UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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ACCELIGHT TECHNOLOGIES, INC., Petitioner,	)	
v.	)	IPR2025-01566 U.S. Patent No. 10,042,116
APPLIED OPTOELECTRONICS, INC. Patent Owner.	)	

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Deposition of

ALAN WILLNER

WEDNESDAY, AUGUST 12th, 2026

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Reported by: EMMA KEETER
RMR, CRR, Ca. CSR No. 14387

A P P E A R A N C E S

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Also present:

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YOUNGUN KIM, Applied Optoelectronics Patent Agent

I N D E X

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E X H I B I T S

* = marked off the record

Exhibit	Description	Page
Ex 1001	US Patent No. 10,042,116	*
Ex 1004	United States Patent Application Publication, Lee et al, Pub. No. US 2014/0183344 A1, Pub. Date July 3, 2014	*
Ex 1005	United States Patent Application Publication, Kim et al, Pub. No. US 2014/0169389 A1, Pub. Date June 19, 2014	*
Ex 1007	Design and Challenges in a 100 Gb/s Hybrid-Integrated Photonic Circuit, by Bernasconi et al	*
Ex 2010	Declaration of Alan E. Willner, Ph.D. in Support of Patent Owner Response	*

BE IT REMEMBERED that, on WEDNESDAY, the 12th day of AUGUST, 2026, commencing at the hour of 9:37 a.m. thereof, by remote videoconference before me, Emma Keeter, a Certified Shorthand Reporter in and for the State of California, there personally appeared:

ALAN WILLNER,

called as a witness, who, being by me first duly sworn to tell the truth, the whole truth, and nothing but the truth, was thereupon examined and interrogated as hereinafter set forth.

THE VIDEOGRAPHER: Good morning. We're on the record at 9:37 a.m. Today's date is August 12th, 2026. This is the recorded remote video deposition of Alan Willner in the matter of ACCELIGHT TECHNOLOGIES, Inc. versus Applied Optoelectronics, Inc. This deposition is being held via Zoom.

My name is Karen Torres-Corona. I'm the videographer with Focus Litigation Solutions. The court reporter is Emma Keeter. Counsel, please introduce yourselves and state whom you represent, after which the court reporter will swear in the witness.

MS. BHATTACHARYYA: Good morning, everyone. Arpita Bhattacharyya from the Ashurst Perkins Coie law firm on behalf of Petitioner, Accelight Technologies.

MS. CAROTHERS: Jo Dale Carothers of Weintraub Tobin,

attorneys for Opto -- Applied Optoelectronics, Inc., and with me is my colleague, Eric Caligiuri, also of Weintraub Tobin, and Youngun Kim from Applied Optoelectronics, Inc.

THE REPORTER: My name is Emma Harris. I am California Certified Shorthand Reporter No. 14387.

Please raise your right hand.

THE WITNESS: I would like to affirm, if that's all right.

THE REPORTER: Of course.

THE WITNESS: Thank you.

THE REPORTER: Please raise your right hand.

Do you solemnly affirm the testimony you are about to give in the matter -- I'm sorry. I completely got befuddled there.

Do you solemnly affirm the testimony you are about to give in this matter will be the truth, the whole truth, and nothing but the truth, so help you God?

THE WITNESS: If I could affirm without the last part.

THE REPORTER: Of course. Of course. Please raise --

THE WITNESS: Can we try that again?

THE REPORTER: Yes.

THE WITNESS: Thank you. Thank you. My apologies for not mentioning this before.

THE REPORTER: No apology necessary.

Do you solemnly affirm the testimony you are about to

give in this matter will be the truth, the whole truth, and nothing but the truth?

THE WITNESS: I do.

THE REPORTER: Thank you. Go ahead, Counsel.

EXAMINATION BY MS. BHATTACHARYYA

Q. Good morning, Dr. Willner.

A. Good morning.

Q. Dr. Willner, have you been deposed before?

A. Yes.

Q. How many times?

A. I don't know an exact number off the top of my head.

Q. Mm-hm. It -- would it be in the ballpark of three or four times or more than ten times?

A. It's fair to say I've been deposed more than ten times.

Q. Okay. And since you have been deposed before more than ten times, I will not give you a full set of instructions on how the deposition will proceed today, but do you have any questions before we get started, though?

A. No. But I -- will you be mentioning about breaks?

Q. Yes. I -- I'm happy to take a break every hour or so, but if -- if you need a break at any point, just let me know. We'll -- I'll be happy to take a break. I will only ask that if I have a question pending, that you answer my

question before we take a break.

A. Thank you.

Q. Do you understand that you are under oath to answer my questions truthfully and completely?

A. I have affirmed to do so.

Q. Okay. Are you under the influence of alcohol or any medication or drugs that would impair your ability to answer my questions truthfully and completely today?

A. I don't believe so.

Q. And where are you testifying from today?

A. Los Angeles.

Q. Precisely where in Los Angeles -- Los Angeles?

A. This is in my office at the University of Southern California.

Q. Is there anyone else in the office with you?

A. No.

Q. Counsel is not in the office with you; correct?

A. Correct.

Q. Dr. Willner, what have you done to prepare for the deposition today?

A. I read the -- my declaration. I reviewed much of the material that was cited. I had discussions with Counsel.

Q. When you said you reviewed much of the materials that was cited, do you mean the prior art references that

were presented in the IPR addition?

A. I reviewed the -- many of the references that I had given an opinion on in my declaration that were from the prior art submissions by the petitioner.

Q. In addition to the prior art references in your declaration, did you review any documents that refreshed your recollection in preparation of the deposition today?

A. I think -- I'm not sure I -- I understand the question. There's a lot of material. There's the petition. There was the patent owner's response.

Q. Okay.

A. I tried to make a -- tried to review in preparation for today.

Q. Okay. Did you review the prosecution history?

A. I -- I did look through the prosecution history.

Q. Did you look through the prosecution history in preparation for the deposition today, or at a prior time?

A. Both.

Q. And you said that you met with Counsel in preparation for this deposition. Who did you meet with in particular for your -- to prepare for the deposition today?

A. So the meeting was remote, and it was with Dr. Carothers and Mr. Caligiuri.

Q. Did you meet with or talk to anyone at Applied Optoelectronics?

A. I don't believe so.

Q. Did you talk to anyone at Applied Optoelectronics during the preparation of your declaration?

A. I don't believe so.

Q. Would it be fair to say that you have not met with anyone at Applied Optoelectronics during the course of your preparation of your declaration or preparation of your deposition today?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Can you please repeat the -- the question?

Q. BY MS. BHATTACHARYYA: Would it be fair to say that you have not met with anyone at Applied Optoelectronics during the course of the preparation of your declaration in this IPR or for the preparation of your deposition today?

A. I -- I don't remember meeting with anybody.

I think there -- I -- there's somebody, I -- I believe, from -- from the company on the Zoom today. I'm not sure, actually.

Q. Oh. But -- yes, but have -- have you -- but you have not had any conversations that you recall with anyone at Applied Electro -- Applied Optoelectronics prior to today; correct?

A. So -- so I don't remember having discussions pertinent to the -- to the IPR with -- with people, so in --

in terms of in preparation of my declaration or -- or in preparation for today, I just don't remember having any such conversations that are relevant.

Q. Okay. When were you engaged by -- strike that.

When -- when were you engaged or -- to -- to work on this IPR matter?

A. I don't remember.

Q. Well, can you -- can you estimate a -- a time frame when you may have been approached to work on this IPR matter?

A. I -- I've -- you may be aware that I've been retained as an expert for multiple of the patents, and in terms of when each one was -- I was engaged, it's a little fuzzy. I'm more than happy to look that up and -- and try to get back to you about that. But it's -- it's -- I mean, I -- I can definitively say it was -- it was before the -- before I submitted the declaration, and -- with plenty of time for me to do the proper preparation. I just don't remember how far in advance.

Q. Who approached you to be retained for the multiple IPRs that Applied Electro -- Applied Optoelectronics is involved in?

A. So I was a -- I'm retained through a -- a witness service, I guess, is one way to call it. They had contacted me to see if I was interested, and I think -- I -- I'm going

by memory, because this isn't -- so I could be wrong. Ha. I could be wrong. But I think that I was contacted, and I had a -- I don't really remember the details right now, actually. I assume I had a -- I had a -- a remote meeting to dis -- to -- to meet with counsel involved, and they got back to -- I -- I don't know. I mean, the -- the -- I'm now going from memory, and my memory isn't -- isn't that clear.

Q. And -- and you said that you had a remote meeting with counsel involved. Is that Dr. Carothers and Mr. Caligiuri?

A. So I -- I really should, you know -- I'm now going into -- my memory is not clear, and I don't really remember who, and I barely remember having such a meeting. I just assume I did, so it's -- it's a -- it's a guess. I'm speculating. I -- because I just don't remember. But that's -- that's the normal course.

Q. Okay.

A. But I couldn't affirmatively say, you know, who was at that meeting. I just don't remember as I sit here today.

Q. So I -- I understand that you are working on multiple IPRs and maybe even the district court litigations where Applied Optoelectronics is a party. Aside from all of these Applied Electro -- Optoelectronics cases, have you worked with the law firm of Weintraub Tobin before?

A. I don't remember having done so. And you -- you mentioned the district court in -- in your question. I'm not sure I've submitted anything with regards to that. I don't remember having done so. I -- I might have. I don't remember doing so. So it -- that's a different -- a different issue, I believe.

Q. Is this the first time you're working with Counsel at Wein -- at Weintraub in relation to all the IPRs for Applied Optoelectronics?

A. I don't remember working with Weintraub on these -- on these IPRs before.

Q. Let me rephrase my question.

Is this your first engage -- engagement with Counsel at Weintraub?

A. I don't remember having a -- another -- a prior engagement with Counsel -- with -- with anybody at Weintraub. I might have. I just don't remember having done so.

