering, signal processing, and spatial representations, and the audio technologies that occur, the processing methods and some of the considerations that overlap with

audio.

Q Have you heard of the Oculus DK1.

A Not specifically the Oculus DK1. I believe you are referring to a head-mounted display called the Oculus that, I believe, is marketed by Meta.

Q What is a head-mounted display?

A Well, that depends on what era we're talking about. There's a very general definition of what that might be. There have been head-mounted displays, for many years, explored by the military, et cetera.

Q What is a head-mounted display? What would a person of ordinary skill in the art, at the time of around 2014, 2015, have understood a head-mounted display to mean?

A Well, they would possibly understand it to mean everything having to do with the whole history of head-mounted displays. There's all kinds of variations and understandings and capabilities, that I think are pretty well-described in books on the history of virtual

reality, et cetera.

Q Are there certain components that tend to be incorporated in a head-mounted display?

MS. PARTRIDGE: Objection. Form.

A Other than a head and a display. The form of the display can be, typically, something -- I think, again, I'm not recalling exactly. I think some of the earlier head-mounted displays restricted, maybe, to a monocular visual display.

Q So they only had visual displays and monocular visual displays at that?

MS. PARTRIDGE: Objection to form.

A Again, I'm really digging into my memory banks here, so I'm going to be unspecific. I'm just going to give you an example that, you know, I think there's a historical version of an Air Force pilot or something with a monocular kind of glass that might show something, like, a runway or a target, or something like that. So it was considered head-mounted, let's say, in the same way that my glasses are head mounted.

Q So it sounds like -- what I asked you is, what would a person of ordinary skill in the art have understood a head-mounted display to be as of 2014 or 2015?

And your answer seems to be it would have included something that goes on your head and would have included a display; is that right?

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

A What I'm saying is that in the time frame that you provided, that it could mean any number of variants of things that had a -- some sort of coupling to a head and that had some sort of form of visual, auditory, possibly tactile, I don't even know if it was anything olfactory. But, you know, there's a whole very -- as I just testified, there's a whole variation of different things that, collectively, I think, referred to or were referred to, at the time frame you're talking about, as head-mounted displays.

Q Okay. So when I asked you about the Oculus DK1, you said you don't -- you haven't

heard, specifically, of the Oculus DK1; is that right?

A I was referring to a specific model, DK1.

Q I'm asking about a specific model.

Do you know about the Oculus DK1?

MS. PARTRIDGE: Objection. Form.

A I have seen an Oculus headset somewhere, I don't recall exactly where. I might have even tried one on at a convention, or something of that sort. I don't recall if it was a DK1 or DK4 or, you know, whatever model.

Q Okay. So you couldn't tell me how an Oculus DK1 works?

A Not with any great detail.

Q And is your answer the same with regard to the Oculus DK2?

A Yeah, exactly. In other words, I know they have a visual display, I know they have an auditory display. By, I would call it, indirect knowledge and not actually holding one and taking one apart, which I may do some day, who knows.

But at this point, I've never taken one apart to know how it might work interactively with other software or hardware.

Q So, you know that the Oculus DK2 has a visual display and an auditory display; is that right?

A No, I'm going to be a little more specific here. I'm going to say that every instance that I've been aware of, which have primarily been through media, but also having tried on an Oculus headset once or twice in my life, that there's a visual display involved and I believe it's a stereo-visual display, and I believe that it has stereo, or some sort of sound reproduction, I think, possibly, 3-D audio.

And to my knowledge of that, I don't recall if it was a DK1 or DK2. So I can't tell you specifically if something is different from what my personal experience was versus the two specific models you mentioned to me.

Q But your recollection is that every Oculus model, including the earliest DK1 and DK2

models, had a visual display and 3-D audio; is that right?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A No, that's right not.

Q No? I'm just trying to get at, do you know the answer to this question?

MS. PARTRIDGE: Objection. Form.

A Well, let's re-read your question because I'm trying to answer it accurately.

Q I know. I appreciate that. I'm just trying to understand.

Do you know what components either the Oculus DK1 or DK2 had?

MS. PARTRIDGE: Objection. Form.

A Again, I have experienced something that I know was an Oculus headset and it contained stereophonic visual display. I believe it had interactive capabilities. I believe it had 3-D audio. And I have no clue as to its model number, if I was experiencing a prototype, et cetera, no idea.

Q When would you say you experienced this Oculus prototype or model, or whatever it was?

MS. PARTRIDGE: Objection to form.

A I believe it was over two years ago. For sure it was over two years ago.

Q Was it over five years ago?

A It was before COVID because it was at a conference.

So, I believe the last time I experienced one might have been, oh, boy, I don't remember. It was pre-2000.

Q So, this was before 2000?

A Yes. Yes.

Q Okay. And you said it had -- this Oculus device had interactive capabilities.

What does that mean?

MS. PARTRIDGE: Objection. Form.

A The visual imagery would change as a function of my head movement left and right.

Q Okay.

MS. PARTRIDGE: Ms. Osman, we've been on about an hour. Is now a good time to take a

break?

MS. OSMAN: I'd like to keep going. We can take a break in a few minutes, if that's okay.

MS. PARTRIDGE: Dr. Begault, are you okay to go on for a few minutes? If not, we can take a break right now since there's no question pending.

THE WITNESS: Well, I can go on for another few questions, I suppose. That's fine by me. Why don't we stop at 9:45, which is my time, and probably 12:45 your time.

Is that acceptable for everybody?

MS. OSMAN: Fine with me, Dr. Begault.

THE WITNESS: Is that okay with you, Jayme?

MS. PARTRIDGE: Sure.

THE WITNESS: Okay.

Q So you experienced an Oculus device that had interactive capabilities, and you said that means the visual images changed as you moved your head.

Did the sounds also change as you moved

your head?

MS. PARTRIDGE: Objection. Form.

A I believe they did.

Q Do you recall, were you able to interact with visual images in that -- using that Oculus device?

MS. PARTRIDGE: Objection. Form.

A I -- and I don't play a lot -- I don't play games and, so, somebody might have been manipulating controls for me. So, I think there was a simulation of interactivity, at least. All I recall was that -- that maybe I was looking at different locations in a room. And that's about all I remember.

Q What conference was this? You said this was at a conference.

Do you remember what conference it was?

A No. It was -- I don't remember which conference it was exactly. I can tell you it was an Audio Engineering Society conference and I think its emphasis was on virtual reality.

Q Do you remember where the conference

was?

A Los Angeles.

Q Is this a conference that you attend regularly?

A This was -- well, I've been attending Audio Engineering Society conferences regularly since the '90s, but this was a special conference, so it hasn't been repeated, to my knowledge. Perhaps it has been.

Q Why do you say it was a "special conference"?

A Well, the Audio Engineering Society has annual conventions which include -- excuse me -- a conference component -- excuse me. And then there are targeted or, you know, conferences on specific topics. And so, this was in the latter category. It was a conference on a specific topic.

Q So, it was an Audio Engineering Society conference with a VR emphasis in LA before the 2000s?

MS. PARTRIDGE: Objection. Form.

Q Do you remember this Oculus DK1 device,

did it track -- track you while you had the headset on?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A You know, I'm going to correct my answer on something. So this conference was long enough ago that I presume I was using an Oculus device. But, you know, I actually don't recall exactly if it was an Oculus device.

I say that because I believe it was maybe around that time that some phototypes were introduced, I don't know. It could very well have been, because the conference was long enough ago, that, you know, I'm zeroed in on the sound, basically, is what I'm always zeroed in on. So it might not have been an Oculus device.

But your questions keep coming back to DK1 and DK2. And, again, I'm going to reemphasize, I have no idea what model it was. And I'm going to correct some of my previous answers and say, you know, I'm not even certain if it was an Oculus device that I was wearing. I

kind of made a presumption about that.

Q Okay. So it's not necessarily even an Oculus device, I understand.

Do you know, did this -- did this device, whatever it was, track you while you were wearing the headset?

MS. PARTRIDGE: Objection. Form.

A Whatever the device was that I was wearing, I know that if I turned my head left and right, or right, I should say. You can't do them both at once. If I turned my head to the left, there was the virtual imagery that one would expect, right, that the imagery stayed in its virtual location while I moved my head to the left. And I know if I moved my head to the right, then the virtual imagery stayed where it was. I think because it was a conference, you know, you're sitting in a chair, and then somebody's handing you a -- some sort of gaming device, like a joystick or something of that sort. And so, that's kind of what I recall.

And, again, forgive me for saying with

any certainty that it was an Oculus device; I made a presumption there.

Q I appreciate the clarification.

MS. PARTRIDGE: And, you know, we're going to take a break because we said we were going to at 11:45. So we're taking a break now. There's no question pending.

MS. OSMAN: That's fine.

THE WITNESS: And what time should we return?

MS. PARTRIDGE: 15 minutes.

PLANET DEPOS TECHNICIAN: We're going off the record at 12:46.

THE WITNESS: Thank you.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record, 13:01.

MS. OSMAN: Thank you.

BY MS. OSMAN:

Q Dr. Begault, did you speak with your attorney during the break?

MS. PARTRIDGE: Dr. Begault, I'm going

to allow you to answer that question yes or no and nothing else.

MS. OSMAN: Ms. Partridge, if you talked to him about the substance of this deposition, that's not privileged.

BY MS. OSMAN:

Q Dr. Begault, did you talk to your attorney during this break?

MS. PARTRIDGE: Dr. Begault, I object on privilege and I instruct you not to answer other than yes or no.

MS. OSMAN: Okay. Then we can go on break and we can have a talk with the board to talk about this.

MS. PARTRIDGE: Okay.

MS. OSMAN: Let's go on break. We can talk about --

Let's go off the record.

PLANET DEPOS TECHNICIAN: Let's go off the record. 13:02.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the

record. 13:02.
BY MS. OSMAN:
Q Dr. Begault, did you speak with your attorney during the break?
MS. PARTRIDGE: Objection. Privileged.
I'll allow you to answer the question yes or no.
A Yes.
Q Did you speak with your attorney about the substance of this deposition during the break?
MS. PARTRIDGE: Dr. Begault, I am going to instruct -- I will instruct you not to reveal any attorney-client privileged information based on any conversation.
Q Dr. Begault, did you speak with your attorney about the substance of this deposition during the break?
MS. PARTRIDGE: I will allow you to answer that question of whether or not you spoke to your attorney as yes or no.
A I answered, previously, that I spoke to the attorney.

Q Did you speak to your attorney about the substance of this deposition?

MS. PARTRIDGE: Objection. Attorney-client privilege.

A If I'm understanding what you guys are talking about, then I can answer that I spoke to the attorney, and that's the limit of what I can say.

Q Okay. My question for you is different. Did you speak to your attorney about the substance of this deposition during the break?

MS. PARTRIDGE: And I am objecting as attorney-client privilege and ask you not to reveal any attorney-client privileged information.

Q Dr. Begault, are you planning to follow that objection [sic]?

A Well, I'm only going to -- if I understand what's going on right now, because I don't, other than to know that I can answer yes, that I had a conversation with the attorneys, my understanding is everything else is privileged.

MS. OSMAN: Okay. Let's go on break.

Let's go off the record. I think we need to call the board. Let's go off the record.

PLANET DEPOS TECHNICIAN: Off the record, 13:04.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record, 13:20.

BY MS. OSMAN:

Q Dr. Begault, is it correct that sitting here today, you can't tell me how the Oculus DK1 worked?

A I'm here. Just, for the record.

Q Dr. Begault, did you hear my question?

A Test 2, 3, okay.

Q Could you hear my question, Dr. Begault?

A Oh, wait. I'm sorry. I had my audio off. Now I can hear you.

All right. I'm with you.

Q Dr. Begault, is it right that sitting here today, you can't tell me how the Oculus DK1 worked?

A That's correct. I can't tell you how the Oculus DK1 worked.

Q Is it also correct that you can't tell me how the Oculus DK2 worked?

A That's correct. I have no idea what exactly an Oculus DK2 is.

Q How about HTC Vive beta? Do you know what that is?

A No idea.

Q Sitting here today, you cannot tell me how the HTC Vive beta worked either?

A That's correct.

Q How about HTC Vive pre? Have you heard that before?

A No, I have not.

Q Do you know what it is?

A I don't.

Q And you can't tell me how it worked?

A That's correct. What was it, I'm sorry, can you repeat that? An HTC...

Q Vive pre.

A Can you spell that last part?

Q P-R-E.
A Vibe, V-I-B-E, pre?
Q V-I-V-E.
A I'm not sure exactly what that is, however you spell it. I'm still not sure how you spell it. But, no, I'm not familiar with that.
Q Dr. Begault, do you attend VR conferences?
A No. Not really. I attend the conferences put on by the Audio Engineering Society.

I've gone to meetings generally concerned with virtual reality, I think mostly in the 1990s, back when it was nascent, just developing, but that's a very loose term. It gets used for all types of things, so...
Q Have you heard of the Game Developers Conference?
A I've heard of the Game Developers Conference.
Q Have you attended any Game Developers Conferences?

A Never.
Q Never.
How about Oculus Connect? Have you heard of that conference?
A No, I have not.
Q So I assume you've never attended that conference either?
A That's correct.
Q Have you heard of the Consumer Electronics Show?
A Yes, I have.
Q Have you attended that conference?
A No, I haven't.
Q How about the Electronic Entertainment Expo?
A I have not attended a conference of the electronic something expo.
Q Entertainment Expo, thank you.
A I have not attended that conference.
Q Have you heard of Steam Dev Days?
A No, I have not heard of Steam Dev Days.
Q And you have not attended that

conference either?

A No, that's correct.

Q Unite Boston, is that a conference that you've heard of or attended?

A No.

Q And Maker Faire, is that a conference that you've heard of or attended?

A I've heard of it, but never attended it, and I'm not sure exactly what it is.

Q By 2014, or 2015, creating 3-D audio environments was well-known; is that right?

MS. PARTRIDGE: Objection. Form.

A There were many papers about how to create 3-D environments by 2015, including my own book.

Q So you agree with me that by 2015, creating 3-D audio environments was well-known?

MS. PARTRIDGE: Objection. Form.

A Well-known, maybe, to people who had an interest in that area.

Q Okay. What's the difference between 3-D audio and binaural sound?

A I think that, generally speaking, it depends on how it's being used, the specific context. So, I think we need to define it so that there's no ambiguity.

Q I'm asking you to define it. What is 3-D audio and what is binaural audio?

MS. PARTRIDGE: Objection. Form.

A Well, the way that I use those terms is interchangeable, pretty much. Binaural sound can also include dummy head recordings, which do not include some of the 3-D sound technologies that allow more flexible manipulation of the captured sound.

Q For our purposes today, is it fair to assume that you're using 3-D audio and binaural sound interchangeably?

MS. PARTRIDGE: Objection. Form.

A I believe that's how I pose it in my declaration, but I'd like to check that. Is that okay to check that, just to confirm that we're on the same page about that, in terms of the context that we're speaking about?

Q Dr. Begault, why don't you check that during a break. For now, let's keep moving.

A Okay. I'll make a note to do that.

Q Thank you.

MS. PARTRIDGE: And, Dr. Begault, if you need to do that to answer Ms. Osman's questions, you need to do that on the record, not during the break.

A Well, then should I do it now?

Q Well, no. I don't want you to take the time to do it now.

My question -- you said that you used, generally, 3-D audio and binaural sound interchangeably; is that right?

MS. PARTRIDGE: Objection. Mischaracterizes his testimony.

A Again, it depends on the context we're speaking about. I'm just trying to recall if I made a statement to that effect in my declaration specifically or not.

But I will say that binaural sound can encompass dummy head recordings. Some people, in

some contexts, will call that 3-D sound. Other times, we'll talk about 3-D sound, like, I believe I spoke about it in my book, in the way that people were using digital signal processors to be able to have flexible control over sound positions and imagery in a way that wasn't possible with dummy head recordings. So, again, it's very context-specific about when we're using these phrases.

So we have to sort of drill down and look at the particular context. So that's why I'm trying to be careful and to say that, for purposes of our discussion, which has to do with my declaration, that I'd like to clarify if I've, you know -- how I've referred to those things.

Q For the purposes of our discussion today, if you're drawing a distinction between 3-D audio and binaural sound, can you make that clear?

MS. PARTRIDGE: Objection. Form.

A I will make clear, yeah, when we're talking about audio processing, I will be very precise about what I mean.

Q Great. By 2014 and 2015, did those of ordinary skill know how to use head-related transfer functions to generate binaural sound?

A Persons of ordinary skill in the art would have been able to do the research to be able to implement 3-D audio, in terms of creating virtual sound.

Q Okay. And by 2014 or 2015, did those of ordinary skill also know how to incorporate that binaural sound into virtual environments?

MS. PARTRIDGE: Objection. Form.

A Well, that would depend on the person of ordinary skill in the art having any knowledge of virtual environments or not, or virtual reality systems. So that's a completely different ball of wax, right?

So plenty of people working strictly in the audio field, like I do, who are quite, you know, adept at implementing 3-D audio, but your question was more broad. It was about would they know how to incorporate that into a virtual reality system. And I don't know if that

necessarily follows.

Q So by 2015, it's not necessarily the case that those of ordinary skill in the art would know how to incorporate binaural sound into a virtual environment; is that right?

MS. PARTRIDGE: Objection. Objection. Form.

A I don't believe that a person of skill in the art familiar with 3-D audio, with emphasis on the audio, would necessarily have the requisite skills to manipulate virtual visual imagery, for instance, which would probably be necessary to implement a virtual reality system.

Q The visual imagery would be necessary to implement the virtual reality system?

MS. PARTRIDGE: Objection. Form.

A Usually when the term "virtual reality" is used, it tends to incorporate, generically speaking, and, again, this depends on what specific context we're talking about, because some people might use the terms differently, but when we think of virtual reality, we're thinking about,

usually, some combination of visual and auditory. And so, the auditory component, 3-D sound, would be a domain of expertise for folks like myself. But I would have no idea how to, for instance, create a virtual visual image.

Q Okay. Are you equating virtual reality with a virtual environment?

MS. PARTRIDGE: Objection. Form.

A Well, it depends who you're talking to.

So at NASA, years ago, we, in the '90s, we didn't like the term virtual reality. We called it virtual environments. Because we -- we're saying, well, reality is very different than what you see in a virtual environment.

So in that context, you know, we were concerned with the phrasing, and that's something that I sometimes say. You know, I'll use the word virtual environment.

But I could think of other ways to use the word virtual environment, too. For instance, we could speak about a virtual acoustic environment. And so, that would be a very

different thing.

But, okay, I think this is sort of context-dependent. So, again, all the papers that came out of NASA in the 1990s, we called that virtual environments, whereas, I think, the commercial world was calling it virtual reality.

Q And those virtual environments and the papers that came out of NASA in the 1990s, those included visual and auditory -- visual and auditory displays; is that right?

MS. PARTRIDGE: Objection. Form. Foundation.

A Not all the papers included audio.

Q But they all included visual displays.

MS. PARTRIDGE: Objection. Form. Foundation.

A No. There were also displays that were haptic, for instance. There were also combinations of auditory and haptic.

Q So were there virtual environments that did not include visual images?

MS. PARTRIDGE: Objection to form.

A I think I testified earlier that I have spoken about creating virtual environments that are strictly acoustic. So I could create a virtual acoustic environment.

Q So my question for you, that started this discussion, was, by 2014 or 2015, did those of ordinary skill in the art know how to incorporate binaural sound into a virtual environment? Your answer, as I understood it, was, no, because it wouldn't know how to do the images.

Are you now saying that a virtual environment doesn't require images?

MS. PARTRIDGE: Objection. Foundation. Mischaracterizes testimony.

A I think your original question, and the one I was trying to answer, was, and this is the context in which I was answering your question, was that although many people might have had auditory, or I should say, audio signal processing expertise, to create 3-D sound and to create 3-D audio virtual environments, such as myself, I

understood your question to say, well, would they know how to implement those virtual acoustics into a virtual reality system that included visual imagery?

And my answer to that was, no, they wouldn't know -- necessarily know how to implement that because now we're talking about systems and software that produces visual imagery, somehow connected to signal processing that's concerned with visual imagery that has to, then, communicate with signal processing or processes that create virtual auditory imagery. And there's a line between those things often, in terms of people's expertise and the type of software which you would write, et cetera.

Q Let me ask my question again, perhaps you can answer it this time.

By 2014 or 2015, did those of ordinary skill in the art know how to incorporate binaural sound into visual environments?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Only in the following context: In a strictly virtual audio world, in a world where we are not talking about communicating to a visual rendering system, there are persons of ordinary skill in the art, in audio and audio signal processing and related skills having to do with acoustic, psychoacoustics, and signal processing would know very well how to create a virtual auditory environment.

Q Okay.

A But your question goes, again, I think, to would they know how to put that into a virtual visual environment. I don't know if the right wording was "put into," but there is a domain of audio, and audio expertise, audio software, signal processing, that's very different from the demands and the technological requirements to create virtual visual imagery.

Q Okay. And when I say virtual environment without specifying virtual auditory environments, that could include images --

MS. PARTRIDGE: Objection. Form.

Q -- correct?
A Maybe.
Q Okay.
MS. PARTRIDGE: Objection to form.
MS. OSMAN: I didn't ask a question. Thank you.
MS. PARTRIDGE: Well, you indicated correct and it showed up as a question.
So, objection. Form.
Q And by 2014 or 2015, did those of ordinary skill in the art know that they could alert users that they were leaving an environment by altering the process of binaural sound?
MS. PARTRIDGE: Objection. Form.
A What do you mean by "processing"?
Q What does processing mean to you?
A A lot of different things. I mean, it's -- processing means change.
Q Okay. Let me re-ask my question.
By 2014 or 2015, did those of ordinary skill in the art know that they could alert users that they were leaving an environment by changing

binaural sound?

MS. PARTRIDGE: Objection. Form.

A I don't believe that, at that time, as I've indicated in my declaration, there was anything akin to the changes in binaural sound that I've spoken about in my declaration.

Q At that time, there were no changes, changing binaural sound was not known?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A Changing binaural sound, generally, was known. We would do that as a matter of course. We might change the perceived azimuth of a sound or its perceived elevation position. So, certainly, we could change the location of a virtual image. So that kind of processing was certainly known.

Q How about changing the processing of binaural sound to convert it to stereo, was that known?

MS. PARTRIDGE: Objection. Form.

A Well, it depends on what you're talking

about. If we're just talking about could you flip a switch to go between binaural and, let's say, stereo versus mono, versus any other type of processing on, let's say, a device, I'm not sure. But, again, depends on what is the context we're speaking about.

Q I'm just trying to understand. By 2014 or 2015, did those of skill in the art know how to change binaural sound from either stereo or mono?

MS. PARTRIDGE: Objection to form. Asked and answered.

A There were attempts to modify dummy head recordings, which are binaural recordings, to attempt to make them sound convincing over loudspeakers.

Q I'm not sure you answered --

A Stereo loudspeakers.

Q I'm not sure that answers my question.

My question for you was, by 2014, did those of ordinary skill in the art know how to change binaural sound into stereo or mono sound?

MS. PARTRIDGE: Objection. Form.

A I just gave you an example that was known by 2014 or 2015. There were a number of processes that were well-known, that were attempts to change a binaural sound, which would normally be delivered over headphones, over loudspeakers.

Q If you were hearing headphones --

A Sorry. And just one follow-up to that. Stereo loudspeakers.

Q Okay. I think you maybe are still not answering my question. My question wasn't specifically how they would make this change, I'm just asking, at a higher level, would a person of skill in the art know how to change binaural sound to either mono or stereo?

MS. PARTRIDGE: Objection. Form.

A They might know some ways to do it, like the way I just gave you an example of.

