

Transcript of Chris Kyriakakis, Ph.D.

Date: August 13, 2025
Case: RODE Microphones, LLC, et al. -v- Zaxcom, Inc. (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

_____

RØDE MICROPHONES, LLC AND
FREEDMAN ELECTRONICS PTY LTD.
Petitioners,
v.
ZAXCOM, INC.,
Patent Owner.

_____

IPR2025-00230
IPR2025-00231
IPR2025-00232
Patent 7,711,443
Patent 7,020,902
Patent 10,276,207

_____

VIDEOCONFERENCE DEPOSITION TESTIMONY OF
CHRIS KYRIAKAKIS, Ph.D.
TAKEN ON WEDNESDAY, AUGUST 13, 2025

REPORTED BY:

Rebecca Klanderud, RPR, CSR

Job No. 595246

VIDEOCONFERENCE DEPOSITION TESTIMONY OF CHRIS KYRIAKAKIS, Ph.D. was taken in the above-styled and numbered cause on Wednesday, August 13, 2025, at 11:56 a.m. EDT, via Zoom communication, before Rebecca Klanderud, RPR, CSR and reported remotely by machine shorthand and realtime technology, pursuant to the Federal Rules of Civil Procedure for the United States District Court pertaining to the taking of depositions and the provisions stated on the record or attached hereto.

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Also Present:
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Addison McNaughton, Exhibit Technician

(All parties present joined remotely.)

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THE COURT REPORTER: Good morning, everyone.

This is Rebecca Klanderud, the court reporter for today's deposition, California Certified Shorthand Reporter, License Number 14527.

Do counsel stipulate and agree that I may administer the oath remotely, and that the oath so given is valid for the purposes of this deposition, please?

Ms. Chipperson?

MS. CHIPPERSON: Yes. That's fine.

THE COURT REPORTER: Thank you, ma'am.

Mr. Fisher?

MR. FISHER: That's fine on our side, too.

THE COURT REPORTER: Very good. Thank you, sir.

Doctor, kindly raise your right hand.

(The court reporter administered the oath to CHRIS KYRIAKAKIS, PH.D.)

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THE WITNESS: I do.

THE COURT REPORTER: Thank you, sir.

Counsel, the witness has been sworn, and you may proceed.

MS. CHIPPERSON: Great. Thank you, Rebecca.

CHRIS KYRIAKAKIS, PH.D.,

a witness in the above-entitled matter, having been first duly sworn, testified on his oath as follows:

EXAMINATION

BY MS. CHIPPERSON:

Q. Good morning, I guess to both of you. It's good afternoon for us here in New Jersey.

So, Dr. Kyriakakis, I think I heard you tell Rebecca that she could call you Dr. K.

Would that be okay if I do the same?

A. That would be fine.

Q. Okay.

A. It reminds me of my basketball days, so that's good.

Q. Okay. All right. I don't want to

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mangle your name, so that will definitely make it easier.

So -- so as you're aware, I represent -- I'm with Chipperson Law Group. I represent Zaxcom, Inc. who is the patent owner in this proceeding, so I represent them for --

MS. CHIPPERSON: And let's see here.

Addison, I guess if you can pull up the declaration of Dr. K?

That's the 001 exhibit, and I think that's probably the exhibit we'll be using most often today.

BY MS. CHIPPERSON:

Q. But once that's pulled up, on the first page, it will identify the IPR numbers and the corresponding patent numbers, so I just want to clarify with you that that's what we will be discussing today.

THE EXHIBIT TECHNICIAN: Okay.

One moment while I get that pulled up.

Okay. The exhibit is on the screen.

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(Deposition Exhibit 1 was marked for identification.)

BY MS. CHIPPERSON:

Q. Okay. So, Dr. K, do you recognize this as your declaration submitted in the three IPR proceedings that are listed there on this first page?

A. I do.

Q. Okay. Thank you.

So just as a point of clarification, I'm sure your counsel has probably told you, but the IPR2025-00231, the institution was vacated on Friday, and that is the one that relates to U.S. Patent Number 7,929,902. So this -- today's deposition will not be related to that matter.

MS. CHIPPERSON: And I think, Addison and Rebecca, that other than this declaration which was submitted in the past, that we've -- we've changed everything to just represent those two IPRs, correct?

MR. FISHER: I'm sorry.

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Could you repeat your -- are you asking the witness or me?

MS. CHIPPERSON: No. I'm ask- -- I'm clarifying with Rebecca and Addison that the documents have been changed to just refer to the 00230 and the 00232 matters.

THE COURT REPORTER: Very good. Thank you for that clarification, Ms. Chipperson. We appreciate it.

MS. CHIPPERSON: Okay. Okay. Thank you.

MR. FISHER: Just a couple of -- a couple of points.

I don't think the documents themselves have been changed, so I'm not sure what you mean by that.

MS. CHIPPERSON: I'm just making a simple clarification that with -- if you look at our markings on the documents, they're -- originally, we scheduled the deposition for three IPRs, and that was the case header for the documents and what we gave to Planet Depos for

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everything, but now we've asked them to remove one of them.

So if you look at our header on the bottom of the documents that we uploaded for today, they only referenced the 230 and 232 IPRs.

MR. FISHER: So I think the problem is that we're not -- we're not actually able to see the whole document. I see you've presented -- and I guess I have to object to it on that basis as well. We're seeing one page of it, but you haven't made it available for download.

So I guess I don't know how you're going to proceed with exhibits with just showing a page at a time where we don't have access to the whole exhibit.

So can you --

MS. CHIPPERSON: Do you want to download the documents?

I mean, we were going to go to the relevant pages as I go through the deposition, but if you'd like to download them, you know,

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you can do that as well.

MR. FISHER: I mean we're entitled to see the whole document.

MS. CHIPPERSON: Um-huh.

MR. FISHER: So I think that the --

THE COURT REPORTER: We can put it in the chat if you'd like. If both counsel agree, we can put it in the chat, and you can download it from there if you'd like.

MR. FISHER: If that's the most efficient way of doing it, that's fine. I just don't -- we can't really accept having a page of a document just in general that -- that Zaxcom is presenting without having access to the whole exhibit. In fact -- yeah. That also goes to, you know, recognizing even whether this is, in fact, the -- I'm sure it's the actual declaration with no, you know, omissions or anything, but just as a formality, I think we need to actually have access to the whole exhibit in each instance.

MS. CHIPPERSON: Okay.

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MR. FISHER: So if the chat's the way to do that, then that's fine.

MS. CHIPPERSON: Okay.

MR. FISHER: And the witness should be allowed to download it and pull up a local copy.

MS. CHIPPERSON: Yeah. That's fine.

THE EXHIBIT TECHNICIAN: Yeah. I could create a shared folder, and then share the link in the chat, and then you can click on that. And if you refresh when I add the exhibit, you should see them and be able to download them or just open them up from that folder, if that works.

MR. FISHER: That's fine.

THE EXHIBIT TECHNICIAN: Okay. Give me one moment. I'm just going to get that folder set up.

MR. FISHER: As long as it works, I think that's fine. We'll try it out.

THE EXHIBIT TECHNICIAN: Okay.

MS. CHIPPERSON: Okay.

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THE EXHIBIT TECHNICIAN: Give me one moment. I'm just going to get that folder. It shouldn't take me more than a minute, and I'll share the link in the chat in a moment here.

MS. CHIPPERSON: And can we proceed while you're doing that, Addison, since, Rebecca, you're still available for the record, correct?

THE COURT REPORTER: Absolutely. I'm writing every word here. Thank you.

MS. CHIPPERSON: Okay. So let's move ahead that's --

MR. FISHER: Yeah. I'm -- yes.

I'm okay proceeding with this exhibit, but I'd like this resolved before the next exhibit is presented.

MS. CHIPPERSON: That's fine. No problem.

BY MS. CHIPPERSON:

Q. I think I have some other general questions that don't relate to the exhibit, so that's why I'm thinking we can go ahead. And

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then I'll circle back to my question about whether or not you recognize the document as your declaration once you have that local -- local copy. That's fine.

MR. FISHER: That's fine.

BY MS. CHIPPERSON:

Q. Okay. So from your recollection, you signed your declaration in Los Angeles, California on December 4th of 2024; is that correct?

A. I'd have to look at the last page to see that. That sounds like the right month. I don't remember the date.

Q. Okay. Okay. We'll circle back.

MR. FISHER: This goes to, you know, the concern I had with access to the whole exhibit rather than just whatever page you happen to be presenting.

MS. CHIPPERSON: Okay. That's fine.

BY MS. CHIPPERSON:

Q. So just to get some formalities out of the way about how I would like to refer to

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things shorthand just to -- for brevity, so when I refer to the parties today, I would like to refer to Zaxcom, Inc. as Zaxcom. RØDE Microphones, LLC I will refer to it just as RØDE. And Freedman Electronics Party LTD I will refer to as Freedman.

Is that fine with you, Dr. K?

A. Yes.

Q. Okay. And then as far as patents, if it is a patent of Zaxcom, I will refer to that by its last three digits. So, for example, U.S. Patent number 7,711,443, I will call that the '443 patent, and U.S. Patent number 10,276,207, I'll refer to that as the '207 patent.

Is that clear?

A. Yes.

Q. Okay. When it comes to prior art patents, I will just refer to them by their first inventor name.

So, for example, I will refer to U.S. Patent number 6,825,875 just as Strub, which I think is the way we've -- both parties have been

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kind of referring to it in the documents. And for another example U.S. Patent Number 5,479,351, I'll refer to that as Woo, okay?

Is that fair?

A. Yes.

Q. Okay. Okay. And I think Rebecca has already gone through some of this stuff, but, you know, I'm going ask you questions regarding your declaration and your analysis therein.

If you do not understand the question, let me know, and I will repeat it or rephrase it for you. If you answer the question, I will -- I will assume you understood it.

Is that understood?

A. Yes.

Q. Okay. Okay. And can you just tell me a little bit: What type of computer are you on today?

A. What type?

It's a Macintosh.

Q. Okay. Is this your personal

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computer?

A. Yes.

Q. Okay. I guess it has probably an integral camera or external?

A. No. It's an integrated camera and microphone and speaker.

Q. Okay.

A. Yeah.

Q. Okay. And can you please close out any other applications on your laptop other than this -- this -- Zoom screen, and then, you know, obviously whatever you need to open a local copy of the documents?

A. Yeah. I don't have anything else open. I have --

Q. Okay.

A. I have Adobe Acrobat Reader open.

Q. Oh, that's fine.

But no email, no messaging apps?

A. No.

Q. Okay. Okay. And who else is in the room with you?

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A. Other than Mr. Fisher?

Mr. Fisher. That's it. It's just the two of us.

Q. Okay. Okay. And can you just do a pan around the room just to show us like the environment that you're in?

A. Yes. I have an external moni- -- an external monitor connected, so I just don't want to lose the dongle.

Hold on for me. Okay. Let me pick up the cables. Here's my -- Mr. Fisher. And behind me, I think you can see what's behind me.

Is that --

Q. And how about straight in front of you?

A. In front of me, I have a box that I'm using to lift my computer up to eye level, close to eye level. I don't know if --

Q. Can you just pan your computer around so I can see what's straight in front of you?

A. I guess I'm not seeing my -- oh, I'm sorry. Behind camera.

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MR. FISHER: She wants to see --

THE WITNESS: Yeah, yeah. I gotcha. I gotcha. I gotcha, yeah. Here.

MR. FISHER: That dongle is about to fall off the table.

THE WITNESS: Yeah. That dongle's going to fall off.

Can you see that?

BY MS. CHIPPERSON:

Q. Okay. Yes. Thank you very much.

A. Okay.

Q. Okay. Do you have a cell phone with you today?

A. I do, but it's blank. It's sitting on the desk. I can put it away if you'd like.

Q. Yeah. Maybe just put it somewhere behind you.

A. All right. I'll put it in my bag.

Q. Okay.

A. Okay.

Q. Okay. So if you need a break at any point, just let me know. Obviously, I'm happy

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to accommodate.

If there's a question pending, though, I'll -- I will ask that you answer the question before we take break.

I think Rebecca mentioned please answer all questions verbally. The court reporter can't write down a nod, a shrug, or a gesture.

Even if you know what my question will be, please wait until I finish. Give your counsel a second to potentially object so that we can get a clean record.

Does that -- do you understand?

A. Yes.

Q. Okay. Okay. Will you please state your full name for the record?

A. My name is Chris Kyriakakis.

Q. And what is your current address?

A. My current address -- home address or business address I guess?

Q. Business is fine.

A. Yeah. 3480 McClintock Avenue, little

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C, big C, Los Angeles, California 90089, and that's University of Southern California.

Q. Okay. That's your address at the University of Southern California?

A. Um-huh.

Q. Okay. All right. Have you had your deposition taken in the past?

A. Yes.

Q. How many times?

A. Eight or nine. I lost track. Something like that.

Q. And what type of -- were those all different matters, or were you deposed multiple times in the same matter?

A. I believe there was a recent matter that I was deposed twice because of -- there was a response that I was deposed on, but I think -- all the others were set different -- separate matters.

Q. Were they all IPRs?

And do you know what I mean by IPR?

A. I do. They were -- no. They were

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not all IPRs. Most were IPRs.

Q. Okay. So how many of them were not IPRs?

A. Two. Yes, two.

Q. And were those patent litigations?

A. Yes.

Q. Okay. And in the patent litigation, did you represent the patent owner or the accused infringer?

A. I have done both, but I don't know the percentage of my cases. It's been mostly the patent owner, but I have done both sides.

Q. Okay. So for the two patent litigations, one was for the patent owner, and one was for the accused infringer?

A. You mean the non-IPR ones?

Q. Yes.

A. One was for the -- let me think.

Yes. That's right.

Q. Okay. So in the six to seven IPRs, how many of those were for the patent owners?

In how many of those cases did you

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represent the patent owner?

A. In the depositions?

Because I've had other depositions that are not -- I haven't been deposed in.

In the depositions, it's been -- I'm sorry. I don't have the numbers in front of me. I'm giving you approximate numbers but it's --

Q. That's fine. Approximate is fine.

A. I would say two for patent owner and four on the -- for the defendant.

Q. Okay. And how many other IPRs have you participated in where you were not deposed?

A. There was -- there was only one that I participated in, and the other side decided not to depose me. It was instituted, but they didn't depose me.

Q. Okay.

A. The others -- there are others that I'm currently on that haven't reached the deposition stage yet.

Q. Okay. What would you say is the approximate quantity?

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A. Of --
Q. IPRs that you were not deposed in?
A. Because of not reaching that stage yet or because I was passed over?
I would say -
Q. That you were --
A. -- eight to ten, something like that.
Q. Okay. And how --
THE COURT REPORTER: I would just ask you folks to slow down a little bit. You are just kind of cutting each other off.
MS. CHIPPERSON: Okay.
THE COURT REPORTER: So I think if you slow down your speech a little bit, I think we'll avoid that problem.
MS. CHIPPERSON: Okay.
THE COURT REPORTER: From my experience, that's usually the answer.
Thank you so much.
MS. CHIPPERSON: Okay.
BY MS. CHIPPERSON:
Q. Let's see.

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And how many patent litigations were you involved in in which you were not deposed?

A. Other than the ones that are ongoing and awaiting decisions, I will -- it was only one.

Q. And how many patent litigations do you have ongoing at this point in time?

A. Three.

Q. Three, including the patent litigation relating to this IPR?

A. No. That would be four, then. Three plus this one in various stages.

Q. So is it -- well, how would you -- let me strike that.

How would you split your time between -- well, strike that.

What is your -- what is your primary profession?

A. I'm a professor at the University of Southern California.

Q. So you would consider being an expert as your secondary profession?

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MR. FISHER: Object to the form.

THE WITNESS: It's a consulting profession.

BY MS. CHIPPERSON:

Q. Okay. And what is the time split that -- between being a professor and being a consultant for patent-related matters, let's say, for the -- for this year, 2025?

A. I don't know. I didn't estimate that. I should say so the other cases that I mentioned are not all -- every day. You know, they're not in the same stage, so it's not like I have multiple cases per week to work on. I have to say I don't know how attorneys do it. It's pretty amazing to me, but -- so they're in various stages. So I don't know. I would say 80 percent, 80/20, if you count weekends and nights. I haven't thought of it that way.

Q. So during the year, 2025, you estimate that you spent 80 percent of your time teaching as a professor, and 20 percent of your time consulting on patent-related matters?

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A. Assuming by "your time," you mean 7 days a week, 24 hours, not -- I don't spend my teaching days doing patent work unless it's the evening. So, yes.

Q. Well, let me rephrase.

Of the time that you spend working as a professor and doing consulting, would you say that 80 percent of it is spent as a professor teaching, and 20 percent is spent as a consultant on patent-related matters?

A. Yes, with the clarification that most of the patent-related work is done after I'm finished with my professor -- it's usually done on weekends or evenings, so, yes. For the total week, yes.

Q. And if we were to ask you about the year 2024, what would you break -- what would you say is the breakdown?

A. I believe I had -- I didn't have as many cases. I probably had two cases in 2024. Again, I'm going from memory, so I'd have to -- and some cases overlap between '24 and '25, so I

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would say it was a higher percentage for -- or lower percentage for the patent consulting.

Q. Okay. Do you understand that being under oath means you're sworn to tell the truth?

A. Yes.

Q. Okay. And do you understand that your responses here have the same force as in a courtroom with a judge and a jury?

A. Yes, I do.

Q. Is there anything that would prevent you from testifying accurately today?

A. No.

Q. Are you taking any medications that will interfere with your ability to testify accurately?

A. No.

Q. Have you ever been convicted of a felony or misdemeanor?

A. No.

Q. What do you understand your role to be in this matter?

MR. FISHER: Object to the form.

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THE WITNESS: My role is to read through the materials that were at issue and provide expert opinions on many of the technical terms that were discussed in these documents.

BY MS. CHIPPERSON:

Q. Is it your role to opine on the validity of the Zaxcom's patents?

MR. FISHER: Same objection.

THE WITNESS: It's my role to understand how it -- if at all, it relates to prior art, and then, yes, opine on the validity based on that understanding.

BY MS. CHIPPERSON:

Q. Did you review your declaration before coming to this deposition today?

A. Yes, I did.

Q. Is there anything in your declaration you would like to clarify or restate?

A. Not at this time. As we go through it, if we find a typo here and there, I'll probably let you know, but I didn't --

Q. Okay.

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A. Yeah.
Q. Did you review any materials prior to preparing your declaration?
A. Prior to preparing my declaration?
Q. Um-huh.
A. Yes. I think we have provided the materials listed somewhere. Yeah. It was a lot of the prior art and other documents that are listed there.
Q. Did you include all of the materials that you reviewed in preparation of your declaration in your declaration?
MR. FISHER: Object to the form.
THE WITNESS: I believe they are -- pointed to a separate exhibit. I'm not -- I'm not positive about that.
MR. FISHER: Again, I'm going to object. Unless the -- okay. The -- I see the exhibit folder has been provided.
MS. CHIPPERSON: Okay. I don't have the chat open here.
MR. FISHER: Dr. K, you can open up

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the declaration there and look at it or otherwise look at a copy.

THE WITNESS: Yep.

So I do have a section -- I'm looking here on the screen. I do have a section on --

BY MS. CHIPPERSON:

Q. I can help you with that. I believe it's at page 17 and 18.

A. Yep. Here it is. Yep. I believe that's a summary, though. It's not -- I don't think it's a list of every single document. I was under the impression that that was provided separately by the attorneys as a -- as part of the docket, but I'm not sure how that works.

Q. Okay. So you -- you believe you reviewed materials in addition to what is listed on pages 17 and 18 of your declaration during preparation of your declaration?

MR. FISHER: Object to the form, mischaracterizes prior testimony.

THE WITNESS: Let me just take a quick look to see what I said here.

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So at the top of page 18, "I reviewed the Challenge Patents, their file histories, the prior art, and all exhibits cited in this declaration, including the documents in the Table of Exhibits."

So those are the documents that I reviewed.

BY MS. CHIPPERSON:

Q. Did you review documents in addition to those listed in paragraph 35 of your declaration?

A. So when you say reviewed, you mean did I draw knowledge from things that I know from in the past?

I'm not sure what you mean "review."

Q. It's the typical review.

I mean, what would you consider a review?

Did you read the document at all?

MR. FISHER: Object to the form.

THE WITNESS: My opinion is based on these things, but I can't -- you know, if 5

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years ago I read a book that has to do with satellite GPS, I don't know if I would consider that review for this. It's knowledge that I gained.

BY MS. CHIPPERSON:

Q. So you may be relying on additional documents for the preparation -- when you prepared your declaration?

MR. FISHER: Same objection.

THE WITNESS: I'm relying on what I say in the beginning of paragraph 35: In forming the opinions expressed in this Declaration, drawing on my experience in the field of signal -- of audio signaling processing, including teaching, research, and consulting experiences. (as read)

So I did not put anything in here that is not cited, but knowing where to look may have been -- for example, in looking through all the prior art is influenced by my knowledge of this field.

BY MS. CHIPPERSON:

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Q. Okay. How were you retained in this matter?
A. In what sense "how"?
Q. How were you retained?
How were you hired for this matter?
A. I was contacted by the law firm, had a discussion, um, and they gave me a letter of retention.
Q. And who -- who did you speak to at the law firm when you were retained?
A. It was Mr. Fisher.
Q. Okay. About when were you retained?
A. It was late 2024 that I -- it's -- I don't remember the exact month.
Q. Would you say it was after September 1st, 2024?
A. I'm sorry. I'm not sure. I could easily look at it at the break if you would like a more precise date and I can -- I can let you know.
Q. Okay. We can do that.
And just to sidestep back for a

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second, now that you have a full copy of your declaration, do you agree that this is your declaration?