Q. Dr. Willner, have you reviewed US Patent Number 10,042,116 in preparation for your deposition today?

A. I have.

Q. Is it okay if I refer to it as the '116 patent during this deposition?

A. Yes.

Q. And let me just put the -- the patent in the chat

box. The '116 patent was previously marked as Exhibit 1001.

Let me know when you have it.

A. I have it.

Q. Okay. Let's go to the claims of the '116 patent, which start in column 12.

A. So I have a -- a printed copy, a hard copy, without -- I believe there are no notes in it -- of the '116 patent.

Q. It's okay if you refer to that, but can you confirm for me that there are no markings or writings on it?

A. I -- as far as I can tell, there are no writings on it.

Q. What other documents do you have with you in your office for the deposition?

A. I have several documents that are, I believe, clean copies. I haven't checked through every page, but I believe they are clean copies. I have my declaration. I have -- and I'll list them by shorthand -- the Yoshikawa reference, the Ho reference, the Lurie reference, the Bernasconi reference, the Soldano reference, the Ho reference from 2 -- it's a patent from 2 -- November 20 -- published November 20, 2014 -- the Kim reference, the Lee reference, the petition by the petitioner, patent owner's response to the petition, and Dr. Lebby's declaration.

Q. Okay. Can you confirm for me that all of those

documents that you have with you do not have any writings or markings on them?

A. So it -- that -- I wouldn't want to waste your time, because there are hundreds of pages here. For me to give you an affirmative answer, I would -- it would take me a little while to -- to flip through all of the pages. I can -- these -- these -- these are documents that are, I believe, freshly printed, and if I do come across anything that looks like it's a marking, I'll -- I'll be sure to tell you. Unless you want me to look through them, and I -- and I'm happy to do so.

Q. No. I don't want you to look through them, but I'll ask you to put all of them aside and not look through them as -- as I'm asking you questions. If I want you to look at a document, I will specifically tell you to look at a document, but please put aside all of the documents for -- for now.

Did you get that, Dr. Willner?

A. Oh -- so the documents are here because I -- I believe this isn't a memory test, so in case there's a question -- in case there's a question on my declaration, as an example, and I wish to look up something, I -- I'd like to have the ability to look at a document that it's referring to or that -- that may help me to give a -- an accurate answer, even if you -- you may not ask me to pick

it up.

Q. No, that -- that is not how it works, Dr. Willner. I will -- if you need a document, I'm happy to provide you the document, but you cannot have a stack of your own documents with you that you cannot even confirm whether they have markings on them or not to refer to during this deposition. If you need a document, I'll provide you the document.

I'm al -- already uploaded the -- your declaration in the chat and have uploaded the '116 patent on the chat. If you can -- you're free to download the documents that I've uploaded and look them -- look at them on the screen, but you are not free to just -- just pick up any document that you have in the office with you and look at them to answer my questions.

Do you get that, Dr. Willner?

A. It sounds like if I were to confirm that there were no markings on it, that I would be able to -- to confirm that if I were -- wanted to look at a -- a document, I could confirm to you that there -- I would identify to you, I can confirm that there are no markings on it, and then I would feel very comfortable to have it help -- to help refresh my memory.

Q. Dr. Willner, this is not how a deposition works. You are not supposed to bring with you a stack of documents

that you can refer to at your -- whenever you feel like it. You are only allowed to look at documents that I provide to you, and I would have been comfortable just you having your declaration with you or something like that, but it seems you have all kinds of documents with you, and I -- I -- I cannot see what other documents you have on your desk, so you could have a bunch of other materials, written notes -- I have no access to it.

So I will ask you to please set aside all your notes. You can look at the documents on the screen that I upload on the -- on -- on the chat, and I'm also happy to share my screen if it come -- if it's needed.

A. So if I were to ask you that in order for me to give an accurate answer, I would like to look at a certain document that would be one of the exhibits, is that a fair question to ask?

Q. Yes. That's a fair question to ask, and if I deem it is necessary for you to look at the document, I will provide that to you through the chat.

A. What if -- what if I say I need it -- I need it to help refresh my memory?

MS. CAROTHERS: Counsel, may I suggest that -- do you want -- perhaps it's easier for him to work off of printed copies than a screen. Do you want him to affirm that -- I believe he's told you a list of what he thinks he has there.

Do you want him to tell you those are clean copies, or are you insisting that he has to work off of a screen, only looking at pages you show on the screen?

MS. BHATTACHARYYA: He -- he --

MS. CAROTHERS: I'm just trying to clarify.

MS. BHATTACHARYYA: He has to work off the screen, but I'm giving him access to the entire document that he can download or -- but he has to look at them on the screen. Ms. -- Dr. Carothers, you requested a Zoom deposition, and this is how the Zoom deposition is going to work. I'm not comfortable with him looking at any document that he has available on his desk.

MS. CAROTHERS: And we -- and you object to him printing copies from your chat?

MS. BHATTACHARYYA: It -- these are very long documents. If he can print them very quickly, that -- that is fine with me, but I -- I can direct him to very specific pages on his declaration to ask him some questions, and -- and if he thinks he needs to print them, that's fine with me, but I don't want to waste -- waste time doing that.

MS. CAROTHERS: All right. We -- we object that there should be no reason he can't have clean copies of documents in front of him or that they couldn't have been provided ahead of time by you, Counsel. However, we suggest that we move forward and see if he requires more than what you're

providing him to answer your questions.

MS. BHATTACHARYYA: If he does need any document, I'm happy to provide them to him. And I made that very clear. And most doc -- depositions, counsel just share documents on the screen. I'm happy to do that too, but I prefer giving the witness the full document, which I have made available through chat. So I think let's just proceed with the deposition.

Q. BY MS. BHATTACHARYYA: Dr. Willner, I'll ask you to look at the documents on the screen. You're happy to -- I'm happy for you to download them on your desktop if it's easier for you to do that, but please do not look at documents that you have printed out and have with you in your office.

A. So probably, the main documents that we'll be discussing are fairly short. These are just the patents or -- or the Bernasconi. So those -- I don't believe it would take too long to print those out and to confirm -- actually, I have them printed out. I can even confirm those right now, that they don't have any -- any markings.

I -- I think my CV, Dr. Lebby's CV -- you know, those -- a lot of the other ones, the petition -- I can put those aside. I -- patent owner's response -- those are not the main ones I'll be -- I could ask you if it comes up. But the main ones, I think, are basically the -- the prior

art references. Those are fairly short. I could very quickly -- they should probably take me one minute per to just confirm with you, and I would put everything else aside.

Q. Okay. How -- how about we proceed with one document at a time; okay? And you may not even need to print out everything. So -- so -- and what we can do is that I can upload some documents on the chat before we take our next break, and you can use that time to print them out.

For now, can we just go to the '116 patent, and maybe you -- and you can just confirm that the '116 patent printed out that you -- that you have with you doesn't have any markings? Can you do that quickly?

A. I believe I actually did already.

Q. Okay.

A. I thought on the record I had. But as I said -- and it took me less than one minute --

Q. Okay.

A. -- I'm happy -- I'm happy to take the -- there really are just a few. It would be three or four minutes. I'd be happy to look at the ones I have already printed out -- I mean, that have already been printed out -- and just confirm. And then -- and then it's a done deal.

Q. Let's just proceed with one document at a time. Can you please confirm that the '116 patent that you have

with you doesn't have any markings or writings on them?

A. I believe I've already confirmed that, but I'll confirm it again.

And do you want me to confirm my declaration?

Q. Not right now.

A. But you had put that into the chat.

Q. I did, but when we get to your declaration, I will ask you to do that; okay?

A. Am -- am I free to look at it now if I wish?

Q. I'm not going to ask you any questions about your declaration right now, so can we please focus on the '116 patent for now?

A. But my opinions are -- are in here, in the declaration, so I -- I may look at the '116, but in order to refresh my memory, I may look here. Do you want me to --

Q. No, I do not want you to look at your declaration right now, Dr. Willner. Please put that aside.

Dr. Willner, can you please go to claim 1 of the '116 patent?

A. I'm there.

Q. Claim 1 of the '116 patent recites, an arrayed waveguide grating, within parentheses, AWG, close parentheses, chip comprising five different elements.

Do you see that?

A. I see that the preamble describes an arrayed

waveguide grating, in parentheses, AWG, close parentheses, chip comprising, and then it lists several elements.

Q. What does the term "comprising" in the preamble mean to you?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I would like to look at my declaration to help refresh my memory.

Q. BY MS. BHATTACHARYYA: Can you answer as a person skilled in the art, what does the term "comprising" mean to you, Dr. Willner?

A. I feel, to give an accurate answer, I would like to look at my declaration.

Q. Do you recall giving an opinion about the term "comprising" in your declaration?

A. This isn't a memory test, so I don't -- I -- I would like to look to make sure if I did or didn't.

Q. Dr. Willner, I cannot have you for every question I ask spend time looking at your declaration, even if you have not given an opinion on it.

So you have worked on -- in multiple IPRs before; right?

A. Yes.

Q. So what does the -- and you have come across the term "comprising" in patent claims before; correct?

A. Correct.

Q. So what does the term "comprising" mean to you as -- as one skilled in the art?

A. So preambles can mean different things, in -- in my experience. "Comprising" may or may not have different meanings. I would like to see in my report -- in my declaration if I made any comment about that. So -- especially given that preambles may or may not be -- have great weight, I want to -- to take a look.

So in -- in the absence of me having memorized my declaration, I -- I would say that I'd like to see it, and I'll give you an accurate answer.

Q. What -- what is your understanding of the plain and ordinary meaning of the term "comprising"?

A. I'm going to -- unless you -- unless you --

Q. I'm asking you to put your declaration aside, Dr. Willner --

A. Sure. You -- please -- if you -- if you instruct me that I must, then I will.

Q. I'm ask -- I am instructing you to put your declaration aside and just answer, what is the meaning of the term "comprising" to you as one skilled in the art?