You could also, I mean, hypothetically speaking, take the left and right channel of a binaural signal, mix them together into a monaural signal. So a person would know how to do that, I suppose. A person of skill in the art would know

how to do that very hypothetical thing.

Q And by 2014, or 2015, would those of ordinary skill in the art have understood that they could change the processing of binaural sound to provide an alert or to provide a warning? Is that something that they would have understood?

MS. PARTRIDGE: Objection. Form. Asked and answered.

A No. I think that the change in the signal processing used for binaural sound, as a warning or alert specifically to the ways that that is done as described in my declaration, I had not heard of that. I don't think people of -- persons of skill in the art would have known that by 2014 or 2015.

Q So there's nothing inherent about, for instance, changing binaural sound to stereo or mono that would provide a warning to a user?

MS. PARTRIDGE: Objection. Form. Objection. Foundation.

A That's not true.

Q So it sounds like you are saying that

changing binaural sound to stereo or mono would provide an alert or warning to user?

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

A No. Not necessarily. It depends.

Q Are there -- it depends.

Are there instances in which changing binaural sound to mono or stereo would provide an alert of warning to a user?

MS. PARTRIDGE: Objection. Form. Asked and answered.

A In the ways that are described in my declaration, I believe that those would be effective alerts of changes to binaural sound. But those are specific methods that are described that I think would be possible of creating an alert.

Q Okay. So you're saying -- and forgive me if I get this wrong, please, correct me. Sounds like what you're saying is changing binaural sound to stereo or mono could be an alert or a warning to a user, but it's not necessarily,

not in every instance; is that right?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A I'm trying to understand the question here to answer you accurately.

So, one can make these changes to binaural sound to stereo, to monaural, and they can be done in a way that would not provide an alert. They could be done in a way that could provide an alert.

Q Did those of ordinary skill in the art, at the time of the invention, know how to reduce the volume of sound?

MS. PARTRIDGE: Objection. Form.

A Yes. I believe that the idea of changing the gain of a sound is well-known to people of skill in the art.

Q And did those of ordinary skill in the art know that they could alert users they were leaving an environment by reducing the volume of sound?

MS. PARTRIDGE: Objection. Form.

A That, I'm not sure about.
Q Why do you say you're not sure?
A Well, I'd have to know what we're talking about specifically. Leaving a virtual environment might mean a lot of different things. I mean -- and I think your word, your question was alert? Did you say "alert"? No, I'm sorry, you better restate the question.
Q Sure. Let me re-read the question because I didn't say virtual environment either. I said, do those of ordinary skill in the art know that they could alert users that they were leaving an environment by reducing the volume of sound?
MS. PARTRIDGE: Objection. Form.
A So what do you mean by "environment"?
Q What does environment mean to you?
MS. PARTRIDGE: Objection. Form.
A As I stated in my declaration, everything that surrounds us. I could give you the more specific definition if I read from my declaration. It's fairly specific in there.
Q I prefer that you answer my question.

So, using that definition of environment, do you want me to re-read my question?

A I do.

Q Okay.

A Excuse me.

Q Would those of ordinary skill in the art, at the time of the inventions, know that they could alert users that they were leaving an environment by reducing the volume of the sound?

MS. PARTRIDGE: Objection. Form. Asked and answered.

A Well, again, you haven't defined what environment you're talking about. I don't think a person of skill in the art would know I was leaving my office and going to another room by reducing the volume of something that's unspecified in your question. I don't know what we're talking about, in terms of reducing the volume of what?

Q So you think reducing the volume of sound would not provide an alert in a physical

environment? Would it provide an alert in a virtual environment?

MS. PARTRIDGE: Objection to form. Mischaracterizes the testimony.

A I didn't say that it wouldn't or it would. I said I don't know because I'm trying to get more specific with what you're talking about.

There's a whole universe of interpretations I can give to that question.

So I'm sitting here trying -- so I gave you that crazy hypothetical of I'm leaving my room and going to another room and some sort of sound reduces in volume. I don't know. I need help here.

Q Is there a circumstance under which you could alert users that they were leaving an environment by reducing the volume in sound?

MS. PARTRIDGE: Objection. Asked and answered. Form.

A There could be circumstances where that would work.

Q So, reducing by the ton of the

inventions, those of ordinary skill in the art would have known that they could use the reduction of volume of sound as an alert to users, at least under some circumstances, correct?

MS. PARTRIDGE: Objection. Form.

A They could use a reduction in volume for what? I'm asking because I need clarification on your question.

Q Sure. So it sounds like what you're saying is that under some circumstances, reducing the volume of sound would constitute an alert to the user; is that right?

MS. PARTRIDGE: Objection. Form.

A Under some -- under the circumstances I've described in my declaration, I have given an example where a reduction in volume could act as an alert that one is leaving an environment.

Q Can you point me to that example, please, Dr. Begault?

A Sure.

So I'm going to look at my printout so I can find that page.

Q Wonderful.
A All right.
Q Okay.
A I think I can point you to paragraph 69 and paragraph 70. Maybe 68, 69, and 70. So I'll direct you to pages 38 and 39.
Q Okay. So let me ask you my question again. So by the time of the alleged inventions, did those of ordinary skill in the art know that they could use -- they could alert users by reducing the volume of sound?
MS. PARTRIDGE: Objection. Form. Asked and answered.
A I don't know if a person skilled in the art would have known that a significant change in the volume of virtual sound would be useful in that regard.
I think that there was an understanding about reducing volume by a POSA. People knew about changing gains on sounds.
But, here, we're talking specifically about lowering the sound volume as a significant

change, all right? And, also, possibly as a spatial auditory distance cue.

Q Okay. What is a WED?

A Oh, boy. I used to know. Wearable -- oh, boy. A wearable E display. I forget the E.

Q Okay. Does the '179 and '184 patent use that phrase in any particular way?

MS. PARTRIDGE: Objection. Form.

A Honestly, I don't recall.

Q Okay. Does a WED, I think it's wearable electronic device, does that necessarily include a certain component or components?

A It include a device and it's wearable, and contains electronics. I think that's about the best I can do for you.

Q Okay. By the time of the alleged inventions, did those of ordinary skill in the art know how to use a wearable electronic device, a WED, to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A I'm trying to recall if there were

examples of that.

So, what might we include within WEDs anyway? What scope of things are we calling wearable electronic devices? I mean, is it my watch? Is it a pair --

Q I would ask you that question. What's included in a WED?

A Well, generically speaking, I've never read a dictionary definition, but, you know, based on what that means, that could include everything, including my watch, that could include headphones, could include just about anything, right?

Q So, if that's your definition, that's fine. My question is the same.

Do you want me to re-ask the question?

A Yes, please.

Q By the time of the alleged invention, did those skilled in the art know how to use a WED to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Asked and answered. Objection. Form.

A I don't know. It depends which area of

person skilled in the art are we talking about. Are we talking about audio persons? People whose expertise are persons of skill in the art in audio and 3-D audio?

Q What about people who are experts in the field or VR? Did they know how to use a WED to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Well, not being a person of skill in the art in virtual reality, generally, was speaking about visual displays and haptic displays and that sort of thing, then my answer there is, I'm not certain if they would know or not.

Q Okay. So you don't know -- so your testimony is you don't know if those in the field would know how to use a WED to determine if a user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A Oh. That's a different question. I thought your question was something having to do with an alert or something.

If you go back two questions, then maybe I can answer your last question.

Q So let me read it again. My question, I hope, is the same. It's did those of ordinary skill know how to use a WED to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A And so, I asked for a couple of clarifications.

Person of skill in the art in audio or person of skill in the art in something else?

Q Well, why don't you tell me if a person of skill in the art according to the level of ordinary skill that you propose in the declaration?

MS. PARTRIDGE: Objection. Form.

A Right. Can I re-read that, what that says?

Q Sure.

A Okay. Great. Let's do that. Well, then we'll go back to your question.

So, I said a person of ordinary skill

in the art would have technical fields relevant to the digital signal processing, electrical engineering, computer engineering, computer science, a familiarity with basic principles of audio engineering, and a familiarity with the relevant literature means of implementing virtual 3-D binaural audio processing, including those that were widely available at the time of the disclosure. Noting that virtual binaural is used interchangeably with 3-D, back to a prior question there.

So, this does not talk about a person of skill in the art having, necessarily, any knowledge, I believe, that was pertinent to your last question, which was wearable electronic devices.

I think that the one wearable electronic device, that that person skilled in the art would be very familiar with, are the acoustic transducers commonly referred to as headphones.

Q Okay. So your testimony is, based on the level of ordinary skill in the art that you've

proposed in your declaration, you do not believe that that person of ordinary skill would know how to use a WED to determine if a user was leaving an environment; is that correct?

MS. PARTRIDGE: Objection.

A They might know something. They might have a suspicion that there are tracking devices, right, that those have been well-known since the '90s, all kinds of tracking devices that have come about. But they wouldn't be necessarily -- know much more than the fact that they exist; that they have something to do with the location of a person, perhaps, their hand. It depends on the particular implementation and context. So it kind of depends where and what we're talking about.

So I do believe that that's kind of the level of expertise that might even be beyond a POSA that a layperson might be familiar with.

Q Okay. Now, let's modify the question to impose the level of ordinary skill in the art proposed by the petitioner and by Dr. Roginska, where there is experience in virtual and augmented

reality.

So if a POSA now has, not only audio engineering experience, but also experience in virtual augmented reality, did that person of ordinary skill in the art know, at the time of the alleged inventions, how to use a WED to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Relevance.

A So you're asking me to go into Dr. Roginska's mind to know what she meant by a POSA?

Q No. That's not -- that wasn't my question.

I'm telling you that -- well, let's strike that.

You said you reviewed Dr. Roginska's declaration; is that correct?

A That's correct.

Q Okay. Dr. Roginska proposed a slightly different definition of person of ordinary skill in the art. According to her, a person of

ordinary skill in the art would have had experience in virtual and augmented reality.

So I'm asking you the same question that I asked you -- that I've asked you now, which is, did a person of ordinary skill -- if we're imposing a definition of person of ordinary skill in that art that includes someone with experience with virtual or augmented reality, did a person of ordinary skill in the art know how to use a WED to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Relevance. Objection. Outside the scope.

A Again, I'm not certain. I mean, it's -- that was her definition. I gave you an answer earlier about most, not only POSAs, but laypeople probably have some fundamental idea of the concept of tracking devices being part of a system. But that's about the limit of it, right? So I don't know if that even qualifies as a person of skill in the art. But my definition is different because of focusing on audio and escrow

acoustics.

Q Okay.

A Implementation is part of 3-D audio.

Q Okay. But you can't tell me under Dr. Roginska's definition?

MS. PARTRIDGE: Objection.

Q That's my question.

MS. PARTRIDGE: Objection. Outside scope.

A I think I just answered your question about that.

Q Are you a person of ordinary skill in the art, under Dr. Roginska's definition?

A I believe I answered that for you earlier, indirectly.

I don't know exactly what her requirements are for a -- I don't remember her exact phrase, for -- maybe you're going to have to re-read it to me or I'd have to look at it. Which aspects -- which aspects of Dr. Roginska's definition of a POSA? Maybe go through each of them.

Q Well, her definition, here, let me read it to you. Her definition requires -- the key aspect is, requires experience in virtual reality and/or augmented reality.

MS. PARTRIDGE: Objection. Form. Incomplete.

A Well, it, again, it depends what she means by virtual reality and augmented reality. Again, I probably have greater familiarity with certain aspects of what are referred to, often, as virtual reality systems or virtual environment systems, given my years of experience at NASA, et cetera.

But, I wouldn't necessarily say that those are necessary as, you know -- well, I guess I don't need to contradict her definition necessarily. I just need to answer your question.

So you're asking me, again, what?

Q I'm asking you if you --

A I'm getting lost.

Q Sure. I'm asking you if you meet Dr. Roginska's definition of person of ordinary

skill in the art?

A I, personally?

Q Yeah.

MS. PARTRIDGE: Objection. Form.

THE WITNESS: I apologize for getting mixed up there.

A I have greater expertise than a layperson in those fields of virtual environments and virtual and augmented reality, but I would not say that I'm skilled in any aspect of many -- well, I'm not skilled in a lot of the aspects of virtual reality, right. So I have no expertise in the area of tracking devices or visual displays or I can't program the communication systems that allow the visual and the auditory systems to render things. There's many levels to that level of expertise that I think go beyond Dr. Roginska's declaration as well, actually, the things she speaks about.

Q Okay. So did those of ordinary skill in the art, and I want to apply your definition of to what a person of ordinary skill in the art,

just to be clear. According to your definition of, did those of ordinary skill in the art know how to use a wearable electronic device, without a tracking device, to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Outside scope.

A You know, I'm trying to imagine if there was a GPS functioning watch that might have tracked people's position while they're hiking or something. I don't know. I'm kind of speculating here, if that existed or people knew about that. I think those did exist. So if those are wearable, I don't know if they were in a wearable version. I'm just sitting here trying to recall it. By the way, I am getting a little fatigued. I wouldn't mind a break soon, but I'm happy to finish with this line of questioning, if it doesn't go on too long.

Is that okay with you?

Q That's fine. I have a few more questions, if you wouldn't mind bearing with me a

little bit longer.

To confirm, you're saying you just don't know if persons of ordinary skill in the art would have known how to use a wearable electronic device without an independent tracking device?

MS. PARTRIDGE: Objection. Form.

A No, I don't think that's what I said. I --

Q So -- sorry, I misunderstood. Can you repeat your answer then, or explain?

A No, I'm going to need you to repeat your question.

Q Of course. I'll read it again.

Did those of ordinary skill in the art know how to use a WED without an independent tracking device to determine if a user was leaving an environment?

MS. PARTRIDGE: Objection. Form. Outside scope.

A I don't know.

Q As of the time of the alleged inventions, 2014 or 2015, did designers know how

to create a system that allowed users to interact with virtual sound-producing objects?

MS. PARTRIDGE: Objection. Form.

And, Ms. Osman, I'll let him answer this, but you're already going past when he asked for a break.

MS. OSMAN: I told --

Q Go ahead and answer.

MS. PARTRIDGE: It's a new subject, but I'll let him answer the question since it's pending, but after that, we'll take a break.

A Please repeat the question.

Q Did those of ordinary skill in the art know how to use -- excuse me. As of the time of the alleged inventions, 2014 or 2015, did designers know how to create a system that allowed users to interact with virtual sound-producing objects?

MS. PARTRIDGE: Objection. Form.

A In the audio world, by 2015, depending on how we define the word "interaction," there were ways -- well, that a POSA, by my definition,

would know how to, let's say, interactively change the virtual position of a sound, for instance.

Q So are you saying they could select and move a sound?

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

A I have a patent, I think it's around that era -- or around that time, where sounds could be moved based on your desire to move a sound.

Q Okay. Could you, like, highlight a sound in some way?

MS. PARTRIDGE: Objection. Form.

A Well, we could move it to allow somebody to hear it more clearly.

Q Is there anything else that you could do with a sound?

MS. PARTRIDGE: Objection. Form.

Q Let me ask -- let me re-ask that question.

Is there any other way that a user could interact with a sound, a virtual

sound-producing object?

MS. PARTRIDGE: Objection. Form.

A That's a very broad question. I guess there is. To interact with the sound? I mean, sure. I mean, there's something called, for instance, a binaural mixing console that allows a recording engineer to interactively change the level of different sounds in a recording environment.

Q Let me re-ask my question to make it a little bit clearer, I hope. Is there any other way that a user, in some sort of environment, could interact with a virtual sound-producing object?

MS. PARTRIDGE: Objection. Form.

A I gave you an answer. There was a recording studio, something called a binaural mixing console recording, and engineers would interact, doing things like changing the position of the guitar relative to the vocalist, moving sounds around for, you know, whatever effect that they wanted to do. So that's -- was something

that a user in a recording studio would do.

MS. PARTRIDGE: Ready to take a break, Dr. Begault?

THE WITNESS: I am.

MS. OSMAN: This is a good time for a break. We can take one now. Can we do ten minutes? Is that fine, Dr. Begault?

THE WITNESS: Yeah, that would be sufficient. Can we make it, actually, 15? Would that be acceptable?

MS. OSMAN: That's fine, we can make it 15.

THE WITNESS: So I have 11:13 my time, so we're going to come back at 11:28.

MS. OSMAN: That's fine.

PLANET DEPOS TECHNICIAN: Off the record. 14:13.

THE WITNESS: Thank you.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record. 14:31.

BY MS. OSMAN:

Q Hello, Dr. Begault. Did you speak with your attorney during the break?

A No.

MS. PARTRIDGE: Objection.

I'll allow you to answer that question yes or no, Dr. Begault.

Q Dr. Begault, same question. Did you speak with your attorney during the break?

MS. PARTRIDGE: Objection. Same objection.

I will allow you to answer that question yes or no, Dr. Begault.

A No.

Q Okay. Dr. Begault, I understand that you provided an opinion on claim construction.

What process did you use to arrive at the claim construction positions that you propose?

MS. PARTRIDGE: Objection. Form. Objection. Outside the scope.

Are you talking about claim construction in the District Court litigation,

Ms. Osman?

MS. OSMAN: Ms. Partridge, I will appreciate if you could restrain your speaking objections.

MS. PARTRIDGE: I'm not going to let him answer these questions if it's part of the litigation --

MS. OSMAN: Let's go off the record, please. Thank you.

PLANET DEPOS TECHNICIAN: Off the record. 14:32.

(Discussion held off the record.)

PLANET DEPOS TECHNICIAN: We are back on the record. 14:34.

BY MS. OSMAN:

Q Dr. Begault, I apologize for the interruption there.

I understand -- I'll repeat my question so we can get back to what I was asking.

So I understand that you provided an opinion as to claim construction in your declaration.

What process did you use to arrive at the constructions that you propose?

MS. PARTRIDGE: Objection. Form.

A I think the process involved defining certain terms. I think there was an exercise, at one point in this litigation, where I was providing some definitions, but I'm not sure if that's relevant here. But I know that part of the claim construction here, in this declaration had to do with definition of terms.

Q And how did you define those terms in this declaration?

MS. PARTRIDGE: Objection. Form.

I just don't know what declaration you're talking about, Ms. Osman.

MS. OSMAN: Ms. Partridge, Dr. Begault knows what declaration I'm talking about. And so, I'd really appreciate it if you could confine your speaking objections. The only proper objections are, really, objection. Form.

MS. PARTRIDGE: That's not true. I've read the rules again. I just want to know, for

the record, what declaration you're talking about. If you're talking about the District Court declaration, then we're not going to talk about here. If you're talking about his declaration that he's given in the IPR, then I'll let him answer questions on it. I'm just asking the question.

MS. OSMAN: This is really improper. You're wasting my time on the record. The only declaration we're discussing here is the supplemental declaration that we've been discussing all day.

MS. PARTRIDGE: Okay. Thank you for that clarification. I really appreciate it, Ms. Osman.

BY MS. OSMAN:

Q Dr. Begault, could you, please, answer my question.

MS. PARTRIDGE: Objection. Form.

A So, please, restate it.

Q How did you define the terms in your declaration? You proposed two claim constructions

in your declaration; how did you come to the definitions that you proposed?

MS. PARTRIDGE: Objection. Form.

A Okay. So in my supplemental declaration, under claim construction, there is a definition of the word "environment." I came to that based both on my understanding as an expert. I also consulted some of the etymology of that word and found that there's a consistent meaning for what the word environment means.

Q So --

A So that was part of my process, if you will, was to look at the etymology of the word and also just combined with my own understanding of what that word meant.

Q Okay. So you say that was part of your process. What else did you do to understand what the word "environment" meant?

MS. PARTRIDGE: Objection. Form.

A Well, I guess I could look at exactly what I wrote in the declaration, if you'd like me to explain it more specifically for you.

Q Dr. Begault, I'm not asking about what definition you're proposing. I'm just trying to understand what process you used to come up with the definition of the words that you proposed definitions for.

Do you understand my question?

MS. PARTRIDGE: Objection. Form.

A Sure. So these words are defined by my, as I gave you a process of understanding the root meaning of the words, and then looking at their usage in the '179 and '184, and to make clear what those words meant in those two patents.

Q Okay. So you looked at how the terms were used in the patents; is that right?

A I did.

Q Okay. In your declaration, I don't know if you have your declaration open to you, in paragraph 20 you say you have applied the plain and ordinary meanings of the claim terms.

Do you see that?

A I do.

Q What do you mean by "plain and ordinary

meanings"?

A The layperson definition of it, meaning that these are ordinary meanings that I have applied.

Q Okay. What does -- what does the term "environment" mean?

MS. PARTRIDGE: Objection. Form.

Q Strike that. Let me re-ask that question. It was a bad question.

What is an environment?

A Well, as I've written in my declaration here, it's the circumstances, objects, and conditions by which one is surrounded. And that seems to be consistent with the etymology of the word.

And so, in terms of the patents, ones [sic] can be surrounded by circumstances, objects, or conditions that are either real, virtual, or both, simultaneously.

Q Okay. And you're reading from the bottom of paragraph 21; is that right?

A Yeah. That seemed to be the most

accurate way to answer your question.

Q So an environment, under your understanding, could be a virtual environment; is that right?

A That's --

MS. PARTRIDGE: Objection. Form.

Q So it could be a physical environment?

MS. PARTRIDGE: Objection. Form.

A It's that which surrounds us either virtually or in reality.

Q Okay.

A Or both, simultaneously.

Q Right. So could it be an augmented -- augmented environment?

A Yes, since that's a condition where you could be surrounded -- we're not -- well, you can't -- you could be surrounded in -- yes, it could be within an augmented environment, period.

Q And is that what you would say is the plain and ordinary meaning of environment --

MS. PARTRIDGE: Objection.

Q -- an environment can be physical or

virtual.

MS. PARTRIDGE: Objection. Form.

A That's what I said here and that's what I believe.

Q Just so the record is clear. You're saying, yes, the plain and ordinary meaning of environment is that it could be either physical or virtual; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, I guess I could imagine other things that an environment might be for somebody. Somebody could have an imaginary environment in one's dream. You know, I could think of a lot of different hypotheticals in which things that surround somebody comes under different types of conditions or displays, et cetera.

But, I wanted to make it specific to the patents here, so that's what I gave a definition for.

Q Okay. Just to be clear, it sounds like your response to me was emphasizing that environment is not necessarily limited to either

virtual or physical. It could be a virtual or physical environment and could be other types of environments as well; is that correct?

MS. PARTRIDGE: Objection. Form.

A Well, outside of the scope of this patent discussion and outside of the scope of my deposition, I gave you a hypothetical because I was trying to imagine other ways that there could be an environment. So I went to the concept of an imaginary environment or a dreamed environment. So, I don't think that falls in either category.

But I believe what I was talking about here, in the deposition, was real, virtual, or both, simultaneously, types of environments of things that surround us.

Q Okay. So in the next paragraph, I'm looking at paragraph 22 in your declaration, and that's Exhibit 2012, you say a person of ordinary skill would have understood the term environment, as used in claim 7 and 14 of the '179 and '184 patents to mean the physical surroundings in which a user operates.

Do you see that there? Did I read that correctly?

A Yes, you did, that first sentence.

Q Is this definition different than the one we were just discussing?

MS. PARTRIDGE: Objection. Form.

A No. It's a subset.

Q Okay. So, are you proposing that environment means just physical environments?

A No. I'm saying here that we can talk about the position of a person in a physical environment, but they might be interacting with virtual or real objects.

Q So, the definition that you propose here, and you say this is the definition in the context of the claims, is that environment means physical surroundings in which a user operates; is that right?

A I can't think of any other place that a user could operate.

Q Could a user operate in a virtual environment?