A. Yes.

Q. Okay.

A. Well, I didn't read the whole thing, but I scrolled through it, and it looks like what I wrote.

Q. Okay. So how many different matters have you worked on for Freedman?

A. This is the first one.

Q. Okay. And how many different matters have you worked on for RØDE?

A. The first. This is the first.

Q. And is your billing rate for this matter still 525, as stated in your declaration?

A. Yes, it is.

Q. And approximately how much have you billed so far for these matters?

A. I can tell you approximately in hours. It's around 50 hours so far. I guess we can multiply that out.

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Q. So you have billed approximately 50 hours for all -- well, strike that.

Have you worked on all four IPRs for Freedman, RØDE?

That would be the three in the cover page, plus one for the '444 patent?

A. Yes, I have. Yes.

Q. Okay. So you have spent around 50 hours working in total for all four matters?

A. Yes. That's not counting today's deposition.

Q. Okay.

A. Yeah.

Q. And what was the work that you performed in those 50 hours?

A. I had to -- I read through the patents at issue. I found prior art. Wrote the -- that's it. Had to work on the technology backgrounds, and then go through the challenged claims. Tried to map them to the prior art.

I don't know how much more detail. It's the normal work that is required for

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putting together an expert witness.

MR. FISHER: I would just as a -- voice a cautionary privilege objection and counsel the witness not to reveal the substance or details of any conversations or correspondence with counsel in the course of these matters.

THE WITNESS: (Witness indicating).

BY MS. CHIPPERSON:

Q. Okay. We've covered some of these while we were waiting for the exhibit.

I will also refer to the United States Patent and Trademark Office as the USPTO.

Okay with you?

So has anyone ever asked --

THE COURT REPORTER: I'm sorry.

Was that a -- I'm sorry. I didn't get an answer to that.

THE WITNESS: The answer was yes.

THE COURT REPORTER: Thank you.

If you could just keep your voice up a little bit, and then just continue slowing

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down. Thank you.

THE WITNESS: Okay.

MR. FISHER: If you can -- I wonder if it's possible to increase the volume of your microphone --

THE WITNESS: Yes. I can do that.

MR. FISHER: -- a little further?

THE WITNESS: I'll put it on maximum, and hopefully we won't click. But if we do, Addison will tell us. All right.

BY MS. CHIPPERSON:

Q. Okay. Has anyone ever asked the USPTO to exclude your expert testimony in an IPR?

A. No.

Q. Has anyone ever asked to exclude your test- -- expert testimony in a patent litigation?

A. No.

Q. And, earlier, we talked about the number of IPRs in patent litigation cases that you have been involved in.

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How many of those cases were with Dechert?

A. I think I answered that earlier. It's none. You asked me if I had done other work with Dechert, and I have not. This is my first case with Dechert.

Q. Okay. That -- I don't believe that was a question that I answered [sic], but thank you for that.

So this is your first case with Dechert?

A. Yes.

Q. Okay. And how did you prepare for today's deposition?

A. I reread my report and some of the relevant prior art or some of the prior art.

MR. FISHER: Just hold one second.

I'm happy for you to generally answer the question with the same privilege objection, and caution you not to reveal any discussions, the substance of any discussions that you had with counsel. Otherwise, you can go ahead and

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answer.

THE WITNESS: Sorry. That's how I prepared. I read my report and some of what I thought were relevant sections in prior art.

BY MS. CHIPPERSON:

Q. So did you meet with anyone to prepare for today's deposition?

A. I met with Mr. Fisher.

Q. How much time did you spend with Mr. Fisher?

A. It was just -- I don't know -- six to eight hours.

Q. So the six to eight hours that you spent meeting with Mr. Fisher to prepare for the declaration, is that part of the 50 hours that you've spent working on these cases?

A. No, it's not.

Q. Okay. So prior to today's deposition, you've spent about 56 to 58 hours working on these cases?

A. That sounds about right, yes.

Q. Okay. And you did not meet with

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anyone else other than Mr. Fisher?
A. Yesterday, no.
Q. In preparation for today's deposition, did you meet with anyone other than Mr. Fisher?
A. There was another attorney remote in for a short period of time, but there was no conversation. There was -- he was just listening in.
Q. So another attorney attended your meeting with Mr. Fisher?
A. Remotely to listen in for a short period of time.
Q. So prior to today's deposition, you did not have any other meetings with anyone other than Mr. Fisher?
MR. FISHER: I'll object to the form.
THE WITNESS: You're asking in preparation for the deposition or --
BY MS. CHIPPERSON:
Q. Yes, um-huh.
A. That's correct.

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Q. Okay. Have you reviewed the exhibits -- strike that.

Do you believe you have reviewed all of the exhibits filed in the IPRs to date?

A. I do. I can't say that I did yest- -- all of them yesterday, but, yes, I did.

Q. And those would include exhibits filed after you signed your declaration?

A. I don't know the dates of the exhibits filed, but -- I'm not sure. I'm not -- it's possible. I just -- I don't know the timeline of all the exhibits.

Q. But it is your understanding that you've reviewed all of the exhibits filed in all of the -- in both IPRs at issue today?

A. Yes.

Q. Okay. Okay. If we could go to paragraph 6 of your declaration?

A. Yes.

Q. You state -- hold on. I'm getting there on my copy.

So you state that your curriculum

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vitae was attached as an appendix to the declaration.

Is that correct?

A. That's what I -- that's what it says there, yes.

Q. So is that statement accurate?

MR. FISHER: Object to the form.

THE WITNESS: I'm looking to -- at the table of contents, and I don't see appendices. So maybe it was supposed to be an appendix, but probably became part of the exhibits. So I'm not sure if that's -- if it's there. I don't see it.

BY MS. CHIPPERSON:

Q. So is section 6 of your declaration accurate?

MR. FISHER: Object to the form.

THE WITNESS: My intent was to provide my CV. Maybe at the time I wrote this I was under the impression it would be an appendix, but it didn't make it as an appendix. I believe I've provided it, but if you're asking

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if the word appendix is accurate -- I'll see. Okay. It's not accurate.

BY MS. CHIPPERSON:

Q. So should this paragraph be stricken from your declaration?

MR. FISHER: Object to the form, calls for a legal conclusion.

THE WITNESS: That's --

MR. FISHER: It mischaracterizes his prior testimony.

THE WITNESS: I don't know if it should be stricken. I think it should be say -- it should say was provided or is provided in the exhibits, or something to that effect. I don't know the right legal language.

BY MS. CHIPPERSON:

Q. So is it your position that paragraph 6 of your declaration should be amended?

A. To show the loca- --

MR. FISHER: Object- -- hold on.

THE WITNESS: Sorry.

MR. FISHER: Object to the form.

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THE WITNESS: It -- a few words should be changed to show where the CV is.

BY MS. CHIPPERSON:

Q. How would you amend paragraph 6 to correct your declaration?

A. Change the last five words to provided in the exhibits.

Q. Okay.

A. I'm improvising here because I don't -- I don't know how my CV was provided. I know it was, though.

Q. But this is your declaration, correct?

A. Yes.

Q. Can you tell us whether you have any experience in television broadcasting?

A. I have experience over many years of research in working with people and teams in television and broadcasting for experimental purposes to further my research goals, yes.

Q. Have you ever worked in television broadcasting?

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A. Not as an employee. As a consultant looking at new technologies that could change how television and broadcasting -- some aspects of -- audio aspects of television and broadcasting could look into the future.

Q. Who did you consult for in your work in television broadcasting?

A. I consulted -- and these were -- just to clarify, consulting implies payment. These were unpaid consulting jobs or engagements that were part of my research.

And so I was -- I consulted with WGBH in Boston, the -- I'm trying to remember here. Panasonic. These have been over several years, so I'm sorry if I'm straining to remember some of them.

Q. That's fine.

A. Yeah.

Q. So you've never been paid to work in television broadcasting?

A. That's right.

Q. Okay. And what was the unpaid work

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that you did for those companies?

A. It was to put together experimental setups that bring multiple microphones and recording devices into a space or in distributed spaces, meaning at a distance connected by Internet or wirelessly, to figure out if there's a next generation -- if there are next generation technologies that could advance the science in immersive audio, which is my main area of research over the years.

Q. And when was this work done?

A. It's been done over the past 20 years sporadically.

I should mention. You asked about television and broadcast. Some of -- several others were not done directly with a television broadcast company, but with some of the artists themselves.

So, for example, the New World Symphony in Miami, we did the world's first immersive distributed device concert over a multi-channel audio concert over the Internet.

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I worked with the rock and roll group Duran Duran to do an immersive picture and sound capture of one of their performances.

And there are other examples, Herbie Hancock, many others.

Q. So in those examples you just provided, was any of that work paid?

A. No, it was not. As I said, it was part of my research to further the goals of what we were doing in the lab that resulted in publications and the other normal academic path.

Q. Okay. Can you tell us whether you have any experience in production sound recording?

A. Yes. So those -- some of the examples that I already mentioned, plus other collaborations within the School of Cinema and Television at the university working with students in studios to do production sound, both in the studio and in remote locations.

I'm listed on IMDb as -- what is my title -- immersive audio engineer for a movie

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that was released past in production.

Q. What movie was that?

A. It was called Seven Swans.

Q. And you're listed on IMDb as an immersive audio engineer?

A. I would have to get the exact words for you. It's -- I'm not sure what the exact title was for my listing, but I know it's there.

Q. And that work was unpaid?

A. Yes.

MR. FISHER: Object to the form.

THE WITNESS: Sorry.

BY MS. CHIPPERSON:

Q. Okay. In paragraph 10, it says you performed several multi-channel recordings.

Can you describe what you mean by multi-channel recording?

A. Yes. It's -- these are recordings that involve many microphones and not just microphones, but also what the industry calls direct feeds from instruments. So tracks, I guess, and I list here some of the ones that I

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already mentioned.

64-track recording, that means there were 64 audio inputs to the recording equipment. Some of them were microphones that were wireless on the performance. Others were wired microphones, you know, drum kits, and other things, the typical way you would do a recording, except that we added many more microphones than is typical in a concert because we were trying to capture the spatial distribution of instruments and sound in the venue.

I also worked with the Boston Symphony and the Handel and Haydn Society. This was through the collaboration with WGBH, as I mentioned, so I had the -- the purpose of it was to capture the acoustical characteristics of an amazing concert hall, Boston Symphony Hall, and that required multiple microphones, some on the performer or near the performers, some hanging from the ceiling, so combinations of those and many others. I think I list them all here.

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Q. So in the -- let's just use this 64 audio --

A. Um-huh.

Q. -- track example that you provide for this next few questions.

You said that the 64 audio inputs were microphones or direct feeds.

Were the microphones individual performers?

A. It was a combination. Simon Le Bon, the main singer, had, for example, a microphone on him that was wireless. There was a background microphone on him.

Nick Rhodes on the keyboards also had it by a microphone because he sings backup vocals, but there was also a direct feed from his keyboard, so it's a combination.

The drum kit had eight microphones arrayed around and two on contact microphones on the instruments themselves. So that's why we had so many tracks. It's very difficult to capture these.

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Q. Did any of the tracks include more than one audio source?

MR. FISHER: Object to the form.

THE WITNESS: The ones worn by the singers were just the singer. The microphones that were not worn by performers but were placed on stands were intended to pick up the nearest instrument, but they may have picked up others as well.

One of the reasons we use so many microphones is to try to isolate as much as possible.

BY MS. CHIPPERSON:

Q. Do you recall any track that included two or more audio sources?

A. In one track?

Q. Yes.

A. I -- it's been a few years, so I don't remember. That wasn't the intent. The intent was to capture each individual instrument or performer separately because that's what makes it easier to mix later. So I'm sorry. I

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don't remember checking each track for instruments for other than the intended sound.

Q. So the reason that you had one audio source per track was to make it possible to mix the track later?

MR. FISHER: Object to the form, mischaracterizes prior testimony.

THE WITNESS: It's not to make it possible. It's -- sometimes that's useful because it gives you more flexibility.

BY MS. CHIPPERSON:

Q. Did any of your audio tracks include a recording of the entire performance?

A. Yes. There was a set of microphones, a stereo pair of microphones on the cameras that were at the back of the club, and I'm trying to remember. I believe we had some hanging -- yes. We had an experimental microphone hanging from the ceiling that looks like a sphere, and it's picking up ambient sounds.

Q. And what do they call a track that has all of the audio on it?

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MR. FISHER: Object to the form.

THE WITNESS: Well, here's the thing. Saying all of the audio is a bit strange because, you know, the distant microphones don't pick all of the audio, they pick up the reflected sound in the hall, but that was just a clarification.

I don't -- I don't know if there's a name for that track. If it's intended to pick up ambience, as I mentioned before, they might be called ambient mics or hall mics in a concert hall.

BY MS. CHIPPERSON:

Q. Are you familiar with the term "scratch track"?

A. A scratch track. I think so. I think it's a track that is sometimes recorded by the camera as -- or some other device that has -- that's trying to pick up everything there for reference in case it's needed to listen to something that was not caught by the other microphones.

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It's hardly ever -- it's not used in production unless there was some disaster.

Q. So the microphones that recorded all audio available at the microphone were not included in the multi-track recording of the event?

MR. FISHER: Object to the form.

BY MS. CHIPPERSON:

Q. Is that correct?

A. Yeah. All --

MR. FISHER: Same objection.

THE WITNESS: All 64 microphones -- I guess they weren't 60- -- they were -- I'm trying to think. I think there were 58 microphones and six direct instrument feeds. All of those tracks were recorded from the event.

BY MS. CHIPPERSON:

Q. Did those 64 tracks include the tracks recorded by the camera?

A. They did. They were not used in the final production, but they did -- we did record

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them.

Q. And why were they not used in the final production?

A. Well, in the final production, when we do these things, we -- a perspective is selected as to how to present the performance: Where in the audience do you want to put the listeners in?

And that determines aesthetically what and how much of each microphone feed to use.

And I believe in that one, we decided that those were too far away to give us any useful perspective. So instead, for ambience, we used the hanging sphere microphone.

Q. So would it have been possible to create a multi-track recording for that event just on the audio recorded at the cameras and in the sphere?

MR. FISHER: Object to the form.

THE WITNESS: A multi-track recording based on those microphones could certainly be

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created. It wouldn't have been very good, but -- technically, we can record -- anything can be recorded. The intent was not to just record for the sake of recording but to have useful content.

BY MS. CHIPPERSON:

Q. How would -- if you were to use the ambient microphones -- I'll use your term, your ambient microphones to create a multi-track recording, how would you individually edit, let's say, the singer?

MR. FISHER: Object to the form.

THE WITNESS: Well, that's the thing. The ambient microphones pick up very little of the singer because they're too far away. So if your intent is to edit the singer, you need a microphone in front -- you need the microphone closer to the singer.

BY MS. CHIPPERSON:

Q. And do you have any experience in actually miking a singer, meaning, putting the microphone on the singer?

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A. Yes, absolutely.
Q. And how would do you that for someone like Simon Le Bon?
A. First, you ask permission very nicely because -- it depends on the kind of microphone. So if it's -- if it's going to be a head-worn kind of a bloom little mic that goes in front of his mouth, he didn't want that. So we had to come up with ways to both hide the wires to the -- I'm talking about the wireless mic. There was another mic near him that he was holding that wasn't mounted on him. But the wireless mic, you have to hide the wires. You have to hide the transmitter, make sure it has batteries, and then run the wires to where it's acceptable to him.
Q. What type of microphone was that?
Do you recall?
A. Whoo. I'm sorry. Maybe Sennheiser, but I'd have to go back. It's been a while.
Q. Was it a Lavalier microphone?
A. No. It was -- well, so we started

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with a Lavalier during rehearsals. He didn't want it showing. So we ended up putting a smaller microphone hidden inside his clothing just like they do in Broadway plays, inside --

Q. Okay.

A. -- near his mouth, yeah.

Q. And how do you direct the microphone to make sure that it's capturing that singer?

A. You mean, how do I point it?

Q. Yes.

A. Oh, I see. Well, it depends on the kind of microphone that -- in the case of an omnidirectional microphone, there's no need to point.

In the case of a directional microphone, you -- there are some indicators on the microphone that tell you which way is front and which way is back because the back won't be picking up very much.

Q. So how would you position a directional microphone?

A. In the same way as I described the

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process. You just have to make sure, take a little bit more care in which way the capsule is pointing, so it's mostly pointing towards the singer's mouth.

Q. Now, you said he had a microphone pointing towards his mouth, and he also held the microphone in his hand?

A. Yes. He actually switched between the two. I'm not sure the reasons. Singers sometimes prefer one type of mic over another. So both were being recorded, and the front of house engineer from Duran Duran that was running the console had a pre-agreed set of fader positions on the console to decide which of the two mics to use for each song or for each part of the song.

Q. Okay. So the performance was -- scratch that.

Was the performance mixed live during the performance by the audio mixer?

A. The front of house audio mixer was mixing for the loudspeakers. I believe there

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were three, left, center, and right, above the band. This was in the House of Blues. And so they were mixing because this was a live performance, and the audience dancing on the floor wanted to hear that mix.

The mix that we were making was not -- was a -- was intended for my research lab where we were looking at many more channels of -- loudspeaker channels for reproduction, and so that was mixed after the fact in the lab.

Q. And how would the sound engineer mix for attendees?

A. So that engineer works with the group, so knows them very well, knows what's coming, and so they have a preset perspective that they want to do for each song. There are some sound effects.

One of my favorite songs, Girls on Film, has cameras snapping. Obviously that wasn't happening on stage. It was a pre-made sound effect, and so the engineer would play that from a recorder and mix it in with whatever

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else was happening, the guitars, and so on.

So they decided on a perspective, and then just know what instruments -- some instruments are not used for every song, so they turn those faders down to avoid noise pickup.

I'm just describing very normal mixing techniques here. It's just that this wasn't a person that just walked in. They had knowledge of what's going to happen, and they had notes.

Q. So would a sound engineer adjust characteristics of the lead singer's audio track relative to other audio tracks?

MR. FISHER: Object to the form.

THE WITNESS: That's possible, yes.

BY MS. CHIPPERSON:

Q. Is it typical?

MR. FISHER: Same objection.

THE WITNESS: It kind of depends on the song, since we're talking about songs here. Sometimes the -- for whatever reason, if the crowd is getting louder, the engineer might want

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to turn up the voice by a little bit. I'm just thinking of -- so, yes, it happens. I don't know if it's typical, but it does happen.

BY MS. CHIPPERSON:

Q. Would you be able to adjust the characteristics of, for example, the lead singer's audio if you were only using the ambient mic track?

A. For the live performance, that would be very hard. For after the fact, there -- if for some reason those were the only tracks you were given and were asked to turn up his voice, there are signal, audio signal processing techniques that would allow you to achieve that by isolating the voice from the recording and raising it and doing other things, but that's not something that would happen live.

Q. Is it very hard, or is it not possible?

MR. FISHER: Object to the form.

THE WITNESS: Is what very hard? I'm sorry.

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BY MS. CHIPPERSON:

Q. Is it difficult to adjust the characteristics of the lead singer's audio from an ambient mic recording, or is it not possible to do that?

MR. FISHER: Same objection.

THE WITNESS: If we're talking about a live recording, meaning a playback of a live recording, as we were talking about here in the club, it -- the answer depends on where the ambient mics are. There's no -- you know, some ambient mics are not directly on the singer but reasonable nearby in which case it's relatively easy. If they're further back, then the singer gets more distant and more reverberant, and it becomes less effective. It's not hard to do after the fact if you have the right signal processing chain.

BY MS. CHIPPERSON:

Q. If you pointed the microphone, the directional microphone on a singer in the wrong direction, what would happen?

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MR. FISHER: Object to the form.

THE WITNESS: It depends on what kind of directional microphone it is. They each have patterns that are intended to be either very narrow in the front, but allow some from the back or slightly wider pickup from the front and really, really diminish the sound pickup from the back. But in general, what would happen is you would get a lower level of the singer's voice compared to an omnidirectional microphone.

BY MS. CHIPPERSON:

Q. So if a directional microphone on a singer were pointed at the audience instead of the singer, would you -- what would be the mix in the resulting audio between the audience's audio and the singer's audio approximately?

MR. FISHER: Object to the form.

THE WITNESS: The singer's voice, as I said, would be lower than it would have been if the microphone was pointed at the singer, but I can't give you an exact result because this is not a laser, right?

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So it depends on the angle at which it's -- the microphone is seeing the singer's mouth.

BY MS. CHIPPERSON:

Q. Okay. And you would likely still hear the singer in such a scenario?

MR. FISHER: Same objection.

THE WITNESS: If it was bumped by accident, yes, but if I was intending to do that I could make it so that you could almost not hear the singer, especially among the other noise. That's -- those are -- that's the intent of a directional microphone.

BY MS. CHIPPERSON:

Q. Okay. And how many directional microphones were used in your 64-bit performing -- performance?

A. 64 track.

Q. 64-track recording, yes.

A. I wish it was 64 bit.

How many directional microphones other than the one on Simon Le Bon?

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I don't recall the one on Nick Rhodes. It might have been directional as well, but I'm not positive about that. The others were not -- oh, okay. Sorry. Revise me.

There was a kick drum microphone that's placed inside the kick drum, and that was a directional mic. I think that's it.

Q. What was the type of the other microphones that were used?

A. The none -- the other omnidirectional.

Q. Okay.

A. Yeah.

Q. And do you have similar experience putting mics on actors --

A. Yes.

Q. -- in television recordings?

A. Sorry. Yeah. The answer to that, yes.

It was a -- another experimental production that we did. It was actually with the same -- the same director that directed the

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movie that I mentioned earlier also was part of a Shakespeare group and paying an homage to Shakespeare's Theater in the Round where the audience sits around the play, we actually reversed that and put -- sorry. Yeah. Yes. We put the actors around the audience. And so for that, we needed wireless microphones on them as they were moving around, plus, again, ambient microphones to capture some of the sound in the sound stage.

Q. Did you use directional microphones for the actors?

A. No. Those were all omnidirectional.

Q. Okay. Are you a member of a sound union?

A. I'm not.

Q. So in your declaration, you refer to multi-channel and multi-track.

Do you use those two words interchangeably?