A. And you're -- again, I'm -- if you -- if you tell me I cannot look at it now, I won't. But unless you tell me I can't, I will look at it.

Q. I -- yes, I'm telling you you cannot look at your

declaration right now.

A. Okay.

Q. Please answer my question --

A. So my -- so I may have said something different in my declaration. I don't remember. But "comprising" -- that -- without giving four corners of a definition, but in general, "comprising" is often thought of as "including."

Q. So when the claim recites -- in particular, claim 1 of the '116 patent recites, an AWG chip comprising several different elements, it -- it would mean that the AW chip -- AWG chip includes those elements; correct?

A. So since I haven't memorized my declaration, I may have said something different in there. But in general, including if -- if -- if, in -- in the general sense, "comprising" is often thought of as "including," then I think it would in -- then the AWG chip would include, if that's an understanding, the elements that -- that follow.

Q. You can now look at your declaration and tell me if you have said anything different in your declaration about the -- about the meaning of "comprising."

A. Do you want me to confirm that there are no markings on my declaration?

Q. Yes, please -- please do that. No need to do that for your -- for your CV, which is fairly long, but you can do that for the -- the main -- your main opinions pages.

A. So I can confirm that it does not appear to me that there are any markings on this printed hard copy version of my declaration, excluding the Exhibit A.

Now, your question about my -- any opinion I may have given or not given about "comprising" -- I'll now take a look, if that's all right.

Q. Yes, please let me know when you're done.

A. So, I don't believe I gave an opinion contrary to a general understanding of "including."

Q. And your general understanding of the term "comprising" means "including"; correct?

A. I believe you've -- that my general understanding of "comprising" -- that, in general, would be "including."

Q. Claim 1 of the '116 patent recites that the AWG chip comprises a substrate, among other elements; correct?

A. Correct.

Q. Based on your general understanding, that would mean the AWG chip includes a substrate; correct?

A. I believe that's -- that's a fair statement.

Q. Would it be correct to say that the AW -- strike that.

Would it be correct to say that the -- strike that.

Would it be correct to say that because the AWG chip includes a substrate, that the substrate is a part of the AWG chip?

A. I -- I guess the question is -- you're using the term "part of." Could you -- how are -- how are you using "part of"?

Q. What does the term "part of" mean -- mean to you?

A. Well, I -- I guess the -- you -- I didn't use it, so I would say that the -- the "comprising," including a substrate -- the substrate is included in the -- in the AWG chip. "Part of" without -- in sort of a generic way? "Part of"? It's -- it's included in. Included as part of the -- the AWG chip. But I'm not giving any extra weight or meaning to "part of," beyond "including."

Q. If I take my coffee cup here and I place it on my desk here, does my coffee cup become part of -- strike that.

If I take my coffee cup and I place it on my desk in my office, does my desk become included in the coffee cup?

MS. CAROTHERS: Objection. Form.

THE WITNESS: This sounds like a -- I believe it may be a hypothetical. It's something that, you know, given that we're talking about terms, and terms have meaning, I -- I'd want to be -- I -- it would take me a long time to really try to think of the -- the meaning behind what you said.

Q. BY MS. BHATTACHARYYA: I'll ask the question again. It's not a very complicated question.

If I place my coffee cup on my desk, does the desk

become part of the coffee cup?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So this does sound like a hypothetical. It sounds like, given that a person of ordinary skill may look at terms, they -- they would look at intrinsic evidence, their own -- their own understanding, extra -- so the idea that to sort of take the cup and the -- and the -- and the desk, now to take words that may apply to the patent and -- you know, would they apply here too? What does it mean? It sounds like a hypothetical. Sounds like it's something I would need to think quite deeply about, especially if those words will come back and be -- might be applied to the '116.

Q. BY MS. BHATTACHARYYA: I -- I'm not asking you about terms in the patent. I'm just asking you a hypothetical scenario. If -- if -- if -- if I put my coffee cup on the desk, if I even glue it -- my coffee cup to the desk or mount it in some other way, does the desk become included in the coffee cup?

A. I'll -- so this -- is the question completely outside of the context of the '116 patent?

Q. I will get to the '116 patent, but you can just answer my question based on the -- just the hypothetical that I gave to you.

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I -- I think that this is a hypothetical question. I think I would need a lot more time in order to be able to give an answer of how terms should be applied, given how terms have -- carry great weight.

Q. BY MS. BHATTACHARYYA: Which -- which term are you talking about that you need to give -- give a lot of thought to?

A. Well, there are many issues involved. I -- in the first time you mentioned, you said the coffee cup is on top of the desk, then -- then you -- the next time, it was the -- I think when you mentioned it was glued, maybe, it was -- it feels like I'd need to really think through what all the issues might be, think through what a person of ordinary skill within the -- the desk/coffee -- the desk/coffee cup genre might be think -- it's just too hard to -- to give an off-the-cuff answer, as far as word -- words that may -- you know, may have great meaning.

Q. Dr. Willner, it sounds like you're refusing to answer my question.

A. Oh -- I'm -- I'm -- I -- I would -- I would hap -- very happy to answer your question. I would need a lot of time to do so. It may not be able to happen in one day, though.

Q. Okay. I will ask my question again, and if you still think that you will need a lot of time to think about

it, just -- just state so, and I will move on, but it will be part of the record that you are refusing to answer even a simple question. So listen carefully to my question.

If I take my coffee cup and mount it on my office desk with glue or with some other adhesive, does my office desk become included or become part of my coffee cup?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Given that this is a hypothetical example, given that the -- many of the words being used are -- there are some similarities in the words to the '116 patent, and the words do carry great meaning, I would need to think very carefully and in more detail before ascribing and -- and answering this hypothetical.

Q. BY MS. BHATTACHARYYA: Let me ask you a question very specific about the '116 patent, then: Claim 1 of the '116 patent recites that the AW chip -- G chip comprises a substrate; correct?

A. I believe you said "comprises." I think it's "comprising," although I don't -- I -- my apologies. I don't mean to correct you.

Q. No, that's fine. An AWG chip comprising a substrate. That's what is recited in the '116 patent; right?

A. Correct; the -- the -- claim 1 has a preamble, an arrayed waveguide grating chip comprising, and one of the

elements is a substrate.

Q. And earlier, you testified that "comprising" means "including"; right?

A. Well, I -- I said in general that one can think of "comprising" often means "including," and I do not believe I'd given any opinion inside of the -- my declaration to the contrary.

Q. So the A -- so claim 1 of the '116 patent recites that an AWG chip includes a substrate; correct?

A. So given that I think in general, often, "comprising" can mean "including"; given that I have not given an opinion to the contrary, then the AWG chip would include a substrate.

Q. What does the term "substrate" mean to you?

A. A substrate is, for the purposes of my declaration, in order to be able to give an opinion, as I have, I was using the -- the term as a supporting base.

Q. And would you say that the plain and ordinary meaning of the term "substrate" is "a supporting base"?

A. I -- I think, as I mentioned just a moment ago, I think for the purposes of my declaration. I don't -- I think a person of ordinary skill in the art, the opinions I gave, that that -- that is -- that kind of understanding would be sufficient here to support the opinions that -- that I'd given.

Q. And just to clarify, when you said "that kind of understanding," you mean it would be fair to understand the term "substrate" as "a supporting base" in the context of the '116 patent?

A. So I'll -- I'll just repeat what I said, that -- that for the purposes of my declaration, that a person -- that the understanding that I used in terms of plain and ordinary meaning that would suffice to be able to render the opinions that I did, would be the supporting -- would be "a supporting base."

Q. So going back to claim 1 of the '116 patent, claim 1 recites -- strike that.

Claim 1 of the '116 patent requires the AWG chip to include a supporting base; correct?

A. Well, it includes a -- a substrate, and, again, to sup -- my -- the opinions I've given, I've just simply used "supporting base." I haven't -- in terms of more specifics than that, I haven't used more specifics than that.

Q. But you agree with me that in the context of the '116 patent, "substrate" can mean "supporting base"; correct?

A. I think "substrate," in the way I've used it -- and, again, it's -- in order to give -- render the opinions that I have, I didn't feel it was necessary to give more specificity to that. So I used -- my understanding was "a

supporting base."

Q. Earlier, you testified that claim 1 of the '116 patent recites an AWG chip includes a -- a substrate; correct?

A. I said that the AWG chip -- that "comprising" can often be thought of as the word "including," and that I did not give any opinion to the contrary in my declaration, and the AWG chip would therefore include a substrate.

Q. And if we consider "substrate" to mean "a supporting base," which you have done for the purposes of your opinion, then by extension, the AWG chip would include a supporting base; correct?

A. Not sure I'm giving the opinion that all supporting bases are -- are substrates. I think it's -- I'm not using a -- a -- a definition of "substrate equals supporting base." I think "substrate" -- my understanding is that, for the purposes of my opinion here, it's a supporting base. But if -- if your question is, are they equivalent to me, I don't think I'm giving that opinion, that all supporting bases are substrates.

Q. In the context of the '116 patent, a substrate means a supporting base; correct?

A. In -- again, I -- I -- I'll just -- I'll repeat.

So I've used -- in order to render my opinion, I used the understanding that the substrate -- a substrate in claim

1 -- then, in order to render my opinions, that it sufficed in order to understand that the substrate is a supporting base. And I don't -- do not think one can then say that all supporting bases are substrates. We -- we -- in terms of what I was utilizing.

Q. What -- what -- what types of supporting bases are not substrates?

A. I -- I -- I'd have to think more about that. I -- I don't know if I've given any opinion about that in my declaration. I don't think I have. But we're -- we're now trying to come up with examples, and I'd need more time to think about it.

Q. If an AWG chip is mounted on a PCB board, would you consider the PCB board as a substrate of the AWG chip?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I -- is this a hypothetical, or is this something that's specific in the -- in the art that I -- I should be looking at?