A The user is physical in this particular matter that we're speaking about. We're talking about a user who's a person perceiving things.

Q Can a user be in a virtual environment?

A Well, the physical user can be experiencing a real environment, a virtual environment, or both.

Q Okay. So an environment can be real or virtual, or both?

A That's correct.

Q Okay. But then help me understand what this definition of environment means if it says "physical surroundings in which a user operates."

Does that exclude virtual environments?

MS. PARTRIDGE: Objection. Form.

A No, not at all. I tried to clarify that a little earlier.

The user is a physical person and they're operating in a physical environment, right? And so, I clarify that a little bit further in number 22, paragraph 22, refers to the position of the user and physical space while they

interact with virtual and real objects or components, I perhaps should have said, to clarify that, in an environment of the virtual rendering system.

So, in other words, you have a system, some sort of virtual rendering system, a human is physical. They're obviously sitting in a physical space. And that person, that human, that person in physical space, is interacting with both, possibly, as I should say, possibly interacting with both virtual and real objects, sensations, sounds, around them.

Q Okay. So, the word "environment," according to your construction, refers to only the physical, even if the user is also in a virtual environment; is that right?

MS. PARTRIDGE: Objection. Form.

Q Does environment also refer to the virtual surroundings around a user?

A Wait a minute. I shook my head but I wanted to answer your question. So do you want --

Q Please.

A -- those two questions combined or do you --

Q No, let me re-ask the question because I want to make sure I understand this.

The word "environment," according to your construction, seems to refer to only the physical surroundings, and that seems to be what you're saying, even if the user's also in a virtual environment.

Is that correct?

MS. PARTRIDGE: Objection. Form.

A No. You completely transposed the concepts.

The user, themselves, is in a physical environment because a user cannot be -- you know, when I say "user," I'm talking about a human being. So a physical person that's perceiving either a virtual world or a real world, right? So, when we say the world "environment," and we're talking about the physical surroundings in which a user operates, that refers to the reality of the fact that humans are operating in some sort of

real environment. They can't be -- only in the virtual world can we imagine them to be somewhere else, or can the user imagine themselves to be somewhere else. But, ultimately, there's a user in physical space. So you see a transposed concept.

Whereas, the person in -- experiencing an environment through a virtual system, a virtual rendering system, might be experiencing both a virtual environment and they can also be interacting or sensing things about the physical environment.

Q So why, then, if a person could be in a virtual environment and interacting in both a virtual and physical environment, why, then, should we construe environment to be limited to the physical surroundings of a user?

MS. PARTRIDGE: Objection. Form.

A Why should we what to?

Q Why should we construe, which means understand or interpret, environment to be limited to the physical surroundings in which a user

operates?

A Well, we shouldn't. I never said that. Again, I will restate that the environment can be virtual, real, or both, simultaneously, when we're speaking generically about the term environment and, also, in terms of the claim construction here.

So, if you take the first sentence of 22 out of context, what can be easily misunderstood that I'm saying the word environment only refers to the physical world. And what I was saying here, really, is that the user is operating in a physical world and they are a physical person. But the displays, the virtual rendering system is going to include both aspects of the real world and the virtual world, and sometimes both, simultaneously.

Q Okay. How do you distinguish between different physical environments?

MS. PARTRIDGE: Objection. Form.

A Can you be more specific? Because I mean, I could give you a very high-level answer,

but --

Q Let me ask you this: Is a house a physical environment?

A Yes. I'd say a house is a physical environment.

Q What about a floor in a house? Is that a physical environment?

A Yes, it is a physical environment.

Q What about a room in a house? Is that a physical environment?

A Yes, it could be -- yeah, sure.

Q How about a corner in a room? Is that a physical environment?

A It could be, sure.

Q How about if I stand in a room and I draw a circle around myself? Is that a physical environment?

MS. PARTRIDGE: Objection. Form.

A Draw a circle? How would you be drawing that circle?

Q I took out a piece of chalk and drew a circle around myself.

A So the chalk, itself, is a physical substance. Obviously, people are taller than the chalk. So we might use that physical substance to imagine a virtual or kind of limit, if you will.

Q What if I didn't have the chalk? What if I just imagined a circle around myself? Is that a physical environment?

MS. PARTRIDGE: Objection. Form.

A Well, it would depend on what that imagination involved, I guess. I mean, can you tell me a little more?

Q I'm just standing in the middle of my living room and I imagine there's a circle around myself, and let's say that circle is no more bigger than my two feet.

Am I in a physical environment?

MS. PARTRIDGE: Objection. Form.

A Well, you are in a physical environment because you're standing there and you're imagining, perhaps, something that that circle represents, and I guess that would be a virtual environment, kind of depends on how you imagine

that -- what that circle means to you.

Q Let me adjust the hypothetical. I'm standing in my living room and I've drawn a circle around my feet, it's an imaginary circle, and I don't have any imagination or any construction of what that is.

Am I in a physical environment?

MS. PARTRIDGE: Objection. Form. Sorry. Objection. Form.

A Well, you just said you're in a living room, and I think I said earlier that all humans are occupying some sort of physical environment, by definition.

Q Yes.

A So you are in a physical environment.

Q But the physical environment I'm in is my living room, not the circle around my feet; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, you're surrounded by a circle.

Q It's not a real circle.

A You are surrounding yourself by a

circle in a physical environment.

Q Let me ask this question in a different way.

If I imagine a circle around my feet in my living room and then I step out of that imaginary circle, have I left my physical environment?

MS. PARTRIDGE: Objection. Form.

A Well, I guess it would be how we would define that.

I could see that, for instance, if you had an unruly child and you drew a circle in the corner and said, "go stand in the circle," that might appear to that child as a very, you know, physical location that, you know, they're not supposed to step out of until punishment time is over.

I don't know if parents do that anymore, I don't know, but anyway, my point is that we're -- you know, there's certainly a kind of imagination that somebody's going to bring to some of these things. Excuse me. And I -- so I

don't know if I'm answering your question or not.

Q Well, you gave me an example of a case where you think there could be a physical environment, just based on the circle. But you didn't answer my question. Which is, if I have an imaginary circle around myself in my living room, if I step out of that imaginary circle, have I left a physical environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A I'd have to know more about that particular physical environment. I mean, you know, there could be damage on the floor where you put that circle and the floor has caved in. So you could say, well, that's one kind of physical environment. Now you're on the part of the floor that works, that's got support. So you're in another physical environment.

Another person might say, oh, no that's all in the living room. In just the same way, you could say, well, I left the living room and went to the dining room. And if I left the physical

environment, well, yeah, I left the physical environment of the living room to the dining room. Well, did I leave the physical environment of the house? No.

So it's really kind of a question of context and specifics of what you're asking. So there's no clear one answer I can give you to these things.

Q But is it possible, like, let's say I'm in my living room, I'm on a rug, there are no changes, there are no patterns, and I've drawn this imaginary circle around my feet, is it possible that I've left the circle and am still in the same environment?

MS. PARTRIDGE: Objection. Asked and answered.

A Anything's possible.

Q So, yes? Your answer's yes?

MS. PARTRIDGE: Objection. Form.

A I'm sorry, I didn't let my -- go ahead. I didn't hear the objection.

MS. PARTRIDGE: Objection. Form.

THE WITNESS: Okay.

A I don't know. I'd have to know more. But there's certainly -- if you define what you talked about as a living room, you know, I don't know. I'm trying to -- I'm grasping for a little more context.

Q Okay. And what more would you need to know?

A I guess I'd need more details about these physical environments you're describing.

Q Can you tell me what kinds of details? Like, what things would change your answer here? What information would matter?

A Well, the physical environment would change, let's say, if over the top of the circle there was an air conditioner blowing cold air and you moved to a different location in the same room and suddenly there isn't cold air blowing on top of you.

So, are we talking about the physical environment in terms of the temperature gradient between, you know, one location and another, or

are we talking about the walls of the room that surround a person in that particular physical environment?

I mean, again, it kind of matters how it's defined in a particular context.

Q Okay. So, what is a 3-D virtual environment?

A Three dimensions, meaning that we're not in a flat space. We have both elevation and we have distance and we have height. So it's three-dimensional. And it's an environment that could potentially have either, I guess, visual, but definitely auditory images anywhere in that.

Q Why do you say a 3-D virtual environment is an environment that could potentially have visual but definitely auditory images? What is an auditory image?

A What is an auditory, what, I'm sorry?

Q What is an auditory image?

A Oh. An auditory image can be all kinds of things. But you had two parts to your question.

Why did I say -- can I -- do you mind if I do both questions separate?

Q Yeah, let me ask again. I didn't do that well.

Why do you say that a 3-D virtual environment is an environment that potentially could have visual images, but definitely auditory?

A Well, you know, I might have misstated that answer. I should have said -- because I gave you some examples earlier where you could have virtual haptics, for instance, and no visual information. You could have virtual. You could have all these combination of sensations that are virtual, right? So, there are many things like that.

So, what I really should have said, to clarify that question, is you could be in a virtual auditory world without being in a virtual visual world, right? So you can create experiences that are completely auditory, that are in three dimensions. I think I give some examples in my declaration, for instance.

So that's the first question, I think, answered.

Q Why do you say that auditory -- that the audio component is necessary but that the images are not?

A Well, that's what I --

MS. PARTRIDGE: Objection. Form.

THE WITNESS: Objection to form.

A That's what I was just clarifying for you. That, no, I was correcting my answer, right? I was just giving you an example. There could be just purely haptic virtual. There could be just purely visual virtual, right? But generally speaking, you know, since the 1990s, there's usually some combination of auditory and visual, but not in all cases, there's been variations, you know, the way that people have implemented things.

Q Okay. And then my other question for you is, you said that there could be an auditory image.

What is an auditory image?

A Right. Thank you.

Well, that's a very generic term. I am just talking about all of the images or cognitive realizations that one might make based on auditory stimuli, so that could include, for instance, the location of specific sounds. It could be the sounds of different environments. It could be images, meaning, renderings, if you will, of acoustic components that reach the ears.

Q Renderings is not necessarily an image, a visual image.

MS. PARTRIDGE: Objection. Form.

A I was speaking of acoustic imagery, because that was your question.

Q And how do you play an acoustic image?

MS. PARTRIDGE: Objection. Form.

A Usually with a -- well, the way I like to do it is with a digital audio file, and I usually play it back over headphones.

MS. OSMAN: Can we pull up Exhibit 1038.

(Exhibit 1038 previously marked for identification and attached to the transcript.)

A I'm looking at that OneDrive now.
Q Yes. You should have that.
MS. OSMAN: Erin, would you mind putting Exhibit 1038 in that exhibit folder so that we can pull it up.
A So this should appear -- oh, okay. So now this is appearing not on that document thing, it's now appearing as -- on the Zoom page.
Is that what you intended?
PLANET DEPOS TECHNICIAN: It's in both.
MS. OSMAN: It should be both. Erin, I think you probably don't need to share, we can just download. So, no need to have you pull it up that way.
A That appears to be the NASA version of my book. I mean, I could bring that up, too, if you want.
But you probably want to show me exactly what you've got.
Q So, you recognize this document, Exhibit 1038? You've seen this before.
A First page. Oh, here it is. Let me

bring up the exhibit. Okay. There I have. Yes, that is the 2000 version of my book, yes.

Q Okay. Can you turn to the bottom of page 7 of the book and page 17 of the PDF?

A Okay. Page 7 of the book. Yes.

Q My finger's moving a little bit more slowly than yours.

So if you see the bottom there, there's a section that says "Application Types."

"Within the applications of virtual reality and multimedia lies a wealth of confusing or even contradictory terminology that is inherent in any young technology." And you say virtual reality systems would be better described as virtual environment systems.

Do you see that there?

A I do.

Q We talked a little bit about this earlier, where you told me these virtual reality systems were often called virtual environment systems; is that right?

A Well, again, that was our bias at NASA

because we were trying to be accurate for the exact reason that I wrote here.

Q Okay. And if you'll, please, turn, now, to page 19 of the same PDF and page 9 of the book. I'd like you to take a look at Figure 1.7.

A Sure. Okay. Let me study it a bit, if you don't mind. And let me zoom in so I can see what I wrote.

Does this allow zooming? It doesn't -- oh, yeah, there we go. So you'd like me to look at Figure 1.7?

Q 1.7, please.

A Yes, okay.

Q This figure's called -- let me know when you're ready.

A Okay. Okay. Yeah, I see it and ready.

Q The figure's entitled "Components of Virtual Reality or Multimedia System"; is that right?

A That's what the first sentence says.

Q And then, we just looked at this book, equates virtual reality with virtual environments,

right?

MS. PARTRIDGE: Objection. Form.

A Equates, meaning that -- yeah, that -- if I understand what equates means, yeah, sure.

Q Okay. And then this figure shows that this virtual environment includes visual graphic generation, as well as audio generation; is that right?

A This figure shows components. And let's take a look at the way that that figure is referred to in the text, just to be accurate here.

All right. So, you will see there, on page 8, virtual reality and multimedia systems can be described in terms of a diagrammatic representation. It usually involves the following elements, okay? So, then, it's talking about what things might usually include. And so, you can see that there's visual graphic generation and audio generation being shown as what things might usually include. They might include other kinds of input to a user as well.

Q Okay.

MS. OSMAN: Can we pull up -- Erin, would you mind pulling up another exhibit. This is going to be called Begault Exhibit 1. This exhibit is entitled "Headphone and Head-Mounted Virtual Displays for Virtual Environments."

(Begault Exhibit 1 marked for identification and attached to the transcript.)

A Oh, shoot. Did I lose that page?

Q Dr. Begault, let me know when you have access to that document.

A I do. I'm bringing it up. So this seems to be from long ago. This must be in the early 1990s or something. Oh, I don't know. I haven't seen this in a long time.

Q Do you recognize this document?

A Well, it's got my name on it, so I guess, yeah, I was working for San Jose State University Foundation at NASA, so this would have dated it prior to 1999, and it appears to be a co-authored paper between myself, Stephen Ellis, and Elizabeth Wenzel, so I see all those things.

Q Okay.

A But I haven't looked at this paper in many, many years. So I'm happy to refamiliarize myself with it as necessary.

Q Thank you.

Can you, please, turn to page 2 in this paper, 2 of the PDF, and I think, also, the paper. No, 3 of the PDF. Sorry, 3 of the PDF and page 2 of the paper.

A Sure. Okay.

Q It's entitled "Levels of Fidelity."

A Levels of Fidelity. Yes, okay. Let me zoom it in here a little bit. All right. Very good.

Q Okay. Can you take a look at that paragraph and let me know when you're ready?

A The first paragraph, Levels of Fidelity, and everything that follows it.

Q If you could just read that one paragraph that's entitled Levels of Fidelity.

A Okay. Okay. I might need to look at Figure 2 to understand it.

Q That's fine. You can look at Figure 2

as well.

A All right. All right. Let me go over here to Figure 2, Hierarchies.

Right. I think I'm familiar. Refreshed my memory about these. So, go ahead.

Q Okay. So this paragraph, what did you mean by the first sentence in the paragraph on page 3 of the PDF, it says -- and I'll read it for you. It says "At a minimum, virtual reality systems usually involved visual interaction on a variable level of complexity."

What does that mean?

A Oh, what that means is what you see on the left side of Figure 2.

So, that was a paper that my co-author, Ellis, had written, and he created these various hierarchies, if you will. So in the paragraph that we're referring to here, if you look at that, where it says "At a minimum, virtual reality systems usually involve visual interactions on a variable level of complexity." The second sentence there refers to the increasing levels of

simulation that one might use in a visual display.

Q All right. And then in, I think it's the third paragraph -- third sentence in that same paragraph, it says "note that the level of visual information contained within the display drives the hierarchy. Audio only appears at the virtual environment level."

What does that mean?

A First, let's see, I'm going to say here. Look at this again. So if I can remember.

By the way, Ellis was a visual perceptual scientist, so, he was primarily concerned with vision and its dominance. We know that vision can be very dominant over audio, in terms of certain tasks or percepts that we might have in the real world, as well as, perhaps, in a virtual world.

So, what was meant by this third sentence, that you asked me there, let's see, where does it have the third level? That's what I'm looking for. You know, it's kind of maybe a mistake. I'm looking for the word "virtual audio"

on the left side of Figure 2, and I don't even think he put it there. So, I think his point was, basically, even though I don't see it in the figure the way that it's described here, audio only appears at the virtual environment level. Let me see if that's true. Okay. Yeah, there it is.

Okay. At the top it says "coordinated multisensory display."

So I think that's where Ellis' hierarchy here, when he says the word "multisensory," that would include audio as part of that.

So, in a sentence here, it says "Audio only appears at the virtual environment level."

That's just pointing out that he didn't really even talk about anything with audio just up at the top, except the top hierarchy in that diagram.

And so, this was his way of saying that vision, you know, visual dominance, you know, is very important. And you can read the rest of the

paragraph. Talking about virtual realities, ties to things like an aircraft and flight, and things of that sort.

Q Okay. And you're framing this as Ellis' writing, but your name, I think, is the first one on this paper; is that right?

A Oh, I stand by this. I stand by everything here. But it's co-authored. I don't know who wrote what in these. When we write a manuscript like this and we're all co-authors, we're all checking each other's statements and modifying them.

Q So, are you -- this seems to suggest that visual images are the minimum and that audio's only added after, if there are visual images.

Is that incorrect?

MS. PARTRIDGE: Objection. Form.

A Well, virtual audio had been known for many years, primarily, through the use of dummy head recordings.

So, before virtual reality became a

kind of commercial concept and was being explored at NASA, early 1990s, you know, well before that, you would have binaural sound recordings of, let's say, nature environments, for instance. And so, you would have a virtual audio environment that's purely audio, right? And it could transport you to different locations. And these were even sold commercially, as means of relaxation tapes and things of this sort, in the '80s, I think, and even earlier than that. And binaural recordings with virtual auditory simulations, then, I think they were broadcast in Germany in the 1950s, at least.

So, when virtual reality came into a commercial idea, then, of course, what people were excited about was not the audio, they were excited about this idea of visual representation.

So, you know, we're a visually dominated world, and that's what excited people in the commercial world.

So that's why you can see this emphasis here.

But it doesn't rule out virtual auditory environments at all.

Q No, it absolutely doesn't. It just says the virtual audio is only added once you have a -- once you have enough visual images at that virtual environment level; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, again, this is talking about a specific, you know, specific time and a specific topic here.

So, we were talking about, here, the use of audio and how audio can complement the virtual visual displays, okay?

So, the -- if I recall what the overall concept was, that there had been a lot of attention, at that time, to virtual displays using virtual information. And so, our purpose was to show or to emphasize how audio could enrich that model of using, primarily, a visually dominated system.

If I recall, some of these early virtual visual displays would have audio that

wasn't binaural, they would just have very primitive kinds of audio.

Q You're saying you disagree with this? This seems to suggest that you need images for a virtual environment and then you can add audio.

Are you disagreeing with that statement?

MS. PARTRIDGE: Objection. Form.

A Absolutely. And you can't characterize this paper saying that it requires audio to have virtual visual images. That's not the point of this paper at all.

What the point of this paper is, is that you can improve a virtual visual display by including virtual audio. So the idea here was that there's an argument, if you will, that we can take a virtual visual display and improve it by using virtual audio. But that doesn't negate the possibility, nor does this paper ever argue that one must have that. If anything, it was saying that, well, if you'd like -- the fundamental argument, if I recall, is that -- what we mean to

do is improve virtual visual imagery by the use of an existing technology, which was 3-D audio.

Q But it describes a virtual environment as including both virtual imagery and audio; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, this particular paper does. This was the emphasis of this, was a virtual environment system that was at NASA, so that started off being visually -- well, through visual simulation, I think, was the earliest efforts that were made in that technology, and, then, other researchers, including myself, were brought in to work on the virtual audio imagery because it was known that, oh, this will help improve, you know, these virtual visual simulations, or potentially could. We didn't know, at the time, how much it could improve it.

Q What does determining, with the WED, when the user is leaving the environment mean?

MS. PARTRIDGE: Objection. Form.

A Can you show me where that -- the

context of where that's said.

Q Sure.

MS. OSMAN: Let's pull up Exhibit 1001, please. And that is the '179 patent.

(Exhibit 1001 previously marked for identification and attached to the transcript.)

A Oh, I lost the page again, sorry.

Exhibit -- I'm not there yet. And, again, you would prefer I don't use the Google Patent version?

Q Yes. Please use the PDF.

A Okay.

PLANET DEPOS TECHNICIAN: It should be up.

A I don't see it yet. Hold on. Oh, '179 patent?

Q Yeah, '179.

A Okay. Got it. It's up now, and it's teeny tiny so I've got to try to zoom it. It's blurry, too.

Q And then, once you have that open, please, turn to the very last page of the

document, it's page 39.

A Hang on. I'm having problems.

Q Sure.

A The search window's open by accident. I'm trying to get out of it. So let me reload the page.

It's funny, the first time, it was interacting very quickly, and I have really fast downloads. So, now, this is not interacting so well.

So you would like me to go to the last page of the patent?

Q Page 39, correct.

A Page 39. I'm there. It's very blurry so I'm going to do my best.

Where are you?

Q So the very last page of the patent, claim 14, and it's in column 48, starting at line 10.

A I've got to blow this up somehow.

I think I see it. "Determining, with the WED, when the user is leaving the

environment."

Is that the sentence you're talking about?

Q That's the sentence.

A Okay.

Q So --

A Okay.

Q Do you want me to repeat my question to you?

A Stand by. I want to read this in context.

Okay. Yeah, go ahead and read the question.

Q What does determining, with the WED, when the user is leaving the environment mean?

MS. PARTRIDGE: Objection. Form.

A Well, it could mean leaving either a virtual or a real environment by means of a wearable electronic device.

Q Okay. And what does the "determining, with the WED" part of that statement mean?

MS. PARTRIDGE: Objection. Form.

A Depends on what type of WED we're talking about. Could depend on, you know, any number of possible formations of what that WED might be.

Q Well, Dr. Begault, you provided an opinion about this claim; isn't that right?

MS. PARTRIDGE: Objection. Form.

A Well, you'd have to refresh me by taking me to that page of my declaration. I'm not recalling specifics about that. I'm pretty sure you did, but I just need to be -- I'd like to see it.

Q Well, my question for you is, did you provide an opinion about the validity of this claim, claim 14 in the '179 patent?

MS. PARTRIDGE: Objection. Form.

A Yes, I'm pretty sure I did.

Q To do that, I assume you must have understood what this claim means?

A Yes, whatever I wrote in the declaration, I understood what I was saying.

Q Okay. So then, all I'm asking you is

to just explain to me what this limitation means, what does "determining, with the WED, when this user is leaving the environment," what does that mean?

MS. PARTRIDGE: Objection. Form.

A And I'd like to go to my declaration to address it from that.

Do you want me to do it from memory or to just give you some hypothetical?

Q You're welcome to go to your declaration. My question's the same.

A Fine. Well, I'd like to look at that, then, if you would give me a moment here.

This was claim 14; is that correct?

Q Claim 14.

A Yeah, okay. All right.

Let's see. Well, I am not finding my description of it, unfortunately. Stand by here.

Is this the '179. Oh, that's the '179 patent. I see, I was -- I see the problem. I was looking at the wrong document.

Okay. So, I don't recall saying

anything specific about the WED itself, I rather commented on what occurs when a system determines someone's leaving an environment.

Q Okay. So my question to you is, what does that limitation mean? What does it mean, determining, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A Well, it means exactly what it says. I mean, there's some sort of electronic device that's worn that can, thus, determine when somebody's leaving the environment. We can think of many different ways that that might occur.

Q Would the WED determine when the user is leaving the environment if it's using external sensors?