MR. FISHER: Object to the form.

THE WITNESS: Are we still on

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paragraph 10, just for reference?
BY MS. CHIPPERSON:
Q. No. This is just in general.
MR. FISHER: Same objection.
BY MS. CHIPPERSON:
Q. Let me see if --
A. I think --
Q. Let me see if I can find you a section.
A. Okay.
Q. I think I can.
If we look at paragraph 44 on page 22.
A. Okay. I'm scrolling. 44, yes.
Q. So you say that each -- at the end of the middle of the sentence, "each dedicated to a single channel or track."
Does that mean that a channel and a track are the same thing?
MR. FISHER: Object to the form.
THE WITNESS: No. Sometimes they are confused that way, but in my mind, channels --

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and I was going to answer your earlier question. Multi-channel, when I say that, I mean multiple loudspeakers as in a surround sound is multi-channel, and tracks are the recorded tracks that we were talking about before.

Typically, in these elaborate productions, you have many more tracks than loudspeakers, unless you have a very understanding partner at home like I do, and then you can have a lot of loudspeakers.

BY MS. CHIPPERSON:

Q. Okay. Did you use any Zaxcom equipment in any of your recordings?

A. No, we did not.

Q. You mentioned Sennheiser.

Did you use Sennheiser wireless transmitters in any of your recordings?

A. We did. That was one of them, yes.

Q. Do you recall the model number?

A. No, not off the top of my head.

Q. Is the Sennheiser wireless transmitter was essentially the same as a Zaxcom

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transmitter when it -- scratch that.

Does -- in your understanding, would a Sennheiser wireless transmitter perform the same functions as a Zaxcom transmitter?

MR. FISHER: Object to the form.

THE WITNESS: That's -- I don't know -- other than the function of recording and transmitting, I don't know the inner workings of either one actually, so I can't answer that.

BY MS. CHIPPERSON:

Q. What is your familiarity with Zaxcom equipment?

A. Just what I saw on their website.

Q. And what did you see on their website?

A. I believe it's been a while since I looked, but it's products that they sell that are related to wireless microphones and receivers.

Q. And you're familiar with the Zaxcom products that are described in the Zaxcom patent, correct?

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MR. FISHER: Object to the form.

THE WITNESS: I don't know.

Does the patent list model numbers?

I'm not familiar with -- I couldn't tell you each model number and what it does. I just saw them -- whatever is on their website as of a few months back when I was first retained.

BY MS. CHIPPERSON:

Q. Were any -- scratch that.

What was the size of the Sennheiser wireless transmitter that you used approximately?

A. I don't know. A few inches, a rectangle.

Q. Two inches?

A. I don't know the exact number.

Q. Could -- can you please provide a range?

A. Three to 5, something like that.

Q. Three to 5 inches square?

A. I believe it's rectangular. I don't know. It's -- so maybe 3 to 5 by 2 to 4. I

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don't know. I'm really improvising here.

Q. When's the last time you used a Sennheiser wireless transmitter?

A. It was for the live performance of the Byzantine chants. Well, not the live performance. The recording in the studio that I mentioned back in that paragraph that we were in my CV. It was last year.

Q. So you last used a Sennheiser transmitter in the year 2024, but don't recall the size?

A. I wasn't looking at it for size. It was something that we clipped onto some of the performers.

Q. Did you personally clip the device onto a performer?

A. No. The tech at the studio did that.

Q. Did you handle the Sennheiser wireless transmitter at all?

A. In what sense?

Did I hold it? Yes.

Q. What would you say the weight was of

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the Sennheiser transmitter?

A. Well, you're really testing my guessing abilities here. I don't know.

Q. Less than a half a pound?

A. Probably, yes.

Q. Okay. Let's switch back to the Zaxcom patents for a moment.

What do you believe the purpose of the Zaxcom patents to be?

MR. FISHER: Object to the form.

MS. CHIPPERSON: Yeah. I'll -- scratch that.

BY MS. CHIPPERSON:

Q. Would you agree that the purpose of the Zaxcom patents is to prevent dropouts?

MR. FISHER: Same objection.

THE WITNESS: No. I don't agree with that at all. I wrote about the background of what I believe were the Zaxcom patents in my report, and we can jump there if you'd like.

BY MS. CHIPPERSON:

Q. Sure.

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A. I'll just need to find that section.

I guess one area, in one place where I read that is on page 23, which is more of a summary of the specifications for the challenged patents, paragraph 46. And I go into some detail in the next paragraphs, that they -- the patents have to do with synchronization, time code generators, and then in paragraph 52 I say that they disclose embodiments in which each -- in which each performer is equipped with a local audio device capable of locally recording.

So I think the -- the Figure 1 that's there on the next page right above paragraph 53, I think a POSA would understand by just looking at this figure that there are recorders that connect wirelessly to a main -- to a -- to a console or receiver, and there's a remote control.

There's very little -- I don't think there was any mention in the -- well, I'm sure there's no mention in the claim of dropouts. I believe maybe twice in the abstract of I think

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both patents, so, no. I wouldn't consider them to be dropout related.

Q. You do not consider the Zaxcom patents to be dropout related?

MR. FISHER: Same objection, asked and answered.

THE WITNESS: None of the challenged claims talk about dropouts. The specification, as far as I can remember, only mentions the word dropout in the abstract.

BY MS. CHIPPERSON:

Q. What do you understand a dropout to be?

A. In the context of audio recording, a dropout is a piece of a -- a part of a recording that has either not been recorded or has a click or a distortion. Usually in wireless, a dropout is something that is -- just didn't make it across.

Q. And it is your position that the Zaxcom patents do not address dropouts?

MR. FISHER: Same objection,

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mischaracterizes prior testimony.

THE WITNESS: The opinions I gave were based on the challenged claims. There's nothing in those that I saw that has anything to do with dropouts. So, yes, that is my position.

BY MS. CHIPPERSON:

Q. I'm asking about the patent as a whole, including the specification and the claims.

Does any portion of the patent document as a whole address dropouts?

MR. FISHER: Object. Object to the form.

THE WITNESS: I don't believe so, other than the abstract.

BY MS. CHIPPERSON:

Q. If we take a look at page 37, paragraph 70 of your declaration, you talk about dropouts there and the prior -- in this section, you're talking about the prior Lectrosonics IPRs.

Did the prior decisions address

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dropouts in those prior IPRs?

MR. FISHER: Object to the form.

THE WITNESS: Are you asking about the board's decisions on the Lectrosonics IPRs?

BY MS. CHIPPERSON:

Q. Yes.

A. So I looked at those after I opined on all -- everything that I wrote here. I'm trying to remember. At least what I -- what I wrote here, which was probably from the notes, that when I read those -- when I read those -- not the notes, but when I read the decision.

The "dropout repair" shows up on page 38, but I believe what the board found is that it -- it had no nexus with the claims.

MR. FISHER: Counsel, is there some specific decision you want the witness to look at?

MS. CHIPPERSON: No. This -- I am asking about his declaration and what he wrote in his declaration. So we can go to the decision and -- let's see. Let's switch to --

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yeah. Let's go to Exhibit 14, which is the final written decision in IPR2018-00972.

THE EXHIBIT TECHNICIAN: One moment.

And do you want me to keep this marked as Exhibit 14 or Exhibit 2 for today?

MS. CHIPPERSON: You can mark it as Exhibit 2.

THE EXHIBIT TECHNICIAN: Okay.

One moment. I'll get that posted, and I will also add it to the shared folder.

(Deposition Exhibit 2 was marked for identification.)

MR. FISHER: Okay. I do see that that exhibit has appeared in the shared folder.

THE WITNESS: Yeah.

MR. FISHER: Do you have access to that?

THE WITNESS: I do.

THE EXHIBIT TECHNICIAN: Okay.

The exhibit is on the screen.

BY MS. CHIPPERSON:

Q. Did you review this decision in

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preparation of your declaration?

A. Yes. I believe I did.

Q. So does this decision discuss dropouts?

MR. FISHER: Object to the form.

THE WITNESS: The last time I saw it was six or seven months ago, so I'd have to go read through it and -- to answer that accurately.

I'm trying to see if in the paragraph -- in paragraph 70 if the reference -- if the citation I have says anything about that, but I just don't remember off the top of my head.

BY MS. CHIPPERSON:

Q. Do you recall if the claims in this proceeding in this Exhibit Number 2 were amended?

A. I don't recall.

As I said, this was -- I read this as supplementary material, but I didn't -- I don't recall everything that was in the decision. The patents were not the same patents, even though

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they had a lot of overlapping similar claims, but I would really have to go read that decision again. It's been months.

Q. But you discuss this decision in your declaration, correct?

A. Right. Which I wrote six months ago or so or more.

Q. So you don't recall what's in your declaration at this point?

MR. FISHER: Object to the form.

THE WITNESS: I recall what I see on the screen in my declaration, I just don't recall every aspect of the Lectrosonics decision.

BY MS. CHIPPERSON:

Q. Your paragraph 70 discusses the word "dropout."

Can you elaborate on what you are saying about dropout in this paragraph?

A. I guess -- the sentence that starts: "But the PTAB found," what I'm saying here is I'm -- I guess I'm summarizing that -- so I

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guess Zaxcom had some objective indicia related to replacing remotely recorded audio data. And the purpose of that sentence I think -- which is called dropout repair by them, and the purpose of that sentence was my opinion that the PTAB found that there was no nexus with claims.

Q. And what does that mean that there's no nexus with the claims?

MR. FISHER: Object to the form.

THE WITNESS: Without being an attorney and giving the legal, exact definition, to me it means that what's in the claims and what was purported to be objective indicia, it doesn't -- is not supported by the claims.

BY MS. CHIPPERSON:

Q. And which claims are you referring to here?

A. Presumably the board has listed which claims. I didn't write that here, so I don't know.

Q. You didn't write section -- paragraph 70 of your declaration?

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A. No. I didn't write which claims, the numbers of the claims, the claim numbers.

Q. Generally, are you referring to the original claims or the amended claims?

MR. FISHER: Object to the form.

THE WITNESS: Just based on this, what I wrote here, I think -- I believe -- I'm referring to whichever claims the PTAB used to make this decision. I don't know -- I don't know that I recall the full history.

BY MS. CHIPPERSON:

Q. Do you recall what the decision said regarding dropout repair that we've shown you in Exhibit 2?

MR. FISHER: Same objection.

THE WITNESS: I would have to go read that exhibit to find -- to answer that. I don't -- I don't recall off the top of my head, no.

BY MS. CHIPPERSON:

Q. Did Zaxcom amend its claims in the case in this IPR -- IPR2018-00972?

A. I don't recall.

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Q. So in paragraph 70, when you use the word "claims," you don't know whether you're referring to original claims or amended claims?

MR. FISHER: Object to the form.

THE WITNESS: As I said before, I'm referring to the claims that the PTAB based their decision on, but I don't know if they were the original or the amended without reading that entire decision again.

BY MS. CHIPPERSON:

Q. So based on your experience, were radio frequency dropouts a problem in the concerts you recorded prior to May of 2005?

MR. FISHER: Object to the form.

THE WITNESS: First, to clarify, it's not radio frequency dropouts, it's audio dropouts.

But in my recollection, because I was involved in the mixing of all of those after -- afterwards, I don't recall of any time where we had a dropout.

BY MS. CHIPPERSON:

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Q. Is one reason for an audio dropout a loss of radio frequency communication?

A. Between the transmitter and the receiver, that is one reason, yes.

Q. Would that be considered a radio frequency dropout?

A. That's not a term that a POSA would use because it implies that the radio frequency itself dropped out. It -- it would cause a dropout of audio packets that were being carried by that channel of communication.

Q. And what was your role in preventing dropouts during the recording of these concerts you have listed?

MR. FISHER: Object to form.

THE WITNESS: Crossing fingers was the number one role.

The best role was -- the more -- most important role was to make sure that the transmitters had good line of sight to the receivers in the venues. Usually it's objects such as metal objects or walls that would cause

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that kind of interference.

Other kind of dropout -- um, I would say that's -- that was my main role was to set the channels of -- the radio frequency channels of each of the receivers so that they don't overlap and cause interference with each other, with each of the transmitters. I'm sorry. And making sure that we use best practices in RF communications.

BY MS. CHIPPERSON:

Q. Do you have any experience preventing dropouts in the filming of a television show or movie?

A. Well, I don't work in the industry that does that. I have done however -- I've done recordings in studios with cameras and had to deal with preventing dropouts at WGBH studios, for example, and also at the USC studios.

Q. Have you ever been at a location where they were recording a motion picture or television show?

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A. Yes, several times.
Q. Do you recall how many times?
A. I don't know. Five or six.
Q. And what -- what was the show that was -- the shows -- what were the shows that were being recorded?
A. Well, these were all student productions, so I don't remember the titles of all of the shows. But at the USC School of Cinema, students have to make their own films, and that involves exactly what you said, sets and on-location recordings, production -- sound stages. So I've been in all of those.
I've also been present in sound stage recordings in the WGBH studios, so I have experience with that as well.
Q. So your experience with the filming of motion picture and television was in association with the student productions at USC?
MR. FISHER: Object to the form, mischaracterizes.
THE WITNESS: The productions were --

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the students were from USC, but the productions were not all at USC. Some of the sound stage elements were, but there was -- you know, there -- we visited Joshua Tree for some scenes. I'm trying to remember other places in Downtown Los Angeles, outdoor scenes.

BY MS. CHIPPERSON:

Q. Was this experience part of your duties as a professor at USC?

A. So the way -- yes. It was part of my job at USC to -- not to go do these productions but to further the research that I contribute to; that in an academic position, we get judged by papers and advancing science as it's recognized by others. And because the science that we were looking at here was the number of audio channels and how that infor- -- loudspeaker, playback channels, and how that influences human perception of direction and envelopment of sound, the best way to do that was not only by equations, but by doing hands-on recordings. And so, yes, that was -- that was a

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part of that research.

Q. So this experience was part of your duties as a professor at USC.

Yes or no?

A. I -- duties isn't the right term here. I'm saying I don't have duties. Like, I don't have -- I don't get judged what I did by the end of the week.

So it was -- my goal was to become a tenured professor and publish papers, and that's what I get judged on in my annual record or report. So it was part of that, yes.

Q. Were the students in these recordings your students or another professor's students?

A. Both.

Q. Did you have outdoor performances, outdoor recordings of these performances?

I think you mentioned the Joshua Tree.

Was that an outdoor recording?

A. It was. I was -- I guess it's a performance because there were actors, but, yes.

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It was part of a film. Yes.

Q. And how did you protect against audio dropouts in an outdoor performance?

A. There, it was not -- it was mostly not about walls being in the way, but it was distance, line of sight, and keeping the distance reasonable, and keeping the channels separated enough so they don't interfere with each other.

Q. So would a dropout occur when a transmitter worn by a performer moved out of range of a receiver?

MR. FISHER: Object to form.

THE WITNESS: That's -- it's possible, yes. That's one way that a dropout can occur.

BY MS. CHIPPERSON:

Q. Can a transmitter that's not in the range of a receiver properly transmit to that receiver?

MR. FISHER: Same objection.

THE WITNESS: Well, if it's

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completely out of range, I don't think it would even see the receiver as a -- as a receiver of its signal, right?

BY MS. CHIPPERSON:

Q. So would that result in a dropout?

MR. FISHER: Same objection.

THE WITNESS: If it was out of range, it would result in a no audio being transmitted, period.

BY MS. CHIPPERSON:

Q. Would you define no audio being transmitted as a dropout?

MR. FISHER: Same objection.

THE WITNESS: No. A dropout to me means there was audio being transmitted. Something happened, and some of it got lost, and then it got picked up again, so there's a gap in the audio.

BY MS. CHIPPERSON:

Q. So in your definition of dropout, there's always continuous communication between the transmitter and the receiver?

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MR. FISHER: Object to the form, mischaracterizes.

THE WITNESS: No. That's not what I said.

If there's a dropout, communication must have stopped for some reason. So it's not continuous. But when there's no dropout, there is continuous communication.

BY MS. CHIPPERSON:

Q. Is one form of communication dropping out that a transmitter has moved out of the range of its receiver?

A. That is one form. There are other forms, but that is one, yes.

Q. Is it possible to not have a dropout when a transmitter has moved out of the range of its receiver?

MR. FISHER: Object to the form.

THE WITNESS: To not -- the thing with the range is that it's not a hard line in the sand, so it degrades slowly depending on environmental conditions and other things. So

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you might -- if there's a specified range for which the receivers and transmitters are well within and you cross it by a little bit, you still might be fine. So I don't know how to answer that more precisely.

BY MS. CHIPPERSON:

Q. If you cross it by a lot and you're clearly out of range of the transmitter's receiver, will a dropout in communication occur?

MR. FISHER: Same objection.

THE WITNESS: Yes.

BY MS. CHIPPERSON:

Q. How did the movie or television industry deal with dropouts that occurred in May of 2005 and earlier?

MR. FISHER: Object to the form.

THE WITNESS: I mean, I don't know if I can speak for the entire industry.

In my experience, because I know several recording engineers, we meet at the Audio Engineering Society conferences, and there are papers presented there. Typically, they're

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-- they try to -- if they don't have a backup recording from another microphone that could fill in that gap, then they -- other techniques are used in post production and digital audio workstations to try to fill that gap or to minimize the -- any clicks or drops that would be audible.

BY MS. CHIPPERSON:

Q. Were backup recordings known prior to May 2005?

MR. FISHER: Object to the form.

THE WITNESS: Yes, they were.

BY MS. CHIPPERSON:

Q. What type of equipment would perform a backup recording prior to May of 2005?

A. Backup recordings have been around since the beginning of studio recording history. You can -- even before digital. Multiple tape recorders were used just in case there was a problem.

It depends on the situation. You could have a digital recorder that records

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straight to hard disk. There are digital audio tapes, multi-channel or two channel. There are many -- it depends on the availability of equipment and the situation and sometimes the budget.

Q. And where were these digital recorders located?

A. During the recording?

Q. Yeah.

A. Typically, near the equipment rack. Yeah.

Q. Would that digital recorder record ambient audio or individual audio?

MR. FISHER: Same objection, form.

THE WITNESS: Well, the purpose of a backup -- I think is what we're talking about here -- is to record everything at two different locations.

BY MS. CHIPPERSON:

Q. And by "equipment rack," do you mean sound cart?

Is -- would "sound cart" be another

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term for equipment rack?

MR. FISHER: Object to the form.

THE WITNESS: That is -- that is one type. In a studio, the equipment rack is in the control room. In the field, sometimes there's a sound cart or a truck in production, you know, in sports production or concerts, many different places.

BY MS. CHIPPERSON:

Q. And would a sound cart or an equipment rack need to change location to stay close to an actor or someone wearing a wireless transmitter?

MR. FISHER: Object to form.

THE WITNESS: That really depends on the kind of production. If it's wireless only or if it's wired, you typically want those within range of whatever technology is used to bring the audio from the performer to the recorder.

BY MS. CHIPPERSON:

Q. According to your experience, would a

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member of the sound crew need to notify the director if an actor wearing a wireless transmitter moved out of range of the sound cart?

MR. FISHER: Object to the form.

THE WITNESS: Yes. They typically do that so they can re-shoot the scene if possible. It's not always caught because the sound person may be distracted, is listening to other things, but, yes. When it's caught, it's usually -- they notify.

BY MS. CHIPPERSON:

Q. And what would typically happen if a director is notified that a transmitter moved out of range?

MR. FISHER: Same objection.

THE WITNESS: The director would probably go and listen to what happened to judge the severity of it, ask about whether it was also in all microphones, if there's coverage from other microphones.

I'm blending together multiple

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performance -- the director, when I mean that, in a movie. In a music production, it might be different because they would just do another take right away.

So multiple ways of checking would happen, and then deciding what to do after that.

BY MS. CHIPPERSON:

Q. And I think you said one possible outcome is you would refilm the scene; is that correct?

MR. FISHER: Object to form, mischaracterizes prior testimony.

THE WITNESS: That is one possible outcome.

In modern -- well, in all -- for many years, filmmaking, a lot of the production sound, wherever the scene was being shot, is actually not used or very little of it is used in the final film. The actors go into a stage which is called a loop stage and/or ADR, automatic -- automated dialogue recording [sic], and they rerecord in a studio environment their

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dialogue by lip-syncing exactly to what they were saying during the movie in the scene, and that obviously doesn't have dropouts because it's in a studio.

BY MS. CHIPPERSON:

Q. Would you consider the receipt of an Emmy Award from the Academy of Television Arts and Sciences to be a notable honor?

MR. FISHER: Object to the form.

THE WITNESS: I -- it depend- -- I don't know. Yes, I would. It depends on what area it was in I suppose.

BY MS. CHIPPERSON:

Q. Would you consider the receipt of a Technical Achievement Award from The Academy of Motion Picture Arts and Sciences to be a notable honor?

MR. FISHER: Same objection.

THE WITNESS: I don't know how to classify honors as notable or more or less notable. It's -- it's an award.

BY MS. CHIPPERSON:

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Q. Have you ever seen a 24-pound backpack used as a wireless transmitter?

A. I have not weighed every backpack that I have seen, so I don't know.

Q. Have you seen a backpack used as a wireless transmitter?

A. Well, a backpack by itself or with equipment in it or on it?

Q. A backpack similar to what is shown in Figure 1 of Strub?

We can go to that and pull that up.

MS. CHIPPERSON: Addison, that would be our Exhibit Number 6.

THE WITNESS: We could --

MR. FISHER: Hold on.

Object to the form.

And why don't we wait until the exhibit appears before you --

THE EXHIBIT TECHNICIAN: One moment. I'll get that Exhibit 6 pulled up.

And can I mark that as Exhibit 3 before I pull that up?

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MS. CHIPPERSON: Yes.

THE EXHIBIT TECHNICIAN: Okay. One moment.