Q. BY MS. BHATTACHARYYA: It is -- it relates to the '116 patent, but it's not a question about the prior art references.

A. Oh -- oh, so this -- so this is a -- a term -- this is an example not -- that isn't part of the '116? And you're -- I -- I didn't understand it -- it's -- it's not part of the -- not part of the prior art that's been

identified?

Q. Dr. Willner, please answer the hypothetical as you see it. If you -- if you need clarifications on the hypothetical, I'm happy to provide that, but my question is, if an AWG chip is mounted on a PCB board, would you consider the PCB board as a substrate of the AWG chip?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So in order for me to -- to give you an opinion as to your hypothetical, I would need a lot more time to think about it.

Q. BY MS. BHATTACHARYYA: Can you give -- can you please give me an answer to my hypothetical as you sit here today, based on all the knowledge that you have? And you -- you can say that this is not your -- you haven't given it much thought, whatever parameters you want to put in there, but please answer my question.

A. So in order for me to give you an accurate answer, I would like -- and given that it's a hypothetical case, I would need a lot more time in order to be able to accurately answer your question.

Q. Dr. Willner, you have to answer my questions truthfully and completely, and so I'm asking you again the question -- I'll ask the question again. To say that you need more time to think about it is not -- is not -- it's not a truthful answer. You can answer my question to the

best of your ability, based on all the knowledge you have sitting here today; okay? And you can put in your caveats if you want, but please answer my question.

Do you want me to repeat the question?

A. You don't need to. I'm going to give the same answer. Because I am answering. My answer is that I will need a lot more time to -- in order to be able to give an accurate answer to your hypothetical question.

Q. Dr. Willner, I'm allowed to ask you hypothetical questions, and you have to answer my hypothetical questions to the best of your ability.

Do you get that?

A. Well, of course.

Q. So I will ask my question again, and you cannot refuse to answer it by saying you just need more time to think about it.

MS. CAROTHERS: Objection. Form.

THE WITNESS: I'm -- I'm -- I'm not -- I -- I don't -- I think that was not correct. I -- I didn't just say, "Oh, I need more time to think about it." This is something that I didn't give an opinion about. You -- you're -- this is a new -- something new. Hypothetical, I -- I mean -- and I am giving you an answer, which is, I -- this hypothetical -- if you want an accurate answer, I will need more time to think about it.

Q. BY MS. BHATTACHARYYA: Okay. But let me break down the question to you.

What is an AWG chip?

A. Are you asking me what's an AWG chip in -- within the specifications or within the claim number 1?

Q. What does the term -- what does an AWG chip mean to you?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So AWG chip -- I've been focusing on, of course, claim number 1, and looking at what is claimed there. AW chip is mentioned numerous times in -- in the -- in the patent. So I can start to read to you. I'm sure you don't want me to do so. I can start to read to you what this AWG -- AWG chip -- the -- there are embodiments. There's what's claimed in 1. I -- I doubt -- I doubt you want me to read all of that.

Q. BY MS. BHATTACHARYYA: An AWG --

A. And so to -- oh, I'm not finished with my answer yet.

And so your -- the question of, what is an AWG chip -- it has meaning here. And the -- and the patent goes into a lot of detail about that.

Q. An AWG chip is a common component in optoelectronic devices; correct?

A. An arrayed waveguide grating is a common

component.

Q. So what does "arrayed waveguide grating" mean to you as a person of ordinary skill in the art in the field of optoelectronics?

A. So if I may, I hadn't really finished the last answer. The array -- can I -- but I can answer your new question -- it doesn't really matter. They're all -- they're related anyway.

Q. Please answer my new question.

A. So I think your new question didn't include the word "chip." So -- and my previous answer was the arrayed waveguide grating. So arrayed waveguide grating is -- it's a common type of component. It's -- the -- the -- the word "AWG chip" is -- "chip" may be used -- we'd want to see -- you know, outside the context of the '116, somebody may use the term "AWG chip" in one way or another within some parameters, which I haven't thought all the details of yet.

But "AWG chip" may include different things to different people. I think the arrayed waveguide grating is there, because that's the AWG chip. And then, in terms of the '116, it does talk about what it believes the AWG chip would -- would include.

MS. CAROTHERS: Counsel, I think we've been going for a little over an hour. When you get to a point, if we could take a quick break, I would appreciate it.

MS. BHATTACHARYYA: Okay. We can take a -- take a break. We -- we can go off the record.

THE VIDEOGRAPHER: We're off the record at 10:47 a.m.

(Recess taken from 10:47 a.m. to 10:59 a.m.)

THE VIDEOGRAPHER: We're back on the record at 10:59 a.m.

Q. BY MS. BHATTACHARYYA: Dr. Willner, during the break that we just took, did you have any conversations with Counsel regarding the testimony that you have given today or the testimony that you are about to give?

A. No. What -- what I did do was I looked at the Kim, Lee, Bernasconi, and Soldano references, and I can confirm now that there -- I do not believe there are any writings on them.

Q. Okay. Going back to the '116 patent, which is Exhibit 1001, claim 1 of the '116 patent recites, a planar lightwave circuit, open parentheses, PLC, close parentheses, disposed on the substrate.

Do you see that?

A. Yes.

Q. What does the term "disposed on" mean to you as a person of ordinary skill in the art in the context of the '116 patent?

A. So, I don't believe I gave an opinion about the term "disposed," but the understanding that I used that was

sufficient for my opinions is that it is located, in a broad sense -- located on the substrate.

But that's not a hard definition. It's just an understanding that I used.

Q. Claim 1 of the '116 patent further recites, a tapered region disposed at the second end of the AWG chip configured to receive light via the plurality of output waveguides and reflect the same towards an exposed output interface region of the AWG chip.

Do you see that?

A. Yes.

Q. What does the term "an exposed output interface region of the AWG chip" mean to you?

A. The output interface region is exposed. It's uncovered. It doesn't have things there.

Q. So let's go to your declaration, which is Exhibit 1010.

A. I have it.

Q. Let's go to para -- page 38 of your declaration.

A. Is this ground three?

Q. Yes.

A. Okay. I'm there.

Q. For ground three, which is Bernasconi in view of Soldano, you have opined that Bernasconi in view of Soldano does not meet the -- the claim limitations of claim 1

because neither Bernasconi nor Soldano discloses an exposed output interface region as required by claim 1.

Do you see that?

A. Correct.

Could you please remind me which paragraph you're reading from?

Q. I'm reading from paragraph 104.

A. Oh, okay. Thank you.

Q. With respect to ground three, you have opined on only that one limitation of claim 1; correct?

A. For ground three, I have given an opinion regarding Limitation [1e].

And that's not to exclude anything else, it's just that's -- that's what I am affirmatively giving -- stating there. But there may be other issues that I haven't identified here.

Q. The -- in your opinion, Bernasconi in view of Soldano ren -- does not render obvious claims 1 to 4, 10, and 11 of the '116 patent because neither Bernasconi nor Soldano discloses an exposed output interface region as required by claim 1; correct?

A. So I -- I've identified affirmatively that neither Bernasconi nor Soldano disclose an exposed output interface region as required by claim 1. That's what I affirmatively say.

Q. You have not identified any other limitation of claim 1 that, in your opinion, is missing from the Bernasconi in view of Soldano combination; correct?

A. In terms of ground three, claims 1 to 4, 10, and 11, I have affirmatively given an opinion based on that neither Bernasconi nor Soldano disclose an exposed output interface region as required by claim 1, and I don't identify other reasons here.

Q. I have placed the Bernasconi reference, which has been marked as Exhibit 1007, into the chat box. But, Dr. Willner, you're free to look at your printed-out copy of Bernasconi if you would like to.

A. I have -- I have Bernasconi printed out, and I've confirmed that there -- I don't believe there are any markings on it.

Q. Okay. Let's look at Figure 2(b) of Bernasconi.

A. Certainly.

Q. Figure 2(b) of Bernasconi shows a tapered region of the AWG that reflects light towards an uncovered region of Bernasconi's ceramic substrate, where the APDs are mounted; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So are you reading from the claim of --

Q. BY MS. BHATTACHARYYA: No, I'm -- I want you to refer to Figure 2(b) of Bernasconi and answer my question.

A. Sure. So in terms of the issue of Figure 2(b) of Bernasconi, I do not believe that there's enough detail that's given in this short description and the block diagram of 2(b) in order to be able to accurately answer the question and to accurately be able to ex -- talk about an exposed region, as we -- as we've been discussing.

And the reason is that it's -- the block diagrams -- a person of ordinary skill reading this -- this document would know that there's very likely other things in those block diagrams, some of which are even mentioned in the text. But it's hard to know what's really going on there in the -- in the -- in that diagram, and whether it's, you know, sort of the same side as the substrate without passing the received light through the substrate -- that's -- that -- that's just very difficult for a person of ordinary skill in the art to be able to determine.

Q. I'm happy to take -- break down Figure 2(b) to you, Dr. Bernasconi, but I'm asking you a question just what's shown on the page of Bernasconi in Figure 2(b); okay?

A. I -- I'm --

MS. CAROTHERS: Objection --

THE WITNESS: -- I believe you -- you may have called me Dr. Bernasconi.

Q. BY MS. BHATTACHARYYA: Sorry. I -- I apologize, Dr. Willner.

Let's just take a look at Figure 2(b) of the Bernasconi reference, which is Exhibit 1007.

Figure 2(b) of Bernasconi shows an AWG with a tapered region at one end; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I -- I honestly believe it's very difficult to determine the specifics of what is in this -- the box. One can look at the -- at the drawing of this black box, which a person of ordinary skill in the art would know very likely has other components in there and other materials, other things may be there. And as is mentioned even in -- in the text of Bernasconi.