MS. PARTRIDGE: Objection. Form.

A It could. So I guess that's one possibility.

Q What about if the WED is using external reference points?

MS. PARTRIDGE: Objection. Form.

A Maybe.

Q Is the WED determining when the user is leaving the environment if it's using an external camera?

MS. PARTRIDGE: Objection. Form. Objection. Outside scope.

A I would need to know more, I guess, about this external camera, if it's somehow tied in with the WED or not.

Q If the WED is incorporating the information from the camera to determine when the user is leaving the environment, is the WED determining when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form. Objection. Outside the scope.

A It might be. Might not be. I don't know. I mean, it might be other ways.

Q Why do you say it might not be? When would it not be determining when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

Objection. Outside the scope.

A Well, wait a minute, you gave me a specific example, I thought, of WEDs with a camera talking to the --

Q Right. A WED is receiving information from a camera and using that to determine when the user is leaving the environment.

Does that fit this claim limitation?

MS. PARTRIDGE: Objection. Form. Objection. Outside the scope.

A I mean, I'm not an expert on these sort of camera systems or, you know, tracking systems in general, and how they might interact with a WED, I don't know, necessarily, how that would work. I just know that this is a device that can determine when somebody's leaving an environment and the specifics I don't have. I don't think I indicate anything of that in my declaration.

Q So you don't know how this would work? You don't know how you would use a WED to determine when a user is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A There are many possibilities for how that might work.

Q Is one of them using a camera, an external camera?

MS. PARTRIDGE: Objection. Asked and answered.

A One of many possibilities.

Q Is one of them using an external tracking device?

MS. PARTRIDGE: Objection. Form. Objection. Outside scope.

A It could possibly be.

Q And would a person of ordinary skill, in 2014 or 2015, know how to determine, with a WED, when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Outside scope.

A We went over that earlier, I believe, and this was my answer to that general question: Person of skill in the art in audio and audio signal processing, 3-D audio, and things of that sort, would know how to manipulate audio and audio

cues and the audio digital signal processing. They might not be a person of skill in the art of knowing how to communicate tracking information or other kinds of information to that WED. They might not know how it works, in other words.

They might have a layperson's notion that somehow a WED can add some idea of some components of position. They might be very primitive. It might be six degrees of freedom. Who knows? But I don't think it would go, you know, beyond that. You would need a person of skill in the art who was an expert in WEDs.

Q So, a person of ordinary skill in the art would need quite a lot of detail to try to figure out how to determine, with the WED, when the user's leaving the environment?

MS. PARTRIDGE: Objection. Form.

A I think the way it works is that an expert in audio gets together with an expert in other areas and says, let's form a system.

Q Uh-huh. But I'm asking you, specifically, about the person of ordinary skill

in the art that you've identified in your declaration. That person would need quite a lot of guidance or help from a VR expert to figure out how to determine, with the WED, when the user is leaving the environment.

Is that correct?

MS. PARTRIDGE: Objection. Form.

A No. That kind of -- that's too fuzzy.

I think what would happen is that there would be somebody who would have the requisite expertise in determining positional information, but that the person of skill in the art, by my definition, would know what to do with that information once it was in a form that they could utilize, in order to manipulate the audio.

Q Can we agree that a person of ordinary skill in the art would need either detailed information or help form somebody with this specific expertise in order to determine, with the WED, that the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A Well, maybe not. Perhaps, for

instance, that information that I said that the audio expert would need to manipulate sound, could be easily accessed through some sort of easy computer interface, right?

So, for instance, there are systems that can tell you, you know, give you data streams, let's say, of positional information. And so, once the person skilled in the art in audio has that positional information, then they can, then, take that information and, you know, it doesn't take -- your characterization was that they would be very complicated. Well, sometimes it's not so complicated, it's just a matter of getting that information in a way that's, I guess I'll put it this way: POSA readable, by a person -- as I've explained it.

Now, if you wanted to go, though, into the more subtleties of the things with the WED, its electronics, its, you know, programming, other than things like that, that would be out of the scope of the POSA.

Q Okay. So, if you were going to design

a WED that was able to determine when the user is leaving an environment, that's out of the skill of a person of ordinary skill in the art?

MS. PARTRIDGE: Objection. Scope -- objection. Form. Sorry.

A No. Because you could take that positional information and then the audio expert can have an idea of environmental boundaries, right? So that's the other thing that, if you will, it's sort of a common language, if you will, we have interfacing information. So I can have a model of the virtual or real-world environment that I'm using in my audio world, and that model of the world, in my audio environment, right, I have a model of it, and I know what to do, based on the information that I'm getting from some sort of WED. And then I can, you know, interact -- I can do things that reflect interactivity with that environment.

Q Okay.

A But, again, I'm forming my own environment, if you will, that is to support the

model that's being used in the visual world, but the audio person can certainly build a model of a virtual environment so as to know how to manipulate the audio.

Q Okay.

MS. PARTRIDGE: So we're getting close to the an hour on the record -- or getting past an hour on the record. So when you get to a good stopping place, we'll take a break.

MS. OSMAN: Great, thanks.

Q So, Dr. Begault, it sounds like what you're saying is, if the audio person designs the environment they may be able to, then, determine, with the WED, when the person is leaving the environment.

Is that right?

MS. PARTRIDGE: Objection. Form.

A As I gave you an example where if I build a model of an environment, right, that's trackable to me, right, that I know, for instance, the distance of a sound object, right -- a sounding object. So let's say that's a very

simple example. We might also know the position of that object, and we might get that information from a data stream, okay? And that data stream probably comes from a WED, okay? So, if that information is coming to me, then I can, then, create a model of a virtual world that supports or, should I say, reflects the conditions of the virtual environment to be simulated. And I could do things that are different, even, as well. It really kind of depends, you know, on the particular way or goal of the person doing the audio model.

Q How would this person get this positional data stream that seems like it's necessary? Where would that come?

A Well, in the old days, we would use a -- what was it called? I think it was an RS232 card that was connected to a computer. And that was connected via a serial interface to a device called a Polhemus magnetic tracker. And so, the data stream would arrive as a separate piece of software. And, so, what the person building a

virtual audio world would do is take that streaming information and then create audio software models -- well, I should say audio software to create a, I would say, audio-centric model, is the way I would say that.

Q Okay. So using that stream information, which it sounds like you're saying a POSA would know how to get, a POSA would know how to determine, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A A POSA could potentially understand how to make their model of the virtual audio world correspond, in some way, to the either physical or virtual world that is part of the virtual reality system, which comprises a display of visual information and probably comprises other kinds of effecters and sensors.

Q So it sounds like -- and I'll repeat my question. And if you can just answer it, I'd appreciate it, just to make the record clearer.

A POSA would know how to determine,

with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form. Objection. Outside the scope.

A A POSA would know or could model how that would occur if they were able to obtain the information in a way that that POSA would know how to work with, is the way it's done.

Q And you're -- you were telling me, earlier, that a POSA would know how to obtain that information, the positional information?

MS. PARTRIDGE: Objection. Form.

A Possibly. So, I mean, the Polhemus tracker I mentioned earlier may or may not have been known to a POSA. That probably should have been known to a POSA, since it was commonly used in virtual reality systems. So it was a way of maintaining streaming data.

A more simple example is a POSA could use a joystick, let's say, and put it on their arm and then that constitutes a wearable electronic device of some sort, right? And so, that could be

something that, you know, potentially could manipulate audio in the audio world.

So it's potentially possible that data could be obtained in a format that would be usable by a POSA to manipulate audio information, yes.

Q Okay.

MS. OSMAN: Thank you. I think this is a good time for a break, if that works for you, Dr. Begault.

THE WITNESS: Please.

PLANET DEPOS TECHNICIAN: Off the record. The time is 15:43.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record. The time is 16:01.

BY MS. OSMAN:

Q Welcome back, Dr. Begault.

How are you?

A Give me one moment. Just let me grab a glass of water.

MS. OSMAN: Sure. Let's go back off the record.

PLANET DEPOS TECHNICIAN: Off the record. 16:01.

(Off the record.)

PLANET DEPOS TECHNICIAN: Back on the record. The time is 16:02.

BY MS. OSMAN:

Q Okay. Welcome back, again, Dr. Begault.

A Can you hear me?

Q I can hear you.

MS. OSMAN: Can everybody hear him?

A I see. I don't have my volume up. I think we're communicating now. Test 2, 3, 4. We're good. Okay. Sorry about that. I always turn my volume back.

PLANET DEPOS TECHNICIAN: Back on the record. 16:02.

Q Welcome back, Dr. Begault.

A Thank you.

Q Did you talk to your attorney, any of your attorneys, during the break?

A I'm waiting for any objection, but --

MS. PARTRIDGE: I'm sorry. You can answer the question yes or no. Thank you for being a very good deponent there.

I object on attorney-client privilege.

But you may answer that question yes or no.

THE WITNESS: I'm still learning.

A No.

Q Thank you.

Dr. Begault, I understand you provided an opinion on written description in your declaration; is that right?

A I probably did. I'm trying to recall, written description, if that was a section.

I probably did. I'm just not recalling what that is exactly. I guess I could try to find that.

Q Well, my next question was going to be what your opinion was. So, perhaps, find the opinion and then I will ask you.

A I think that makes sense.

Q Okay.

A Are you looking at any particular part of my declaration?

Q Not at the moment, no.

A So you said "written description."

I'm not playing dumb. I'm really just not sure what that means. There's written descriptions of all kinds of things.

Q I understand, yeah.

A Sorry I'm being difficult.

Q No, it's okay.

Okay. So I can rephrase my question.

Is it fair to say you don't know what the legal term "written description" is?

MS. PARTRIDGE: Objection. Form.

A I'm not an attorney, so I don't presume to give you a definition of anything that's a legal term.

Q So did you provide an opinion about whether the '179 and '184 patents have adequate written description?

MS. PARTRIDGE: Objection. Form. Objection. Outside scope.

A You know, I believe I did with regards to a specific context.

Q And what was that context?

A Well, again, I'm going to do this by recollection, so maybe I ought to take a look at my declaration.

Q Dr. Begault, I just searched your declaration, I think paragraph 49 might be what you're looking for.

A Okay. Let's take a look here because I was thinking of something else, but that's all right.

49. Right. That's exactly what I was thinking about as well.

Q Okay. Well, so did you provide an opinion about written description?

A Yes, I did. I believe my opinion was that the '140 application, which we haven't defined formally here, but for the record, we'll say that that is the precedent to the two patents here. I don't know a better word for it. That I opined that it did provide sufficient written

description so that a POSA would understand the subject matter at hand.

Q Okay. And I wanted to understand a little bit. What do you mean by "written description" there?

A Well, I believe what that means is that a POSA would understand that the writer of this specific application had possession of that claim subject matter.

Q Okay. And what does it mean to have possession of the claim subject matter?

A Well, I believe that the claim subject matter are the statements that are made in the application about claims and specifications.

Q So when you were assessing the '140 application to see if it provided written description support, were you looking for the words of the claim in the '140 application?

A Yes, I think I was. I think I was looking at everything in these.

Q What do you mean by "everything"?

A I mean the specifications and the

claims, right?

I think that the claims are slightly different, but I believe the specifications are the same between the '140 and the patent.

Am I correct about that?

Q You are correct. I think my question was a little bit different.

I was asking you, when you were assessing the '140 application to see if it provided written description support for the claims of the '184 and '179 patents, did you look for the exact words of the claims in the '140 application?

A I was looking at the entire '140 patent -- application to come up with my opinion. Specifically, that, I believe, that a POSA would know how to implement the methods that are described and -- yeah, I think that's what I was getting at with that.

Q So, you were looking at the '140 application to try to determine if a person of ordinary skill, reading it, would know how to

implement the methods?

A Yes, that's right. I think so.

THE WITNESS: You're muted.

MS. PARTRIDGE: Sorry. I was coughing. Objection. Form.

I was wondering why she wasn't writing that down. Sorry.

THE WITNESS: Your volume is about three times louder than everybody else, too.

MS. PARTRIDGE: That's because I'm deaf and my stupid hearing aids just stopped working. Sorry, I'll turn them down.

I'm a disabled person.

Q So, Dr. Begault --

A Sorry.

Q That's okay.

Dr. Begault, were you looking for the exact words of the claim or were you just looking in the '140 application for something that would have told a person of ordinary skill in the art how to implement the claim?

MS. PARTRIDGE: Objection. Form.

A Well, there's a number of methods that are brought out in the '140 application, and those are also in the '179 and the '184. So you recall, I was testifying earlier that I tried to describe to a layperson what these methods might be in my declaration.

And so, in my opinion, the '140 application was describing things a person of skill in the art would know what to do.

Q Okay. That's helpful.

And then, in reaching your opinion, did you look at the '140 application and combine different disclosures or were you focused on one particular disclosure in that application?

MS. PARTRIDGE: Objection. Form.

A I was looking at all of the disclosures in it.

Q Okay. And when you say there's sufficient written description support, is there one particular disclosure that you think provides sufficient support for the inventions or is it a combination of disclosures?

MS. PARTRIDGE: Objection. Form.

A Did either of your possibilities include each and every? Because I think each and every disclosure counts. I mean, right, would be something that could be implemented by a POSA.

Q Okay. So you combined all of the disclosures?

MS. PARTRIDGE: Objection. Form.

A I didn't combine them. I basically have opined that if you were to look at the examples that are given, for instance, that are disclosed, as means by which to accomplish certain things, that those would have been known to a POSA.

Q Okay.

A Excuse me.

Q So, are you saying the different examples would have been known to a POSA and that a POSA would have been able to use those examples to implement the claims?

A No.

MS. PARTRIDGE: Objection. Form.

Q Okay.
A Let me answer your question.
Q Okay.
A Your question was, would they be known to a POSA? What I was saying was, a POSA would know -- would read the application, would read these methodologies, right, and know, oh, I understand the -- what's being described here, how I would implement that.
But it's a different question of, well, would a POSA know -- have known to implement those for a specific purpose in the claims? And I don't believe that that would have been true, the notion of using these methodologies, for instance, as an alerting system would not have been known. They weren't known to me at that time. I don't think a POSA would have known to use these techniques in a way they're described here.
Q And when you say "the way they're described" you mean the way they're described in the claims?
A In particular, yeah --

MS. PARTRIDGE: Objection. Form.

A -- in the claims.

Q Okay. And they wouldn't have known to use alerts the way that they're described in the claims, even after reading the '140 application?

MS. PARTRIDGE: Objection. Form.

A No. I think that's mischaracterizing it. I think they would look at the claims, then -- I mean, if I were reading the patent, I would go, here's some claims, here's an idea, here's a concept. How would I go about implementing that? I'd look at specification, I'd look at the claims, then I'd combine them together, you know, mentally and say, oh, would I know how to do that in order to create this -- you know, to accomplish this goal, for instance, this goal of alerting. And so, that goal could be understood.

Q You're saying that a POSA, reading both the specification and the claims, would be able to accomplish the goal of alerting?

A In the -- according to the alerting

methods that are called out in the claims, okay, the claims that we have been discussing, I'm saying that by reading the specification and reading the examples in the specification, and the -- then we would know, oh, this is -- there's, obviously, a way to do this particular action in order to achieve the claim.

Q Would a POSA reading just the specification have known -- have had reason to alert the using that they were leaving -- to use the alert -- strike that.

Let me ask this again.

Would a POSA, just reading this specification, have had reason to use alerts the way that they're disclosed or claimed?

A I don't know the answer to that question.

Q Why do you say you don't know?

A Well, I'm trying to figure out the question here. Would a POSA know -- why would a POSA read the patent and only -- or the application and only read the specification and

not the claims? I mean, you would read it all, right? So you would --

Q If we're reading the '140 application, it's before the claims. So if we're just looking at the '140 application, would a POSA have known -- or -- strike that.

Just looking at the '140 application, would a POSA have had a reason to use an alert as in the claims?

MS. PARTRIDGE: Objection. Form.

A I don't know what a particular POSA's reasons might be.

Q So, a POSA reading the '140 application would have used an alert as disclosed in the claims?

MS. PARTRIDGE: Objection. Form.

A Well, to be specific, there's a number of people that qualify as a POSA that would never want to make an alert for whatever reason, right? I mean, so, I'm a little kind of out in left field here. I'm not sure what we're talking about.

We've got POSAs. We've got POSAs that

might read this. They might read part of it. I'm trying to figure out where we're going here.

Q Well, I think we're -- hopefully I can clarify. Let me try this differently.

So you were providing an opinion on what a person of ordinary skill in the art would have understood; isn't that right?

A I was, yes.

Q And so, you took a look at the '140 application; is that right?

MS. PARTRIDGE: Objection.

A Right.

THE WITNESS: Sorry. I interrupted.

MS. PARTRIDGE: Objection. Form.

Q Reading the '140 application, would a person of ordinary skill in the art have had reason to use an alert, as claimed?

MS. PARTRIDGE: Objection. Form.

A I can't know what that particular POSA's reasons or what brought them to that particular application.

Q Okay. So you have no opinion about

whether or not a POSA would have known to use an alert, as claimed, based on the '140 application?

MS. PARTRIDGE: Objection. Form.

A Well, I'm trying to figure out who this POSA is. So, for instance, I'm a person of skill in the art, I read all kinds of patents and applications. And I can understand what they're saying and I've got no reason to use it because it's out of the -- out of my world, let's say, or it's a field that I'm not really particularly interested in.

So, that's my answer to you there, is I don't know what this POSA's interests are, what their application is, et cetera.

Q You've provided a definition of what a POSA is, right? You've defined who this POSA is; is that right?

A Yes, I have.

Q So using your definition, would a person of ordinary skill in the art reading the '140 application have used an alert as taught -- as claimed in the challenged claims?

MS. PARTRIDGE: Objection. Form.

A There may be people who are POSAs that would have no need to use an alert in their particular application field. That's the answer I was trying to give you. Just as I have read many a patent that, as a POSA, where I can have an understanding of it and I would have no need to use it.

Q Would it have been obvious to change binaural sound as an alert, based on the '140 application?

MS. PARTRIDGE: Objection. Form. Objection. Legal conclusion.

A I think these are novel ideas, the idea of degrading the binaural sound in the various ways that are described as a means of an alert.

Q So, degrading binaural sound as an alert is a novel idea; is that right?

A That was -- you know, means, methods by which are described specifically in the patents, yes.

Q Does the '140 application disclose

degrading binaural sound as an alert?

MS. PARTRIDGE: Objection. Form.

A Yes, I believe that some of those methods involve a degradation with quotes around the word "degradation" because that could mean several things, of -- what we could maybe use instead of degradation, we could say modifying binaural sound. Maybe that's a gentler term. But it certainly is -- it seems to encompass a lot of the teachings, if you will, of that application.

Q Can you point me to where the '140 application discloses using modifying binaural sound as an alert or warning?

A Sure. Give me a moment. I'll have to refer to my declaration.

Okay. I don't have the '140 in front of me, so I can't tell you particularly where. If you want me to bring it up, I'll be happy to.

Q Dr. Begault, let me put that exhibit in the record so you can look through it.

It is Exhibit 1028.

(Exhibit 1028 previously marked for

identification and attached to the transcript.)

A Great. Give me a moment. It's not up yet.

PLANET DEPOS TECHNICIAN: Currently uploading.

A Sounds good.

Q It's done.

A All right. Let me try. Not yet. I see 1038. I see 1001. And I see my paper and I see test. Try again.

Oh, 1028. There it is. Okay. Great.

Okay. Again, we have a fair amount of blur here, lots of printed matter. So if you'd like me to find for you what you call where a modification of binaural sound is called out; is that correct?

Q Is called out as an alert. So I can read my question for you again. I said, can you point me to where the '140 application discloses using modified binaural sound as an alert or warning?

A Okay.

MS. PARTRIDGE: Objection. Form.

A Okay. All right. All right.

Let's see. So I don't have if I'm -- I'm looking at amendments now, on page 28. I think you want me to look, actually, in the application itself, right? I don't know what constitutes the application versus these amendments, right?

Q Well, you just opined that the '140 application discloses modifying binaural sound as an alert or a warning.

So my question to you is, where is that disclosed?

A Sure. All right. So if you look at Figure 2, for instance, of the description of the drawings, I'll just read it out loud, is that okay?

Q Could you tell me where you're reading, please?

A Yeah. The first place I discovered it is on page 48 of 195, but then there's another thing here that says 93 of 196. So I don't know

which page I'm really on because these are -- oh, wait. The exhibit, it's page -- it's blurry. I think it's 93 of Exhibit 1028, if you could go there.

Q Okay.

A All right. Are you ready?

Q I'm on page 93 and the title is "Brief Description of the Drawings."

Is that the correct page?

A Right, right. So this is one location. Figure 2 is a method to change between providing sound at a sound localization point and binaural sound to a person to providing the sound in stereo sound, mono sound, or altered binaural sound to the person, in accordance with the example embodiment.

Q What does that disclose?

A Well, that discloses a modification of binaural sound.

Q Does it disclose using a modification of binaural sound as an alert or a warning?

MS. PARTRIDGE: Objection. Form.

A That specific -- I think that was the context in which that is discussed and that is -- maybe I can find you a more specific example. It's -- I believe it's in the examples that are given, multiple examples of transitioning between different environments. I think I've itemized a number of those in my declaration that you can go to that should be parallel in the application.

So, you know, these are the things that start with the words "consider an example embodiment," for instance.

So, it's easier for me to give you specific examples from my declaration, but if you want, I could cross-reference it back to this other document, and we could take the time to do that.

Q Well, we can go through your declaration, but my question for you is, is there a specific example that discloses using a change in binaural sound as either an alert or a warning?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Yes. It's basically alerting a person that they have changed their environment.

Q And where is that disclosed in the '140 application?

MS. PARTRIDGE: Objection. Form.

A I'll point it to you.

All right. I will find here -- I do recall there's a section specifically -- and I don't know if I put this in as one of the examples, but I do believe there's an example having to do with just a change in the data rate, right, the ability of the system to simulate binaural sound. I think there's a kind of example of that.

But the examples that I'm looking at, that are in my declaration, we talk about a change in audio rendering from one kind of binaural sound to another. We talk about transitioning from stereo sound to binaural sound. And these are all concurrent with a way of informing the listener that they are moving between different environments and could also be informing the other

participant that they're switching between those things.

Q So, sitting here today, can you point me to any example in the '140 application of degrading or changing binaural sound as an alert or a warning to a user?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A I can give you several examples because the specifications match between the patents and the '140 application, if we can agree that the specifications are the same.

Q I'd like to focus on the '140 application. That's what we're focused on for this discussion.

A That's fine. I guess I'm questioning -- I'm asking this because it's far easier for me to hunt through the examples to answer your question by looking at my declaration because they parallel the '140. If you want me to find the equivalent spot in this document using these very tiny representations on the SharePoint,

I'm more than happy to do that, but it's going to take me a little while.

Q It's fine for you to use your declaration, if that's helpful.

A It is helpful.

So if you go to my declaration and you will see on pages 21 through 24, and you'll see Table 1, transition in physical environments and transitions in 3-D virtual environments.

Q Okay. And so, these are, in your opinion, the examples of using a change in binaural sound as an alert or warning?

A Amongst other ways.

Q What do you mean when you say "other ways"?

A Well, not just changing binaural sound from one type to another type. But, also, changing binaural sound to monaural sound, for instance, or to stereo sound. And then the specific ways that these occur are outlined in later sections, in terms of the methodologies that I had talked about earlier.

Q Okay.

A So, for instance, creating situations where the sound is heard inside of the head instead of externalized.

Q Can you look back, please, at Exhibit 1028 and turn to page 102 in that exhibit.

A 1028, file history. That's what we were just on, right? Is this the one?