And then I will also add that to the shared folder.

MS. CHIPPERSON: Thank you.

THE WITNESS: Actually, Ms. Chipperson, would this be an okay time to take a short break?

MS. CHIPPERSON: Sure. We've been going for a bit.

THE WITNESS: Okay.

I don't know what's a reasonable --

MS. CHIPPERSON: What do you feel comfortable with?

MR. FISHER: Do you want to say 10 minutes?

THE WITNESS: Ten minutes? Yeah.

MS. CHIPPERSON: Ten minutes?

That sounds good.

THE WITNESS: Okay. Thank you.

MS. CHIPPERSON: Okay. Thank you.

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And, Addison, do you think it makes sense to just make all of the exhibits available?

Although you've been pretty quick with this so -- or should we just wait and use them as needed?

THE EXHIBIT TECHNICIAN: If you're okay with me adding them all to the shared folder, I'm happy to do that.

MS. CHIPPERSON: Why don't you do that just so we can save a little time.

THE EXHIBIT TECHNICIAN: Yeah, definitely. Over the break, I will add all of those to the folder.

MS. CHIPPERSON: Thank you. I appreciate it.

THE EXHIBIT TECHNICIAN: You're welcome.

(A short recess was taken.)

(Deposition Exhibit 3 was marked for identification.)

MS. CHIPPERSON: So, Addison, could

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we go to page 6 of the exhibit that you have on the screen, which is Strub. Right there. Yes. Perfect.

Would it possible to rotate that 90 degrees clockwise?

MR. FISHER: Could you repeat that again?

What's the exhibit number now?

THE EXHIBIT TECHNICIAN: This will be Exhibit 3, and the file is 006.

BY MS. CHIPPERSON:

Q. Okay. So I think the question that we had was: Have you ever seen a wireless transmitter in the form of a backpack as shown in Figure 6?

MR. FISHER: Object to the form.

THE WITNESS: I wouldn't call it a wireless transmitter in the form of a backpack. The backpack has equipment in it, including a wireless transmitter and probably other things like a battery, but, so, yes. I've seen that kind of setup.

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BY MS. CHIPPERSON:

Q. Where have you seen this type of setup?

A. I have seen it -- let's see. It was -- I'm trying to remember. It -- it was an experimental system at a university that was doing research on immersive recordings with mobile units. This was -- I'm trying to remember where it was because I -- but possibly Carnegie Mellon.

It's not exactly the same picture, but it was a back- -- it was a backpack with batteries and a receiver -- a transmitter, excuse me, and a camera.

Q. What type of wireless transmitter was being used?

A. I don't remember the details. This was more than 20 years ago.

Q. So you don't recall what type of transmitter was included?

A. If you're asking --

MR. FISHER: Object to the form.

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THE WITNESS: If you're asking about the model, no, I don't. It was an RF transmitter mount in a very similar way in the diagram, and there were two or three people walking around in the lab environment, and they were communicating. It's been a long time, but I've seen similar things, yes.

BY MS. CHIPPERSON:

Q. In your experience, you've -- have you only seen these things in an experimental environment?

MR. FISHER: Same objection.

THE WITNESS: Well, no. Sound recording engineers -- now that I -- on location recording engineers also have backpacks or belt packs that carry a bunch of equipment, including batteries and portable mixers, wireless receivers and transmitters. The picture may look -- not look exactly like this, but it's worn on their body sometimes in the form of a belt, sometimes with batteries on the back.

BY MS. CHIPPERSON:

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Q. Was the sound engineer -- scratch that.

In that example, was the sound engineer being recorded?

MR. FISHER: Same objection.

THE WITNESS: The sound engineer had a microphone and a transmitter to be able to talk to people either on stage or -- I'm trying to remember if this was outdoor. This was probably outdoor, so people closer to the performers or maybe -- I don't know. I don't know who they were talking to, but there was a transmission from the sound engineer to either performers or assistants of performers.

BY MS. CHIPPERSON:

Q. In this example, was the audio of the sound engineer being recorded to a track?

MR. FISHER: Same objection.

THE WITNESS: I don't know the answer to that.

BY MS. CHIPPERSON:

Q. In a typical scenario, is the audio

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of a sound engineer recorded to a track?

MR. FISHER: Same objection.

THE WITNESS: It could be if they want a record of communications. I don't know if it's typical or not.

BY MS. CHIPPERSON:

Q. Okay. So in your declaration, you've reviewed the claims of the Zaxcom patents, the challenged claims, correct?

A. Correct.

Q. Do these challenged claims all require some form of transmitter?

A. I didn't memorize them. If you'd like, I can go look.

Q. I think we'll -- we'll scratch that.

A. Okay.

Q. So let's look at your declaration at page 118.

A. 118.

Q. So here you say -- well, you can go ahead.

Why don't you read your statement

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into the record?

My question for you is: Is this statement that you've written correct?

A. You're referring to paragraph 198?

Q. 118.

MS. CHIPPERSON: Oh, sorry. 118, please.

THE WITNESS: 118 paragraph or page?

BY MS. CHIPPERSON:

Q. Paragraph on page 65.

A. Okay. Because the one you have up -- I see it. Okay. It's not you. I gotcha.

Q. So my question is: Is this statement in paragraph 118 correct?

A. Yes.

Q. So where do you see recording unit 200 located in Figure 1?

MR. FISHER: Object to the form.

THE WITNESS: I don't know if Figure 1 is a detailed drawing of every wire and transmitter. I think it's more indicative of a scenario for Strub. It could be on person 107

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and person 101, that little oval thing on the strap.

It's not indicated if that's what you're asking.

BY MS. CHIPPERSON:

Q. What is item 200?

A. I need to look at the Strub exhibit.

Item 200 shown in his Figure 2 and elsewhere described is one example of a -- what he calls a recording device, and it shows the blocks of -- the component blocks that could be in that example.

Q. And what is depicted as 105 in Figure 1?

A. Well, it's pointing to the back of the person of 101, but I think I might have to search through the document to find that.

Q. That's fine.

A. Is that okay?

Q. Yes.

A. Okay. So in column 8 where they -- where Strub talks about Figure 1, line --

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starting at line 10, column 8: Each of the participants (designated by 101, 2, 3, and 4) are equipped with a recording unit (designated by the numerals 105, 6, 7, and 8), [as read], and then there's more discussion of that.

So it's a recording unit.

Q. Okay. And what is item 200?

A. Also searching. In column 11 -- it's referenced in several places, but in column 11: "FIG. 2 is a block diagram illustrating the functional components of a recording unit 200 in accordance with the invention."

And then further down, in the next paragraph, line 37, it describes what it includes, a system controller 201, and so on, and then goes on to talk about other ways of doing recording units, starting with Figure 3.

Q. So what is item 200?

A. It's a recording unit. One instance of a recording unit -- sorry. I --

Q. And you can -- we might -- just for the sake of time, we might want to keep -- you

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can keep your answers shorter, and you don't have to explain every -- every one, unless it's necessary.

A. Well, I --

MR. FISHER: Counsel, the witness has the right to give a fulsome answer and say -- and explain his answer, so he makes a clear record and is -- and testifies in a factually correct manner. He's not obligated to give sound bites.

MS. CHIPPERSON: Okay.

BY MS. CHIPPERSON:

Q. Well, what -- is --

A. I just want to --

Q. -- item 200 a recording unit?

A. It -- I was going to --

MR. FISHER: Object to the form.

THE WITNESS: I was going to just say that item 200 is one example of the -- of recording -- of a recording unit that Strub gives. It is actually a subset, exact subset of the more general one in Figure 3, which is unit

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-- recording unit 300 on which he spends probably the next 50 columns of his patent describing every component.

BY MS. CHIPPERSON:

Q. So is recording unit 200 shown in Figure 1?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: Figure 1 shows a recording unit without designating which one it is. Considering that the patent of Strub is heavily -- tens of pages focused on recording unit 300 which is the most general one of which recording unit 200 is a simplified subset, I would think that a POSA would look at that and say this is the recording unit that he's talking about.

BY MS. CHIPPERSON:

Q. Is it your position that there are no recording units labeled in Figure 1?

MR. FISHER: Object to the form.

THE WITNESS: I thought we

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established that 105 was a recording unit but . . .

BY MS. CHIPPERSON:

Q. Yes.

Is recording unit 200 shown in Figure 1?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: It's not indicated by number, but since the recording unit that Strub deals with is unit 300, I would assume that that's the one that's in that figure.

BY MS. CHIPPERSON:

Q. Is recording unit 200 the same as recording unit 105?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: Recording unit 105 doesn't designate if it's 200 or 300, but my opinion is that it is the most general one because that's what Strub is all about. 200 is just a simplified example in one of the many

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instances of recording units that he talks about.

BY MS. CHIPPERSON:

Q. Does Strub teach that recording units 105 through 108 have a transmitter?

MR. FISHER: Object to form.

THE WITNESS: Strub's teaching about recording units with transmitters is -- comes later when he brings in what is inside these -- Figure 1 doesn't go into detail of the components of a recording unit. The rest of the patent does.

BY MS. CHIPPERSON:

Q. Which recording unit of Strub has a transmitter?

MR. FISHER: Object to the form.

THE WITNESS: The recording unit in Figure 3.

BY MS. CHIPPERSON:

Q. And which recording unit is that?

A. It's 300.

Q. Do any of the other recording units

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taught by Strub include a transmitter?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: Strub goes into great detail about the applications of these transmitters. For example, skiing, bicycle riding, all of those a POSA would understand have transmitters in them if they're communicating with others.

BY MS. CHIPPERSON:

Q. Does Figure 2 show a transmitter?

A. Figure 2 is four blocks from Figure 3 that do not include the transmitter.

Q. And which recording unit is depicted in Figure 2?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: I guess he calls it 200.

BY MS. CHIPPERSON:

Q. So does recording unit 200 have a transmitter as taught by Strub?

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MR. FISHER: Same objection.

THE WITNESS: Recording unit 200 does not. It's a subset of 300 that does.

BY MS. CHIPPERSON:

Q. Thank you.

Where does Strub teach that 300 is lightweight or small?

And it -- I'm still looking at your paragraph 119 in your declaration. So for reference, you say that these recording units are lightweight and small.

So where does Strub teach that recording unit 300 is lightweight?

MR. FISHER: Sorry, Counsel.

Which paragraph of the declaration are you referring to?

MS. CHIPPERSON: 119.

THE WITNESS: So I have several citations there.

Are you asking me to point you to -- to point to those or something else?

BY MS. CHIPPERSON:

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Q. I -- I am asking where Strub teaches that recording unit 300 is lightweight or small.

MR. FISHER: Same objection, form.

THE WITNESS: So it's -- my opinion is that Strub's entire patent, 94 columns of it or whatever it is, is talking about a recording unit that has all of the components in Figure 3 because that is the most general one. He may not say 300 in the abstract, but that is what he's talking about because that's what the whole patent is about.

I don't remember -- I have to go look at what column 8 citations and the other ones are. I do recall that in the 24-pound question that you asked me before, the ending of that paragraph is that the 24 pounds of a backpack would be if you basically bought those components off the shelf, a POSA, and then says they can be made much smaller and lighter at the end of that paragraph and further down.

So he's clearly talking about small portable recorders, and the only one that he

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just spends multiple parts of his specification on is the one -- describing the components in the block diagram of 300.

BY MS. CHIPPERSON:

Q. In order for Strub to teach the elements of the Zaxcom claims -- strike that.

To your knowledge, was the invention of Strub ever commercialized?

A. I don't know.

Q. To your knowledge, was the invention of Strub ever built?

A. I don't know.

Q. Are you aware of any product that is commercially available that has the features taught by Strub?

MR. FISHER: Object to the form.

THE WITNESS: The features -- which are the features?

You mean Figure 3 features?

BY MS. CHIPPERSON:

Q. All features. I didn't -- my question's not limited.

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MR. FISHER: Same objection.

THE WITNESS: I'm sorry. He has so many features that I'd have to go look through them to see. There are certainly products today that have features, some of the features that I list there in paragraph 119: position sensing, transmitting, receiving, recording, but I don't know how to give a full answer for it because I'm not -- I don't know if I know every commercial product out there.

BY MS. CHIPPERSON:

Q. Do you know the filing date of Strub?

A. I have it here somewhere. No. I don't recall it. I have to look it up.

Q. I can --

A. It looks like April 21st, 2000.

Q. Yes. That's correct.

A. Okay.

Q. So do you believe that in April of 2000, a person of skill in the art in audio and wireless communications could have built a battery-powered recording unit that was wearable

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on the body with the capability of simultaneously recording video, displaying video, wirelessly transmitting video, and receiving video?

MR. FISHER: Object to the form.

THE WITNESS: I believe a person of skill with those skills could have built that. I -- as I mentioned, I saw versions in the university lab that had those, but if you're asking me about product, I don't know the answer to that. I don't -- I don't know if there -- it's technically possible to build. I don't know if there was one at that time (witness indicating).

BY MS. CHIPPERSON:

Q. Do you believe that a person of skill in the art in April of 2000 could have built a battery-powered recording unit that was wearable on the body with the capability of simultaneously recording video, displaying video, receiving video, and transmitting video simultaneously in the form -- in the form of a

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personal camcorder?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: I'm sorry.

You said wearable on the body in the form of a personal camcorder. I'm not able to reconcile those two statements.

BY MS. CHIPPERSON:

Q. I'll re- -- I'll restate the question.

Are you -- do you believe that in April of 2000, a person of skill in the art in audio and wireless communications would be able to build a recording unit that was battery powered, wearable on the body, and capable of simultaneously recording video, displaying video, receiving video, and transmitting video in the size of a personal camcorder?

MR. FISHER: Object to the form.

THE WITNESS: Yes, I do.

BY MS. CHIPPERSON:

Q. And what size would you say?

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What would you say the size of such a device could be approximately?

MR. FISHER: Objection.

THE WITNESS: The size of a reasonably sized set of VR goggles with microphones and screens and cameras on them.

BY MS. CHIPPERSON:

Q. And this is in April of 2002?

A. Yes. That was the beginning of the multimedia industry --

Q. Sorry. Sorry. April of 2000.

A. 2000. Yes. I understood it to be 2000.

Yes. There was -- I saw -- I personally saw demonstrations of those kinds of goggles with head trackers and cameras, wireless transmission, all of the features that you mentioned. So I believe it's poss- -- that wasn't what you were asking me. You were asking me if it's possible that somebody could build it, and I firmly believe that it is -- that it was.

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Q. What do you believe was the size of a personal camcorder in April 2000?

MR. FISHER: Object to the form.

THE WITNESS: I don't know. 8 inches by 3, something like that, by 2 wide.

BY MS. CHIPPERSON:

Q. So approximately 8 inches by 3 inches by 2 inches.

Okay. So I'll ask the question again just for clarity.

Do you believe that in April of 2000, a person of skill in the art in audio and wireless communications could have built a battery-powered recording unit that was wearable on the body with the capability of simultaneously recording video, displaying video, receiving video, and transmitting video in a package that was equal to or smaller than 8 inches by 3 inches by 2 inches?

MR. FISHER: Same objection, asked and answered.

THE WITNESS: I do, and that's why I

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gave you the example of the goggles. They were roughly the same size worn on the head and had all those components in them.

I personally saw demonstrations in the USC labs, the computer vision labs and others -- well, the computer vision lab. There was demonstrations of that in a room with two or three students walking around doing what you described.

BY MS. CHIPPERSON:

Q. What were the dimensions of the VR goggles?

A. They're roughly the size of a camera. I mean, I don't know. Whatever the width of the head is, 6 or 8 inches (witness indicating). I'm sorry. I don't -- it's goggles that were worn on the head in front of your eyes with screens and transmitters and other things, batteries.

Q. In April 2000, are you aware of a personal camcorder that was able to transmit or stream video?

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MR. FISHER: Object to the form.

THE WITNESS: There were certainly camcorders that could transmit video, but I don't know -- professional ones. I don't know --

BY MS. CHIPPERSON:

Q. Which personal camcorders could transmit video in April of 2000?

MR. FISHER: Same objection.

THE WITNESS: Yeah. I'm having trouble with placing them at the exact date, so I'm not -- I guess my best answer is I don't know. It was around that time, so, yeah.

BY MS. CHIPPERSON:

Q. So you're not sure whether there was a personal camcorder available in April 2000 that was capable of transmitting video?

MR. FISHER: Same objection.

THE WITNESS: No. That wasn't something that I looked at for this report.

BY MS. CHIPPERSON:

Q. Are you aware of any personal

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camcorders that existed in April of 2000 that were capable of receiving video from an external device?

A. I am aware of camcorders that were receiving video from an external device, but, again, I don't know the exact dates.

Canon had some models that could do that, but I'm not able to give you a more precise date.

Q. Do you believe that model existed in April of 2000 or earlier?

A. I believe so, but, again, I don't have -- I don't have a recollection of the date that I first saw it.

Q. And approximately how much did a conventional camcorder weigh in April of 2000?

A. Um --

MR. FISHER: Object to the form.

THE WITNESS: I don't know. I guess a pound. I've -- I don't know.

BY MS. CHIPPERSON:

Q. Do you think that a conventional

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camcorder as it existed in April of 2000 was able to be fit in a pocket?

MR. FISHER: Same objection.

THE WITNESS: No. I don't think so.

It depends on the size of the pocket, but, no.

BY MS. CHIPPERSON:

Q. And to clarify, I'm talking about a pants pocket. Let's use that as an example.

MR. FISHER: Same objection.

THE WITNESS: No. I don't think so.

BY MS. CHIPPERSON:

Q. So does Strub teach a person of skill in the art how to make a device that could simultaneously record, transmit, receive, and display video in the size of a conventional camcorder?

MR. FISHER: Object to the form.

THE WITNESS: Strub teaches what would -- all the components would be for somebody to build a device that he describes in his patent. He gives several examples of very

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small forms of such devices where this invention could be used, for example, mounting on a bicycle or somebody skiing. Presumably, those are very small. So in my mind, he does teach that, yes.

BY MS. CHIPPERSON:

Q. Does Strub teach the components that would be required to build a device that could simultaneously record, transmit, receive, and display video in the size of a conventional camcorder?

MR. FISHER: Same objection, asked and answered.

THE WITNESS: The components -- so he teaches the function of each block in Figure 3, but I don't know what you mean by "components."

BY MS. CHIPPERSON:

Q. Does Strub teach every component that would be required to make a device that could simultaneously record, transmit, receive, and display video in the size of a conventional camcorder?

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MR. FISHER: Same objection, asked and answered.

THE WITNESS: A POSA looking at Figure 3 of Strub would know exactly what every component is. If you're asking if Strub teaches how to manufacture the plastics or metals, that's not what the patent is about. That becomes just a manufacturing problem. The components to me are something that makes it work, and that's what he teaches in Figure 3 and in the whole patent, of course (witness indicating).

BY MS. CHIPPERSON:

Q. So does Strub teach every component that would be required to make a device that records, displays, transmits, and receives video in the size of a camcorder?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: Yes. Figure 3 are those components, and I believe that's what Strub is teaching.

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BY MS. CHIPPERSON:

Q. So what does Strub teach for a -- let's turn -- sorry.

Let's turn to Figure 3 now of Strub, which is page 5.

A. Yes. I have it.

Q. Okay. So do you see the system controller 301 in the center of that figure?

A. Um-huh, yes.

Q. What does Strub teach as that component?

MR. FISHER: Object to the form.

THE WITNESS: I'm looking through the Strub patent.

BY MS. CHIPPERSON:

Q. That's fine.

A. So in column 12 is one place that's helpful here, line 10 or line 11, "the system controller 301 controls the operation of, and mediates interaction among, the other components of the recording unit 300."

Q. Yes.

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Does Strub teach an actual component that can be used as system controller 301?

MR. FISHER: Object to the form.

THE WITNESS: So when you say "actual component," are you referring to an electronics component?

Is that how am I to understand it?

BY MS. CHIPPERSON:

Q. Yes.

Let's actually just turn to column 14, the first paragraph of Strub, which is on page 19, and maybe this will help you.

What does Strub teach as a component that could be used as system controller 301?

MR. FISHER: Same objection.

THE WITNESS: As one example, he teaches a Motorola 68HC11 microcontroller which was a microcontroller chip available at the time. I think that's an example he uses there.

BY MS. CHIPPERSON:

Q. Are you familiar with the Motorola 68HC11 microcontroller?

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A. I'm familiar with the Motorola series of microcontrollers. I don't know if this exact part number -- they had other models in that series, but I am familiar with the Motorola 68XXX, yes.

Q. And in April of 2000, how many bits is a Motorola 68XXX microcontroller?

MR. FISHER: Object to the form.

BY MS. CHIPPERSON:

Q. Are you familiar -- sorry.

Go ahead. Answer the question.

A. Well, I'm -- I was going to ask when you say "bits," are you talking about -- what kind of bits are you talking about?

The processing bits?

The --

Q. Um-huh.

MR. FISHER: Same objection.

THE WITNESS: I don't recall.

Probably 16, but I'm not sure. It's been a while.

BY MS. CHIPPERSON:

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Q. Okay. Is the Motorola 68XX series of microcontrollers capable of displaying video?

MR. FISHER: Same objection.

THE WITNESS: The Motorola microcontroller is not a display device, so I'm not sure what that means.

BY MS. CHIPPERSON:

Q. In Figure 3, does Strub show that the system controller receives video from a video data acquisition device?

MR. FISHER: Object to the form.

THE WITNESS: Yes.

BY MS. CHIPPERSON:

Q. Is the Motorola 68XX series, as it existed in April of 2000, capable of receiving video from a video data acquisition device?

MR. FISHER: Same objection.

THE WITNESS: Of receiving it?

Yes. I'm sure it was. I don't recall exactly the performance of it, but if he's listing it as an example, I would think it would be.

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BY MS. CHIPPERSON:

Q. Does the system controller -- does the Motorola 68XX series of microcontrollers, as it existed in April of 2000, have the ability to be wired directly to the video data acquisition device?