And so does it look like there's an end -- just based on the figure, is there an end that's at an angle and reflects light? If you just looked at it, it -- it looks like there's an angle, and -- and light is being reflected.

Q. BY MS. BHATTACHARYYA: Okay. I just want you to just answer my question based on just the figure. We are not concerned about what may be missing in the figures or other components is there; okay? Just based on the figure --

A. Is "okay" a question to me?

Q. I -- I will phrase my question, but I want you to answer my question just based on what you can see from the figure; okay?

A. Oh, so that is a question? So the answer is, it's very difficult to answer your -- the question based on what I see in the figure. I tried to. I can tell you what the figure -- what -- what shows, but there's -- unfortunately, the claim of the '116 has other issues that one needs to know details about, and that black -- that black box is -- that's shown for the AWG -- or that's shown with the word -- with the letters AWG -- it -- it's -- a person of ordinary skill in the art would -- would know that it's very likely there are other things there that would or that could very well invalidate its -- its corresponding to the claim 1 of the '116.

Q. Dr. Willner, I do not want you to think about what is missing from the figures of Bernasconi. Please answer my questions based on what you can clearly see from Figure 2(b) of Bernasconi. If -- can you do that?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Well, I can look at the figure. I know that the text tells me that there are some things there. So I -- I can make believe it doesn't exist, but, you know, it -- it -- I -- do you -- if you want me to make believe the text doesn't exist and I'm just looking at the figure, I can do that.

Q. BY MS. BHATTACHARYYA: Does the text contradict anything in -- that's in the Figure 2(b) of Bernasconi?

A. So the text is giving -- is informing me. Is informing a person of ordinary skill. There are -- that that's -- that's a box. That's a black box that may have other things in there, and that -- that if I'm trying to apply this to claim 1 of the '116, that's important. And I need -- and I would want to know that. A black -- you know, drawing black boxes -- I think it's clear from the '116 that there -- there are things that are important that can't be glossed over.

Q. And what is the important thing that you're trying to understand from Bernasconi?

A. Sure --

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I'm trying to look and see if this issue of -- what are some of the things that may be, in -- in terms of the -- the arrayed waveguide grating? AWG. The -- it's an AWG box that has other things in there.

So as an example, if it has other layers in there that may be a substrate as well, and -- and if we -- if it's supposed to come out without passing through the substrate, then I wouldn't know it.

Q. BY MS. BHATTACHARYYA: Okay.

A. And -- yeah. That's -- I think that's...

Q. Okay. Figure 2(b) of Bernasconi shows a box that is labeled AWG; correct?

A. Bernasconi has a -- a box which is a -- a box that has the letters AWG written on them.

Q. And the letters AWG would mean arrayed waveguide grating; correct?

A. So the -- it's clear from Bernasconi, from the text, that although AWG stands for arrayed waveguide grating, that there are very likely other things in that box.

Q. In Figure 2(b) of Bernasconi, the box that is labeled AWG has a tapered region at one end of the box; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So outside the context of the '116 patent, the Figure 2(b) of Bernasconi has a -- has a -- a box that -- with the word -- with the letters AWG, in which it's showing a slanted region, and where light is being reflected from that slanted region.

Q. BY MS. BHATTACHARYYA: Figure 2(b) of Bernasconi shows that light is reflected off the slanted region of the box labeled AWG, and that light travels towards APDs that are mounted on a ceramic base; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I -- I did not memorize Bernasconi. I believe you used the term "ceramic base," so I'm going to want to go try to piece all this together. And...

You used the word -- words "APD detectors." I think I'm having trouble because I think there was a couple of words that were modified -- it sounds like many of the words are coming from claim 1. Some of the words, though, were replaced. So is there a way to slowly explain what -- what that is?

Q. BY MS. BHATTACHARYYA: I did not use the term "detectors." I just said "APDs," which is shown on -- in Figure 2(b) of Bernasconi.

A. I believe you didn't say the word "detectors," but the words -- but the letters APD -- the D stands for "detectors." So I was using one word of the three words that APD stands for.

Q. Let me refer you to the second paragraph in the introduction of Bernasconi. Bernasconi states, starting line 4 in the second paragraph of the introduction, that -- or let's take it from the first line of the second paragraph of the introduction of Bernasconi.

We present an example of ten-channel parallel transmitter and receiver optical sub-assemblies, open parentheses, TOSA and ROSA, close parentheses, with an aggregated capacity of 107 Gbps, period. They consist of arrays of DFB lasers and avalanche photodiodes, open parentheses, APD, close parentheses, combined with silica arrayed waveguide gratings as multi-demultiplexers, period.

Do you see that?

A. Yes.

Q. So Bernasconi is using the term APD to mean avalanche photodiodes.

Do you see that?

A. I see that, and avalanche photodiodes or avalanche photodetectors. People in the art will sometimes use it one way, sometimes the other.

Q. Okay. So now going back to my prior question, Figure 2(b) of Bernasconi shows a box labeled AWG, which has a tapered region, and light reflects off that tapered or slanted region towards the APDs that are mounted on a base; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the box that has the letters AWG has a slanted region where the light is coming in from the left, will be reflected from that slanted region, then go through other things inside that box that a person of ordinary skill would likely -- would know likely exist there, and then ultimately, it is heading towards a box that is labeled with APD.

MS. CAROTHERS: I'd like to just use this opportunity to put on the record that the witness will want to review and sign.

MS. BHATTACHARYYA: Sure.

Q. BY MS. BHATTACHARYYA: So in Bernasconi's Figure 2(b), there is a surface in the box labeled AWG through which light exits the AWG towards the APD area mounted on the base; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Yeah, a lot of what you said is hard to gather. I think one -- one can look at -- at Figure 2(b), see that there's a box, which a person of ordinary skill in the art would know would likely have other -- other aspects to it -- other things in there, as is reflected in the text of Bernasconi, and so the light -- all I can gather is that the light is somehow being reflected, may be going through other layers, other things, and then it -- it will leave that -- leave that box labeled AWG, which may contain other things. And then it will be heading towards the box labeled APD.

Q. BY MS. BHATTACHARYYA: As light exits the box labeled AP -- AWG and travels towards the box labeled APD, light is traveling through a -- a space that has nothing in it; correct? According to Figure 2(b) of Bernasconi?

A. So Figure 2(b) of Bernasconi shows a box that is labeled an AWG, of which a person of ordinary skill in the art would know likely has other layers, may also have its own substrate, and the -- it is -- light is coming from the left to -- towards the right, hits this slanted region from

the figure, is reflected, then is going through unknown -- unknown regions, exits the box that's labeled AWG. The figure itself doesn't identify anything between the AWG box -- black box and the APD black box in between. At least, the figure doesn't -- the -- there may be something in the text. I don't remember.

Q. Based on just the -- based on -- strike that.

Based on the Figure 2(b) of Bernasconi, there does not appear to be anything that's between the box that is labeled AWG and the box that is labeled APD, such that the light exiting the AWG box is traveling through free space before he -- hitting the box labeled APD; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I -- may I -- I -- can I take a look -- since I didn't memorize Bernasconi, is it all right if I --

Q. BY MS. BHATTACHARYYA: Yes, please take a look to see if Bernasconi mentions anything in between the AWG and the APD.

A. Thank you.

Okay. So the Figure 2(b) -- oh, could you please repeat the question?

Q. In Figure 2(b) of Bernasconi, there does not appear to be anything between the box labeled AWG and the box labeled APD, such that light exit -- exiting the A --

AWG is traveling through free space before reaching the -- the APD; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the black box of the AWG is -- the -- the black box that has the letters AWG has, according to -- a person of ordinary skill in the art would know that there are other parts, very likely, part of what's inside of that black box.

The -- and I do want to say that that tapered region or what you -- you -- I think you referred to it as a tapered region. I called it a slanted region. The -- Bernasconi calls it an external mirror. External turning mirror. I'm not so sure that that's -- that -- that would even fit the definition here, an external turning mirror, that -- an external turning mirror -- turning mirror redirects the light onto an array of APDs. That's -- I'm reading from Bernasconi -- that's -- that's now a little bit -- could be viewed as a little different than what -- what the '116 claim 1 is talk -- might be talking about.

But coming, then -- this external turning mirror, which was not clearly seen in the -- in Figure 2(b) -- the light would be reflected down, perhaps go through various other layers, perhaps even another substrate that's there, exit the box of -- of -- that's labeled AWG.

I wasn't able to find on my cursory reading right now,

nor do I see it in the Figure 2(b), that -- that there would be anything placed between the box that's -- has the AWG label and -- between that box and the box that's labeled APD.

Q. BY MS. BHATTACHARYYA: Dr. Willner, you said that the box labeled AWG could have other layers or things in it.

Does Bernasconi provide any disclosure of what is included in the box labeled AWG as shown in Figure 2(b) of Bernasconi?

A. Bernasconi, first of all, is -- is fairly short, and there's a lot of detail that's missing. It does have some things that would lead a person of ordinary skill in the art to understand that there's more going on, so as an example, that -- there -- thermoelectric coolers are mentioned as well.

In terms of the -- the other boxes, the -- the -- one of the boxes for -- in just Figure 1; right -- these big -- these boxes that have a label on it -- it mentions that -- that the -- the bar, which relates to the DML laser -- the -- the bar -- the bar is flip chip mounted on a carrier, so that's a -- another issue in another -- in another box.

Q. Dr. -- Dr. Willner --

A. I believe that -- I believe that substrate -- I believe that substrate is also mentioned somewhere else that's not even -- it's part of another box that isn't even

specified. The word "substrate." So I --

Q. Dr. Willner, I'm only asking you about Figure 2(b). You are now looking at other figures and talking about DML laser, which is part of the TOSA. We are not talking about the other figures of Bernasconi. We are only talking about Figure 2(b). So I will repeat my question.

Ber -- Bernasconi does not provide any disclosure of what are the different layers or components of the box that is labeled AWG in Figure 2(b); correct?