Q That file history of the '140 application. And I'm asking you to turn to page 102 of the PDF.

A 102, okay.

So, just to make sure we're on the same page, so to speak, yes, 102, it says page 11 at the bottom. Yes.

Q Okay. Perfect.

So I'd like you to take a look at line -- the paragraph that starts at line 16. The first words are "in scenario 110 a, a user 120 wears electronic earphones 122."

Do you see that there?

A I do.

Q Can you read that paragraph and let me know when you're ready?

A Oh, sure.

All right. I think I'm done.

Q Okay. In your opinion, does this paragraph, the description of this invention in this paragraph, does that match the claimed inventions?

MS. PARTRIDGE: Objection. Form.

A Yeah, I believe it does.

Q Okay. Is there an HMD in this example?

MS. PARTRIDGE: Objection. Form.

A Well, there are earphones and there's a laptop display, I believe, here.

Q Is there an HMD?

A The word HMD is not here.

Q Okay. Is there an HMD that displays a virtual image?

MS. PARTRIDGE: Objection. Form.

A There are HMDs that display virtual images.

Q In this specific example, is there an

HMD that displays a virtual image?

MS. PARTRIDGE: Objection. Form.

A It does not show an HMD in this particular paragraph.

Q How about a WED? Is there a WED in this example?

MS. PARTRIDGE: Objection. Form.

A Let's see here. I don't see the word "WED" in here.

Q Okay. And so you agree, also, that there's no WED that displays a virtual image?

MS. PARTRIDGE: Objection. Form.

A You know, to be accurate here, I think what I would need to do is take a look at the figure. Isn't there a figure that this is referring to? So that way we could maybe -- Figure 1. So maybe we ought to look at Figure 1 to be able to more accurately answer your question.

Q Figure 1 is on page 178 of this same document, if you want to take a look.

A Yeah, let's take a look. All right.

All right. Then we would need to determine if some of these things are HMDs or not. It's a little hard for me to tell. 160, for instance. So let's see here. I guess I could search.

Okay. I see -- I'm sorry, what page were we on? You gave me the page.

Q We were on page 102.

A 102. Yeah, this is very difficult for me to tell. Now, we were talking about figure -- what was it, Figure 2, was it? Figure -- what was it?

Q Figure 1 --

A Figure 1.

Q -- and the scenario in Figure 1.

A What page is Figure 1?

Q Figure 1 is on page 178.

A 178, okay.

So, honestly speaking, looking at this, I can't tell if there's an HMD or not that's associated with the device identified as either '160 or '162 there, SLP moves into object with

'116.

Also, there's a question of, I don't recall, at 124 there, which is some sort of virtual person that somebody's communicating with, if they're wearing an HMD. Maybe it's not specific in these examples. I just -- I don't recall exactly.

Q Okay. So the paragraph that we are looking at is scenario 110. Which is that box on the top of Figure 1.

Do you agree with that?

A I don't know. 110?

Q You don't know. Why don't you look at the paragraph.

A Let's go back to the paragraph. Is it talking about 110?

Q It says "in scenario 110."

A Oh, okay. Okay. Well, then, yes, this looks to be like a person wearing a binaural -- somebody wearing headphones. I think that's what 122 is. And it looks like they are working -- I'm not sure, what is 127? Do you know what that is,

or 129?

Q 127 is a cup, designated as an SLP and a stapler as designated as another SLP, 129.

A Okay.

Q I'm just looking at page 102, that's lines 28 through 30.

A Okay. Let me go to 102. 102, 102. 196. All right. And, okay. All right.

So this doesn't talk about 102 here, in that paragraph that we've been discussing. We were on 102, the paragraph beginning "in scenario 110," right?

Q That's what we're looking at.

A Right.

So I don't see HMD here. But I would -- might need to know more about that particular -- all of the things that are there that are described for scenario 110, all right?

Q Sitting here today, you don't see a disclosure of an HMD?

MS. PARTRIDGE: Objection. Form.

A I don't see --

THE WITNESS: Sorry.

A Between lines 16 and 26, there is the -- the word HMD does not appear.

Q And sitting here today, you also didn't see a disclosure of a WED in this scenario; is that correct?

MS. PARTRIDGE: Objection. Form.

A Only if we exclude electronic earphones. And I don't know if this is specific to whether or not the electronic headphones are otherwise called out to have a tracking device connected to them or not.

Q So those electronic earphones that exist in this scenario, they don't display a virtual image in this scenario, do they?

MS. PARTRIDGE: Objection. Form.

A No. They do describe a display, visual acoustic images.

Q The electronic earphones display a virtual image?

A A virtual acoustic image.

Q What is that virtual acoustic image?

A The voice of an intelligent personal assistant to a sound localization point, the voice of a friend to a second sound localization point.

Q What environment is the user initially in, in this scenario?

MS. PARTRIDGE: Objection. Form.

A As pictured there, the user of this, the physical user appears to be sitting at a physical desk.

Q And how does the environment change?

MS. PARTRIDGE: Objection. Form.

A How does which environment change? The virtual environment or the physical environment?

Q I'd like you to answer that question. You said he is sitting at a physical desk. During this scenario, does his environment change?

MS. PARTRIDGE: Objection. Form.

A Well, there appears to be changes in the imagery on the laptop. There appears to be changes to the virtual acoustic imagery. And, let's see, anything else?

Yeah, so, there's changes, definitely,

to the sound localization, imagery, sound imagery. And let's see. There also seems to be a change of imagery, visual imagery.

Q Does the user leave any environment during the course of the scenario?

MS. PARTRIDGE: Objection. Form.

A There's a change in the environment.

Q Does the user leave an environment?

MS. PARTRIDGE: Objection. Form.

A It's possible to say that any change in an environment is transitioning or leaving one environment and -- to another.

By the way, I will need a brief break, maybe for five minutes, but I can answer another question, if you're in the middle of a stream.

Q Sure. I'd just like you to answer my pending question, which is, is any change in the environment, does that constitute leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Yes. I believe that when you change an

environment, you're leaving one condition, one arrangement, one set of circumstances and objects and things that surround a person, and you're going to another circumstance.

MS. OSMAN: All right. Well, let's take -- let's take a break.

THE WITNESS: Great.

MS. PARTRIDGE: Dr. Begault, do you need to eat?

THE WITNESS: No, I'm fine. I just need five minutes. I'll be back in five minutes.

PLANET DEPOS TECHNICIAN: We are going off the record. 16:45.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Yes. Back on the record. 16:50.

BY MS. OSMAN:

Q Dr. Begault, did you talk to anyone during your break?

MS. PARTRIDGE: Objection. I'll allow you to answer that question yes or no. Please don't reveal any privileged information,

Dr. Begault.

A No.

Q Before we went on break, I asked you whether a change in -- strike that.

Before we went on break, I asked you whether any change in an environment constitutes leaving an environment.

I'm not sure I got your answer.

A Oh.

MS. PARTRIDGE: Objection. Form. Asked and answered.

A Sure. So, if you change an environment, you have now officially left one version of an environment and you are entering another version of an environment.

Q If I'm sitting in my office and my associate comes in, have I left my environment?

MS. PARTRIDGE: Objection. Form.

A Your environment has changed, so, if we were thinking about it in terms of, for instance, a model of kind of a virtual world, or let's say we're in the film world, right, where we would be

talking about different scenes, so we've suddenly left a scene with one person in it to a scene with two people in it. If your assistant came in and took your coffee cup and took it from the right side of the desk and put it on the left side of the desk and then left, then your environment has changed.

Q So I didn't ask you if my environment changed. I asked you, have I left my environment?

MS. PARTRIDGE: Objection. Form.

Q So have I left my environment if an assistant walks in the door?

MS. PARTRIDGE: Objection. Form.

A It could be understood if we phrase it the following way: You have left an environment that had one set of conditions and now you have entered another environment with another set of conditions.

Q And that occurred even though I did not move from my chair, I have left one environment and entered into another?

MS. PARTRIDGE: Objection. Form.

A Well, again, this talks about how we define environment. And so, I defined environment to you, and in my declaration, earlier, as a change in the circumstances and the surroundings that are around a person. I gave a better -- better definition in the declaration.

But, anyway, so, yeah, if your assistant walks in, that's a change, right? So you've left one environment which had a certain set of conditions. And in the case that you're just describing there, we're talking about an office with one person in it, hypothetically, and now we're talking about, oh, now you've moved to a new environment that includes two people.

Q And what if the lights flicker off, the lights in my office flicker off if I sit too long, which happens more often than it should, does that mean I've left my environment?

MS. PARTRIDGE: Objection. Form.

A Well, yes, because now what's occurred is that there's been a significant change in the luminosity and, you know, there would be a

significant change to your percept of the objects and things that surround you. So you have left a lit environment and now you've entered a darkened environment. It might be in the same physical space, but, you know, in terms of the way that environments and manipulation of environments is understood, that's a transition. And that transition is a movement, if you will.

Q But is a transition always leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Okay. I don't want to get wrapped around the axle here, so I want to make sure I'm answering correctly.

We are leaving one environment and we're entering another environment, under the definitions I gave you earlier for what an environment is.

So when we make a change in the surroundings or circumstances, and I don't remember my exact wording, so maybe I should pull that up so that I can be precise here. Stand by.

I'm just going through my declaration. That's all I'm going through.

Okay. The term "environment" means the circumstances, objects, or conditions by which one is surrounded. So, if the circumstances, objects, or conditions by which one is surrounded change, then you have left one environment and you've gone to another environment.

Q So, if I move my coffee cup from the right side of my desk to the left side of my desk, have I left my environment?

MS. PARTRIDGE: Objection. Form.

A Your environment has changed. Your prior environment, where your coffee cup was on the left side now is on the right side, in some people's worlds, would cause great terror and objection to whoever moved your coffee cup because you always like your coffee cup on one side. So, you've changed my environment. You've moved me out of my comfort zone into a new comfort zone, which might be one way that some people may refer to that.

So change in the circumstances, objects, or conditions by which one is surrounded.

Q And your testimony here today is that any change in the circumstances or conditions or objects around you is leaving one environment and getting into a new environment; is that correct?

MS. PARTRIDGE: Objection. Form.

A That is the way that we are operatively speaking about that, yes. This is a change in those things. If you think about it in terms of the timeline, right, I'm here in time zero, and here are the circumstances and objects and things that are around me, and now I'm here at another future point in time or another past point in time, and those circumstances differ, then we have left one set of conditions and percepts and surroundings and objects and whatever and model, things that are in our model, and we are now in another version of it.

Q Does a user in a 3-D virtual environment leave an environment every time sound is changing?

MS. PARTRIDGE: Objection. Form.

A No.

Q Okay. When would they not be leaving an environment?

A Under the example that you gave. So we're talking about -- let's try to give it a little context here. What is the context? We're talking about a user -- I'm sorry.

Q I'm trying to understand. So from your testimony, what it seems to be that you're saying, is that anytime there's a change in an environment, you have left the original environment. And so I'm trying to understand, if the user is in a 3-D virtual environment and something about the sound changes, does that mean they've left an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Not always. It can and it can't.

Q When would the user not be leaving an environment even though sound has changed?

MS. PARTRIDGE: Objection. Form.

A They could be in a concert hall environment and the environment is of musical performance, let's say, and the music is changing over time. And so, that music is changing all the time, but from that context, we're in a virtual environment listening to a Beethoven string quartet, perhaps, and if they switch to a different, let's say, a Haydn string quartet, we are still in that concert hall environment and the circumstances haven't changed because we're listening to a string quartet.

Q Have the conditions changed because the music is different?

MS. PARTRIDGE: Objection. Form.

A Well, again, this depends on what -- yeah, how fine of a point you want to put on this. I think the conditions there have not changed from the perspective of the fact that we have musicians playing music.

Now, the environment would have changed if, suddenly, the string quartet, there's a tuba trio that comes out and plays some music. So that

is a change in the environment because now we have different sound sources in that environment.

Q So if a tuba quartet comes out, then you are in a new environment. You have left your original environment; is that right?

MS. PARTRIDGE: Objection. Form.

A I'm going to give you the same definition I gave you earlier, which is that there's been a change in the circumstances and the objects that are surrounding you when the tuba quartet comes out. Some things have changed, some things have not. If I were, let's say, scripting a movie, then this would be thought of as a transition in scenes.

Q But we're not scripting a movie, we're talking about -- you explained to me that an environment can be a physical real environment. So in a physical, real environment, are you saying a change in an environment means that you have left an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Well, that depends. I mean, so if we were -- yeah, it really depends on what level and what we're talking about. I mean, if somebody went to the concert hall to hear a string quartet and then went to hear the tuba quartet, that layperson would say, well, I'm in the environment of a concert hall, if they were just speaking about the room they were in, right? So that's one level of talking about it.

But in the environments that we're talking about here, in the patent, we're talking specifically about changes to the circumstances and objects, particularly, those that would precipitate some type of alert.

So, for instance, if I were a TV producer, I might make a change, a scene change between the tuba and the string quartet, and that would be produced to give the illusion of two different environments because we've now -- it might be different ways of representing it virtually, for instance. So it depends on the levels we're talking about. But in terms of the

patents and what I'm talking about here, is that when you have something, like a situation where one person is present in a virtual simulation and then suddenly there's two people present in a simulation, that is definitely a change in the environment.

Was that your light?

Q That was my light. Sitting too long.

A Yeah, well, I hope you can recognize that as a change in your environment.

Q So you keep using the word "change," but I'm really not asking about a change in environment. I'm asking, have you left one environment and entered another?

And I'd bring you back to the example of me sitting in my office. I'm sitting in my office and somebody walks in the door or I move my coffee cup.

Have I left an environment and entered into a new environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Once again, I'm going to come back to paragraph 21, and I'm going to say that you have left the conditions by which you were surrounded by, which is you have left a condition where you had illumination and now you are in a condition where you have less illumination. So that is a different type of environment.

You might have your heat on, one part of your day, and then the heater breaks and you're freezing in your office. You're sitting right there, but that's a change in your environment.

Q So, in paragraph 21, you relied on general-purpose dictionaries for the definition of environment; is that fair?

A Not completely.

Q Okay. Are there dictionaries there that are not general-purpose dictionaries?

A Well, as you can see, I did search the etymology of the word. I also looked at its Greek root.

Q Okay. But you didn't rely on dictionaries that were specific to VR or to 3-D

audio; is that right?

MS. PARTRIDGE: Objection. Form.

A I relied on, for instance, my own book on this. So, I relied on my own experience, particularly, of leaving one virtual environment and going to another virtual environment with audio simulations. I think I gave a number of examples.

Q Okay. So this definition you proposed, you don't think is sort of a layperson definition, this is a definition that is specific to the 3-D audio realm; is that right?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A No, I gave you a definition that came from Webster's dictionary, so I think that's a layperson's definition.

Q Yep.

A So, you know, but as an expert, I'm citing it, I'm applying it to the questions that are here. Excuse me. I've got to cough.

Q Okay. And if we could turn back to

scenario 110, that we were looking at, and page 102 of Exhibit 1028.

In this scenario, is there any alert or warning?

MS. PARTRIDGE: Objection. Form.

A Effectively, yes, there is.

Q How do you know that?

A Because there's a very salient change in the auditory presentation.

Q And is a salient change in the auditory presentation always going to be an alert or a warning to a user?

MS. PARTRIDGE: Objection. Form.

A If we define an alert and a warning as some sort of noticeable change, yes.

Q Does it say alert or warning in this specification?

MS. PARTRIDGE: Objection. Form.

A Line 16 to 26, I don't see the word "alert" or "warning."

Q How is this change in sound being used as an alert or warning?

MS. PARTRIDGE: Objection. Form.

A Oh, how does it work?

Q How is it being used as an alert or warning?

A Let's see if I can answer that specifically.

MS. PARTRIDGE: Objection. Form.

A Okay. Let's see. It's blurry, so I'm having a little problem here. Hang on.

So, there's a conversation, I guess, with a voice of a friend. And that person, see if I understand this correctly, see, I'm not -- I don't have a figure in front of me, transition box 128 to 2020B, but the -- what occurs is that somebody leaves the sound localization system and then another sound localization point moves to a different location.

I think I have that correct.

Q And so that change in sound localization is a warning to the user?

MS. PARTRIDGE: Objection. Form.

A It's a change in condition that is

alerted to a user by a salient change in the audio cuing.

Q I don't think I understand your answer. Can you explain that?

A Well --

MS. PARTRIDGE: Objection. Form.

A Sure. Give me a second.

Okay. So the salient change here has to do with an intelligent personal assistant and a friend who calls. And in this scenario, there's a change in the environment between when there is a communication with a friend and then there's the intelligent personal assistant located somewhere else.

So what this describes is that when the telephone conversation ends, the salient audio cue is that there's a change in the position of the localization of the intelligent personal assistant.

Q And where's the alert or warning to the user?

A The change in position.

Q And the change in position is also the change or leaving an environment --

MS. PARTRIDGE: Objection.

Q -- the user leaving one environment and entering another?

MS. PARTRIDGE: Objection. Form.

A It's a change in the virtual -- the environment -- it's a change between two virtual environments. Yes, virtual acoustic environments.

Q The word "alert" or "warning" does not appear in this passage, does it?

MS. PARTRIDGE: Objection. Form.

A Literally, those words do not appear.

Q Okay. Is changing binaural sound always an alert to a user?

MS. PARTRIDGE: Objection. Form.

A It depends on how we talk about how that change might occur.

Q So is that -- is that a no? I'm asking, is change in binaural sound always an alert to a user?

MS. PARTRIDGE: Objection. Form.

Objection. Asked and answered.

A It depends. It can't -- it doesn't always have to be an alert. It's usually when it's a change that acts as a salic cue.

Q Does this scenario disclose reducing the volume of sound?

A No, this is changing the position of a sound.

Q Does it disclose determining, with the WED, when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A The word "WED" is not present here.

Q Can you please turn to page 109 of this same exhibit.

A Sure.

Q I'd like you to look at a passage that starts at line 29, on page 109, and continues on to page 110, up to line 4.

Starts with "consider an example."

A Okay. That's line number 8; is that correct?

Q Line number 29 --

A Oh, 29 at the bottom of page. "Consider an example in which a user listens to audio drama"?

Q Yes.

A So just that whole paragraph there?

Q Just that paragraph, please.

A Okay. Great, great, great, okay.

Okay. I'm very familiar with this example.

Q Okay. Is there an HMD in this example?

MS. PARTRIDGE: Objection. Form.

A That is not specified in this particular example. I'd have to know if there's a context to this, where a HMD is called out. But I don't see it called out here necessarily.

Q Okay. So that's, no, there's no HMD in this passage?

A Well, it says binaural sound. I don't think that a person would be driving, they're listening over car speakers, they don't have an HMD out. And then it mentions putting on headphones.

So an HMD is not mentioned here.

Q Okay. And so there is -- what about a WED? Is there a WED in this example?

MS. PARTRIDGE: Objection. Form.

A Specifically, the word "WED" is not listed here.

Q Is there a virtual image?

MS. PARTRIDGE: Objection. Form.

A Oh, go back to your last question. "The system knows," you'll see that clause there, that might include a WED, I don't know. But, you know, it's the last sentence there. At this time, the system knows, right? And so, that's, maybe, elsewhere, more specifically designed -- defined to include a WED or not. I don't recall at this very moment.

So I just wanted to clarify that on my previous answer. And now you can go to your next question, if you'd like.

Q But do you agree this paragraph does not disclose a WED?

MS. PARTRIDGE: Objection. Form.

Mischaracterizes testimony.

A What I was trying to say there was when it says "the system knows," I'm not clear, at this point, without doing some more digging here, how "the system" is defined. If that system does include an WED or not.

So, it may infer a WED by context, but right now, what we're doing is we're looking at one paragraph. And, so, I'm not sure exactly everything that's included in the phrase "a system."

Q Okay. This paragraph, the word -- in this paragraph, the words "WED" don't exist; is that right?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A The literal letters WED, as an acronym, do not appear in this paragraph.

Q Okay. Aside from going back to find out what's concluded in the system, there's no WED; is that right?

MS. PARTRIDGE: Objection. Form.

A Again, my answer is, the system, whatever that system encompasses, may or may not include a WED. I don't recall.

Q Okay. Is there a virtual image in this paragraph?

MS. PARTRIDGE: Objection. Form.

A There's a virtual auditory image.

Q Is there a visual image in this paragraph?

MS. PARTRIDGE: Objection. Form.

A No. This is a display of audio information in this example because it's an audio drama.

Q Okay. And the headphones don't display a visual image, do they?

MS. PARTRIDGE: Objection. Form.

A I don't see that culled out here.

Q And in this example, the sound starts out monaural; is that correct?

A Correct.

Q And then it switches to binaural?

A Yes.

Q So this does the opposite of what the claims teach or the claims describe; is that correct?

MS. PARTRIDGE: Objection. Form.

A No.

Q Do the claims recite switching sound from monaural to binaural?

MS. PARTRIDGE: Objection. Form.

A Well, I'm not recalling exactly the monaural-to-binaural transition culled in the claims. But, certainly, you know, in that order. But the general concept of the fact that we've made a salient change in the audio representation, it could be looked at, in this example, and a POSA would immediately see this, that, oh, well, the person could be walking towards their car, listening to a binaural audio radio drama, and they got in the car, and then it switches to monaural sound. So there's a binaural-to-monaural transition, and everything that's true of that is true of a monaural-to-binaural transition.

Q So you're saying it would have been

obvious to a POSA that they could sort of do the opposite of what's disclosed in this passage?

MS. PARTRIDGE: Objection. Form.

A This passage is giving an example so that a POSA can best understand how the concept works, what the concept is. And it would seem clear to a POSA that what is being described here is a transition from binaural to monaural or monaural to binaural sound, depending on whether or not you wanted to wear headphones or whether or not you were in a car, where it's illegal to wear headphones.

Q Okay. But that passage doesn't describe binaural to monaural, it only describes monaural to binaural; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, it knows that the signal is originally binaural and it's been transformed to monaural to play it in the car.

Q Uh-huh.

A And then it -- and because it's inherently a binaural signal that it switches to

binaural when the person gets out of car, so it's back to its original form. So, in a way, there's actually two transformations that are occurring here, right, because, originally, the audio drama is in binaural and some transition to that to monaural inside the car. Then they go the opposite -- you get the opposite condition when the person leaves the car.

Q So a person of ordinary skill would have understood that you could do the opposite, you could have switched from binaural to monaural; is that right?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Yeah. There may be other examples of that. I'm not recalling exactly.

Q Well, let's focus on this one for now.

Does this example disclose altering binaural sound as an alert or a warning to the user?

MS. PARTRIDGE: Objection. Form.

A It describes a transition in sound

that, through the use of a salient cue, that the headphones are now operating, and, so, there's a change in the audio presentation that would be perceived fairly significantly because the sound would be very different.

Q So, is there altering, does it disclose altering binaural sound as an alert to the user?

MS. PARTRIDGE: Objection. Form.

A Well, here it's describing switching the audio drama to binaural sound when you put on headphones after you left the car.

So, it's a form of information, if you will, to the degree that it's an alert, that, oh, okay, I'm now listening to a binaural recording in binaural. And so, I'm now hearing a successful presentation of my binaural audio drama that, previously, I wasn't able to hear.

So in a way, that's an alert. It's an alert that, well, okay, we've changed our condition.

Q What is it alerting the user of? The user puts the headphones on his head when he

leaves the car in this scenario; is that right?

MS. PARTRIDGE: Objection. Form.

A Yes, it does say that.

Q So what is the user being alerted of?

MS. PARTRIDGE: Objection. Form.