Actually, scratch that.

What does Strub teach as an example of a video data acquisition device?

MR. FISHER: Same objection.

THE WITNESS: Let me search for that.

I'm looking at column 31, at the top. It looks like he's talking about a -- at the time, an NTSC video acquisition -- video data acquisition device.

BY MS. CHIPPERSON:

Q. Does Strub teach that Super Circuits PC-17YC can act as a video data acquisition device?

MR. FISHER: Object to the form.

THE WITNESS: Super Circuits.

I have to search for these terms

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because I haven't memorized it. So Super . . .

So could you -- you don't have to repeat the model number, but could you repeat the rest of the question?

BY MS. CHIPPERSON:

Q. Does Strub teach that a Super Circuits PC-17YC video camera can be used for the video data acquisition device 302 of Figure 3?

MR. FISHER: Object to the form.

THE WITNESS: So he talks about that in -- at the bottom of column 19 and the top of column 20. And as a nonlimiting example, he lists this camera model.

So, yes. I think the answer to your question is, yes, he does teach that.

BY MS. CHIPPERSON:

Q. And are you aware whether a Super Circuits PC-17YC video camera could be connected to a Motorola 68HC11 as shown in Figure 3?

MR. FISHER: Same objection.

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And, Dr. K, could I ask that you maybe slow down and speak a little more loudly to make sure that the reporter can get everything?

THE WITNESS: Yes. Sorry.

Okay. I'm not familiar with that specific model, but, in general, in order to get video into a processing chip like the Motorola, the right kinds of connectors have to be provided on the board on which the chip resides.

And so for him to be showing that as an example, the system controller chip in a real product implementation would be sitting on a PC board that has connectors to outside audio and video data acquisition devices.

BY MS. CHIPPERSON:

Q. So would the Motorola 68XX system controllers that existed in April of 2000 have the processing speed to handle realtime video acquisition from the video data acquisition device 302?

MR. FISHER: Object to form.

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THE WITNESS: I don't have the specifications in front of me, but I know they were used in such -- in multimedia-type applications, and Strub is telling us this both in the specification and in the diagram.

BY MS. CHIPPERSON:

Q. Would it be helpful if we pulled up the specifications for the M68HC11?

A. Maybe. I don't know. If I can just glance at it. I like to give opinions that I've studied, not just on the fly, so . . .

Q. But you consider yourself a person of skill in the art as of April 2000 when Strub was filed, correct?

MR. FISHER: Object to the form.

THE WITNESS: Yes. I just don't know if I could -- if I memorized every specification of every part that was available at the time.

BY MS. CHIPPERSON:

Q. And is it your position that somebody of skill in the art could make the invention of Strub by reading the Strub patent?

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MR. FISHER: Object to the form.

THE WITNESS: I think I said that before.

Yes. It is my opinion. I don't know if they would use the example of this camera that he says illustratively is a visual data acquisition device. I don't think he limits the use of which camera to use, but the functionality of what Strub uses could definitely be created by following his teachings.

BY MS. CHIPPERSON:

Q. So could you make the invention of Strub based on what is taught by Strub?

MR. FISHER: Same objection.

THE WITNESS: Could I make the inven-- you mean, could I implement it?

BY MS. CHIPPERSON:

Q. Yes.

MR. FISHER: Same objection.

THE WITNESS: I could. It's not a single person. It would be a team of engineers

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doing it, maybe guided by the expert. Somebody has to design the enclosures and place the antennas and design the PC boards, but that's common engineering knowledge that is -- that engineers who are given functional diagrams perform in order to create a device, if that's the tasks they're giving.

BY MS. CHIPPERSON:

Q. So would you say experimentation would be required to build the product of Strub based on the Strub specification?

MR. FISHER: Same objection.

THE WITNESS: No. I don't think experimentation would be required. I said -- I think I said implementation. I'm not sure what I said, but not experimentation.

BY MS. CHIPPERSON:

Q. What would the housing look like?

A. That --

MR. FISHER: Object to form.

THE WITNESS: That's a decision that is often made outside of engineering

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departments. It's the product management or the product design that designs -- that decides on the shape of housing so --

BY MS. CHIPPERSON:

Q. Would the electronic components of Strub work without a proper housing?

MR. FISHER: Object to the form.

THE WITNESS: All electronics require housing. You can't really make a product with just hanging circuit boards, so --

BY MS. CHIPPERSON:

Q. Does Strub teach that housing?

MR. FISHER: Same objection.

THE WITNESS: I don't know. I'd have to go look, but that's so obvious that I don't know that it would even be needed. That's common knowledge.

BY MS. CHIPPERSON:

Q. But experimentation -- would experimentation be required to create the housing?

MR. FISHER: Same objection.

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THE WITNESS: I'm unclear on what kind of experimentation you mean.

Does it fit?

Does it -- I would think that the dimensioning would be known before the housing is designed because the engineers would tell the product design people: This is the smallest we can make this circuit.

And then the product design people would design a housing that is driven by other -- perhaps other needs as well, including aesthetics.

BY MS. CHIPPERSON:

Q. So where does Strub teach the housing that would be required?

MR. FISHER: Same objection.

THE WITNESS: I can look for that if you'd like, but I think he may not say it because it's so obvious that you need to house electronics.

BY MS. CHIPPERSON:

Q. Would the electronics require RF

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shielding?

A. In --

MR. FISHER: Same objection.

THE WITNESS: In the case of wireless communication components that are part of them, yes.

BY MS. CHIPPERSON:

Q. And where does Strub teach RF shielding?

MR. FISHER: Same objection.

THE WITNESS: I don't know if it's in there, but, again, that's obvious wireless communication knowledge. Strub is trying to advance the knowledge by -- with his invention, not talk about basic things.

BY MS. CHIPPERSON:

Q. What does Strub teach as the data storage device 305?

MS. CHIPPERSON: And, Addison, if we can go to page 50, please, of Strub and look at column 76, lines 26 through 30?

THE WITNESS: Sorry. I'm scrolling

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here. It's just easier for me to read it here.
Column 76?
BY MS. CHIPPERSON:
Q. Yes.
A. Lines 23 through 30?
MR. FISHER: Sorry.
What lines were those, Counsel?
MS. CHIPPERSON: 26 through 30.
THE WITNESS: 26 (sotto voce).
Okay. I see it.
BY MS. CHIPPERSON:
Q. So does Strub teach that flash memory can be used as a data storage device?
A. That's one of the examples, yes.
Q. Are you familiar with flash drives as they existed in April of 2000?
A. Yes.
Q. Do you know when flash drives were first introduced?
A. I don't know the exact date, but it was probably in the late 1990s.
Q. And how do USB flash drives work --

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scratch that.

Do USB flash drives plug into a USB port to operate?

A. Yes.

Q. Do you know what the largest capacity flash drive that was available in April of 2000? [sic]

A. No. I'm sorry. I don't remember that.

Q. Would you say it was less than 10 megabytes, more than 10 megabytes?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: I'd prefer not to guess because I don't -- I didn't look at the history of evolution of drives, so --

BY MS. CHIPPERSON:

Q. That's fine.

Are you familiar with the IBM DiskOnKey flash drive?

A. DiskOnKey. No. I don't remember that one.

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Q. So how much video data could you store on an 8 megabyte flash drive approximately?

MR. FISHER: Object to the form.

THE WITNESS: That -- it really depends on how it's stored, what the resolution of the video is, how much compression is being used. I don't know.

BY MS. CHIPPERSON:

Q. What if we compressed the video and the video was low quality?

Then how many minutes of video do you think you could store on an 8 megabyte flash drive?

MR. FISHER: Same objection.

THE WITNESS: Without doing the calculation and knowing the size, I would say a few -- a few minutes, but I -- this is just a total guess.

BY MS. CHIPPERSON:

Q. Okay. And what does Strub teach as the operational time for a recording unit?

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A. The operational time.

Is that a term that he uses?

Q. I can -- let's go to column 13, lines 18 through 21.

A. "Is it desirable that the power supply" -- that one?

Q. Yes, um-huh.

A. He gives an example, several hours, e.g., 2 to 5, without recharging.

Q. So if you were to record severely compressed, low-quality video for 2 to 5 hours of time using what we're going to say 8 megabyte flash drives, how many flash drives would you need?

MR. FISHER: Object to form, assumes facts not in evidence.

THE WITNESS: Yeah. I don't know how to answer that. I don't have exact numbers for that.

BY MS. CHIPPERSON:

Q. So if an 8 megabyte flash drive can record for a few minutes, do you agree that a

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large quantity of them would be required to record for 2 to 5 hours?

MR. FISHER: Same objections.

THE WITNESS: So my previous answer, as I said, was a guess. I don't know how many minutes, but . . .

And the 2 to 5 hours, I'm not sure he means continuous recording. I think he's saying you're out in the field, and you want your pack to last 2 to 5 hours. But, hey, if -- whatever the drive was could fit on one drive, you'd -- you would need more than one to record many hours, yes.

BY MS. CHIPPERSON:

Q. So if one 8 megabyte flash drive could record a few minutes, then to record one hour would require how many flash drives --

MR. FISHER: Same objections.

BY MS. CHIPPERSON:

Q. -- in your experience?

A. This sounds like one of those math problems in high school, but I don't --

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Q. Well, you are a person of skill in the art.

A. I understand. It's just that we're starting with kind of an unknown quantity.

Q. No. We're talking about 8 mill- -- millibyte flash drives -- sorry, megabyte.

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: If we were to use my guess of a few minutes, let's say 10 minutes, then you would need 6 for one hour, but I don't know if that's the right number.

BY MS. CHIPPERSON:

Q. Okay. And it's your position -- is it your position in your declaration that the Strub recording unit shown in Figure 3 could receive data, video data from other recording units?

And we can go to paragraph 76 of your declaration, page 39.

A. Okay.

MR. FISHER: Object to the form.

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THE WITNESS: Yes. That's right.

BY MS. CHIPPERSON:

Q. Okay. So if the recording unit of Figure 3 -- strike that.

How would the recording unit of Figure 3 receive data from -- for other transmitters?

A. Presumably through the receiver 310.

Q. Would the receiver 310 receive all four data streams simultaneously?

A. I'm sorry.

What are the four?

Q. In your declaration -- I'm taking number four as an example from the first page of the '443 patent. We can pull that up for reference.

But in your declaration, you're talking about how one unit, one Strub recording unit can receive audio and video data wirelessly from other recording units, correct?

A. Yes.

Q. Okay. I chose the number four

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because that happens to be what's shown on the front page of the '443 patent.

Would you like me to pull that up?

It's just an example number, so . . .

So in that example that's shown in the Zaxcom patent, how would the Strub recording unit of Figure 3 receive audio and video data from four other units?

MR. FISHER: Object to the form --

THE WITNESS: Maybe we do have --

MR. FISHER: -- hypothetical.

THE WITNESS: Sorry.

Maybe we do have to look at it because I -- the four devices that I'm thinking of don't have video. I think they're -- in the Zaxcom patent. I think they're just audio transmitters, unless I remember incorrectly.

BY MS. CHIPPERSON:

Q. Well, in your declaration you state that Strub discloses a plurality of wearable audio/video recording units, each storing locally generated audio and video and wirelessly

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transmitting the same audio and video to one or more of the other wearable devices. [as read]

So that's what we're talking about.

And I'm saying with one or more, we're using an example of four as shown in the Zaxcom patent.

MS. CHIPPERSON: But let -- let's pull the Zaxcom patent up, '443 again.

THE EXHIBIT TECHNICIAN: Which exhibit was that?

MS. CHIPPERSON: It's our original Exhibit 2.

THE EXHIBIT TECHNICIAN: Okay.

One moment. Let me get that pulled up, and I will mark that as Exhibit 4.

MS. CHIPPERSON: Thank you.

(Deposition Exhibit 4 was marked for identification.)

THE EXHIBIT TECHNICIAN: All right. The exhibit is on the screen.

MS. CHIPPERSON: Let's go to Figure 1, which is the figure that's displayed on the

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front page.

BY MS. CHIPPERSON:

Q. So, Dr. K, why don't you tell us what's happening in the Figure 1 of the Zaxcom patents?

A. I don't know what everything's happening, but it looks like there are four devices transmitting. I believe, though, that those are audio devices, unless I am incorrectly recalling that. Yeah. Those are local audio devices.

So I guess what I'm trying to say is Strub talks about video in addition to audio, and so it's possible that Strub could -- Strub's invention clearly would allow that, the scenario that is graphically depicted in Figure 1 of Strub. I just want it to be clear that the four devices that are shown in '443 Figure 1 are not video devices.

Q. And where are those four devices transmitting to in Figure 1?

A. To the receiver 106.

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Q. Okay. So if we go back to your declaration, the first sentence of paragraph 76 --

A. Um-huh, yes.

Q. -- you're stating that the Strub recording units can store locally generated audio and video and wirelessly transmit the same audio and video to one or more of the other wearable devices.

Is that correct?

A. Yes.

Q. Okay. So my question is: When you look at Figure 3 of Strub, if it is transmitting to one or more other wearable devices, how are those other wearable devices -- let me ask a different question. Scratch that.

If the unit shown in Figure 3 of Strub is transmitting auto and video to one or more other devices, we can even say two for the sake of argument, how are they transmitting that audio and video?

A. Yeah. There's a wireless protocol.

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I'm just looking for the specification. I don't know if he specifies the wireless protocol. He specifies several wired protocols, but . . .

I did just a quick search, but the answer to your question is that they are transmitting through a wireless protocol of which there are several off the shelf. And so as long as the receiver and transmitter are built to comply with that wireless protocol, like an RF one or an IEEE one, then that's how.

Q. But how is the device of Figure 3 -- what's -- let's back up. Scratch that.

MR. FISHER: Counsel, it's actually noon here, and we were thinking of taking a lunch break if we could do that.

MS. CHIPPERSON: Sorry.

What time is it?

MR. FISHER: Noon.

MS. CHIPPERSON: Noon for you.

Okay. Yeah. I think that's fine.

So how long?

MR. FISHER: 45 minutes, I guess.

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MS. CHIPPERSON: Okay.

So I think that would put us back at 3:45 our time --

MR. FISHER: Yeah.

MS. CHIPPERSON: -- 12:45 your time?

MR. FISHER: Yeah. That's right.

THE WITNESS: That's fine.

MS. CHIPPERSON: Yeah. That's fine.

THE WITNESS: Great. Thank you.

(A lunch recess was taken.)

BY MS. CHIPPERSON:

Q. Okay. Let's see.

Where were we at here?

MS. CHIPPERSON: Let's go to the 004 Exhibit of the '443 patent, please, to Figure 1.

THE EXHIBIT TECHNICIAN: Okay. And we'll be marking that as Exhibit 5?

MS. CHIPPERSON: No. We've used that one before. That's your Exhibit Number 4.

THE EXHIBIT TECHNICIAN: Oh, okay. Thank you.

MS. CHIPPERSON: Um-huh.

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MR. FISHER: Sorry.

We're going to the '443 patent, you said?

MS. CHIPPERSON: Yes.

MR. FISHER: So file number 002?

THE EXHIBIT TECHNICIAN: Correct.

MS. CHIPPERSON: Yes.

THE EXHIBIT TECHNICIAN: It looks like we are on page 2, and I have that up on the screen as well.

BY MS. CHIPPERSON:

Q. Okay. So, Dr. K, is it your position that Strub teaches the system shown in Figure 1?

MR. FISHER: I object to the form.

THE WITNESS: Strub teaches the functionality of the system, if that's what you're implying, but I don't know. If -- that's -- Strub teaches the functions that the system performs.

BY MS. CHIPPERSON:

Q. And what component in Strub performs the function of item 106?

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MR. FISHER: Same objection.

THE WITNESS: Let's do a quick check here.

That's the receiver. So it would be 310, equivalent to 310 in Figure 3 of Strub.

BY MS. CHIPPERSON:

Q. 310.

A. Yes, of -- page 5 of Strub. It's mentioned elsewhere, but I'm just pointing to the figure.

Q. So it's your position that receiver 310 shown in Figure 3 of Strub is -- performs the same function as receiver 106 in Figure 1 of the '443 patent?

MR. FISHER: Object to the form.

THE WITNESS: It performs the function of a receiver. I need to look to go look at the '443 again to see if 106 does other things.

Would you like me to do that?

BY MS. CHIPPERSON:

Q. Yes.

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A. So what I'm seeing here -- so there's -- the '443 gives detail on the protocols used in the receiver. I don't know that -- so Strub is using an off-the-shelf-type receiver, transmit architecture, so it's hard for me to compare.

But at a high level, the receiver is receiving the streams from the transmitters, and that's what's happening in Strub as well.

Q. So in Strub, does receiver 310 receive audio and video from other recording units?

A. Yes.

Q. And how many recording units?

A. I don't know that Strub specifies a maximum number. It's illustrated in Figure 1. There are a few, but I don't know that he specifies a maximum number.

Q. So would you say at least three?

A. I'd have to look through Strub. I don't know that he . . .

Q. Does Strub show four recording units

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in Figure 1?

A. Strub -- yes.

Q. And does the Zaxcom patent show the ability of receiver 106 to receive data from four transmitters?

A. In that figure, it does, yes.

Q. Do you believe that Strub teaches a system where data could be received at a recording unit from four other recording units?

A. I do. I don't see any limitation in Strub.

Q. Okay.

A. Yeah.

Q. Okay. So looking back at Figure 3 of Strub -- do you need us to pull that back up?

Okay.

A. No. I have it here.

MS. CHIPPERSON: You're fast, Addison. So thank you.

BY MS. CHIPPERSON:

Q. Receiver 310, if this recording unit is receiving audio and video from four other

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devices, is that data stream coming through receiver 310?

A. Yes.

Q. Okay. And how does receiver 310 receive four different data streams?

A. It -- it depends on the implementation on the protocol. The receiver could have multiple channels. The transmission scheme could be one of many types: UHF, VHF.

Q. What does Strub teach as far as the receiver being able to receive audio and visual data from multiple other units?

A. Again, I don't know that he teaches a number, but based on the scenario that he teaches of -- I can't remember -- all them people singing happy birthday and people being together at a concert and other places. It's certainly multiple, but I'm not sure that he gives a number. I'd really have to go look again.

Q. My question's a little different than what you're answering.

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I'm asking, how does Strub teach a person of skill in the art to use the receiver 310 to receive four different data streams?

I know you said -- you said there's multiple embodiments.

I'm asking you what does Strub teach as a possible embodiment?

A. So I -- a POSA looking at this would understand that Strub is assuming that its commodity network is used, like the examples of what I mentioned before. So a person designing a product, they're using the inner workings. They use this block diagram of Strub, would pick the appropriate receiver/transmitter and wireless protocol to support the number of streams that they wanted to support.

Q. What does Strub teach as an example for transmitter 309?

A. A quick search.

It just says it receives and transmits signals, but, again, it's the same -- whatever protocol is used by the receiver, the

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transmitter has to be compliant with it so that the path from one to the other is consistent.

Q. Let's take a look at Strub at column 38, which is page 31, please.

A. Yep.

Q. So is that an example of what Strub teaches for transmitter 309?

A. You're saying at the top of 38?

Q. Yes. You may want to start at the bottom of -- yes. I think the top of 38 is fine.

A. Yeah. I think that's -- so he gives one example of 2.4 gigahertz, but then says "other parts of the frequency spectrum can be used."

So those are the examples I mentioned before, UHF, VHF, and others.

Q. But the type of transmitter, would that be an analog television signal transmitter and receiver?

MR. FISHER: Object to the form.

THE WITNESS: I think he's just using

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that as an example. At the time, probably still, analog television receivers were using 2.4 gigahertz --

THE COURT REPORTER: I'm sorry.

You're going to have to slow down, Doctor. You're talking way too fast for me.

THE WITNESS: Sorry. Sorry. Sorry.

THE COURT REPORTER: Could you repeat that answer?

Thank you.

THE WITNESS: I think Strub uses this as an example. So 2.4 gigahertz is a frequency that was used, and it probably still is used by analog television, but I don't think he's teaching to use just analog.

BY MS. CHIPPERSON:

Q. Does Strub teach that one version of transmitter 309 is an analog television signal transmitter?

A. To me, this is a nonlimiting example. It's just an example.

"Illustratively 2.4 gigahertz (the

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'nominal' frequency)" --

Q. Well, please answer yes or no.

MR. FISHER: Object to the form.

The witness can answer how he chooses fit -- how he sees fit.

THE WITNESS: This example does list that analog is a possibility, analog television signal transmitters are a possibility, but it clearly says after that it could be of many other kinds.

BY MS. CHIPPERSON:

Q. Well, does it say there are other types of transmitters or other frequencies?

MR. FISHER: Object to the form.

THE WITNESS: It just says "transmitters and receivers operating at other parts of the frequency spectrum can be used." It doesn't specify if they're analog or digital.

Again, this is just one example. I could look for digital transmission. Maybe he talks about that as well.

BY MS. CHIPPERSON:

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Q. No. That's okay.

So if we have a situation where trans- -- sorry.

Let's go with the receiver 310 is an analog television signal receiver, then how would receiver 310 receive four data streams from four other recording units?

MR. FISHER: Object to the form, misleading hypothetical.

THE WITNESS: If a POSA was tied to use just that, which is not normally the case, then a multi-channel -- different -- not audio channel, a multi-radio frequency channel receiver/transmitter combination could be used that puts different streams on different channels. So --

BY MS. CHIPPERSON:

Q. And how many streams were available in April 2000 on a multi-channel RF receiver?

MR. FISHER: Object to the form.

THE WITNESS: (Witness indicating).

I don't recall.

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BY MS. CHIPPERSON:

Q. Approximately?

MR. FISHER: Same objection.

THE WITNESS: I'm being forced to guess.

I don't know. So, yeah. I just --

BY MS. CHIPPERSON:

Q. You're not aware what a typical multi-chan- -- how many channels would be available in a typical multi-channel RF receiver in April of 2000?