A. I believe it does, and I believe a person of ordinary skill would -- would read the whole document, and then it would inform somebody about, what does it mean to have a box? What is -- if there's a box drawn, does that -- is that meant to say that there's nothing else in there? Is that giving a complete picture?

So I think one can -- a person of ordinary skill would look at Bernasconi and -- and understand that there's a lot of detail in this thing, that there's detail missing from even the box labeled AWG. Bernasconi even mentions a couple of things that are part of that A -- AWG box that -- that aren't -- that aren't drawn out there.

So I -- I think -- I think that's what a person of ordinary skill would understand, that -- that there's not enough there to disclose aspects of the '116.

Q. Can you tell me where in Bernasconi does it tell you other components or layers of the AWG?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So a person of ordinary skill in the art would -- when reading Bernasconi, would look at Figure 2(b), would look at the AW box and -- sorry -- AWG box and -- and know that -- that there's likely other things in there. And then, Bernasconi itself describes other things that are part of -- part of that box. And -- and I've mentioned a couple of things already.

Q. BY MS. BHATTACHARYYA: I'm asking you to tell me exactly where Bernasconi describes other things that are part of the AWG box.

A. May I use a pen?

Q. Sure, you can -- you can mark it on your -- on the copy that you have.

A. So I think that the person of ordinary skill in the art would look at Figure 2(b), the box that's -- that has the letters AWG. They would understand that -- that the box very likely contains other things.

The -- to your -- your -- your question about where in Bernasconi does it talk about it, the -- it talks in general that -- on the second page, the ROSA consists of four parts, as shown in Figure 2, and then it talks about free-space collimating optics not shown. I don't know where that is;

right? Is that -- is that part of -- is that feeding into the AWG? That's a good question. I don't know.

It says, frequency tuning is achieved via a resistive heater assembled on the same PLC chip. So that -- that tells me that there's something else, perhaps, there that's not shown in 2(b). An external turning mirror redirects the light, so -- but that also has some -- some physicality to it that may or may not be shown in detail.

The -- and as I come back to the issue, as a person of ordinary skill would look at this, would -- would know that -- that -- that there's very likely other things there. I think that's just very plain and clear, that there could be other layers, including a layer that's called a substrate, that -- that then would have requirements, based on claim 1.

Q. Dr. Willner, you are not answering my question.

Bernasconi itself does not disclose any other components or layers within the AWG; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I -- I believe I did answer that. I think Bernasconi in the text -- first of all, a person of ordinary skill in the art -- that's the way they would understand this, that there would -- that there is likely other -- other layers that very well could be part of this. They would understand that this is a black box type of a

description. It's supported by the -- some of the text that I -- that I read before on page 2 of Bernasconi, where it did talk about other things that may be there.

Q. BY MS. BHATTACHARYYA: Dr. Willner, you read to me a text that talks about other things that may be present in the ROSA; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I'm not -- I read a -- I read from things that are part of the -- of the ROSA, but I think it's pretty clear to somebody reading it who's a person of ordinary skill in the art, a couple of those things really just do relate to -- to the AWG box.

Q. BY MS. BHATTACHARYYA: Can you --

A. That resistive -- the frequency tuning is achieved via resistive heater. That's -- that's -- that's relating to the AWG box. And I just don't see a lot of detail; right? I mean, there's not enough there to know. The external mirror. That seems to be related to the AWG box. But you don't really see the detail, so it's hard to know. And there --

Q. Dr. --

A. -- specific things in the '116 one needs to know.

Q. Dr. Willner, I'm asking a very simple question. Does Bernasconi, in its written text, provide any disclosure of what is present in the box labeled AWG, as shown in

Figure 2(b)?

A. I think a person of ordinary skill in the art would -- would read and understand that there's -- there is disclosure of things not shown, such as the -- as I mentioned before, that frequency tuning is achieved via a resistive heater assembled on the same PLC chip. I -- that -- that -- that is telling me that some -- something may very well be there on the same PLC chip. That's -- that's pretty good.

An external turning mirror. I don't know what an external turning mirror -- what the details of that are, but it's -- it's -- that's kind of telling me that that's part of that -- that box that we were talking about. The AWG.

And -- and a person of ordinary skill would -- would know that there are other things. It's -- it's -- it's not limited to that.

Q. Does Bernasconi in its written text say that the AWG includes a substrate?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the -- if -- does -- may I -- may I read through, because I didn't memorize it?

Q. BY MS. BHATTACHARYYA: Sure.

A. So, a person of ordinary skill in the art --

Q. Dr. Willner, I'm going to stop you right there. Can you please point me to where in the written text of

Bernasconi does it say that the box labeled AWG includes a substrate?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the words verbatim, "the AW" -- quote, "the AWG box" -- well, could you please repeat the question?

Q. BY MS. BHATTACHARYYA: Does Bernasconi in its written text or in the drawings show that the AWG includes a substrate?

MS. CAROTHERS: Objection. Form.

THE WITNESS: And you're saying it -- I can't use a -- a -- the -- what a person of ordinary skill in the art would know?

Q. BY MS. BHATTACHARYYA: Yes. I'm not -- I'm asking you a very specific question about what's disclosed in Bernasconi.

So does Bernasconi disclose in its drawing or in its written test -- text that the AWG includes a substrate?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the words verbatim, quote, "the AWG includes a substrate," end quote -- those words verbatim are not -- I -- I did not see them.

Q. BY MS. BHATTACHARYYA: Did you see any disclosure in -- in Bernasconi that's referring to a substrate in the AWG?

A. Is this -- am I allowed to use a person of ordinary skill in the art?

Q. I'm ask -- I'm not asking you to read in a substrate in the AWG. I'm asking you about the disclosure of Bernasconi.

Does Bernasconi itself tell you in written words or via drawings whether the AWG includes a substrate layer?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So Bernasconi -- you -- you used the word "disclose." So if "disclose" is some -- is what a person of ordinary skill in the art may understand it to be, then I've answered that. If you're asking me, are they verbatim -- is it done verbatim or in -- in either the diagram -- which is a black box diagram -- or in the text, then verbatim, having that "the AWG includes a substrate" -- I did not -- close quote -- I did not see those words.

Q. BY MS. BHATTACHARYYA: Dr. Willner, I'm not asking you for a verbatim quote in Bernasconi. I am asking you, is there any explicit disclosure in Bernasconi referring to anything about a substrate in the AWG?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I -- I -- although -- although a person of ordinary skill in the art would know that -- that the AWG box may very likely include its own substrate, the text itself has -- and the figure are -- it's -- it's not

explicitly or -- I cannot at this point affirmatively say how it's explicitly stated, although this is -- I go back to the same issue, which is, it -- it's just this black box. There's not a lot of detail in the whole -- in the whole article, and a person of ordinary skill would know that there's a lot missing.

Q. BY MS. BHATTACHARYYA: And just to clarify, Bernasconi does not in its disclosure say anywhere that the AWG includes a substrate layer in it; correct?

A. Yeah, so I'll go back to my --

MS. CAROTHERS: Objection. I -- one moment, please. Objection. Form.

THE WITNESS: Yeah, I'll go back to my previous answer. I think that your question is trying to narrow down or expand what I said, so I'll -- I'll just say it again, because I think my answer -- I did answer your question, but I think you were -- the way you phrased it was -- was somewhat broader.

The -- in terms of what's disclosed, the -- I think it's very clear that there's not a lot of detail in Bernasconi. That in terms of what's disclosed, a person of ordinary skill in the art would understand that a box of -- labeled AWG would very likely include other things. And one of those other things could very well be a substrate.

Now, have I identified where Bernasconi has explicitly

stated that there is a substrate inside of the AWG box of Figure 2(b)? I don't think I've been able, as I sit here, to -- to identify such an explicit statement, although it may be there.

MS. CAROTHERS: Counsel, it's been just over another hour. Would you like to take a break?

MS. BHATTACHARYYA: Sure. It's almost lunchtime. Do you want to just take a lunch break now?

MS. CAROTHERS: Let's go off the record and discuss, if that's okay.

MS. BHATTACHARYYA: Okay.

THE VIDEOGRAPHER: We're off the record at 12:02 p.m.

(Recess taken from 12:02 p.m. to 12:49 p.m.)

THE VIDEOGRAPHER: We're back on the record at 12:49 p.m.

Q. BY MS. BHATTACHARYYA: Dr. Willner, during the last break that we just took, did you have any conversation with Counsel about the testimony you have given in the deposition so far or the testimony that you may be giving in the deposition?

A. No.

Q. Dr. Willner, you are currently a professor of Electrical and Computer Engineering at University of Southern California; correct?

A. My title is Distinguished Professor of Electrical

and Computer Engineering and the Andrew and Erna Viterbi Professorial Chair.

Q. Do you do research work at USC as part of your employment there?

A. I -- I do do research at USC.

Q. What is the focus of your research work at USC?

A. My work at USC -- and I -- I -- while I'm at USC, I should mention, I've -- also have involvement in industry in many ways, plus having started my own company.

In terms of just limiting it to the work that's at USC, within the confines of my optical communications laboratory, so I deal with optics and photonics technologies, communications, signal processing, and networking. And that's just as -- primarily, because I've been involved with a lot of things.

Q. And what is the focus of your work that you do outside USC in industry or in your own company?

A. So I've been involved as a consultant to many companies. I've been involved on -- on technical advisory boards for many companies. I started my own company within the con -- within the area of optical communications technologies. And then, as president of the IEEE Photonics Society and president of Optica -- those are professional societies -- I had a lot of interaction with issues that related to the optical communications industry. And as

editor-in-chief of three different journals in the field as well, I had a lot of interaction with issues of -- that related to the optical communications industry.

Q. And what -- what does your company do? Or let me take a step back.

What is the name of your company?