A Well, first, that the system is operating properly. So if they put the headphones on and didn't hearing anything, then they would know, oh, that something's wrong in the communication system. If they put the headphones on and they heard things in monaural, then they might be alerted to the fact that I'm not listening to a -- something that I intended to be an audio drama occurring in binaural.

Q When the user is driving the car and the audio is in monaural, is that spatial audio rendering?

MS. PARTRIDGE: Objection. Form.

A I wouldn't call it spatial audio, no. I would think monaural sound, one channel sound. I mean, a loudspeaker can interact with the acoustics of the car and things might sound

different spatially, but it's not by the intention of the person who produced the sound.

So, it -- you know, fundamentally and theoretically, it's not spatial sound. But, of course, the loudspeaker, the monaural loudspeaker exists in space, if you will.

So it might be to the right of the listener. So it has a spatial property from the perspective of the listener, but the radio drama, itself, is not being transmitted with any spatial information.

Q Okay. Does this scenario disclose reducing the volume of sound?

MS. PARTRIDGE: Objection. Form.

A No. There's no reduction of the volume of sound in this example.

Q Does it disclose determining, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A We discussed, earlier, the phrase "the system knows." So that could very well be a WED.

Q It says the system knows the audio

drama is a binaural signal.

MS. PARTRIDGE: Objection. Form.

Q Does the -- does this scenario disclose determining, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A Well, this could read that the system knows to switch the audio drama to binaural sound.

Q In this scenario, when is the audio switched?

A When the person leaves the car.

Q And what does the person have to do?

MS. PARTRIDGE: Objection. Form. Objection. Form.

A What does the person have to do? Well, I think they have to put some headphones on.

Q Yes, they put headphones on their head.

Is the system -- is the WED determining when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A Well, it could be that the headphones,

themselves, are a form of WED. We've talked about the fact that wearable electronic device could be considered, from one standpoint, the electric transducers of the headphone speakers themselves. There's obviously some sort of electronic device that senses when the person has put the headphones on, so that could possibly be a wearable electronic device.

So, again, "the system" probably encompasses some of these features.

Q Let's turn to page 117 in the same document, please.

A Sure.

Q I'd like you to look at line 28, again, onto the next page, ending at page 118 at line 4?

A Okay. Should I study it?

Q Yes, please. Just take a look at the paragraph.

A Okay, I think I'm ready.

Q Okay. Is there an HMD in this example?

MS. PARTRIDGE: Objection. Form.

A It could be other type of sensor, you

see that phrase there, in the second sentence.

Q Could you read --

A Wait, wait a minute, I'm sorry. I misspoke. Scratch that last answer.

No, there's no HMD mentioned here.

Q Is there a WED mentioned here?

MS. PARTRIDGE: Objection. Form.

A Yes. That could be included here. The electronic device includes a sensor such as a camera or other type of sensor. So that may or may not include WED.

Q Okay. Is there a visual image in this example?

MS. PARTRIDGE: Objection. Form.

A There is an object that is mentioned, which it could be real or it could be virtual. And so, that real or virtual object is -- could possibly be visual, or visually acquired.

Q What environment is the user initially in this scenario?

A Well, it doesn't really say what environment the person is in.

Q Does the user leave any environment in the scenario?

A Actually, there are characteristics of an environment. Let me rephrase that a little bit there.

So they're in an environment where they have an intelligent personal assistant three feet in front of them. So that's one scenario -- that's one aspect of the scene, okay?

And then, apparently, there is an object that's involved as well.

So what was your question, I'm sorry?

Q I said, did the user leave any environment in this scenario, or in this example?

MS. PARTRIDGE: Objection. Form.

A Give me a second.

They may have.

Q Why do you say "they may have"?

A Well, they've changed their distance to an object.

Q Okay. Is there a possibility that they have not left an environment?

MS. PARTRIDGE: Objection. Form.

A Well, I'm trying to read this literally here.

So it's not explicitly said here, but, apparently, there's a change in distances, right, there's some sort of ongoing change in the circumstances and surroundings for this person because they're moving. That's what's inferred here.

Q And so, you think that means the user has left an environment?

MS. PARTRIDGE: Objection. Form.

A They've left one set of circumstances and surroundings into another set of circumstances and surroundings where an object has become closer to them, is the way I read this.

Q Is there any change in binaural sound that's used as an alert or warning in this scenario?

MS. PARTRIDGE: Objection. Form.

A Yes.

Q What is the change in binaural sounds

that's used as an alert or warning?

A Well, as indicated here, moving the sound localization point. Removing the sound localization point, switching or changing to stereo or monaural sound.

Q And how does this act as an alert or warning?

MS. PARTRIDGE: Objection. Form.

A Well, the warning is that a person is getting within a predescribed -- or a pre-prescribed distance to an object.

Q It doesn't say alert or warning here, does it?

MS. PARTRIDGE: Objection. Form.

A The literal words "alert" or "warning" don't occur here. But what would happen is a very salient change in auditory cuing would occur, which is, effectively, an alert or a change that is significant to a listener.

Q Is there a -- does this scenario disclose reducing the volume of sound?

MS. PARTRIDGE: Objection. Form.

A It may.

Q Where does it teach reducing the volume of sound?

A The word such as moving the SLP. So that can be a movement in distance which would correspond to a change in its volume.

Q So under certain circumstances, maybe you would understand this to include a change in volume, is that what you're saying?

MS. PARTRIDGE: Objection. Form.

A Reading this as a POSA, I know that when I move the sound localization point of a virtual object, one of the things that can occur is that there would be a change to its volume.

Q Okay. Does it teach reducing the volume of sound as an alert?

MS. PARTRIDGE: Objection. Form.

A Exactly within the way that I was describing it earlier, it's an alert that you are within a prescribed distance of an object. And so, it's certainly alerting somebody that, oh, now you're within this prescribed distance. And so --

Q Doesn't that mean the object is getting closer and not farther away?

MS. PARTRIDGE: Objection. Form.

A I'm sorry, could you restate that question?

Q Wouldn't that suggest that you were getting closer to the object and not farther away from the object?

MS. PARTRIDGE: Objection. Form.

A Well, I don't know if it necessarily means that you're getting closer to the object. It could mean, maybe, that this predetermined distance, that's mentioned here, might be that you're getting too far away from that object. I don't know. I mean, it's not -- it's not specified here. It just only says a predetermined distance. So that's some criteria that's tested. If the criteria's met, then the alert is given.

Q And when you're saying "alert," you're saying it's an alert because you were moving the SLP or removing the SLP and that is an alert?

MS. PARTRIDGE: Objection. Form.

A Moving the SLP is one of several ways that are indicated here that would produce a salient audio cue. It would be a noticeable change. And a noticeable change acts as an alert, auditorially.

Q Is a noticeable change always an alert? Is it necessarily an alert?

MS. PARTRIDGE: Objection. Form.

A Hypothetically, I can think of examples where a noticeable change wouldn't be an alert. But in the context of the patents and in the context of these disclosures and the context of all of that methodologies that are outlined, these are producing salient cues, these are noticeable transition in the type of audio rendering.

Q Okay. Does the scenario disclose determining, in the WED, when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A I thought we discussed that earlier when I gave you an answer regarding "other type of sensor."

Q Maybe you could remind me what your answer was.

Does it disclose determining, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A Should we look at my prior answers or do you want me to just try to --

Q Please repeat your answer.

A Oh, okay.

Okay. So ask -- sorry. Repeat your question.

Q I asked you, does this scenario or this example disclose determining, with the WED, when the user is leaving the environment?

MS. PARTRIDGE: Objection. Form. Asked and answered.

A Okay. So, it discloses a sensor, okay? And that device determines a distance between the electronic device and/or a listener to an object, okay?

So, that would be, potentially, a change in the environment because it would be a

change in the environmental conditions, and so, it would be leaving, let's say, one type of environment to another type of environment, the environmental change being that you are now closer to something than you were before, or farther away from something, according to some predetermined distance.

Q Let's turn to page 119. I think it's the very next page.

A Yep.

Q And look at line 18.

A Okay.

Q This is Figure 6. I'd like you to look at line 18 through the next page, line 27.

A The following page, 27?

Q Yeah, the following page, 27?

A So we're talking about several paragraphs?

Q Sorry, apologies. So, page 119, line 18, through page 120, line 27. We are talking about a few paragraphs.

A Okay. And then there's a Figure 6.

Can you direct me to where Figure 6 is?

Q Sure. Figure 6 is on page 182.

A 182. Got it.

So right now we're on page 160, right? So --

Q We're on page 119, we should be.

A 119. I'm sorry. I was looking at the wrong number.

All right. So let me switch back and forth. It's going to take me a little time because --

Q And, actually, maybe I can just have you read line 18 on page 118 -- 19, excuse me, up to line 11 on page 120.

A Oh, okay. So let me -- give me a moment then, here.

Q Okay.

A I'm sorry, the line numbers again, I'm going to write them down.

Q So from page 119, line 18?

A Uh-huh.

Q Through page 120, line 11.

A Okay. Line 11. Let me look.

Page 119, line 18. Messed up on that. Starting "Figure 6 is a method"?

Q Correct.

A Got it.

Talking about a flowchart.

Okay. Let me go, now, to the figure, completing the paragraph. I'm now going to the figure.

That was page 182; is that correct?

Sorry, I didn't take a clear note.

Q Yes, that's correct. Page 182.

A Okay. Figure 6. Got it.

Okay. I think I've got that. I'm just going to copy and paste that figure so that I can look at it simultaneously. I'm going to just paste it into a blank Word document.

Do you have any objection to that?

Q You know what, I have a pretty straightforward question about this, so I'd rather you not open Word or open another application.

A Okay. Let me go back to 119.

Q Yeah.
A Just that I might need to go back to the figure.
Q That's okay. I'd rather you not open any --
A Okay. Okay. So I'm on page 119, I'm at --
Q So --
A Figure 6 is a method to determine. I'm there, go ahead.
Q Okay. So I'm going to ask you, actually, about a passage that is on the beginning of page 120, it's the one that goes 1 through 11. My question for you is, all of the examples of restricted areas listed here are physical locations, are physical areas; is that right?
MS. PARTRIDGE: Objection. Form.
A No. Not true.
Q So these are not physical locations?
A Yes, that's correct. It seems to include both virtual locations as well as physical locations.

Q Where is there a virtual location?

A If you look at line 8, restricted areas can also include areas where a person or object is located in areas where another SLP is located. So that sound localization point could be a virtual object. And so, the model of the virtual world might have restricted areas that have nothing to do with the real physical world. And so, there's an example there.

Also, these restricted areas that are called out here could be some part of a model of a virtual world, right? So there could be virtual construction zones, or something of that sort, in a virtual world. So, let's say you're going through some sort of virtual world and there's a necessity to provide alerts about restricted areas. And so, the -- so I don't think these are necessarily physical.

Q Okay. If you'll look at the same page, down to line 20, I want you to take a look at the example that starts with consider the example above in which "Alice wears earphones."

A Yeah.
Q Just read through that paragraph.
A Uh-huh, yes. Okay. Hang on.
Can you remind me of the acronym HPED?
Q I think it's -- hang on. Let me find out. I think it's -- let me just be sure. One second.
The specification defines it as handheld portable electronic device.
A Handheld portable electronic device, okay. So a kind of wearable electronic device, except this one is handheld and it's --
Q Handheld.
A Got it. Okay. All right. Thank you.
So, reading it now.
All right. I've read it.
Q In this example is there an HMD?
MS. PARTRIDGE: Objection. Form.
A If this example is all in a physical world, then, no.
Q And is there --
A I guess I can imagine a situation where

all of these things are occurring and, you know, virtual world or something, virtual cars and things of that. But I sort of think it's physical environment is what we're referring to here.

Q Yeah, let's restrict ourselves to what is actually taught and disclosed.

So it says Alice is wearing earphones; is that right?

A It says that she's wearing earphones, yes.

Q Right. So there's no WED either?

A Well, no. I think we went on to discuss that an HPED, you know, handheld portable electronic device, is a form of wearable electronic device. Hey, we just --

MS. OSMAN: We lost your attorney.

THE WITNESS: I've got to stop.

MS. OSMAN: Let's stop.

THE WITNESS: I'm going to take a break. I'll be back in five minutes.

MS. OSMAN: Okay. That's fine. Erin, we're off the record.

PLANET DEPOS TECHNICIAN: Off the record at 17:48.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record at 18:11.

BY MS. OSMAN:

Q Welcome back, Dr. Begault.

Did you speak to anyone during -- did you speak to your counsel during the break?

MS. PARTRIDGE: I'll object to the extent I would like you not to reveal any attorney-client privilege information. Yeah, we did talk. He told me to turn off my Wi-Fi and turn off my Bluetooth.

Q Dr. Begault, can you answer the question, please.

MS. PARTRIDGE: You can answer yes or no.

A Yes.

Q Did you discuss the substance of this deposition during the break with your counsel?

MS. PARTRIDGE: Object as to

attorney-client privileged information and instruct you not to answer.

Q Dr. Begault, are you going to follow that instruction?

A My understanding is I'm supposed to follow whatever attorneys are telling me to do. I don't know, I mean, I could -- so, somebody has to tell me what to do here.

I've been instructed not to answer the question. So until such time, I know that there was something about turning her Bluetooth off, she's already mentioned.

Q Dr. Begault, did you discuss the substance of your deposition with your counsel during the break?

THE WITNESS: Jayme, are you instructing me to not answer that or what?

MS. PARTRIDGE: You can answer it.

THE WITNESS: Okay.

A No. The only discussion I had was over Zoom while we were off record. I wasn't sure why Jayme had disappeared off the line and Patrick

Dunn came on and told me that she had lost her power. And so, that was the only conversation I've had with the attorneys.

Q Thank you.

Before we took our break, Dr. Begault, do you recall that we were talking about page 120 of Exhibit 1028 and we were looking at lines 20 through 27, specifically?

Do you recall that?

A I do, yes.

Q Okay. And I had asked you if, in this example, there is a WED.

Do you remember that question?

A Yes.

MS. PARTRIDGE: Objection. Form.

Q Is there a WED in this example?

MS. PARTRIDGE: Objection. Form.

A Okay. Your question is, is there a WED in this example?

Q Yes, that's right.

A Right.

MS. PARTRIDGE: Objection. Form.

You've got to slow down while I'm on the phone.

THE WITNESS: Very good.

A So, I believe I had described to you earlier, we had a discussion that an HPED is a form of WED, except that it's specifically something held in the hand.

Q Doesn't the '140 patent application distinguish between an HPED and a WED?

MS. PARTRIDGE: Objection. Form.

A I don't recall the details of it. But, obviously, if the '140 is describing both of those and probably defining the acronyms, the distinction could be, let's say, between one being handheld and the other not.

Q Okay. So an HPED is not a WED, is it?

MS. PARTRIDGE: Objection. Form.

A No, I said that my understanding of an HPED is that it's a form of a wearable electronic device, except where I'm wearing it in inside my hand.

Now, if there's a different definition

of that, that I'm forgetting, that you want to point me to, I'm happy to look at that.

Q I'm asking you how the '140 application treats HPED and WED.

It does not equate them as the same, does it?

MS. PARTRIDGE: Objection. Form.

A I honestly don't recall exactly.

Q Okay. This passage does not literally disclose a WED, does it?

MS. PARTRIDGE: Objection. Form.

A It does not literally have the word -- or the letters WED.

Q Is it your opinion that a person of ordinary skill would have understood that a HPED is similar to a WED?

MS. PARTRIDGE: Objection. Form.

A They can both provide similar functionality.

Q So, it's your opinion that a person of ordinary skill would have known that they could substitute a WED for the HPED in this example.

Is that what you're trying to explain?

MS. PARTRIDGE: Objection. Form.

A Let me look at it a little more carefully.

Well, the common root here is electronic device. So it's probably less relevant to a POSITA whether it's handheld or, you know, what part of the body is holding it, you know, or how it is worn or held, et cetera. But what a POSA would look at this and see is that we have something instructing an electronic device to perform an action.

Q Okay. And it would have been obvious that you could use another electronic device?

MS. PARTRIDGE: Objection. Form.

A Well, I believe that the electronic device has to be, in some way, collocated with a human, as far as I can see from this example.

Q And what I'm trying to understand is, are you saying it would have been obvious, from this disclosure, to a person of ordinary skill, that they could use a different electronic device

than what's disclosed?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A There are a lot of different devices described in this paragraph, as you'll see. There's a GPS device, which could be put in your hand as part of a telephone, could be on top of your headphones, you know, on the band. We have cameras with object recognition software. So it seems to include all types of sensors and electronic devices here.

So, reading the whole paragraph in context, basically, what it's speaking about is sensors, and electronic devices that initiate some sort of action.

Q Okay. So you're saying it recites or it talks about specific electronic devices, that HPED and GPS device, and you're saying based on that disclosure, a person of ordinary skill in the art would have known -- understood that they could use other devices?

I'm just trying to understand. Is that

what you're saying?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A What I'm saying is, is that the POSA would read this and see examples of different types of electronic devices so, you know, there's an example that starts off with an HPED and then we go to, as another example, a GPS device, you know, or object recognition device, so these are very general terms, they're not being very specific. They are basically talking about something that could act in conjunction with a device that would both sense and communicate the need to make a change.

Q Okay. There isn't any disclosure of a WED in this passage, though; isn't that right?

MS. PARTRIDGE: Objection. Asked and answered.

A My answer was that there's no literal recitation of the letters W-E-D. But I did answer you to say that it could be understood that it might include a WED because, again, the root is an

electronic device, and that's the primary message here. There might be devices in the future that are worn internally, who knows.

Q Okay. And there isn't WED or an HPED that discloses or that displays a visual image, is there?

MS. PARTRIDGE: Objection. Form.

A You're referring to this paragraph, right?

Q In this paragraph, right.

A Yeah, in this paragraph.

MS. PARTRIDGE: Objection. Form.

Q Are there any virtual images or visual images at all in this example?

MS. PARTRIDGE: Objection. Form.

A Well, there is a camera that's doing object recognition, but I don't know if that's really being used as part of a display. That's really for recognition, it says here.

Q Okay. So is your answer, no, there are no visual images in this example?

MS. PARTRIDGE: Objection. Form.

A Incorrect. I mean, there are visual images because there's an object recognition device. There's a camera, so that infers that some sort of visual component is being analyzed.

Q Is there an HMD or WED that displays a visual image in this example?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A I don't see HMD in this paragraph that presents a -- well, the letters H-M-D are not here.

Q And so, I assume you'd agree there's also no WED, in this example, that determines that Alice is leaving a virtual environment?

MS. PARTRIDGE: Objection. Form. Objection. Foundation.

A Well, I have to answer that in conjunction with the way I answered you before, which is with the root word "electronic device," and HP is one form of that, HP can be a form of wearable electronic device, so that is part of the system. So it doesn't say WED literally, we can

agree on that. But it gives a number of examples here and they're not specific about what part of the body they're worn on, so...

Q Does the HPED, in this example, determine that Alice is leaving a virtual environment?

MS. PARTRIDGE: Objection. Form.

A In this paragraph, it seems that the HPED is doing the transitioning, or, you know, doing something with the signal itself.

There's a more generic term here, sensor, and other devices.

The sensor is -- are talking -- you know, it's talking about sensors separately from HPED. It's not clear if they're conjoined or not.

Q The HPED does not determine when Alice is leaving a virtual environment; is that right?

MS. PARTRIDGE: Objection. Form.

A It may be part of a system.

Q I'm not sure I understand.

What may be part of what system?

A The system determining Alice is on a

binaural call, for instance, there's a sensor.

So there's a system here and we have, for instance, a GPS device or object recognition device, right? And so that's part of a system that provides a signal to the HPED. So these things are working together to, you know, determine a location of Alice in this particular example, and it's providing some sort of instruction. But they're not necessarily separated.

Q The HPED is not doing the determining, itself, it's receiving information from the GPS device or a sensor; is that right?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A Sometimes a sensor can be part of HPED. For instance, GPS devices are part of handheld personal electronic devices. I have a GPS device on my cell phone.

Q I'm not asking you in general. I'm asking you about the specific passage.

In this specific passage, is the HPED

doing the determining that Alice is leaving an environment?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A It's --

THE WITNESS: You know, your last objection didn't come all the way through. Can you just repeat it, Jayme.

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

A What I was saying was that the center -- the sensor is interacting, most likely, with the HPED, as it's described here. So, for instance, I mean, I can imagine a system where the sensor is nothing more than something capable of transmitting a voltage.

So, that voltage might refer to something, like, how bright is it outside? Like a photo sensor or something like that.

So, the photo sensor has to work with something else to be able to know what to do, like the lights in your office, you know, we could talk

about the sensor being the, you know, the photo sensor above your light switch, and that's just conveying a voltage to some other system that, then, decides what to do. But you'd have to look at the two as a, you know, a conjoined system; one can't do one thing without the other.

Q In this passage, it says "a car has a sensor that determines that Alice is on a binaural call and instructs an HPED of Alice to switch the call to mono."

In that system, is the sensor determining or is the HPED determining?

MS. PARTRIDGE: Objection. Form.

A In my understanding, a sensor, on its own, works in conjunction with some sort of system, as part of a system, I should say. So just like the example that I gave you about your photo sensor in your office, here, the sensor might be nothing more than is it a binaural call or is it not a binaural call? But the instructions that are carried out on the basis of that trigger, which might be as simple as a 1 or a

0, are going to be carrying out what those -- that 1 or that 0 means. In other words, the meaning of an instruction.

So, you know, a POSA would read this and know well, of course the sensor is not going to, quote, unquote, instruct everything that HPED is going to do, the sensor typically just reads out a voltage based on some condition.

Q So, your reading of this is that even though it says a sensor determines that Alice is on a binaural call and instructs the HPED, that, you would understand that to mean that the HPED is determining that Alice is on a binaural call.

Is that right?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A I was separating out the part of the phrase that says "instructs."

Q Uh-huh.

A So the sensor may put out a 1 if you're on a binaural call; this car may put out a 0 that that shows you're not on a binaural call. But the

instruction part, you know, what do you do with that 1 and that 0, that's part of a system.

Q And so, what system is determining that Alice is leaving a virtual environment, or any environment?

A Well, see, in this example here?

Q Is there -- if it exists, yes.

A If it exists.

Q Uh-huh.

A Well, I suppose we could look at another example there. So she enters the car, right, and there's a system in the car that pairs with the HPED, so that's a kind of trigger, if you will, there and then the system, itself, which includes the HPED, more than likely, switches the call from binaural to monaural.

Q Okay. And does that HPED do the determining? Does it determine that Alice has left an environment?

MS. PARTRIDGE: Objection. Form.

A All the HPED does is respond to some sort of sensor or instruction about a change in

condition. What you do with that information, like, switching -- causing a significant switch in the auditory presentation mode, is something that is done by a system which is, in this example, most likely contained on the HPED because that's concurrent with the prior sentence because the HPED switches the call to mono.

Q Okay. Does this example disclose lowering the volume of sound?

MS. PARTRIDGE: Objection. Form.

A This refers to switching the mode of spatial presentation from binaural to monaural.

Q All right. So it does not disclose lowering the volume of sound?

MS. PARTRIDGE: Objection. Form.

A Not necessarily, no.

Q Okay. And then, does this example disclose switching sound from binaural to mono, as an alert or warning that Alice is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A In the same context we were discussing

it in an earlier example, yes. It's a -- immediately salient audio cue that our system has now gone through a transition and has paired. So it's an alert, if you will.

Q Why does Alice need an alert to know that she is in a car or leaving a car?

MS. PARTRIDGE: Objection. Form.

A The alert isn't about the -- whether or not she's leaving or entering a car. The alert has to do with the fact that now you are confirming that your audio is coming to you in monaural, for instance, because you are in a car. If it didn't do that, then there would be some problem with the system.