MR. FISHER: Same objection.

THE WITNESS: I don't, but I do recall that receivers could be cascaded together. So if they were living in different boxes, you could increase the number of channels.

I just don't know. I don't remember the number of channels in each receiver.

BY MS. CHIPPERSON:

Q. And how would that work if you cascade them together?

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A. You would have some transmitters sending to the channels available in one receiver and others to another, and then somehow multiplexing the signals to send to the rest of the system.

Q. So in a cascading-type embodiment, you could have four different transmitters, each receiving a data stream, and then tied to a multiplexer -- sorry -- receivers -- let me -- let me restate that.

In the example that you just gave, if you were cascading receivers, you would have four different receivers, each receiving a data stream, and they would output to a multiplexer; is that correct?

A. If they were single channel receivers, yes, but if they were four-channel receivers, then you would just need one.

Q. Okay. And can an analog television signal transmitter connect directly to a Motorola microcontroller 68XX?

MR. FISHER: Object to the form.

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THE WITNESS: I think, as we said before, you don't really connect directly to the microcontroller for anything. It sits on a board with I/O connections and converters as needed to get the signals coming in to be in the form that the processor can understand and handle.

BY MS. CHIPPERSON:

Q. So would you need an analog-to-digital converter to connect an analog television signal transmitter -- sorry -- analog television receiver to the microcontroller?

A. Without -- so some microcontrollers had built in A to D, analog-to-digital converters, so I don't -- if they didn't, you would need to have it on the circuit board, but if it did, you can go directly.

Q. Would you need one analog-to-digital converter per data stream?

A. Not necessarily. It would depend on the multiplexing scheme. So you could -- I don't know. I'm designing on the fly here, so I

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don't feel super comfortable about that, but it's -- I think it's technically possible to demultiplex and split the stream into whatever is needed to be picked up by the -- by the microcontroller.

Q. But you are a person of skill in the art as of -- you were a person of skill in the art in April of 2000, correct?

A. Yes.

Q. And a person of skill in the art in April of 2000 would have been able to -- scratch that.

In your opinion, would a person of skill in the art in April of 2000 have been able to build this Strub embodiment based on the Strub patent specification?

A. Yes. I think I answered that before.

Not in 30 seconds, like what we're doing here, but, yes.

Q. And do you -- are you familiar with a type of transmitter that could have been used in April of 2000 to perform this function --

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scratch that. I'm sorry.

Are you aware of a type of receiver that was available in April of 2000 that would perform this function?

A. I can't name a model number, if that's what you're asking, but there was certainly UHF receivers that could --

Q. Can you name a brand of receiver?

A. No, not off the top of my head. Sorry.

Q. And is it your understanding that the Strub system can record all four data streams that are being received through the receiver 310?

MR. FISHER: Object to the form and the hypothetical.

THE WITNESS: I'd have to look at my report. I'm pretty sure the answer is yes, but to give you a clear answer, can -- I'd like to look through that section of my report, if I can find it.

I think it's mentioned in paragraph

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76 that we were talking about.
BY MS. CHIPPERSON:
Q. So the answer is yes, you believe that the Strub system would be able to record all four data streams being received by receiver 310?
MR. FISHER: Same objections.
THE WITNESS: Could I take a couple minutes to look?
BY MS. CHIPPERSON:
Q. Sure. Of course.
A. Yes. Yes. My -- it is my opinion that they can be recorded simultaneously.
Q. Okay. And would a 4 megahertz processor operating with an 8-bit I/O be capable of receiving auto and visual data from the receiver 310?
MR. FISHER: Object to the form, the hypothetical.
THE WITNESS: I don't know how to answer that in isolation.
Is there somewhere you can point me

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to so I can read what's said about that?
BY MS. CHIPPERSON:
Q. Let me ask an easier question.
Is a 4 megahertz 8-bit I/O processor capable of processing video in real time?
MR. FISHER: Same objections, asked and answered.
THE WITNESS: There is resolution of video that can be made small enough for that to happen, but it's really hard to give specifics without knowing more.
BY MS. CHIPPERSON:
Q. So you believe that a 4 megahertz processor with an 8-bit I/O is capable of processing video in real time?
MR. FISHER: Same objections.
BY MS. CHIPPERSON:
Q. Yes or no?
A. If by video we mean all video known to mankind, yes, there's -- I'm sure there's a resolution and bit rate of video that could be recorded with that. So that's what I'm seeing.

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I don't see any more details around the question.

Q. Okay. Okay. How would the Strub device, recording unit store those four data streams?

A. Let's go back to Strub.

So they would be stored in the data storage device 305.

Q. And we had discussed that the data storage device 305 -- scratch that.

Did we discuss that Strub teaches a flash memory as a data storage device?

MR. FISHER: Object to the form.

THE WITNESS: Strub gives several examples. That was one of them.

BY MS. CHIPPERSON:

Q. Would flash memory be a practical implementation of a data storage device for a Strub recording unit receiving four streams of video?

MR. FISHER: Object to the form.

THE WITNESS: It depends on the size

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of the data storage -- of the -- of the -- sorry, of the flash card. It depends on how many slots the data storage device had and the -- it depends on the resolution of the videos we talked about. There is a scenario for which that's possible.

BY MS. CHIPPERSON:

Q. Would a high resolution -- scratch that.

Would the recording unit of Strub be able to record four video streams in an 8 megabyte flash memory card with a reasonable resolution?

MR. FISHER: Same objection.

THE WITNESS: Yeah.

See, this is where this objective part comes in because "reasonable" depends on human perception and the size of the screen and . . .

BY MS. CHIPPERSON:

Q. Well, let's say reasonable is to the same quality as a personal camcorder in April of

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2000.

MR. FISHER: Same objection.

THE WITNESS: So NTSC video compressed via MPEG or similar technology would be very small and would be acceptable if viewed on a small screen, even if there are four of them. Sure.

BY MS. CHIPPERSON:

Q. And does Strub teach a recording unit with four video recording display devices?

A. As we said before, I don't think he says four. I think he says multiple, right?

So I don't think he limits the number.

Q. Does Strub teach a recording unit with multiple video recording display devices?

A. Oh, wait. So now, you're asking display devices?

I thought -- the reason I ask is I thought we were talking about data storage still.

Q. Well, you mentioned screens in your

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last response.

A. Correct. I was just saying that if the resulting stored videos were to be viewed in a small screen, the acceptance quality changes. That's all I was talking about.

Q. And you mentioned MPEG technology and compression.

A. Um-huh.

Q. What type of device would be used for compressing the video?

A. Some kind of processor running the MPEG -- an MPEG compression algorithm.

Q. Would a Motorola 68HC11 4 megahertz processor have the capability of running an MPEG compression routine?

A. So that example that we were using is an example. I don't think that's the only part that a POSA would have to pick to follow Strub. That is a qualifier.

I don't know if -- that's why -- I don't know how many operations, CPU operations would be needed for MPEG to run on that chip.

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It's possible.

Q. Do you believe it would be possible for a Motorola 68HC11 running at 4 megahertz to receive four streams of video and simultaneously compress those four screens of video and record them?

MR. FISHER: Object to the form and the hypothetical.

THE WITNESS: It's very difficult to answer that without looking at programming code and its efficiency specific to those functions. It's not -- it's not a general -- I can't give a general answer without looking at the specific implementation.

There are ways to optimize that kind of code to do the functions you mentioned that are very good, but I won't be able to say for sure without doing it or looking at it.

BY MS. CHIPPERSON:

Q. Does a 4 megahertz processor have the speed to compress four streams of data and store them simultaneously?

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MR. FISHER: Same objections, asked and answered.

THE WITNESS: So when I wrote this report, I didn't look at the algorithm requirements, the CPU requirements for MPEG compression, nor do I -- did I look at the specific architecture of this chip because there are -- there are different ways to do single processing on a chip. So I don't know how I can answer that and give you a useful answer.

BY MS. CHIPPERSON:

Q. Do you think a person of skill in the art would know the capabilities of a 4 megahertz processor?

MR. FISHER: Object to the form, argumentative.

THE WITNESS: The capabilities on a spec sheet just give, you know, everything from a temperature tolerance to how many cycles are available, but for a person of skill in the art to -- tasked to put algorithms on that chip, they would have to understand how to optimize

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those algorithms or take them from optimized libraries, and those existed, but I don't think it's a matter of just looking at the specification and saying, yes, it will fit or not. It takes a little bit of work to figure that out.

BY MS. CHIPPERSON:

Q. Would a processor having 1 kilobyte of on-chip RAM, 20 kilobytes of on-chip ROM, and 2048 bytes of EEPROM be able to receive four visual data screens and simultaneously compress them and store them in storage?

MR. FISHER: Object to the form, hypothetical.

THE WITNESS: I think my answer is the same as before. I feel that we're saying that Strub is only using this chip when there were many other possibilities. So it would really depend on a POSA designing a system like this to pick the correct chip, not the -- not just the example.

To answer your question is I -- I

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don't know. It depends on how well the compression algorithm and the multiplexing were programmed. The better they are programmed, the lower the memory that's needed.

So if I could add one more line. I think this is not -- this is outside of what Strub is talking about.

BY MS. CHIPPERSON:

Q. Well, you're a person of skill in the art, and a person of skill in the art should be able to build Strub from the Strub specification.

So do you believe you could build Strub -- scratch that. I think that was asked and answered.

If the -- scratch that.

So is it necessary to separate a transmitter and a receiver when they simultaneously transmit and receive?

A. How are you defining "separate" here?

I'm not sure.

Q. Okay. With its given meaning.

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A. So different geographic locations you mean?

Q. Well, do you have to take -- scratch that.

Do you have to take into account the location of a transmitter relative to a receiver when both devices will simultaneously transmit and receive?

A. I see.

So if they're in the same environment, so to speak, or box, then you have to worry about RF interference. I think that's what you're asking about.

Q. And how would you deal with RF interference?

A. A POSA knows how to -- a wireless POSA would know about RF shielding, which are basically Faraday cages, metal meshes at a high level, isolating the two, using other methods, frequency hopping, different -- slightly different frequencies. There are many different methods of dealing with that.

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Q. Would you require a duplexer when you have a transmitter and a receiver simultaneously transmitting and receiving?

A. I don't know you would require it. That is a method that can allow you to do full duplex or half duplex communication, so that is a method.

Q. What does Strub teach as far as a method of avoiding RF interference?

A. Let me look.

Was there a paragraph that you would want me to look at?

Because it's -- I can just skim through this.

Q. No. I don't have a paragraph.

MR. FISHER: I guess I'll object to the form.

THE WITNESS: I'm just looking for interference. It's just very hard to go through 56 pages. So let's see.

What column is this?

Column 42 on page 33. I'm just

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trying to see. Line 42 maybe or 41 talks about "transmission losses or signal interference." I don't see anything about -- it's recognized it looks like, but there's no discussion of mitigation.

Again, this would be -- a wireless expert would know -- building this system would know how to do that.

BY MS. CHIPPERSON:

Q. And can you tell us what the methods would be for doing that?

A. I think that's the answer to my question -- to your question a couple of questions ago. Shielding, Faraday cages, half duplex, full duplex, it depends. So switching devices.

Q. And would that require additional hardware than what is shown on Figure 3?

A. Not necessarily. So Figure 3 is a functional diagram of the recorder. The transmitter and receiver circuits, electronic components are not shown there. To me -- so a

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POSA would know that they're in there. That's what makes a transmitter. It's just not the box with the word transmitter in it. It has components.

Q. So the question is: Would additional equipment be required beyond what's shown in Figure 3?

A. And my answer was Figure 3 is not showing equipment. It's showing functional blocks, each of which requires numerous pieces of equipment to -- that a POSA would know how to build into a circuit board. This is not a circuit-level diagram.

Q. Does Strub teach a circuit-level diagram?

A. I don't believe that he does because Strub is not a design patent. Strub is a innovation that has to do with how to create these types of systems, but not what box to put them in or what wire to use.

Q. So to implement transmitter 309, you would require multiple components -- scratch

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that.

You would -- is it correct that you would require multiple components to implement transmitter 309?

A. If I were to build a circuit that performs the function of transmitter 309, that circuit would have a PC board with several components on it, including an antenna. But as I said, that is common knowledge to the wireless expert.

Q. And would the receiver 310 also require multiple components to implement?

A. Yes. In fact, they would be very similar to the transmitter components.

Q. So each of transmitter 309 and receiver 310 would have their own PC board?

A. Not necessarily. They could be built on the same PC board and isolated from interference. That becomes an electronic engineering problem, PC board design.

Q. And are you familiar with beamforming as it existed in April of 2000?

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A. Yes. I'm very familiar. That's a problem that I've worked on in the past.

Q. So was it possible to do beamforming in a battery-powered device in April of 2000?

A. I don't think battery power has anything to do with beamforming. Beamforming is a -- extracting a signal from multiple microphones that is more directional than each individual microphone would be able to provide. The power source could be anything.

Q. So you believe that a battery-powered device could perform beamforming in April of 2000?

A. Yes.

Q. And do you think Strub teaches beamforming?

A. Yes. I think he talks about it quite a bit.

Q. Does Strub teach one of skill in the art how to implement beamforming?

A. Let me take a quick look.

On page 28, at the bottom of column

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31 -- well, around line 51 of that column, column 31, he starts talking about beamforming, and says what it does. And then at the bottom, it says: "The implementation of beam forming is known to those skilled in the art."

And as with other things that are algorithms that are well known, he doesn't give the method or the algorithm, but just said -- just says what it could be used for.

Q. So Strub does not teach how to implement beamforming?

MR. FISHER: Object to the form.

THE WITNESS: He talks about the benefits. I'm just looking through. Sorry.

So there are -- there are several algorithms that could be used to make -- to create a beamform out of multiple microphones. Strub doesn't pick one of them because he assumes that it's known in the art, as he says.

BY MS. CHIPPERSON:

Q. I'll reask the question.

Does Strub teach how to implement

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beamforming?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: I think that was my answer. He doesn't teach a specific method, just says that beamforming would be useful, and it's known to people in the art how to implement it.

BY MS. CHIPPERSON:

Q. Does Strub teach that picture-in-picture could be implemented on video recording display device 306?

A. I don't recall.

Q. You could look -- I do have a section --

A. Oh.

Q. -- column 44, lines 55 through 58 I believe is where it's discussed.

A. Okay. Let me read it.

MR. FISHER: Object to the form.

The witness is not limited to just this section you've pointed to, Counsel.

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THE WITNESS: So, yes. He does talks about "the visual recording display device could be partitioned into windows" for picture-in-picture. I see that.

BY MS. CHIPPERSON:

Q. And what was the state of the art in April 2000 for picture-in-picture?

A. It could be done on televisions. I'm not sure what state of the art.

Q. Are you aware whether picture-in-picture was available on a commercial battery-powered device in April of 2000?

A. I don't have a model in mind. There might have been camcorders that you -- in the display section of it, you could see a small video, plus the one that you were recording. So it's possible, but I don't remember the dates for those (witness indicating).

Q. Does Strub teach power load of its recording unit?

A. I'll have to search for that as well.

Are you talking about in terms of

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watts?

Q. Yes.

A. Is there a section that you have in mind?

Q. No. Sorry.

A. Yeah. There's -- there are a lot of mentions of power, so it will take me some time to go through here.

He talks about various power supplies that can be battery power supplies. He does say that depending on the functional capabilities that are designed into the unit, you could enable a smaller power supply. This is on the bottom of column 70 on page 47.

So he definitely talks about power. I don't know if you want me to go through every instance of power supply. There's 23 of them.

Q. No.

Is there any discussion of watts?

A. I didn't see one.

Q. Do you recall any discussion of cooling for the recording unit of Strub?

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A. I do not.

Q. How much cooling do you think a unit of Strub where -- in the embodiment where it's receiving four streams of video data, how much cooling do you think such a unit would require roughly?

A. Well, so cooling is not measured that way in the sense of how much, but I guess it would be done on the components that get the hottest with heat sinks. Think of them as large pieces of metal that are absorbing the heat. I couldn't give you a size that would be required without knowing kind of how hot it gets at its worst situation.

There are many parameters that go into that: Is the box that it's in vented? What is the external temperature? What's the tolerance of the chip to peaks in temperature?

So --

Q. Do you -- sorry.

A. No, no. It's okay.

A POSA knows that those are

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components that you have to deal with, those elements that you have to deal with when you're designing a circuit to implement something that -- what -- like what Strub is talking about.

Q. Is the backpack of Strub ventilated?

A. If it's anything like a normal backpack, then, yes, but I don't think he talks about that.

Q. How is a normal backpack vented?

A. Well, anything that's not hermetically sealed is vented because heat can escape.

So I'm looking at my backpack here. Even through the zipper, heat can expl- -- can come out and certainly through flaps and other things.

So you would have to try to make it hermetically sealed and not -- otherwise, it's -- heat would leak out.

Q. Do you believe a cooling fan would be required -- strike that.

Do you think any form of physical

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cooling would be required for the recording unit of Strub receiving four video streams and simultaneously recording those four video streams?

MR. FISHER: Object to the form and to the hypothetical.

THE WITNESS: It relates to my previous answer. We don't know how much cooling is needed in terms of -- when I say how much, I mean how big of a surface of metal heat sink would be needed, or whether it would be needed at all. And I don't know how hot it would get, but I certainly don't think that a fan would be necessary.

BY MS. CHIPPERSON:

Q. Have you ever designed a system similar to Strub?

A. I have designed -- well, I've designed a wireless speaker with microphones in a sealed enclosure. So it -- without video, but with having to deal with transmission and reception and cooling and heat sinks and other

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things.

Q. Have you ever designed a battery-powered device that was capable of handling video?

A. I've -- not video. I have designed a battery-powered device that was a multi-way communicator. So people, for example, that are skiing can latch one onto their arm and communicate within reasonable distance using RF, and I had to deal with everything that we talked about: beamforming, heat sinks, isolation of transmitter, and so on, but not video.

Q. Do all of the challenged claims of -- do all of the challenged claims require a wearable local audio device?

A. I have to look at my report where I summarize them to answer that.

Q. Okay.

A. Do you want me to do that?

Q. Um-huh.

A. Okay. So as I'm looking, I'm sorry. You asked if they all require it to

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be wearable?

Q. If they require the local audio device to be wearable.

A. Okay. Let me take a quick look.

Sorry. I can't seem to -- I don't think I have a list of all the challenged claims in one place, so this might take me a little bit longer.

Q. And you can disregard the '902 claims.

A. Right.

I have a printed version of my report here.

Would that be okay if I leaf through that?

Q. Yeah. Sure.

A. Okay. Just a minute.

I'm trying to find it. I thought I had a table of all the claims in one place, but I only have a table of the ones that were in the background, so I need to do some searching.

Q. No. I think it's okay. We can

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strike that.

A. Okay.

Q. Let's just move on.

In the Zaxcom patent, is each performer equipped with its own local audio device?

MR. FISHER: Object to the form.

THE WITNESS: Are we -- in the '443 for example?

BY MS. CHIPPERSON:

Q. Yes.

A. I believe that was the intent, but I don't remember the exact passage that says that.

Q. That's okay.

But that's your understanding of the Zaxcom patent?

MR. FISHER: Same objection.

THE WITNESS: I don't want to give an answer on my understanding without --

BY MS. CHIPPERSON:

Q. That's fine.

A. -- reading the whole document, or at

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least searching for that.

But at least in the background of the invention, it says the body packs are worn by each performer.

Again, I'd have to go -- if you're asking me about the claims, I'd have to go pick out the ones and look at the claims, each one by one, to answer that question for claims.

Q. No. I'm not asking about the claims.

I'm just asking if the patent itself teaches that each performer has its own local audio device?

MR. FISHER: Same objection.

THE WITNESS: Yes, it does.

BY MS. CHIPPERSON:

Q. So in -- in the Zaxcom patents, does it teach that the local audio device of a performer is wired to capture the audio of a person other than the performer?

MR. FISHER: Object to the form.

Leave it at -- (muffled).

THE COURT REPORTER: What was the

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rest of your objection, Mr. Fisher?

Object to the form, what?

MR. FISHER: Sorry.

I object to the form. Then I said we'll leave it at that.

THE COURT REPORTER: Okay. Thank you.

THE WITNESS: Again, without reading the whole thing, it just says "each performer is equipped with a local audio device capable of locally recording the respective performer's audio while also transmitting it to a master recorder."

So I think that's related to your question.

It's hard for me to give general statements without really rereading the patent because I might have missed something today.

BY MS. CHIPPERSON:

Q. How would you define wearable in the context of the Zaxcom patents?

MR. FISHER: Object to the form,

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calls for a legal conclusion.

MS. CHIPPERSON: What was that last part?

MR. FISHER: It calls for a legal conclusion.

THE WITNESS: A wearable device is a device that can be worn on some part of the body of a human being.

BY MS. CHIPPERSON:

Q. In your declaration, at page 53, you reference an SK50 transmitter.

What did that transmitter weigh approximately?

A. Page 53. I don't see that on page 53.

Q. Sorry. Paragraph 53.

A. The SK50. Oh, that's the Sennheiser one. I don't know. A few hundred grams.

Q. And what was the average -- scratch that.

Would you say that was the average weight of an audio transmitter of that type in

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May of 2005?

A. Well, that -- to say the average would mean I would know the weight of every transmitter.

I would say it was typical, but there were others that were heavier or lighter.

Q. What was the heaviest transmitter you were aware of in May of 2005?

A. I don't have a weight or a model that comes to mind. I'm sure that they were not all exactly the same weight. So there must have been a heavier one, a heaviest and a least heavy. I just don't know what those were.

Q. So you're not familiar with the state of audio transmitters in May of 2005?

A. Well, I am aware of the state of audio transmitters, but I don't have a scale to weigh them. I'm familiar with their functionality.

Q. Were you aware of any transmitter in May of 2005 that weighed over 5 pounds?

A. No. I don't think so.

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Q. And what was the approximate size of the SK50 transmitter?