A. The company that I had founded is -- the technology had been sold. It was Phaethon Communications. P-H-A-E-T-H-O-N.

Q. And what does Phaethon Communication do?

A. So Phaethon Communications was a company that I had founded and was the CTO. It had -- was involved with trying to enable higher-performance optical communication systems and to interface with the equipment manufacturers within the industry.

Q. What type of optical communications systems were you trying to improve the performance of?

A. I would say many different types. Trying to -- as one of the areas of involvement, it was trying to limit the degradations that may occur due to chromatic dispersion. But that's one of the areas that -- that the company had been involved with.

Q. What are the companies that you are currently consulting with?

A. Oh -- by the way, I -- I should also mention that

as a member of the US Army Science Board, I also had a fairly broad view of things going on in industry.

In terms of your question, who am I currently consulting for in the industry? I'd have to think about that. Some -- sometimes it's on and off, but it really was -- in terms of consulting and scientific advisory boards over the last 30 years, it's -- it's not a small number. But -- giving you --

Q. My question --

A. -- I'm not giving you a specific name as of right now.

Q. In the last five years, what -- what companies have you done consulting work for?

A. So there were several, but I -- I would be doing that from memory, and I don't want to give a -- give a wrong answer. But there -- I -- I can attest that there were several companies that I was -- had been doing consulting for in the last five years.

Q. Can you give some of the names, even if it is not a complete list?

A. I'd be -- I -- I don't want to guess, and I don't want to be wrong, so --

Q. So are you say --

A. -- I can -- I can follow up. I mean, if that's something that's important, I can try to gather it together

for you.

Q. So sitting here today, you cannot give me the name of any company that you have done consulting work for in the last five years?

A. So I wouldn't want to be wrong. I can give you -- if you -- if you don't limit it to the last five years -- because maybe I'll be cutting it off -- I -- again, it's -- there's -- there's a lot. I don't -- I don't think there's much of a question. I've done a lot of consulting for companies and been on a lot of scientific advisory boards. And --

Q. But --

A. -- in -- including the Defense Science Research Council that did long-term reports for the Department of Defense and -- and the Army Science Board. Which -- which is not a company, of course.

I had to fill out -- this was regularly something I needed to fill out, actually, at the time, to list all the -- all the companies that I had been doing consulting for. So I had gathered it over the years. I just don't have it with me right now.

Q. So sitting here today, you cannot recall the name of a single company that you have done consulting work for; is that right?

MS. CAROTHERS: Objection -- objection. Form.

THE WITNESS: No, I -- I -- I can -- well, are you limiting it to the last five years or ever?

Q. BY MS. BHATTACHARYYA: Forever. Can --

A. Oh, sure. I've consulted for many companies, and I could -- Corning, Raytheon -- golly. There's just so many. I wasn't -- I hadn't prepared the list, but there's 30 years' worth of stuff that I've been doing.

Q. Have you consulted with Corning or Raytheon in the last five years?

A. I might have. I -- I don't -- I don't remember. I -- these are -- that's a detail. But I have -- I can affirmative -- affirmatively say I have been -- I have consulted in the last five years.

Q. Have you ever consulted for Applied Optoelectronics?

A. I don't remember ever doing so.

Q. But you cannot affirm -- say affirmatively you have done or -- or you have not done consulting for Applied Optoelectronics?

A. I -- I just -- I mean, you're -- you're asking me to prove a negative. I -- I have no memory. I have no memory of -- of consulting for that company.

Q. Have you ever designed any AWG chip?

THE REPORTER: Any what?

MS. BHATTACHARYYA: AWG chip.

THE REPORTER: Thank you.

THE WITNESS: I have been involved in the design of -- of AWG chips -- well, of arrayed waveguide gratings. I've been involved in -- in that.

Q. BY MS. BHATTACHARYYA: And the arrayed waveguide gratings that you have been involved in the design of -- what was the application -- application of those AWG?

A. Those applications would be wavelength multiplexing or wavelength de-multiplexing, as -- as an example.

Q. Have you been involved in the design or development of AWG chips?

A. Well, are we talking about the '116 AWG chip or are we talking about -- please define for me what -- what we're talking about.

Q. What is the difference in your mind between an AWG and an AWG chip?

A. So I -- I think we -- we discussed this a little earlier. So the -- outside the context of the '116, "AWG chip" can be used in the industry to include different things or not include them. The '116 includes certain things.

So in terms of the arrayed waveguide grating that I was involved with that I am very familiar with for decades that I've put in chapters I've written, that I've talked

about in courses, that I published in papers, I -- I'm not quite sure the -- I -- I called it arrayed waveguide grating, and I'm -- and now we're adding in "chip." I'm not -- and it's unknown to me what -- what that is meaning in your mind, because it is being used within the context of the '116 in -- in a certain way.

Q. In -- in the context of the '116 patent, what does an AWG chip mean?

A. An AWG chip is discussed in the '116 as -- throughout the -- the specification, and in the claims, especially in claim number 1, there's a -- a specific AWG chip comprising, and then it gives several elements. So I think that's a -- that's a fair statement.

Q. Would it be fair to say that in the context of the '116 patent, the -- the AWG chip comprises an arrayed waveguide grating component?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I think it's fair to say that the arrayed waveguide grating chip would have something that is an arrayed waveguide grating as part of that. I think that -- sorry.

In the con -- and in the context of claim 1. Yeah.

Q. BY MS. BHATTACHARYYA: So you said that the arrayed waveguide grating chip of the '116 patent would have something that an arrayed waveguide grating as part of that.

That -- that's not clear to me -- could -- could you repeat your an -- answer?

MS. CAROTHERS: Objection. Form.

Q. BY MS. BHATTACHARYYA: And I can repeat my question if you -- if you'd like me to.

A. Sure.

Q. Would it be fair to say that in the context of the '116 patent, the AWG chip comprises an arrayed waveguide grating component?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I think that it's fair to say that claim 1 of the '116 would incorporate something that is an arrayed waveguide grating as part of it.

Q. BY MS. BHATTACHARYYA: Let's take a look at claim 12 of the '116 patent.

Let me know when you are there.

A. Oh, I'm there.

Q. Claim 12 of the '116 patent recites, an optical transceiver module comprising various components and -- including an arrayed waveguide grating chip.

Do you see that?

A. Yes.

Q. So as with claim 1 of the '116 patent, the AWG chip of claim 12 would also include something that is an arrayed waveguide grating as part of it; correct?

A. I think -- I think that would be a fair -- a fair way to understand that.

Q. So in the context of the '116 patent, and particularly, claims 1 and 12 of the '116 patent, would it be fair to say that an arrayed waveguide grating is a part or a portion of the AWG chip?

MS. CAROTHERS: Objection. Form.

THE WITNESS: It's -- there's -- I think it's fair to say that when it recites "AWG chip," that somewhere -- somewhere, there's an arrayed waveguide grating that's part of it.

Q. BY MS. BHATTACHARYYA: And when you say that -- "an arrayed waveguide grating that's part of it," you mean an arrayed waveguide grating is part of the AWG chip; correct?

A. I would say that a person of ordinary skill would look at the term "AWG chip" and would think that somewhere -- somewhere, there is an arrayed waveguide grating.

Q. Dr. Willner, what is a planar lightwave circuit, also known as PLC?

MS. CAROTHERS: Objection. Form.

Q. BY MS. BHATTACHARYYA: And if you need some context, Dr. Willner, both claims 1 and 12 of the '116 patent refers to a PLC.

A. A planar lightwave circuit, without giving a definition with four corners, is, generally speaking, a -- an -- an optical -- a photonic circuit. Light is traveling within a plane, and there are -- the circuit -- there's a circuit, which implies that there's some -- some -- something going on with the light. It's not just -- it's not just free -- free-going.

Q. A POSITA would have understood that one application of a planar lightwave circuit would be an AWG multiplexer or AWG de-multiplexer; correct?

THE REPORTER: A what would have understood?

MS. BHATTACHARYYA: A person of ordinary skill in the art.

THE REPORTER: Thank you.

THE WITNESS: So "planar lightwave circuit" is a -- a broad term. Could encompass many different types of -- of devices. One of the types of a planar lightwave circuit can be an arrayed waveguide grating.

Q. BY MS. BHATTACHARYYA: And the arrayed waveguide grating -- strike that.

One type of planar lightwave circuit can be an arrayed waveguide grating applied as a de-multiplexer; correct?

A. So in -- in general, a person of ordinary skill would -- would understand that "planar lightwave circuit" is a fairly broad term; could encompass many different kinds of

circuits, very -- many different kinds of devices, and -- one of which could be an arrayed waveguide grating used as a de-multiplexer.

Q. I just added Exhibit 1004, which is the Lee reference, to the chat box.

MS. CAROTHERS: Counsel, which exhibit is that?

MS. BHATTACHARYYA: It's Exhibit 1004.

MS. CAROTHERS: Just wondering if you could tell -- I -- I'm not working off of the chat, so.

MS. BHATTACHARYYA: Okay. That's fine. It's Exhibit 1004, which is the Lee reference.

MS. CAROTHERS: The Lee reference? Thank you.

THE WITNESS: I have -- I -- I downloaded the Lee reference that you put into the chat. I also have a hard copy that was printed out, and I had looked during one of the breaks to be able to confirm that I don't believe there are any markings on it.

Q. BY MS. BHATTACHARYYA: Okay. I'm fine if you look at your hard copy, Dr. Willner.

A. Thank you.

Q. Dr. Willner, Lee discloses a PLC 110 in its disclosure; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Are you referring to a PLC of the '116 claim 1? Or outside the context of the '1 --

Q. BY MS. BHATTACHARYYA: I'm -- I'm just asking you about Lee's disclosure. Does Lee disclose a planar lightwave circuit labeled as 1110 in its disclosure?

A. So outside the context of the '116, there is a planar lightwave circuit that is disclosed, but I would need more time to be able to say whether that PLC is the PLC of -- of claim 1. On the other hand, did I say that -- did I -- did I affirmatively in my declaration say that it's not the PLC? I'm not sure I gave that opinion.