Q Okay. And how do you know it's an alert or warning?

A It's a salient change in the auditory presentation that would be immediately recognized by the user. So there would be a significant change.

Q Let's look at the bottom of this page and it starts at -- it's the last paragraph on

this page, that carries on to the next one, starts at line 29, beginning with "consider an example in which Glenn is on a phone call with Alice."

Could you read that paragraph?

A Sure.

Q To yourself, please.

A Sorry to interrupt. I'll read it now.

Okay. Go ahead.

Q Okay. Is there an HMD in this example?

MS. PARTRIDGE: Objection. Form.

A Yes, that's -- here it's referred to as a heads-up display. So, those terms are used interchangeably because one is donning a head-up display. So the act of donning usually putting something on and, you know, historically, donning a head-up display would be the equivalent of a head-mounted display.

Q Okay. In this example, sound is switched from stereo to binaural; is that right?

A That's correct.

Q Is there any disclosure of altering or degrading binaural sound here?

MS. PARTRIDGE: Objection. Form.

A We've made a significant change to the audio presentation, so this is concurrent with the answer I gave you earlier about going from binaural to mono inside the car. We can also look at leaving the car and going mono to binaural. Well, in the same way here, he goes to the chat room and he's switching from stereo to binaural, it certainly could also tell a POSA, oh, well, the person might leave this chat room and go back out and talk to Glenn in a less-private environment and then switch back to stereo.

So, you know, the transition -- the direction of the transition, if you will, from scenario A to scenario B is easily understood to be reversible.

Q So it would be obvious that you could do it the other way, is what you're saying?

MS. PARTRIDGE: Objection.

THE WITNESS: I'm sorry, Jayme.

MS. PARTRIDGE: Objection. Mischaracterizes the testimony.

A What I'm trying to say is that the salience of the auditory cue that occurs when you switch from stereo to binaural would be equally as salient to go from binaural to stereo.

Q Okay. Is there any disclosure of changing binaural sound as an alert when the user is leaving an environment?

A You're speaking about this particular paragraph?

Q In this exact example that we're looking at.

A Exact example that we're talking about.

Is there any disclosure of going from binaural to stereo, is your question?

Q No, I'm asking you, is there any disclosure of changing binaural sound as an alert when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Well, there's no change in the -- from binaural to binaural, as I describe it in my declaration. There's, instead, a change from stereo to binaural. And as I just explained

earlier, the reverse of that could also apply.

Q Okay. Is there any disclosure of reducing the volume of sound here?

A No. There's no disclosure about that form of audio alerting.

Q And is there any WED that determines when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Well, there is a description of an HPED, so as I testified earlier, the root part of that acronym is electronic device. In this example, we're talking about an HPED that he holds, but it might be something else that's held in a different manner or attached to the arm or attached to the head. That would be obvious that -- what the functionality of this is being in a handheld device, probably can be functional in a device worn anywhere.

Q So my question for you was, is there a WED that determines when a user is leaving the environment?

MS. PARTRIDGE: Objection. Form.

A The literal letters, WED, are not present in this paragraph.

Q So your answer is, no, there's no WED that determines when the user is leaving an environment?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A What I said was that an HPED could be considered a form of wearable electronic device, except that we're wearing it in our hand, we're grasping it.

Q Dr. Begault, I don't think you answered my question. I'm asking you, is there a WED in this example that determines when the user is leaving an environment?

Can you answer my question?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A Yes. From the standpoint of the answer I just gave you. So, the head-up display, HUD, couples with the HPED, which I've already said is a form of WED. And so, that is a transition in

environments.

Q Does the -- is there a WED that determines that the user is leaving an environment?

A The action --

MS. PARTRIDGE: Objection. Form.

THE WITNESS: Sorry, go ahead, Jayme.

MS. PARTRIDGE: Objection. Form.

A The donning of the head-up display, for instance.

Q That's not the WED, is it?

MS. PARTRIDGE: Objection. Form.

A It couples with the WED, if we consider an HPED to be a form of a WED.

Q The HPED is distinct -- or discussed distinctly in the '184 and '179 patents from the WED; isn't that right?

MS. PARTRIDGE: Objection. Form.

A Well, I answered you earlier about that. I don't recall exactly how they're distinguished between those, so I'm giving you my POSA answer, at this point, that, yes, we think of

an HPED as something held in the hand, but the root idea of an ED is common to both, and who knows, we might be wearing internal devices that are electronic.

Q So your answer to me is, while you can modify what's in this example, you -- instead of the HPED you could have a WED; is that right?

A No.

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

Q You agree with me, it does not say WED, does it?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

THE WITNESS: We missed your prior objection, Jayme. I apologize for speaking too quickly.

Q We did not miss it. It's on the record. We can keep going.

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A Okay. So I'll need the question

reread.

Q The passage does not say WED, does it?

MS. PARTRIDGE: Objection. Form.

A The literal letters W-E-D are not present here.

Q Okay. But you can't answer my question, which is, is there a WED that determines that the user is leaving an environment; is that right?

MS. PARTRIDGE: Objection. Mischaracterizes testimony. Objection. Form.

A I believe I answered that earlier. That we have the donning of a head-up display that couples with an HPED. And if that HP --

Q Apologies. Go ahead.

A If that HPED, if we consider it a form of WED, okay, so it's an electronic device, then it's sensing the change in environment.

Q And you're saying it's sensing a change in environment by coupling with the heads-up display?

MS. PARTRIDGE: Objection. Form.

A By the act of donning the head-up display, there is a signal, if you will, to the system that there's now a change in environments that concurrently activate a change in the form of audio presentation as a cue or as an alert.

Q Is the HPED the one doing that determining? Is that determining coming from the HPED?

MS. PARTRIDGE: Objection. Form.

A No. It's a combination of things. Similar to our discussion about sensors and devices, here, we're talking about a head-up display that couples, that coupling is indicative of a system by which you need both devices to accomplish the goal.

Q Okay. Can you turn to the page 161 of Exhibit 1028, please.

A Yes.

Q Lines 15 through 20.

A Okay. I've read it.

Q Is there an HMD or WED in this example?

MS. PARTRIDGE: Objection. Form.

A There is an electronic device. I don't know how it's worn.

Q Okay. Is there an HMD or a WED?

MS. PARTRIDGE: Objection. Form.

A Same answer. I mean, there is a sensor and it's something detecting something.

Q Okay. So you don't know, based on this passage, you don't know if there's an HMD or WED.

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A That's incorrect.

So, there's an electronic device, right, that's doing the changing or the switching of the binaural sound in response to a change in the activity of the user.

Q Is there an HMD or a WED in this paragraph?

A There might be.

MS. PARTRIDGE: Objection. Form.

A There might be.

Q Okay. And how would you know if there is or is not?

A A POSA, including myself, would read this and say, well, certainly an electronic device of some sort is used. In fact, the words "electronic device" are spelled out here.

Q Is there a visual image in this example?

MS. PARTRIDGE: Objection. Form.

A There is no visual image other than the visual image that's described here. But I think you're referring to a visual display.

Q Correct.

A Yeah, there's no visual display mentioned in this paragraph.

Q Does the user leave any environment in this paragraph?

A Well --

MS. PARTRIDGE: Objection. Form.

A Yes.

Q What environment does the user leave?

A The environment that they have been walking in and the environment in which they are walking quickly or running.

Q What environment does the user enter?
A It's not stated here, but it could be, you know, we could say that it could be an environment where one would want to run or walk quickly.
Q And how do you know the user has left one environment to enter another?
A Well, I think you get an auditory cue.
Q And what is the auditory cue?
A Changes or switches of binaural sound.
Q Does this disclose an alert upon the user leaving an environment?
MS. PARTRIDGE: Objection. Form.
A Well, given that the change in, you know, it's talking about walking quickly or running, that could be concurrent with, let's say, locations where walking quickly or running might be appropriate, so, like, you're walking to the track, or something like that, and then you want to go running. And so, those are two different kinds of physical environments. I'm just kind of making that up as I go.

But, certainly that's a change in environment, so it certainly could refer to a change in environment.

Q I think my question is different. My question was, is there any disclosure of an alert upon the user leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Yes. I gave you an answer. I said that it changes or switches binaural sound.

Q Okay. So you said the change in binaural sound is the alert.

A The change is switch.

Q And how do you know it's an alert or a warning?

MS. PARTRIDGE: Objection. Form.

A It would be a salient and noticeable auditory cue.

Q Why does the user need to be alerted or warned that they're commencing to walk quickly or run?

A Well, I could speculate it could be

motivational. It could be something of that sort. It could be based on, let's say, number of calories burned, distance walked, something of that sort.

Q Is there any disclosure of decreasing the volume of sound in this example?

A It may include that, since it says a changed binaural sound. So, for instance, the binaural sound may change from a more distant SLP to a near SLP. And if that were the change in binaural sound, then concurrent with that would be a change in the volume of sound.

Q Okay. But it doesn't disclose that, does it?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A I think a POSA would look at this and give you the same answer I just gave you.

So, it doesn't say, specifically, the words "change in volume." But when a POSA sees the word "changes binaural sound," right, then that could mean a change in the sound localization

point to a different distance. And so, oh, that usually means reduction or change in volume.

Q But does it have to mean reduction? Could it mean that the SLP is actually -- that the volume's actually increasing or changing --

MS. PARTRIDGE: Objection. Form.

A Yes, it could mean that.

Q Okay. Can we turn to, I'd like to turn back to your declaration and look at paragraph 29.

A Sure.

Yes.

Q In this paragraph you say "prior to the advent of virtual reality, cuing a transition between visual and auditory environments through the use of sound is a familiar concept as old as the history of scene changes."

What do you mean?

Why are you saying it's a "familiar concept"?

A Because there's a whole history of scene changes in the dramatic stage arts, such as operative theater.

Q What do you mean by cuing? What is cuing?

A Well, for instance, a very simple example is in theater, you can cue the fact that we are in a daylight environment and now we've moved to a nighttime environment by lowering the lights.

Q So is cuing the same as warning or alerting?

A It's a --

MS. PARTRIDGE: Objection. Form.

A It's alerting somebody that there, now, is a change in the circumstances and surroundings of a person in an environment that is being represented in a theatrical stage environment.

Q So these audio warnings about leaving an environment were known by 2015?

MS. PARTRIDGE: Objection. Form.

A The use of audio to cue a change in environment has been known for a long time, yes.

Q What about changing binaural sound as an alert or warning? Was that known by 2015?

MS. PARTRIDGE: Objection. Form. Asked and answered.

A You could, basically, cue somebody to the fact that there's been a change in a virtual acoustic environment by changing the form of binaural presentation.

Q What about using a reduction in volume? Could you use a reduction in volume as a cue or a larger warning by 2015? Was that known?

MS. PARTRIDGE: Objection. Form.

A Well, you could use it to cue somebody that, let's say, you've got a binaural representation in a theater -- I'm sorry, in a radio drama and somebody is walking away from the scene. And so, there would be a reduction in volume in that particular audio radio drama that's being heard binaurally and, so, that sound would be reduced and cue the person, who was listening to this radio drama, that the environment was changing.

Q Okay. And what about users leaving an environment? Was it known to lower the volume of

sound as an alert that the user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Well, there's always been a simulation of auditory distance in a sort of theatrical manner. So unlike in the patent, which is referring to using it as a more salient cue, like a dramatic change probably -- possibly, in the volume of the sound. What was known is that you could do, for instance, the example I just gave you, the idea of somebody moving off into the distance, or something appearing in the distance. So this has been unknown.

Q So it wasn't known, at the time of the patent, to reduce the volume of sound as an alert that a user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Not in the same way as in the patent.

Q Okay. Would that have been obvious to a person of ordinary skill? Would they have known that you could reduce the volume of sound as an alert?

MS. PARTRIDGE: Objection. Form.

A They would have known about reducing the volume of a sound to create an illusion of auditory distance for a particular sound object.

Q But they wouldn't have thought that you could reduce the volume of sound to alert or warn a user that they were leaving an environment?

MS. PARTRIDGE: Objection. Form. Mischaracterizes testimony.

A Not in a virtual environment. I've never seen that used as a cue, or kind of, let's say, significant change in volume based on some sort of interaction that the person is doing, like, moving between environments where the listener, themselves, is moving and precipitating that change or the circumstances around them are changing as a function of something in the modeling of the environment. So it's very different in a virtual environment context.

Q What about in a physical environment context? Would that have been obvious in a physical environment context? And let me pose my

question for the record.

So would it have been obvious to a person of ordinary skill, at the time of the inventions, to reduce the volume of sound as an alert or warning to a user that the user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A Okay. I'm lost on what context we're in. I need a little more context. So we're in a physical environment with a listener, right? A listener? Any listener? What kind of listener are we talking about?

Q It could be any listener. Any kind of listener. We're in a physical environment. The user could be in a physical environment listening to some virtual audio.

Was it known to reduce the sound of -- reduce the volume of sound as alert or warning that the user was leaving an environment?

MS. PARTRIDGE: Objection. Form.

A So what am I listening to in your example? I'm sorry, am I listening to a virtual

simulation of sound?

Q You could just be listening to the radio. Virtual simulation or just the radio. Is (indiscernible) the audio an example known to be used as an alert or cue to the user that the user is leaving an environment.

MS. PARTRIDGE: Objection. Form.

A So, again, when you will say "leaving an environment," I'm thinking back to virtual environments. But if I'm listening to a radio here in my living room, I don't think it was ever conceived of to certainly reduce the volume of my radio because I wouldn't be thinking about switching environments in that context. There's a dim button, for instance, that reduces the sound of my stereo by 20 decibels. If I push that dim button, I'm not using that as a cue to change -- as a cue to me from a system, like, a virtual reality system, that I'm changing environments. It's very different.

Q So if you are sitting in -- like, let's take any example of me in my office, I'm sitting

in my office, I'm listening to the radio. If I turn off the radio, have I left my environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A You have changed your environment and, so, in the way we were discussing before, we could be thinking of that as a cue, if you wanted to, as a change in -- from one environment to another. You had a noisy environment because they had a radio on. You've now changed your environment to a quiet environment.

And so, for proposes unknown to me, you may wish to distinguish between those two environments and consider that to be a cue.

Q Okay. And so, under those circumstances, would you say a person of ordinary skill in the art, before the time of invention, would you have known to lower the volume of sound as an alert or warning to the user that they were leaving the environment?

A No.

MS. PARTRIDGE: Objection. Form.

Object. Asked and answered.

Q Why not?

A Well, prior to the --

MS. PARTRIDGE: Objection. Form -- objection. Asked and answered.

THE WITNESS: Okay.

A So, one more time on your question.

THE WITNESS: I apologize. I interrupted, Jayme.

Q At the time of the alleged inventions, would a person of ordinary skill in the art know to lower the volume of sound as an alert or warning to the user that they were leaving an environment?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A I recall, from one of the prior art patents, that there's a fade-out of sound where real sound is provided from a microphone in the ambient. And so, I don't know how well-known that was. I had never heard of that idea myself. But I don't believe that that's the form of volume

reduction that's described here in my declaration.

Q What form of volume reduction are you describing in your declaration?

A One that would provide -- well, one that reflects what my interpretation of the patent is, which is not a gradual fade-out but, rather, a reduction in volume, which infers, to me, an instantaneous reduction in volume, not the same thing as a fade-out.

Q Where does it say instantaneous reduction in volume in the patent?

A I don't know if the word -- I'm sorry. I don't know if the --

MS. PARTRIDGE: Objection. Form.

A I don't know if the word "instantaneous" is used, but there's certainly the word "reduction." And if we looked at it in context, I think we would see that that word reduction is never connected to the idea of fade-out or fade-in. So reduction, to me, means an abrupt game change.

Q How about lowering? Does lowering also

mean an instantaneous change in volume?

MS. PARTRIDGE: Objection. Form.

A In my interpretation, yes.

Q Okay. So, your position is the patent teaches an instantaneous reduction or lowering in volume as an alert to the users?

MS. PARTRIDGE: Objection. Form. Objection. Mischaracterizes testimony.

A I believe the only way that that word is used, and we can go back and look so I can confirm, because I don't recall exactly, the context of the word -- the use of the word reduction. But it could be change in volume or reduction in volume. But, to me, since this is acting as an alert or a cue, the best way to do that would be to do a fairly rapid change in volume without a gradual fade-out or fade-in.

Q So do I understand your testimony as being the only way to have an alert or cue is to have an instantaneous change of volume?

MS. PARTRIDGE: Objection. Mischaracterizes testimony.

A No. First off, my testimony is talking about a lot of different ways to cue a change in -- in environments, other than volume. And then when I say "instantaneous," that's got a technical definition. That's probably overly concise. I meant to say that it's a rapid change that's not a fade-out or a fade-in, a gradual fade-in or fade-out. So it's a, maybe rather than saying instantaneous, I should say immediate or something -- I don't know. I'm not sure of the word because instantaneous has a technical definition, which is as fast as possible. It doesn't necessarily have to be as fast as possible.

But it would not correspond to, like we were talking about, real-world examples, where somebody might walk away and do a gradual fade-out on somebody's sound simulation to make them sound as if they're moving off into the distance. That's a fade-out, or you're doing a fade-in, fade-out with sound between two scenes. That would act less as a cue. What acts as a cue is,

oh, there's been a big change in the volume.

Q So as of the time of the alleged inventions, would a person of ordinary skill in the art known they could reduce the volume of sound as an alert or a warning?

MS. PARTRIDGE: Objection. Form.

THE WITNESS: Go ahead.

MS. PARTRIDGE: Objection. Form.

A I wasn't aware of anybody doing that in 2015.

Q Okay.

MS. PARTRIDGE: When you come to a good stopping point, let's go off the record, please, for a break.

MS. OSMAN: We can take a break now, this is fine.

MS. PARTRIDGE: Okay. Can you give us the time, please, the total amount of time. I know what time it is.

PLANET DEPOS TECHNICIAN: Off the record. 19:06.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record. The time is 19:26.

BY MS. OSMAN:

A Inge, I have a question for you. Did I pronounce that?

Q Inge, yeah.

A I have a friend named Inge Bach from Sweden.

Inge, I have a question. You said, at the beginning, that I could clarify or make a statement about some prior answer I gave you. So I have some information that might be helpful.

Q Sure.

A Okay. I wanted to clarify. We had a discussion about instantaneous volume changes for rapid volume changes.

Q Right.

A And what I should have done was to connect, really, what I think a POSA and myself would interpret those volume changes to mean. And I meant those to be interpreted as a significant change in the perception of auditory distance.

So, it would -- I think it would help clarify my answer if I had said a change -- a rapid change in volume, such as to effect a perceptual change in auditory distance of a sound object.

So, that is consistent with my declaration and that is consistent with what I feel a POSA would have interpreted when the patent talks about a reduction or a change in volume as and alert.

Q So, a reduction or lowering of volume in the claim, you believe, means an instantaneous or, I think you said immediate, significant volume change; is that correct?

MS. PARTRIDGE: Objection. Form.

A Well, I want to make sure that that's related to a change in perceived auditory distance.

Q Is there any way to reduce volume without changing perceived auditory distance?

A Well, for instance, if I begin to whisper, when I might seem like a person at the

same distance who's whispering or just changing the volume of my voice. But if you change the volume enough and I indicated in my declaration a kind of graph that shows how there's a 6 dB change is related to a doubling of perceived distance. So that's kind of the thing that I am referring to, is a change in volume such as to effect a significant change in perceived distance of the sound source.

So that's the kind of cue that's salient. So instantaneous change of one decibel wouldn't be noticed by anybody and it wouldn't seem to be a change in perceived distance.

But if you change the volume enough to create a change in perceived distance, then that becomes very salient because, suddenly, things that are at one distance away from you are now at a farther distance, like, double the distance or something.

So that's -- I wanted to just get that on the record, to clarify that, because I felt like in retrospect, just saying what I did didn't

give you the complete picture of volume -- my interpretation of what a POSA would interpret a change in volume or reduction in volume.

Q Would reducing the volume so that there's no longer any sound, reducing the volume to zero, would that be a significant enough change?

MS. PARTRIDGE: Objection. Form.

A I don't think that's culled out in the patent anywhere.

Q I'm not asking about the patent. You're defining what reducing or lowering the volume is, and I'm trying to understand your definition.

Would reducing the volume to zero meet the claims, under your understanding?

MS. PARTRIDGE: Objection. Form.

A No, I don't think so because that would be reducing it to a perceived distance that was imperceptible, and that's a contradiction in terms. I meant to say that I feel that the patent is discussing reducing the volume of the sound so

that its perceived distance is still audible but it's at a lower volume.

Q And so, how many decibels would you say you have to reduce the sound to, to make the claim limitations?

A Well, minimally, 6 decibels, which is equivalent to a doubling of distance. I don't know, there might be, instead of a double distance, some reduced version of that, so maybe the reduction isn't as far as that. But I think it would be -- I think the limit would be minimally, whatever would cause a person in a psychoacoustic study to say, oh, yeah, that's an unambiguous change in distance for, let's say, 95 percent of your test subjects.

Q What if the volume that you were reducing in sound is only 6 decibels? How do you reduce or lower the sound or can you not reduce or lower the sound?

MS. PARTRIDGE: Objection. Form.

A You reduce the sound decibels by 6 decibels -- I'm sorry, you can reduce the level

of a sound by 6 decibels by changing its voltage to 50 percent of what it was.

Q What if the sound that you started at is only 6 decibels? How do you reduce it by 6 decibels?

A There is no sound system I know of, commercially available, that can reproduce a sound at 6 decibels.

Q Let's imagine a system that reproduces a sound at 6 decibels. Can you reduce it by 6 decibels and still be within the lowering the volume and reducing the volume claim limitation?

MS. PARTRIDGE: Objection. Foundation. Objection. Form.

A Well, that hypothetical is absurd because there's very few sounds that we experience except, perhaps, in the most extreme anechoic chambers, that can produce the sound of 6 decibels.

So, you can actually measure a sound of 0 decibels because all a decibel is a measured relative to 0 decibels, which is a sound pressure

of 20 micropascals.

So, it is possible to actually measure, under the most ideal circumstances, something less than 0 decibels. But now I'm talking about specialized microphones and instrumentation.

Q I'm trying to understand your claim construction. You're telling me that lowering the volume of sound and reducing the volume of sound requires a reduction of at least 6 decibels; is that right?

MS. PARTRIDGE: Objection. Form.

A What I said in my claim construction is lowering the sound by 6 decibels would be equivalent, in a free field, to reducing -- I'm sorry, to increasing the distance of a sound to double its distance.

So that's physical property of sound in a free field.

Q Could you have a noticeable cue without changing the sound by 6-decibel?

A Possibly. Again, I gave you a criteria there that I personally, and I think a POSA would

apply, which is maybe your most sensitive listeners could hear a reduction in, let's say, 3 decibels. But it probably wouldn't be effective for the vast population. So you have to think, statistically, about, you know, when are most people going to sense this?

So, as another example, half loudness, which is sometimes interpreted by people to be double the distance, even though it's farther away in terms in physical property, is 10 decibels.

Q What about reducing the volume of sound to zero? Would that be -- provide a cue to users?

MS. PARTRIDGE: Objection. Form. Objection. Asked and answered.

A Well, I think that would produce an illusion that the sound had disappeared.

So I don't think that's the same thing as we're talking about here because we're not talking about sounds disappearing out of the scene in the context of the patent. Would it act as a cue, it might cue you, the fact that somehow I've been disconnected from the system or something.

Q So is lowering or reducing the volume a cue? Could that be an indicator?

A Well, again, to the patent, in the context of the patent, there are many descriptions or at least several descriptions of reducing or lowering the volume of a sound. And this is sometimes done in conjunction with other binaural processing, I believe.