A. 3 by 2 by 1 by half.

Q. Would you say that this was -- scratch that.

What was the largest sized transmitter you were aware of in May of 2005?

A. Again, I didn't rank them in order of size. Some of them were considered bulkier than others because they had larger antennas. So it's a question of whether we count the antenna as part of the size or not, but I don't have dimensions or ranking of transmitters by dimensions.

Q. Were you aware of any transmitter in May of 2005 that was larger than 5 inches by 5 inches by 5 inches, exclusive of any type of antenna?

A. So not -- you said of any transmitter?

Sure. There are plenty of military transmitters or police transmitters that were

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larger.

Q. Are you aware of any transmitter used in performance audio in May of 2005 that was larger than 5 by 5 by 5, exclusive of the antenna?

A. No. I can't think of one.

Q. So given the state of the prior art in May 2005, what weight do you believe a person of skill in the art in May of 2005 would have been considered to be suitable and in a condition to be worn for a performance audio transmitter?

MR. FISHER: Object to the form.

THE WITNESS: Sorry. I lost you a little bit.

You were trying to make -- you were defining something.

Can you repeat that, please?

BY MS. CHIPPERSON:

Q. Let's scratch that.

Do you believe that a person of skill in the art in May of 2005 would believe that

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Strub discloses a local audio device that is suitable and in a condition to be worn?

A. Yes.

Q. Would a person of skill -- scratch that.

Do you believe that a 24-pound local audio device is suitable and in a condition to be worn?

MR. FISHER: Object to the form.

THE WITNESS: It's definitely in a condition to be worn because you -- but I don't think that that's what Strub is teaching. That's just the nonlimiting illustration -- illustrative example that's -- what would happen if you tried to build Strub's system by going to a store and buying off-the-shelf equipment is what he says. That's not what a POSA would do. Maybe for a prototype, but certainly not for a product.

So it's definitely something that can be worn, but it's not something that he's proposing as being practical.

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BY MS. CHIPPERSON:

Q. And in May 2005, what would a person of skill in the art consider as a weight cutoff for a device to be too heavy to be wearable?

MR. FISHER: Object to the form.

And also, can I ask the witness to slow down and speak a little louder?

THE WITNESS: Okay.

Well, the answer to that really depends on what was being designed. There are -- so the tolerance to weight, there's a tradeoff between that and functionality of what you're building.

A good example for modern times is the Apple Vision Pro that some people consider to be very heavy, others don't, but it provided new and unusual and new functionality.

So I don't think we can answer that there's a cutoff, unless the person is physically unable to carry that and that were nowhere near that category.

BY MS. CHIPPERSON:

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Q. Is a 50-pound local audio device suitable and in a condition to be worn?

MR. FISHER: Same objection.

THE WITNESS: Without other constraints, I've seen, as I said, military backpacks with radio communication that are that. Obviously, it's desirable to have smaller weight, but I don't think it's in a condition to be worn, yes. Sure.

BY MS. CHIPPERSON:

Q. Is there any weight at which you would determine that something is not in a condition and suitable to be worn?

A. I don't know how to give a number for that. I -- people can walk around with different weights depending on their physical ability. So I don't know how to -- how to put a cutoff.

Q. Is there a cutoff?

A. I think every person would have a different one.

Q. Is a thousand pounds -- a

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thousand-pound local audio device suitable in a -- in a condition to be worn?

A. Okay. Probably not.

Q. Is a hundred-pound local audio device suitable and in a condition to be worn?

A. Probably not.

Q. Is a 75-pound local audio device suitable and in a condition to be worn?

A. Probably not.

Q. What is the heaviest local audio device that you remember from May of 2005 in use in your recordings?

A. I don't know the weight of it, but I've seen field recording engineers with microphones, batteries, and recorders carry many pounds, but I didn't weigh it.

Q. Over 10 pounds?

A. Yes.

Q. Okay. If we look at paragraph 244 on page 139 of your declaration?

A. Okay.

Q. Okay. So I'm looking at the quote in

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the middle of the paragraph where you say "highly desirable that the recording unit be adapted to be mounted on (e.g., attached on, or worn by)...the recorder."

Do you know what the ellipses is replacing in that quote?

A. No. I'd have to go there and look. It's 11 -- 11 through 17.

Okay. So the sentence there -- let's see what are the ellipses. Attached on or worn -- okay. It looks like it's rather than held by.

Q. Yes.

So is this sentence saying that the recording unit of Strub needs to be adapted to be worn by a recorder?

MR. FISHER: Object to the form. The document speaks for itself.

THE WITNESS: So to a POSA reading this, there's no change needed. It's just -- adapted means configured or -- yeah, configured.

BY MS. CHIPPERSON:

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Q. Is -- if something requires adaptation to be worn, would you consider that device not inherently wearable?

MR. FISHER: Same objections.

THE WITNESS: Yeah. I don't think that's what he's saying. I don't think he's changing anything. I think -- again, without being an attorney, having seen other similar language in patents, adapted usually means -- not usually. I think in my mind to a POSA means there's a recording unit that is configured to be mounted on, et cetera.

BY MS. CHIPPERSON:

Q. So you read "adapted to" to be equivalent to configured?

A. Yes.

Q. Okay. And then if -- in that same paragraph, you quote 16:49-65.

A. Okay.

Q. And if we could look at that in Strub?

A. 49 through 65 in column 16. Yes.

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Yes.

Q. Okay. Okay. So if we look at this -- let's see where this is -- (sotto voce).

Just a second here.

Okay. Sorry. Let's change that. 16 -- it's further down. It's -- oh, maybe it's not. 49 -- let's look at -- yeah, lines 49 -- so column 16, lines 49 -- so this says that the "components of the recording unit are positioned within a backpack that is worn by the recorder."

Do you see that?

A. I see it, yes.

Q. So what is being worn by the recorder in that sentence?

MR. FISHER: Object to the form.

THE WITNESS: The components of the recording unit. The components are in a backpack, and the whole thing is being worn by the performer -- I'm sorry -- by the recorder, the person recording.

BY MS. CHIPPERSON:

Q. Just one second here.

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A. Sure.

Q. Do you recall the NAGRA V device that -- it's at issue in this case, but were you familiar with it through your career?

MR. FISHER: Object to the form.

THE WITNESS: I'm familiar with NAGRA devices, but I don't know if I know them all by model.

MS. CHIPPERSON: Addison, let's go to the prosecution history for the '443 patent, which is -- I'm not seeing it in the list.

Okay. Well, let's go to Exhibit 21, which is the NAGRA V non-patent literature.

MR. FISHER: And what file number is that?

MS. CHIPPERSON: 21.

MR. FISHER: Oh.

THE EXHIBIT TECHNICIAN: Stand by, and I will label this Exhibit 5.

MS. CHIPPERSON: Okay. Sounds good.

(Deposition Exhibit 5 was marked for identification.)

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THE EXHIBIT TECHNICIAN: One moment.

MR. FISHER: I'm going to object to this exhibit as -- on the basis of lack of authentication, hearsay, relevance.

That's it for now. We don't know where this came from even.

BY MS. CHIPPERSON:

Q. Are you familiar with this product, Dr. K?

MR. FISHER: Same objections to the question as well.

THE WITNESS: Is there a way to make it a little bigger?

Is that already in the folder?

Maybe I missed it.

Okay. Yes. I believe I've seen this before. I don't remember if that was the same model or if they had similar models, but it was -- it's familiar to me, yes.

BY MS. CHIPPERSON:

Q. Okay. So you're familiar with this product from your personal experience?

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A. Like I said, I don't -- I can't say for sure it was the NAGRA V, but something that -- from NAGRA that looked like this I'm familiar with.

MR. FISHER: I guess I'm going to say that my objections to the document apply to all questions about the document.

BY MS. CHIPPERSON:

Q. In your experience, was a product such as the NAGRA V Linear Location Recorder something that you might see people carrying in a bag?

MR. FISHER: Object to form.

THE WITNESS: Does it give the dimensions further down?

BY MS. CHIPPERSON:

Q. Yes, it does, if we scroll.

A. Actually, I have the document here as well.

Q. And actually, we -- let me scratch that last question.

A. Okay.

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Q. Is this type of device the type of device that you might see carried in a bag with a shoulder strap?

MR. FISHER: Same objection.

THE WITNESS: Without knowing the exact model that I saw, I have seen field recording -- recording engineers or field recordists carrying similar looking devices in a -- in a strap or in a backpack or in a strap around their waist (witness indicating).

BY MS. CHIPPERSON:

Q. So, in your opinion, would this device be wearable?

MR. FISHER: Same objection.

THE WITNESS: I believe it would.

BY MS. CHIPPERSON:

Q. Separate from this particular sheet, would you consider an electronic device with -- in the dimensions of 11 inches -- 11.4 inches by 8.6 inches by 4.5 inches to be wearable?

A. As I said, I've seen people wearing these kinds of devices for field work.

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Q. And how would you typically see somebody wearing this type of device?

A. It would be either in a backpack with a battery box or in a -- I don't know what to call it. It's a belt with suspenders over the shoulder made specifically for carrying around audio equipment and other batteries and other things.

Q. And what would make -- how would you define portable?

A. It can run on a battery and can be transported from place to place by being -- by -- carried by a human. That's not a scientific enough definition, but, you know, that's kind of my immediate first reaction.

Q. So what would be the difference between portable and wearable?

MR. FISHER: Object to the form, beyond the scope.

THE WITNESS: I would say that it's wearable -- a wearable device -- all wearable devices are portable, but not the other way

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around. A portable device might be able to be carried from a place -- from place to place, but not necessarily be wearable.

BY MS. CHIPPERSON:

Q. In May of 2005, would a person of ordinary skill in the art have the understanding that a laptop computer would be wearable?

A. Well, in the university system that I mentioned before, the two of them, one of the items that was in the backpack at the time was a laptop. So it's not out of the question.

Q. So is anything that could be placed in a backpack wearable?

A. I think we probably need to qualify. We're talking about electronic devices or audio or something. Otherwise, I wouldn't say that bananas are wearable.

Q. So all audio devices that can be placed in a backpack are wearable?

A. As long as they can operate presumably with battery power.

Q. What would be the understanding of a

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person of ordinary skill in the art in audio and wireless communications in May of 2005 of the term "body pack" when used in conjunction with a local audio device?

A. A body pack, it would be a -- something that could carry a collection of needed gear and be worn by a person.

Q. How is a body pack different than a backpack?

A. Well, a body pack can be on other parts of the body, other -- just not your -- it doesn't have to be the back. I gave you the example of a -- what looks like something around the waist. There could be straps that are holding something.

Q. And is it your position that Strub discloses a local audio device in the form of a backpack -- I'm sorry -- in the form of a body pack?

A. I'm hesitating because I'm not sure what "in the form" means.

He's -- he's saying that the

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backpacks that he's showing contained those devices. Therefore, they're worn, and they're body packs under what I just said, but a local audio device in the form of a backpack, I don't know. That seems a little -- that wording seems a little unusual to me.

Q. So does Strub disclose a body pack local audio device?

A. Yes.

Q. And how would you define "body pack"?

I think you did define it in your declaration.

A. I did. Yeah, I --

MR. FISHER: I guess I'll object to the form, and asked and answered.

THE WITNESS: Yeah. I think it was two or three questions ago.

BY MS. CHIPPERSON:

Q. We can scratch that.

So I -- how did you define a body pack in your declaration?

A. That, I have to go look for.

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Q. I believe it's paragraph 244, if that helps you.

A. Yes. Well, I think I mentioned it in other places, but let me -- let me take a quick look.

MR. FISHER: Object to the form, beyond the scope of the direct.

THE WITNESS: So in paragraph 244. I'm talking as the -- "For example, Strub illustrates and describes its recording unit as worn on the recorder's body in the form of a backpack or other user-wearable package."

So that's what I consider to be Strub's -- one of Strub's places where he talks about it being a body pack.

Um --

BY MS. CHIPPERSON:

Q. So would you consider a hat to be a user-wearable package?

A. A hat by itself, or a hat with electronics in it?

Q. In --

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A. Yes to the second, and no to the first.

Q. So would it be more accurate to say that you believe a body pack is a user-wearable package including electronics?

A. Yes. So I would say in the context of what we're talking about, I guess it would be audio recording electronics, but, yes.

Q. Is a purse holding a cell phone a body pack?

A. Well, purses are typically carried, not worn. I guess there are some that strap across your front. I'm not sure. It depends on the type of the purse (witness indicating).

Q. Do you have any sources for your definition of body pack?

MR. FISHER: Object to the form.

THE WITNESS: I don't have sources in my declaration, but unrelated -- well, I -- I submitted a more recent declaration on the issue of body pack with references there in response to Zaxcom's expert. This is not in this IPR,

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but I did -- I do have sources there.

MS. CHIPPERSON: If we could look at the '443 patent, Figure 3B?

BY MS. CHIPPERSON:

Q. Okay. Do you believe that this picture shows a body pack?

A. Um --

MR. FISHER: Object to the form.

THE WITNESS: So this picture shows the Zaxcom transmitter, I believe. And so some people in the industry call the -- these kinds of products body pack, but that's not limiting. There are other kinds of body packs as we talked about.

BY MS. CHIPPERSON:

Q. Do you believe as a person of skill in the art that Figure 3B shows a body pack?

MR. FISHER: Same objection.

THE WITNESS: I don't know how to say it again the same -- in a different way.

Yeah. This is -- some people in the industry call this a body pack, as do I, but I

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don't want it to sound like I'm defining this to be the only kind of body pack that's possible.

MR. FISHER: Counsel, we've been going for a while.

What do you say about taking a break?

MS. CHIPPERSON: Sure. That's fine.

Ten minutes?

MR. FISHER: Yeah. Sure. That's fine.

MS. CHIPPERSON: Okay. Sounds good.

So we'll be back at -- why don't we just make it 5:40. That's -- wait. No. 5- --

MR. FISHER: 2:40 Pacific, 5:40 Eastern.

MS. CHIPPERSON: Yeah. Sorry.

5:40 our time; 2:40 your time.

THE WITNESS: Okay.

MR. FISHER: That's fine.

MS. CHIPPERSON: Okay.

So we're going off the record.

(A short recess was taken.)

BY MS. CHIPPERSON:

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Q. Okay. So we have proposed a definition of body pack that is a small box housing a transmitter capable of being worn on a belt or in a pocket.

Do you agree with that definition?

A. No, I don't. I think it's too limiting.

Q. In what way?

A. Well, a body pack doesn't have to have a transmitter, and it doesn't have to be a box.

Can you read it one more time?

Q. Sure.

And we're talking about the understanding of the definition of a body pack in May 2005.

It's a small box housing a transmitter capable of being worn on a belt or in a pocket --

MR. FISHER: Objection.

BY MS. CHIPPERSON:

Q. -- and it would include audio

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transmission capability.

MR. FISHER: Object to the form, asked and answered, beyond the --

THE WITNESS: So, yeah. I --

MR. FISHER: -- scope.

THE WITNESS: I guess I don't -- I think all of those terms are too limiting. It doesn't have been to be in a pocket. It doesn't have to be on a belt. It doesn't have to have a transmitter, and it doesn't have to be in a box.

BY MS. CHIPPERSON:

Q. How would an audio transmitter in the form of a body pack not include a transmitter?

MR. FISHER: Object to the form.

THE WITNESS: If the device is an audio transmitter, it does have a transmitter, but I think what I said before was that it doesn't have to be a transmitter.

BY MS. CHIPPERSON:

Q. So when we talk about the definition of body pack in relation to a local audio device or the Strub recording unit, that's where we're

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defining it as a small box housing a transmitter capable of being worn on a belt or in a pocket.

Does that change your answer?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: The -- right. The Strub -- the Strub body pack has many components, and it's not required to have a transmitter, so I -- my general definition of a body pack is that it would not -- it could have a transmitter, but it's not required.

BY MS. CHIPPERSON:

Q. How would the Strub recording unit transmit data without a transmitter?

A. So the Strub recording unit can be used in many different scenarios. So, for example, in the -- the simplified one in Figure 2 is a Strub recording unit, and it certainly doesn't have a transmitter. In other applications where a transmitter is required, then it would need a transmitter.

So that's my objection I guess is

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it's not required for something to be worn on the body to have a transmitter. It depends on the application.

Q. And it's your position that if something is not capable of being worn on a belt or in a pocket, it can still be considered a body pack for the purposes of a Zaxcom local audio device?

MR. FISHER: Object to the form.

THE WITNESS: Well, I wasn't thinking of the Zaxcom device when I made my -- when I formed that opinion. We talked about various kinds of possible forms for a body pack, including belts that are hung from the shoulders, backpacks. You mentioned a hat that -- so I think, yes, belt and pocket are a place, but it -- to me, it sounds like it -- it makes it sound like those are the only, and that's not true.

BY MS. CHIPPERSON:

Q. What do you believe the Zaxcom patent teaches is a body pack?

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MR. FISHER: Same objection.

THE WITNESS: The figures show what you're showing on the screen right now, Figure 3B, but I believe even the Zaxcom '443 patent considers that one possible implementation.

I was looking here at column 10, page 19, I guess. It says local audio devices 102 may be body packs such as the local device 102. [as read]

So that -- in such an embodiment. So, yeah, it could be that, but apparently it's -- it could be other things, too.

BY MS. CHIPPERSON:

Q. My question is: How does the Zaxcom patent define a body pack, not whether a local audio device can be something other than a body pack?

MR. FISHER: Object to the form.

THE WITNESS: I'm trying to see if there's a definition. I don't see it, unless I'm missing it. I don't have a definition. It says wireless transmitters may take the form of

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body packs, but what is a body pack?

I don't see a definition in here.

BY MS. CHIPPERSON:

Q. Is the Sennheiser SK50, mentioned in your declaration, a body pack transmitter?

MR. FISHER: Object to the form.

THE WITNESS: I think as I answered earlier, devices that have this form factor similar to what you're showing on the screen are called by people in the industry to be body packs. My point was that that is a kind of body pack, but it's not the only kind. Body packs is a much broader category, and there are other examples that we talked about.

BY MS. CHIPPERSON:

Q. Does Sennheiser market the SK50 as a body pack transmitter?

A. I'm not sure. I haven't seen the -- I haven't seen the brochure for it, or maybe I have. I don't remember.

Q. One second here.

Does an object need to be lightweight

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to be a body pack?

MR. FISHER: Object to the form.

THE WITNESS: Well, we talked about the weights before. Obviously, people would prefer lighter weight, but I don't know if it's required. If it's something that provides a unique functionality, somebody might tolerate a higher weight.

BY MS. CHIPPERSON:

Q. Would you consider an audio transmitter that weighs more than 10 pounds to be a body pack?

MR. FISHER: Object to the form.

THE WITNESS: It depends on what it did. It's -- is it -- I don't know. I can't answer that. I'd have to see what it looks like and what it does besides audio transmitting.

BY MS. CHIPPERSON:

Q. Is there any weight over which you would consider something too heavy to be a body pack?

A. Well, that was our exercise from

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before, right?

So I didn't have a number. We worked our way down from a hundred pounds. I know that's not practical, but I'm not -- I don't have a specific number to say that one ounce above that will be unacceptable. I don't have a number.

Q. Can you name a local audio device in May of 2005 that was marketed as a body pack that was heavier than 10 ounces?

A. I don't know the weight of some of those early ones, so I can't name any models, no.

Q. But you testified in your declaration to the state of the art in 2005, correct?

MR. FISHER: Object to the form.

What declaration are you referring to, Counsel?

BY MS. CHIPPERSON:

Q. Let's look at your declaration, paragraph 51 on page 26.

A. Okay.

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Q. So in this statement, you're testifying to your knowledge in 2005, correct?
A. But I'm not talking about weight here.
Q. But are you testifying to your memory from 2005?
A. To the concepts listed in the paragraphs above: jam synchronizing, local timecode generators, and et cetera.
Q. And you testify -- do you have testimony to Claim 19 of the '443 patent?
A. I believe so. I'll have to find it.
Q. Page 138, if that helps.
A. Yes. That does help.
So paragraph 242?
Is that what you're asking about?
Q. 244.
A. 244, okay.
Okay. Yes.
Q. So is this your testimony based upon your knowledge of the art in May of 2005?
MR. FISHER: Object to the form.

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THE WITNESS: My testimony here and elsewhere when we talk about, well, any of the components was to the elements that had to do with the -- with the claims, not the weight.

So I -- I was -- I had seen a lot of devices back then, but I couldn't tell you the weight or the color or, you know, things that are outside of the scope.

BY MS. CHIPPERSON:

Q. So when you analyze the meaning of body pack, you did not factor in weight?

MR. FISHER: Same objection.

BY MS. CHIPPERSON:

Q. Is that correct?

MR. FISHER: Same objection.

THE WITNESS: I -- going back to what we said before, I guess I factored it in by knowing that it wasn't a hundred pounds. Otherwise, I wouldn't have looked at it, but, no. My -- my opinions were based on whether this is a -- this is something that somebody can wear on their body.

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BY MS. CHIPPERSON:

Q. What is the weight of a Strub body pack?

A. I guess in that one embodiment that we -- or in one example that we talked about, he said it could be made approximately the weight of a camcorder. I think he also says that smaller is better. I forget the exact language. It's certainly not 24 pounds because that was just an example of saying this is -- you know, if you went to Best Buy today and bought cameras and transmitters, you might end up with a very heavy thing, but that's not what he's teaching.

Q. Did you calculate the weight of a device as shown in Figure 3 that would be capable of receiving four video streams and recording those video streams simultaneously?

A. Well, Figure 3 is not a device. Figure 3 is a functional block diagram. So the weight of a device that incorporates that would depend on other factors such as the weight of the box, the weight of the battery needed to

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power it, whatever else, antennas and things.

So Strub is not showing a box. He's showing -- in that -- in that diagram, he's showing the components at a very high level of the functionality.

Q. Did you calculate the weight of a Strub device that would render the Zaxcom claims obvious?

A. I don't know how my answer --

MR. FISHER: Objection, form.

THE WITNESS: Sorry.

I don't know how my answer would be any different from before. This -- I -- the -- Strub doesn't give a weight, a specific weight for a Strub device. Strub lists -- I don't know -- 50 columns of variations of that device that has the functionality of Figure 3 that would be different for every application. The one for skiing would be a different form than the one for recording concerts.

BY MS. CHIPPERSON:

Q. If a body pack can't be a hundred

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pounds and you didn't calculate the weight of the Strub embodiment that renders the Zaxcom claims obvious, how do you know the Strub device is a body pack?

A. Well, first of all, I don't believe any of the disputed claims mention the word "weight." So I don't think that that matters for -- as far as the claims are concerned.

Q. But was it your testimony that a device that's a hundred pounds would not be a body pack?

A. My testimony I believe was that it would be impractical.

Q. And you also testified earlier that a device that was a hundred pounds could not be wearable?

MR. FISHER: Object to the form.

BY MS. CHIPPERSON:

Q. So how are you making that determination without calculating the weight of the Strub embodiment that would render the Zaxcom claims obvious?

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MR. FISHER: Same objection.

THE WITNESS: Okay. So a couple of things here.

The Strub embodiment would consist of a circuit, as we talked about, or circuit components that would be made to have the function shown in Figure 3. Those are well known to a POSA as to what kinds of components and the approximate weight of them, meaning it's a circuit board with components soldered onto it. There might be some heat sinks, and so on. So that's nowhere near a hundred pounds, and it's probably on the order of devices like the one you have on the screen here. So I didn't opine on whether the claims are invalid or not based on weight.

BY MS. CHIPPERSON:

Q. And what would you estimate the weight of the device shown in Figure 3B to be?

A. Just based on experience from other similar looking devices, you know, a few hundred grams. I don't know.

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Q. So it's your position that the Strub device that would render the Zaxcom claims obvious would weigh a few hundred grams?

A. I believe that a POSA would know how to make a device that performs all of the functions that Strub discloses in a form factor that would weigh about that. It could be in this type of form factor or any other form factor that is in a body pack form, form factor.

Q. And when you say "all of the functions," do you mean all of the functions included in Zaxcom's challenged claims, or all of the functions taught by the Strub patent?

A. Yes to both.

Q. So it's your position that a person of skill in the art in April of 2000 could make an electronic device having all of the features taught by Strub, and the weight would be approximately a few hundred grams?

A. Yes.

Q. Okay.

A. I could add one more thing to that as

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I'm thinking about it. As far as I can remember -- and we could look through them -- so the '443 patent claims don't -- again, don't talk about -- they talk about what the system does, not the weight or the size. So I don't think we were -- the Strub is not limited to that.

Q. Would a person of skill in the art in audio and wireless communications in May of 2005 consider size of a local audio device to be a characteristic of a body pack?

MR. FISHER: Object to the form.

THE WITNESS: A characteristic of a body pack.

It probably would be listed as one of the many characteristics on a brochure, if that's -- I'm not sure if that's what you're asking.

BY MS. CHIPPERSON:

Q. I'm asking if a person of skill in the art in audio and wireless communications in May of 2005 would consider size of a local audio

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device to be a characteristic of a body pack?

MR. FISHER: Same objection.

THE WITNESS: I think that they would consider -- they would want to know the size. So if that's what you mean by characteristic, then, yes. They would also want to know the battery power needed and how long it lasts and the range. So it -- among a list of characteristics, size would be one of them.

BY MS. CHIPPERSON:

Q. How large can an object be and still be considered to be a body pack in the opinion of a person of skill in the art in audio and wireless communications in May of 2005?

A. I don't know if I can give dimensions. This relates to the weight question. If it can be worn and carried, then a person would consider it a body pack, assuming it has the other stuff that we talked about, the electronics.

Q. Would a person of skill in the art in audio and wireless communications in May of 2005

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consider something greater than 5 inches by 5 inches by 5 inches, excluding an antenna, to be a body pack?

MR. FISHER: Object to the form.

THE WITNESS: It depends on what that device did. Maybe.

BY MS. CHIPPERSON:

Q. Would a person of skill in the art in audio and wireless communications systems in May of 2005 consider hideability of a local audio device as a characteristic of a body pack?

MR. FISHER: Same objection.

THE WITNESS: If the application required the device to be hidden, then, yes, but not all applications require that.

BY MS. CHIPPERSON:

Q. Are most local audio devices used by performers concealed?

MR. FISHER: Same objection.

THE WITNESS: So now we're limiting to performers. I was -- I was speaking of people in general.

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BY MS. CHIPPERSON:

Q. Yes.

MR. FISHER: Same objection.

THE WITNESS: It's -- it's possible. If it's a radio performer, no. If it's -- if there are cameras involved, probably, yes.

BY MS. CHIPPERSON:

Q. When you watch a film, do you typically see the local audio device of the performers?

A. In a -- we're talking about film, it's not that common to have local audio devices. The film sound is picked up more commonly with boom microphones lingering and being pointed by boom operators outside of camera view. If there needs to be a body pack that -- with a microphone, then because there are cameras involved, that device would have to be hidden. There are times when it's not, and it's removed through visual effects after the fact.

Q. Are you aware of any movies that

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you've seen where the local audio devices of the performers were visible?

A. I've seen plenty of -- when you say "movies," I've seen plenty of productions that may have had smaller budgets where the devices were visible. I've seen them being visible because they needed to be visible as part of the script, so it's hard for me to answer that.

Q. What movie required the local audio device to be visible because of the script?

A. I don't know if I can give you a title, but movies in which actors are being fitted with devices in the dressing room before they go out, movies of techs where technicians are part of the scene that are wearing body packs. There's all kinds of movies that have been made.

Q. Are those local audio devices operational?

A. Oh, I don't know.

Q. How often have you seen the local audio device used by a news announcer?

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A. I -- not often. I don't know. I haven't -- I can't give you an example.

Q. Can you name a local audio device in May of 2005 that was a body pack, that was marketed as a body pack that was not able to be hidden?

A. I don't know all the models from back then. I assume that would be in the brochure, but I -- it's way too many to remember of any examples that didn't say that.

Q. In May of 2005, did news announcers typically wear backpacks containing their audio equipment?

A. News announcers --

MR. FISHER: Sorry.

I object to the form.

THE WITNESS: News announcers in a studio setting, no, but news announcers reporting with their own microphone, possibly, out in the field.

BY MS. CHIPPERSON:

Q. So for the purpose of these

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questions, we're going to distinguish between a news announcer and a news correspondent.

So a news announcer, we're talking about someone in a studio, not a correspondent in a field, so just for the context of these next few questions.

So in that context, in May of 2005, did news announcers typically wear backpacks containing their audio equipment?

MR. FISHER: Okay. I'm going to object to the form and to the artificial definition.

MS. CHIPPERSON: Strike it.

BY MS. CHIPPERSON:

Q. In May of 2005, did news announcers operating in a studio typically wear backpacks containing their audio equipment?

MR. FISHER: Same objections.

THE WITNESS: They did not, but the recording of their voice was not necessarily done with a local audio device.

BY MS. CHIPPERSON:

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Q. In May of 2005, did news announcers operating in a studio typically wear headbands with audio equipment?

MR. FISHER: Same objections.

THE WITNESS: No. They had no reason to. The recording was being done by microphones over their head.

BY MS. CHIPPERSON:

Q. In May of 2005, did news announcers operating in a studio typically wear harnesses with video cameras?

MR. FISHER: Same objections.

THE WITNESS: I'm not aware of any examples.

BY MS. CHIPPERSON:

Q. In May of 2005, did news announcers typically hold a user interface in his or her hand to operate a local audio device where the news announcer was operating in a studio?

MR. FISHER: Same objections.

THE WITNESS: I would say in most cases there was no local audio recording device,

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so there would be no need for a handheld control.

MR. FISHER: Just to clarify it, Counsel, have you -- did you withdraw your definition in distinction between news announcers and news correspondents for purposes of these questions?

MS. CHIPPERSON: For the questions where I clarified that the news announcer is operating in a studio, yes.

BY MS. CHIPPERSON:

Q. Have you worked on the set of a news announcer operating in a studio?

A. No, I have not.

Q. Is it your testimony that news announcers do not wear local audio devices?

MR. FISHER: Object to the form.

THE WITNESS: No. I believe I said that it's not required. I have colleagues who work in that field, and we often talk about microphone placement that -- external microphones in the studio that have to be held

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out of camera view.
BY MS. CHIPPERSON:
Q. But in some scenarios, news announcers working in a studio are equipped with local audio devices, correct?
A. Yes. Some I'm sure are.
Q. And in those scenarios -- scratch that.
In May of 2005, were local audio devices the size of a personal camcorder typically worn by news announcers operating in a studio?
MR. FISHER: Object to the form.
THE WITNESS: I'm not aware of any such.
BY MS. CHIPPERSON:
Q. In May of 2005, were local audio devices that were typically worn by news announcers operating in a studio able to fit in a pocket?
MR. FISHER: Same objection.
THE WITNESS: I'm sure some were

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probably.
BY MS. CHIPPERSON:
Q. Are you aware of any devices that were not able to fit in a pocket that were used by news announcers operating in a studio in May of 2005?
MR. FISHER: Same objection.
THE WITNESS: I am aware that not all announcers like to have them in a pocket, but I'm not -- I don't know how far that went -- their objections went beyond that.
BY MS. CHIPPERSON:
Q. My question was: Are you aware of any -- as of May of 2005, are you aware of any local audio devices worn by news announcers that are operating in a studio that were not able to fit in a pocket?
A. I'm not aware of any.
Q. Can you name one program in which you have seen a news announcer's local audio device?
A. I don't have --
MR. FISHER: I'm going to object --

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I'm going to object to the form.
BY MS. CHIPPERSON:
Q. Sorry.
Can you state your answer again?
A. I -- I don't have an example. I'm just -- I guess I feel obliged to respond that what I opined on in my report had nothing to do with visibility or weight, as none of those are in the claims, so I just . . .
Q. Are you aware that the Zaxcom patent discusses body packs as typically being worn by news announcers or performers?
MR. FISHER: Same objection.
THE WITNESS: I'd have to look. I know they talk about performers. I don't know what other -- I don't remember what other people they talk about. I'm happy to look.
BY MS. CHIPPERSON:
Q. So when you made your analysis in paragraph 244 of your declaration, were you aware of Zaxcom's teachings related to a body pack?

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A. I was aware -- well, yes. I was responding to the specific -- to the claim language that this paragraph corresponds to, Claim 19.

Q. So is it your position that the definition of body pack as set forth in the Zaxcom patents has no relation to news announcers or performers?

MR. FISHER: Object to the form.

THE WITNESS: I don't think I've said that anywhere.

BY MS. CHIPPERSON:

Q. In May of 2005 or earlier, have you ever seen a performer in a motion picture wearing a headband with audio equipment?

A. No.

Q. In May of 2005, did you ever see a performer in a motion picture wearing a harness with a video camera?

A. That's possible. I have to think of my movie history, but some Mission Impossible movies come to mind that that might have been

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possible, but I'm not certain.

Q. So are you familiar with the state of the art of professional video recorders in April 2000?

A. Yes.

Q. And in April of 2000, were professional video recorders capable of wirelessly transmitting video?

A. Yes.

Q. Did video recorders in April of 2002 use an external wireless transmitter to transmit video?

A. You mean one that was attached to them externally?

Q. Yes. A wireless transmitter external to the video recorder.

A. I believe there were products that did that. I don't have a model if you're going to ask me that, but I believe -- yes.

Q. For -- for the -- for the video recorders that connected to an external wireless transmitter, were the -- did they communicate

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wirelessly or via a wired connection?

A. I believe there were models that had the capability of both.

Q. Are you aware of a video recorder in April 2000 that could transmit video without the need for an external wireless transmitter?

A. I can't point you to a model, so I'm not sure. I believe they were available. I just don't know if I could point you to a specific model.

Q. And looking back -- I guess we're not on -- let's look back at -- excuse me -- page 138, paragraph 244 again of your declaration.

A. Okay.

Q. Do you read Claim 19 as requiring all of the components of the local audio device to be contained in a single body pack?

MR. FISHER: Object to the form.

MS. CHIPPERSON: You might want to scroll up a little bit so he can see the -- yeah. That would be better, so you can see the claim.

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MS. CHIPPERSON: You can start at the "xx."

THE WITNESS: Right.

MS. CHIPPERSON: Yeah. There you go.

THE WITNESS: Sorry.

Could you repeat your question?

BY MS. CHIPPERSON:

Q. Do you interpret Claim 19 to require that the local audio device be in one body pack?

MR. FISHER: Same objection.

THE WITNESS: Um, huh.

So now, we have to go back to the definition -- my definition of body pack which might be different than what Zaxcom's definition is.

So my definition of a body pack is not the form factor that we saw of that device. So under that -- under my definition of body pack, which is a little broader, I think the local audio device is all contained in the body pack.

BY MS. CHIPPERSON:

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Q. So my question is: Does the local audio device need to be contained in one body pack?

MR. FISHER: Same objection.

THE WITNESS: If the body pack is not limited to be the form that's in the figure -- I forget the number of the figure that we saw in the '443.

If the body pack is the definition that we talked about before that I -- that I used, then I believe that it's all in one body pack.

BY MS. CHIPPERSON:

Q. If a local audio device is split between two body packs in Strub, would that render Claim 19 obvious?

MR. FISHER: Same objection.

BY MS. CHIPPERSON:

Q. Let me strike that and rephrase it.

If -- if the Strub local audio device were contained within two body packs, would that be a reason that Claim 19 would not be rendered

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obvious?

MR. FISHER: Object to the form, beyond the scope of the direct.

THE WITNESS: So I'm not trying to analyze this hypothetical. It's -- so a person wearing, let's say, two of Strub's backpacks that are distinct from each other, but somehow form one local audio device?

It seems -- is that -- am I rephrasing that correctly?

BY MS. CHIPPERSON:

Q. Well, let's -- let me give you a different -- let's scratch that.

And if a person -- if -- scratch that.

If the Strub local audio device includes, for example, a headband and a backpack, would you consider that to be one body pack or two body packs?

MR. FISHER: Same objections.

THE WITNESS: Well, since it's one device, I would consider it to be one because

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the headband by itself wouldn't have any functionality. Presumably, it's somehow connected to the -- some electronics in the backpack or something else. So I would consider it to be one local audio device and one body pack because they're connected.

MS. CHIPPERSON: If we go to Figure 4 of Strub -- that's the Zaxcom patent. Sorry.

Strub is -- let's see here. It's original file 006.

THE EXHIBIT TECHNICIAN: And do you have a page number for that?

MS. CHIPPERSON: You've got the right document there. Figure 4 which -- let's see.

THE WITNESS: I think you passed it.

There it is.

BY MS. CHIPPERSON:

Q. So Figure 4, does that -- is that headband in Figure 4 connected to something else?

A. That headband is not a local audio recording device. That's a -- one element of

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Strub's Figure 3. That's the visual -- what does he call it -- video data acquisition device, I believe.

Q. So when a Strub recording unit has two physically distinct components, do you consider that to be one body pack?

MR. FISHER: Object to the form, asked and answered.

THE WITNESS: As I mentioned earlier, so if that -- that's basically a camera, visual data acquisition device. It has to be connected to something in order to be useful and part of Strub's system. So by itself, it's not -- it's not a local audio recording device. If the person's body that we don't see has the backpack that we see on the right, and they're connected, then that's one body pack.

BY MS. CHIPPERSON:

Q. Does Strub describe wireless connections between the recording unit and the visual data acquisition device or video data acquisition device?

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A. Possibly. I'd have to look for it, but I wasn't limiting my connection. I wasn't talking about a functional connection. It doesn't have to be a wire.

Q. Okay. That's fine.

Is it true that a GPS receiver requires a clear view of the sky to receive a signal from the GPS satellite?

A. For at least some portion of time, yes.

Q. Do you believe that GPS signals would work reliably in environments like a subway station?

A. They -- I have two parts to that answer. The -- if they needed to work in a subway station, there could be a -- an antenna that is external that just connects to the receiver and transmits to whoever is wearing a device that needs GPS.

And the second part is in a subway or other enclosed space, you -- you will have trouble with any kind of radio communication,

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including RF.

Q. Would a GPS signal work reliably on a sound stage with metal mesh walls?

A. It depends on when the -- where the antenna of the receiver is relative to the mesh walls.

Q. Well, they receive -- if the receiver is on the sound stage within the metal mesh walls, will you have a problem receiving GPS signals?

A. Well, in studio installations such as this, they typically have an antenna that can always see the satellites, and then it's wired from the antenna to the receiver where performances or recordings are happening if they're trying to get the benefit of satellite GPS timecodes, for example.

Q. Are you aware of any recordings that use GPS signals as a master timecode?

A. Yes, many. Several studios that I've visited. I used to have one in my own lab. I no longer use it, so I don't have it. But, yes,

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I'm aware of many.

Q. Could you give an example of one?

A. Again, you're asking about models.

Q. No. The name of the studio.

A. Oh, oh, oh. I'm sorry. So the -- fairly certain that WGBH had it. The production studios in the cinema school at USC. Um, there are a few others that I visited that I'm actually under NDA and can't talk about what they do, but it does exist. The benefit being atomic clocks are the most accurate synchronization, so studios want that for all of their equipment.

Q. Let's see.

Can we just go back for a second to your experience with multi-channel audio?

Is your experience with multi-channel audio related to -- I think you said spatial -- spatial positioning of the audio?

Let me strike -- strike that.

How much of your research is related to spatial positioning of audio?

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A. I don't know that I could give a percentage, but over the past 25 or -- oh, maybe 27 years now, I've looked at all aspects of initially what was called immersive audio, more recently called spatial audio from the capture of it with multiple microphones to the re-creation of audio -- to -- of environments using loudspeakers, using headphones, so it's a big part. I don't know if you're asking for a percentage. I don't think I could give you that.

Q. Okay.

MS. CHIPPERSON: I think -- I think that's -- that's it. We're -- we're done for -- we're done for today's --

MR. FISHER: All right.

Let's take a short break, and then we'll decide if want to do any redirect. We may not, but I just want to take a few minutes.

Can we reconvene in -- do you want to just make it -- I know it's getting kind of late there.

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Do you want to reconvene at -- in like, you know, 19 minutes?

That makes it four o'clock my time, seven o'clock your time. Again, I know it's getting kind of late.

MR. FISHER: I have 6:39. So 19 minutes would be 6:48, right?

Oh, sorry. 6:58. Okay. So 21 minutes.

MR. FISHER: Okay. Whatever.

Do you want to -- fine.

Do you want to reconvene in 20 minutes?

Is that okay?

Look, if we can get back -- if I can get you an answer sooner, I will.

MS. CHIPPERSON: Yeah.

Can -- how about we limit it to 15?

Is 15 sufficient?

MR. FISHER: That's fine.

MS. CHIPPERSON: Okay. All right. Let's do that.

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MR. FISHER: All right.

MS. CHIPPERSON: All right. So we're going off the record.

(A short recess was taken.)

MR. FISHER: All right. We have no redirect, so I guess the deposition is closed.

MS. CHIPPERSON: Okay. Thank you.

THE COURT REPORTER: Counsel, can I just understand your orders, what you would like to see and when as far as this deposition transcript, please?

MR. FISHER: I think we're going to want it in a week or less, so I guess expedited for us.

MS. CHIPPERSON: Yeah.

THE COURT REPORTER: Do you have a preference, a 3-day or a 5-day?

MR. FISHER: 5-day would be fine for us.

THE COURT REPORTER: Okay. Very good.

And did you want the rough draft?

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MR. FISHER: Yes.

THE COURT REPORTER: Very good.

And how about for you, Ms. Chipperson?

MS. CHIPPERSON: I think we already made our indication on the order that we originally put in. I don't remember what that was. It might have been a 3-day.

THE COURT REPORTER: Oh, I do see on here a 5-day delivery for you.

MS. CHIPPERSON: Oh, okay.

We'll go with the 5-day, please.

THE COURT REPORTER: Do you also want the rough?

MS. CHIPPERSON: Yes, please.

THE COURT REPORTER: All right. Very good.

Well, thank you, everyone. Have a great evening.

(The deposition concluded at 6:49 p.m. EDT.)

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DEPOSITION ERRATA SHEET

Our Assignment No. 595246

Case Caption: RØDE MICROPHONES, LLC and FREEDMAN ELECTRONICS PTY LTD. vs. ZAXCOM, INC.

DECLARATION UNDER PENALTY OF PERJURY

I declare under penalty of perjury that I have read the entire transcript of my Deposition taken in the captioned matter or the same has been read to me, and the same is true and accurate, save and except for changes and/or corrections, if any, as indicated by me on the DEPOSITION ERRATA SHEET hereof, with the understanding that I offer these changes as if still under oath.

Signed on the _____ day of _____, 20___.

_____

CHRIS KYRIAKAKIS, Ph.D.

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DEPOSITION ERRATA SHEET

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CERTIFICATE OF SHORTHAND REPORTER

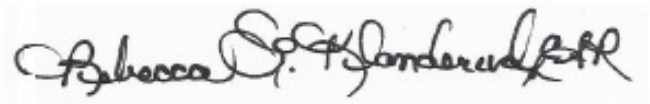
I, REBECCA KLANDERUD, Registered Professional Reporter, Certified Shorthand Reporter within and for the State of California do hereby certify:

That CHRIS KYRIAKAKIS, 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 both parties were represented by counsel at the deposition.

I further certify that the deposition of CHRIS KYRIAKAKIS, Ph.D. was taken via Zoom videoconference communication on Wednesday, August 13, 2025, commencing at 11:56 a.m. EDT.

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.



Rebecca Klanderud
Registered Professional Reporter
Certified Shorthand Reporter

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abilities 74:3
ability 28:14, 134:4, 159:4, 205:17
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