The point is, is that what you want to do is create, psychoacoustically, an impression of a significant change in auditory distance.

Q Where does it say that in the patent? Where does it say lowering or reducing the volume requires psychoacoustically creating a change in acoustics?

MS. PARTRIDGE: Objection. Form.

A That is the way that I interpreted and a POSA would interpret the use of reducing volume as a cue. You wouldn't reduce the volume of a cue, or that is to say of a virtual -- you're simulating, let's say, the sound of something. And you want it to be effective, as a cue, that

there's been a change in the environment. If -- so that concept of significance has its roots in psychoacoustics and the ability to detect that change. And so, it doesn't say explicitly that, but the patent says reducing the volume of a sound so as to -- I mean, I can read the literal words for you. But it's clear, from the context, that it has to be something that somebody can perceive.

Q Does the patent disclose this 6-decibel reduction that you're proposing?

A It does not --

THE WITNESS: Sorry, Jayme, go ahead.

MS. PARTRIDGE: Objection. Form.

A It does not specifically say the words 6 decibels, no, it says reducing the sound or changing the volume of a sound.

Q Dr. Begault, before we move too far into our questions. During the break, did you talk to your attorneys?

MS. PARTRIDGE: I'll let you answer that question yes or no, Dr. Begault.

A No.

Q Thank you.

Can you, unless you have anything else to say about the reduction or lowering of sound, can we turn to paragraph 60 in your declaration, please.

A Sure. I have nothing more to say about that. I just wanted to clarify that on the record.

Q Thank you.

A Uh-huh.

So, paragraph 60.

Q This is a paragraph about the '140 application discussion of alerts and warnings; is that right?

A Yes. May I read it?

Q Please.

A Okay. I've read it.

Q All right. Thanks.

So, I noticed there are a couple of questions I have about this, the first -- second sentence says "The '140 application states at page 115, lines 31, through page 116 line 6," and

then it lists a number of example actions, which includes switching sound from binaural sound to stereo, et cetera, and then, at the end, lower a volume of the sound, provide a sound or audio alert or provide a visual alert.

Do you see that?

A I do.

Q Okay. When it says "provide a sound or audio alert," is there any disclosure or discussion of what that sound or audio alert is?

MS. PARTRIDGE: Objection. Form.

THE WITNESS: I didn't hear the objection.

MS. PARTRIDGE: Objection. Form.

A I don't recall a specific description of a particular sound or audio alert, but it's certainly disclosed here.

Q Okay. And then, the next paragraph, not the next paragraph, but part of the same paragraph, it says "At page 136, the application says, for example, the alert is an audible alert and/or a visual alert to a person, and then, by

way of example, such alerts include," and then it lists a number of alerts.

Noticeably not included in this list of alerts is change of binaural sound; is that right?

MS. PARTRIDGE: Objection. Form.

A That's not included in this list of examples. By way of example, such alerts include but are not limited to.

Q Okay.

A Yes.

Q Okay. And then, in the last part of this paragraph you say "At page 138 of the '140 application, lines 24 through 27, it states 'consider an example where a child runs behind a car when it is backing up. A camera at the back of car provides a video and audio alert in stereo to the driver. The driver, however, does not see or hear the alert, so the car switches the alert to binaural sound that emanates a sound alert from the location of the child'."

Did I read that correctly?

A I believe you did.

Q That's not the same as what's claimed in the patents, is it?

A I think it's consistent.

Q Does the patent disclose adding binaural sound as an alert -- excuse me, do the claims recite adding binaural sound as an alert?

A The claims talk about switching an alert from one mode of audio, such as stereo, to binaural.

Q Let's look at the claims. Where do the claims recite that? I think you might have the '179 patent already open in front of you; is that right?

A Open? I could try to open it from here.

PLANET DEPOS TECHNICIAN: Counsel, sorry to interrupt. It looks like Counsel Partridge is having some connection issues.

MS. OSMAN: Jayme, are you still here.

MS. PARTRIDGE: Can you hear me?

MS. OSMAN: Yes, we can.

MS. PARTRIDGE: I went out. So if

y'all got a couple questions in, that's fine. I assume they were fine. I don't know what's going on with everything.

A All right. Maybe we should back up a question or two, just to get us all on the same page.

Can you back up a question?

Q Well, let me repeat my question.

A Okay.

Q I said -- we said let's look at the claims to see what they recite. So I asked you to pull up the '179 patent, which I think is already in front of you and hopefully open on your computer.

A Okay.

Q Okay. So I think your testimony was that the patent recites switching from stereo to binaural.

Can you look at the claims and tell me is that disclosed -- or is that claimed somewhere?

MS. PARTRIDGE: Objection. Form.

A Frankly, I'm looking at the claims in

my declaration because I can read it more easily because I do recite them between paragraphs -- Section 5, so hopefully that's okay with you. So I'm looking at my hard copy just to enable me.

Q Sure.

A Thanks. Okay, great.

So your question is, where does it parallel, the statements that -- in this example, so that we have switched from stereo sound to binaural sound. In other words, where does this connection occur between the specification and the claim; is that correct?

Q That's correct.

A Okay. Great. Let's make that connection.

So, let me see. And you want to know specifically for '179; is that right?

Q Dr. Begault, I just want to know if there are any claims that recite changing sound from stereo to binaural. To my recollection, the claims all discuss altering binaural sound.

MS. PARTRIDGE: Objection. Foundation.

Objection. Form.

A Can I direct you to claims 3 through 6?

Q Okay.

A Actually, claim -- yeah, claim 4 through 6, I think.

Q Okay. So claim 4, as I'm reading it, says switching the sounds from the binaural sound to stereo.

Is that right? Am I reading that correctly?

A Yes, you are.

Q Okay. Now, let's look back at your declaration and the example that we were just looking at in paragraph 60.

A Yes.

Q So, in paragraph 60, when the driver doesn't hear an alert that is in stereo, the car switches the alert to binaural sound; is that right?

A It does, in this example.

Q All right. So it does the opposite of what the claims say. The claims say switch from

binaural to stereo, and this example switches from stereo to binaural sound; is that right?

MS. PARTRIDGE: Objection. Form.

A Literally, that's what that says. But in -- to be consistent with some of the other answers I've given you previously, these transitions from one thing to another would be read by a POSA to also be, possibly, work in the opposite direction. Let's say the system, for instance, thought that there was a child from the back of the car and emanated a binaural alert, but then the child went away or it was a false alarm. And then, so it would switch back to stereo.

Q In this scenario, would it make sense to have a car switch from binaural to stereo if there was a child behind the car and the user was not noticing the child behind the car?

MS. PARTRIDGE: Objection. Form.

Q Would it make sense to have a binaural -- switch an alert from binaural to stereo?

MS. PARTRIDGE: Objection. Form.

A Well, all I can tell you is, is that the example shows where the camera has made a correct identification and so makes a switch from stereo to binaural.

What I just recited to you was something that would be obvious to a POSA, which would be two possible situations. One is the child is no longer behind the car. And then we would go and reverse way of, oh, there's no longer a need to alert, and now I will cue the listener by switching back to stereo.

Another situation might be a false alarm that the camera detected a child and, in fact, it was a bird and the bird flew away.

Q And so, your testimony is, a person of ordinary skill would have understood that these scenarios were possible?

MS. PARTRIDGE: Objection. Form.

A When a POSA reads these specifications, and there's these examples that are given, I think what they are meant to do is to give the POSA an idea of how these alerting systems, that

manipulate sound in specific ways, could be used. But I don't believe that they're meant to be all-inclusive.

Q Okay. And it would have been obvious to a POSA that there were other ways they could use the system?

A Well, in particular, the way that we've been just discussing it, but certainly you could show that a hazard was no longer present. I mean, my own car right now has a backup alarm when it detects something that's there, and that backup alarm turns off when it's no longer an issue.

So it turns on, it turns off. So we go from condition A to condition B, and we go back to condition A.

Q Okay. Can you turn, now, to paragraph 64, please, also in your declaration.

A Absolutely. Okay. This seems to be a discussion of Dr. Roginska's declaration. Is that correct?

Q That seems correct.

A Okay.

Q Can you just take a look at this paragraph and then we can have a discussion?

A Sure. Give me a moment.

Q In fact, maybe just read the first, looks like, three sentences, and then we can talk. It's kind of a long paragraph.

A Oh, okay.

Yeah, so up to the first reason that I felt that I disagreed with Dr. Roginska.

Q Right. Okay. So my first question to you is, you say PHOSITA, a POSA, would, in fact, have an understanding of how to implement the claimed spatial audio methods described in the '179 and '184 patent, based on knowledge of spatial audio rendering.

What spatial audio -- what knowledge of spatial audio rendering are you talking about here?

A I'm speaking about those methods that are outlined, I believe, in my declaration several pages later. Yeah, actually, the next page, on page 37, methods of creating alerts in the claims.

And so, I've itemized what I believe would be known a PHOSA, a PHOSITA, POSA, to implement these methods.

Q So, just to make sure I understand what you're saying. Are you saying that part of what was -- part of the knowledge of spatial audio methods -- sorry, excuse me -- strike that.

You said that a POSA would have had knowledge of spatial audio rendering and that that knowledge is outlined in the next paragraphs?

MS. PARTRIDGE: Objection. Form.

A So on Section B, which is paragraph 65 through, I think, 80, there's a number of spatial audio methods that would be well-known to a POSA for how to degrade binaural audio to create, for instance, inside-the-head localization; for instance, to change the perceived auditory distance from the sound by lowering its volume, et cetera.

Q Okay. So you're saying a POSA would have known how to create these alerts?

A Absolutely.

Q Okay. And would the POSA also have known that they could use those alerts to let the user know that they were leaving an environment?

A No. I think that's the novelty here. The idea of connecting these methods to the concept of alerting and cuing transitions in environments.

THE WITNESS: I think, Jayme, are you with us? Oh, she's here.

Q So just to clarify for the record, you're saying that a person would not necessarily know that they could use these changes in binaural sound as an alert to the user, that they were leaving an environment?

A Based on my assessment, the patent '179, a way for groups to gather together these various techniques to provide these cues and transitions of environments, and I think, on the whole, that would not have been obvious as a means of alerting someone in the context of virtual environments and virtual reality.

I had not heard of that as a technique

for that purpose in 2015.

Q Okay. If you are reducing or if you are changing binaural sound from binaural to monaural or stereo, for instance, would that necessarily act as an alert to the user that the user is leaving the environment?

A I believe those are salient cues. When I say "salient," I think it's something that's noticeable. Humans are very sensitive to changes in auditory localization, auditory quality.

And so, these methods that are brought out can sound pretty dramatic when you experience them.

Q So, it would be a salient cue if you're changing binaural sound to monaural, it would be a salient cue to the user?

MS. PARTRIDGE: Objection.

Q Would you be able to use that salient cue to alert or warn the user?

MS. PARTRIDGE: Objection. Form.

A That's the concept here in the patent.

Q So, is the answer to my question, yes,

you would be able to use that salient cue to alert or warn the user?

MS. PARTRIDGE: Objection. Asked and answered.

A In the context of virtual environments, as specified in those patents, I think that one could use these changes for something else, but as an alert to a change in environments, that is, again, what I feel is something that was new.

Q Okay. I understand that you're saying it's something that was new. But it was something that you could use as a salient cue to a user that the user was leaving an environment; is that right?

MS. PARTRIDGE: Objection. Form.

A Well, yeah, you could use it because it's described here in the patent.

Q Okay. But you also said that one could use these changes for something else.

What else could they be used for?

A Well, I used, in courses on binaural sound, to demonstrate what inside-the-head

localization would sound like, and then we could discuss its psychoacoustic and physical properties. So we would demonstrate these types of sounds, and then we would discuss why a human would perceive something as sound inside your head.

So it was a way of demonstrating certain aspects of psychoacoustics.

Q Okay. Is there any other reasons you might use this type of alteration of binaural audio?

MS. PARTRIDGE: Objection. Form.

A I have a patent where I used inside-the-head localization as a way of prioritizing communication.

Q Any other purpose for using this type of alteration in binaural sound?

A Sometimes it was done demonstratively. For instance, you might switch from one type of binaural sound to another type of binaural sound to demonstrate, through experimental facilities, changes in auditory localization, depending on the

particular type of HRTFs you use. So there's a resource context for that. You might also switch from the use of head-related transfer functions to stereo to also demonstrate the type of inside-the-head localization that occurs with stereo and to demonstrate what's known in psychoacoustics as lateralization.

Q Are there other reasons you might alter binaural sound in that way?

A Those are the ones that I can think of at this moment.

Q Okay. Can you, please, turn to paragraph 66 of your declaration.

A Sure. Yes.

Q Okay. In this section, you discuss altering or degrading audio cues to prevent the user from experiencing external localization of the sounds.

Is that right?

A Yes.

Q And you agree that POSAs, before 2015, would have known how to alter or degrade audio

cues to prevent the user from experiencing external localization of sounds?

MS. PARTRIDGE: Objection. Form.

A I'm sorry. Yeah. That -- well, I will say that people knew that if you degraded audio cues to prevent experiencing localization to sounds, you would do things to process the sound differently rather than using, let's say, 3-D audio techniques. So you might mix the same signals to both ears.

Q Okay. And this is something that those of ordinary skill in the art knew how to do as of 2015?

MS. PARTRIDGE: Objection. Form.

A Inside-the-head localization is a well-studied phenomena for many years before the days of these patents. So, most POSAs would know that sounds sound like they are coming from the middle of your head if you play the same signal through both of your left and right -- well, both of your headphone channels.

Q Okay. And you agree, also, that

changing sound from binaural to stereo or mono would prevent the user from experiencing -- would alter or degrade audio cues to prevent the user from experiencing external localization of sounds?

MS. PARTRIDGE: Objection. Form.

A I think that's something that was well-understood by POSAs, yes.

Q Okay. Can we turn to paragraph 71 of your declaration.

A Okay. I'm there.

Q So here you're discussing filtering the binaural sound to alter a spectral cue.

Do you agree that a POSA, as of the time of the alleged inventions, would have known how to filer the binaural sound to alter a spectral cue?

MS. PARTRIDGE: Objection. Form.

A Yes.

Q And does changing sound from binaural to stereo or binaural to mono constitute altering -- constitute filtering the binaural sound to alter a spectral cue?

MS. PARTRIDGE: Objection. Form.

A So your question was, does changing from binaural to stereo or mono constitute altering a spectral cue?

Q Let me read it again. My apologies.

Does changing sound from binaural to stereo or binaural to mono constitute filtering the binaural sound to alter a spectral cue?

MS. PARTRIDGE: Objection. Form.

A In essence, it does change the spectral cues when you do that.

Q Okay. Let's turn to paragraph 74, please.

A Yes.

Q In this paragraph, the first sentence, you say "a spectral caused by diminishing high frequencies as a cue to distance would also be known to a PHOSA," or a person of ordinary skill in the art.

What do you mean by that?

A Oh, well, the physics of sound are such that the absorption of sound by air causes sounds

that go into the distance to sound more dull. They lost their energy; the high frequency doesn't -- isn't conveyed at the same amplitude as the amplitude of lower frequencies, which survive -- well, their level is more intact over a longer distance and higher frequencies are affected.

So, basically, to put it in lay terms, the treble is attenuated under tone controls as sound goes off into the distance.

Q And a person of ordinary skill in the art would have known to use a low-pass filter to achieve this diminishing of high frequencies?

A Yes, the use of a low-pass filter to attenuate high frequencies is very well-known.

Q Okay. Can you turn, please, to paragraph 76.

A Yes.

Q Okay. Just -- so here you're discussing degrading a spatial cue of the sound playing to the user. Would a person of ordinary skill in the art have known, as of the time of the

alleged inventions, how to degrade a spatial cue --

MS. PARTRIDGE: Objection.

Q -- of the sound to a user?

MS. PARTRIDGE: Objection. Form.

A Yes. If degradation of spatial cues was done for demonstrative purposes. You know, I know it from the perspective of psychoacoustics, so, yeah, that's something that would be well-known to a POSA.

Q Okay. And would a POSA have known, also, that changing sound from binaural to mono or changing sound from binaural to stereo would degrade a spatial cue of the sound playing to the user?

MS. PARTRIDGE: Objection. Form.

A Yes, that was -- is well-understood, that the spatial cues would change significantly if that occurred.

Q At the end of this paragraph you say "A PHOSITA would recognize common and well-known methods of spatial processing that are relatively

degraded compared to 3-D sound techniques that you're HRTF filtering."

What are the common and well-known methods of spatial processing?

A Stereo, pseudostereo. There's a number of secret sauce spatial processors, they were called spatial exciters. Various processors and POSAs would have been aware of these various gizmos that were out there for their various application in the commercial world, for instance, and they would understand that they would not be processes that would be equivalent to the capability of 3-D sound. So in that sense, they're degraded.

Q I notice here that this limitation says "degrade a spatial cue." You have been using the word "cuing" throughout your deposition today in, what seems like, a sort of different way.

Is this a different cue or is this the same cue you've been discussing?

MS. PARTRIDGE: Objection. Form.

A Well, when I say "spatial cue," I

guess -- or the patent is actually using that word, spatial cue. So, in this context, I'm talking about, for instance, we can degrade a portion of the HRTF that's responsible for our ability to perceive elevation, but that HRTF still may contain enough information to hear sound in a left/right direction for instance. So, it would be degraded from the sense that its elevation cues might be removed.

Q That's not the same as the cuing that you were discussing earlier?

A Cuing --

MS. PARTRIDGE: Objection -- objection. Form.

A Okay. So, you've got to remind me what cuing I was discussing before. I know I've been talking about alerts.

Q Yeah, you were talking about cuing in the context of alerts. You were sort of using it as another way to say alert or warning.

A Oh.

MS. PARTRIDGE: Objection. Form.

A Right. So, when we alert somebody that there's a train -- change in the environment from one environment to another, we're providing a cue, an auditory cue here, as to that occurrence.

So, in that sense, the word "cue" there is being used very generally. We're talking, there, then, about a transition between two environments. Whereas, here, a spatial cue, okay, is talking about degrading spatial information that would normally be contained in a signal to enable sound localization.

So, that was what I believe a POSA would interpret this, that these are spatial cues, degrading a spatial cue could be like the example I just gave you, as a means of degrading -- well, I just said it. Degrading spatial sound. But when we were talking about cuing as a transition between different environments, we might not be affecting the specific spatial cues of an HRTF, but we might be providing a cue through some other means that we discussed quite a bit today.

Q Okay. Let's turn to paragraph 80 of

your declaration, please.

Here you're discussing -- sorry, tell me when you're there.

A Okay. I am there. Let me give it a quick read.

Q Please, yes.

A Yes, it's -- I've read it.

Q So in this paragraph, you say a PHOSITA would understand that altering processing of the binaural sound by the DSB and reducing the volume of the binaural sound localizes to the user at the virtual image to mean changing some aspect of the position of the SLP.

Is that right?

A That's what I wrote.

Q Okay. Would a person of ordinary skill in the art, at the time of the alleged inventions, have known how to change some aspect of the position of the SLP?

A Yes.

Q Okay. So that was known in the art before 2014, 2015?

A They would know how to change the position of a sound localization point by going from binaural to mono, for instance.

Q Okay. And does changing -- yeah, so you anticipated my next question, which is, does changing sound from binaural to either stereo or binaural to mono constitute altering processing of binaural sound?

MS. PARTRIDGE: Objection.

THE WITNESS: Objection?

MS. PARTRIDGE: Form.

THE WITNESS: Oh.

A Sorry, one more time with your question.

Q Sure. Does changing sound from binaural to either stereo or mono constitute altering the processing of binaural sound?

MS. PARTRIDGE: Objection. Form.

A Does that constitute a change? Yes, it does. Changing binaural to stereo, changing stereo to binaural, changing binaural to mono, that constitutes a change. That's altering the

processing of the binaural sound.

Q Okay. Thank you, Dr. Begault.

MS. OSMAN: Can we take a break? Can we go off the record?

MS. PARTRIDGE: Sure.

PLANET DEPOS TECHNICIAN: Going off the record at 20:13.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record. The time is 20:30.

BY MS. OSMAN:

Q Welcome back, Dr. Begault. Thank you for rejoining us.

Did you talk to your counsel during the break?

MS. PARTRIDGE: I'll let you answer that question yes or no, Dr. Begault.

A No.

Q Thank you very much.

MS. OSMAN: With that, I have no further questions. That being said, I'm leaving the deposition open because Ms. Partridge asserted

privilege, and I don't believe that the question asked for or requested any privileged information. So I'm going to -- unless, Ms. Partridge, you are willing to allow Dr. Begault to answer my question from earlier today, I'm going to leave the deposition open.

MS. PARTRIDGE: I'm not going to allow him to answer the question. I completely disagree with you reading the rules because the rules don't say even what you stated to the board, so I find that interesting, but we can certainly take that up with the board.

And also, give me a break and I'll let you know if I have anything.

MS. OSMAN: For the record, I disagree with you. What I said to the board is entirely correct. I copied and pasted from the Trial Practice Guide. Furthermore, you've allowed Dr. Begault to answer the exact same question after other breaks.

MS. PARTRIDGE: You can make your argument however you want to, but I completely

disagree and I think that you mischaracterized, completely, the rules. But I did let him answer some questions, you're exactly right about that, but it did not waive anything.

I think that if you want to take it to the board, we'll take it to the board.

MS. OSMAN: That's fine.

MS. PARTRIDGE: I need to take a break right now so I can decide if I'm going to ask any more question.

I assume that you're passing the witness?

MS. OSMAN: I'm passing the witness. I'm leaving the deposition open.

MS. PARTRIDGE: Have at it.

MS. OSMAN: Ms. Partridge, how long of a break do you need?

MS. PARTRIDGE: 10 or 15.

MS. OSMAN: Great.

PLANET DEPOS TECHNICIAN: Off the record. The time is 20:32.

(Recess taken.)

PLANET DEPOS TECHNICIAN: Back on the record. The time is 20:40.

MS. PARTRIDGE: I have no questions. Pass the witness.

MS. OSMAN: Thank you.

No further questions from me either. Although I will keep the deposition open. Thank you very much, Dr. Begault, for your time.

PLANET DEPOS TECHNICIAN: Off the record. The time is 20:40.

MS. PARTRIDGE: Thank you.

THE WITNESS: When will I receive a copy of the deposition so that I can review it for whatever questions?

MS. PARTRIDGE: We've got to talk to Judy about that.

(Off the record.)

ACKNOWLEDGMENT OF DEPONENT

I, DURAND RENÉ BEGAULT, PH.D., do hereby acknowledge that I have read and examined the foregoing testimony, and the same is a true, correct and complete transcription of the testimony given by me and any corrections appear on the attached Errata sheet signed by me.

_____ _____

(DATE) (SIGNATURE)

CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

I, Judith E. Bellinger, Certified Reporter and Notary Public within and for the State of Maryland do hereby certify: That DURAND RENÉ BEGAULT, PH.D., the witness whose deposition is hereinbefore set forth, was duly sworn by me before the commencement of such deposition and that such deposition was taken before me and is a true record of the testimony given by such witness.

I further certify that the adverse party, EIGHT KHZ, LLC, was represented by counsel at the deposition.

I further certify that the deposition of DURAND RENÉ BEGAULT, PH.D., occurred at the via Zoom on Friday, June 14, 2024, commencing at 11:39 a.m. to 8:40 p.m.

I further certify that I am not related to any of the parties to this action by blood or

marriage, I am not employed by or an attorney to any of the parties to this action, and that I am in no way interested, financially or otherwise, in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 17th day of June 2024.

My Commission Expires: November 3, 2024

Judith E. Bellinger

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