Q. Let...

Let's go to --

A. Don't --

Q. -- paragraph nine of Lee. It's on page 1.

A. I'm there.

Q. Take a moment to read paragraph nine.

Let me know when you're done.

A. Sure.

Q. Okay. Paragraph nine of the Lee reference explicitly states that one application of a PLC may be an AWG de-multiplexer; correct?

A. So Lee, in paragraph nine, which is in the background -- that -- it describes that a planar lightwave circuit -- that can take many different forms, and that an example of a planar lightwave circuit can include -- can include in the background an array -- a...

That -- it mentions specifically, it can be used -- the PLC can be used as a DMUX, and then, in the case of a double PLC, it says that such is -- an arrayed waveguide grating can be used as a DMUX, in the context of a double PLC.

Q. So Lee, in paragraph nine, explicitly states that in the case of a double PLC, the PLC can be used as an AWG de-multiplexer; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So in terms of -- in terms of background -- in terms of -- of background, Lee is saying that a planar lightwave circuit can take many forms. A -- a double PLC could be an arrayed waveguide grating, as -- as an example.

Q. BY MS. BHATTACHARYYA: And particularly, the PLC could be an arrayed waveguide -- waveguide grating that is used as a de-multiplexer; correct?

A. So Lee describes, in the background, a -- the planar lightwave -- planar lightwave circuit, which is a fairly broad term that can include many different kinds of -- of devices. It mentions that one type could be used as a de-multiplexer, and one type of such a de-multiplexer could be -- in the case of a double PLC, could be an arrayed waveguide grating.

Q. What is the difference between a different -- a

PLC and a double PLC?

A. I'd have to look at my declaration to see if I mentioned anything about it. I may not have given an opinion about it, and I'd want to refresh my memory.

Q. If -- if you want to do that, but I don't think you have talked about it in your declaration, so if you want to confirm, that's fine with me, but -- or you can just answer based on your general knowledge in the field.

A. So I -- I'd want to be careful. I don't believe I've men -- said anything that would accurately described -- that would accurately describe a double PLC. So I don't want to -- I don't want to be speculating or guessing, because I want to give you an accurate answer.

Q. So are you saying, sitting here today, you cannot tell me the difference between a PLC and a double PLC?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So double PLC -- I'd want to look into it. I'd want to understand what is being described in -- since I haven't given an opinion about the differences, I'd want to look at Lee. I'd want to see what Lee may be referring to. Maybe it's somewhere else. Maybe it's in some reference. And then, also, to look and refresh my memory about what somebody of ordinary skill would -- would understand it to be. But I think that's a -- that's a fair answer.

Q. BY MS. BHATTACHARYYA: So as a person of ordinary skill in the art, sitting here today, you cannot tell me if there is any difference between a PLC and a double PLC; is that right?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So I've -- I don't think I'm saying that. I think that I want to give you an accurate answer to see what -- what Lee is meaning. If you want me to answer it outside the context of Lee and outside the context of the '116, I can describe, you know, "double PLC" in terms of how I've -- how it may be used in different ways, but I don't think that's what you're asking me. I think you want me to -- you want me to be able to answer you in the context of Lee and in the context of the '116. So for that, I'd probably need to look through Lee to see anything more about that.

Q. BY MS. BHATTACHARYYA: Lee is in front of you, Dr. Willner. If you want to look through it to answer my question, feel free.

A. Oh. But I -- I probably will need a lot of time. You know, this is -- if you want my understanding of -- of how a double PLC is different, I probably won't be able to do it, you know -- I want to read Lee. I'd want to maybe go back to some of the references. Because a double PLC is -- I mean, it -- I wouldn't want to give you an inaccurate

answer. And I don't think I gave a -- an opinion about the -- about a double PLC different than a PLC within my declaration.

Q. You -- you studied Lee before providing your opinion about Lee in your declaration; correct?

A. Yes, I did.

Q. Did you read the background section of Lee before you gave your opinion about Lee in your declaration?

A. Yes, I did.

Q. Did you come across the term "double PLC" when you studied Lee for your declaration?

A. Yes, I did --

Q. -- for your deposition?

A. Yes, I -- yes, I did.

Q. And did you not think to yourself, "What does 'double PLC' mean in the context of Lee here?"

A. Of course I did.

Q. And -- and what was the answer that came to your mind about what "double PLC" means in the context of Lee?

A. So a lot of things came to my mind, and when I looked at it, different things came into my mind. I don't recall them right now. They were not written down as part of my declaration, so I don't remember them. There's no question that I considered it. I thought about it. The differences didn't seem to be relevant to the opinions that

I provided in the declaration, and so I -- I didn't rely on understanding what I thought at the time, and which I did understand -- I didn't rely on that in terms of any opinion, and I just don't remember right now what was -- what I thought at the time.

Q. So let me get this straight: You read Lee, you saw the term "double PLC," you thought about it, but you don't recall anything about what you thought about what "double PLC" means in the context of Lee; is that what you're saying?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I did not say that.

Q. BY MS. BHATTACHARYYA: What -- what are you saying, Dr. Willner?

A. Oh. Okay. So at the time, when I was looking at Lee, I -- I read through Lee. I came across "double PLC," and I came across many different terms. And I was trying to analyze Lee and the '116. What -- there are numerous terms in the specifications that -- and in -- well, not just the specifications, the two patents. And I narrowed down -- I thought about things, and I had an understanding, and I narrowed down to what I was going to give an opinion about. And -- which is the declaration.

There were an enormous number of issues that -- and terms and everything else. And many of them just had -- did

not -- was not -- they were not relevant in terms of determinative for the opinions that I gave. So I did at the time have an understanding. I don't remember right now what was in my mind then.

I'm confident that -- that I thought about it, that it was not important to the opinion -- the opinions that I put down in the declaration. And I'd like to give you an accurate answer, but, again, that's -- it's not in the declaration, I don't think, and I just don't remember right now the -- that which I was -- was going through my mind at the time.

Q. As a person of ordinary skill in the art in the field of optoelectronics, what does "double PLC" mean to you?

A. So, again, I'll have to say that I -- I'd want to look into that. I don't think I gave an opinion about that. It's a -- it's in the -- in the universe of PLC, and so I'd want to really understand how -- how Lee understood it before giving this sort of, what does an ordinary -- person of ordinary skill define or understand this term? But I don't think it appears, really, in -- in the -- in my -- in my declaration.

Q. But you agree that a double PLC is a type of PLC; correct?

A. Well, outside the context of the '116 and

outside -- that -- a double PLC would -- it's in the universe of -- of planar lightwave circuits. So I -- I think that's a fair statement. Are these things two of them side by side? Are they -- I just would want to see what they're -- what they're talking about. That's all.

At the time, I did. At the time, I thought about it, and I just don't remember all of those details.

Q. Let's just take a look at Figure 2 of Lee.

THE REPORTER: 2 what?

MS. BHATTACHARYYA: Figure 2 of the Lee reference.

THE REPORTER: Thank you.

Q. BY MS. BHATTACHARYYA: Dr. Willner, are you there?

A. Yes.

Q. Figure 2 of Lee shows an optical unit 3 -- 300 that is mounted on a sub-mount 140; right?

A. Are you --

MS. CAROTHERS: Objection. Form.

THE WITNESS: Are you reading from someplace within -- within the specification?

Q. BY MS. BHATTACHARYYA: I'm just referring to Figure 2 of Lee. And if you want, I can point you to paragraph 42 of Lee, which refers to the number 140 as a sub-mount.

And throughout the Lee specification, the number 300 refers to an optical unit.

A. I didn't memorize it. Do you want me to look through or should I just -- you represent to me that that's what it is?

Q. I'm representing to you that the Lee reference uses the number 140 to refer to a sub-mount and number 300 to refer to an optical unit.

A. Okay.

Q. Now if you look at Figure 2 of Lee, it shows the optical unit 300 mounted on sub-mount 140; correct?

A. So the optical transmission means...

The optical transmission means, which has as an example a multi-core type of a planar lightwave circuit 110 -- so that, according to Lee, is mounted on a separate sub-mount 140.

Q. So Figure 2 of Lee shows a sub-mount 40 that functions as a supporting base underneath PLC 110; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So given that -- well, we discussed the term "supporting base" earlier today in regards to some understanding of "substrate." Given that I mentioned that a supporting base may be larger -- a larger category, I think we -- and given that "supporting base" comes with a lot of term -- a lot of meaning in the '116, I'd say it's fine to call it a sub-mount here.

Q. BY MS. BHATTACHARYYA: So you agree that sub-mount

140 of -- of Lee is functioning as a supporting base underneath the PLC 110?

A. I'm not sure I --

MS. CAROTHERS: Objection. Form.

THE WITNESS: Yeah, I'm not sure I -- I'm giving that opinion. I certainly -- this is outside the context of the '116, where we have discussed "supporting base." And the Lee reference calls it a sub-mount, and it's mounted on the -- the item 110 -- is -- it says it's mounted on a separate sub-mount, and I -- I -- I would be very -- it would be hard for me to say that anything about supporting it has -- has any relation here in terms of my opinion to the '116. So in terms of "supporting base," I -- I'm not so sure I want to ascribe that here. And I'm not so sure I -- yeah.

Q. BY MS. BHATTACHARYYA: Dr. Willner, Lee discloses that PLC 110 is mounted on a sub-mount 140; correct?

A. I think Lee discloses that the 110 is mounted on a separate sub-mount. That's what it says. A separate sub-mount.

Q. In paragraph 42 of Lee, Lee specifically discloses that the PLC 110 is mounted on a separate sub-mount 140; correct?

A. So Lee discloses that the optical transmission means that may include the planar lightwave circuit, 110, is

mounted on a separate sub-mount, 140.

Q. What does the term "sub-mount" mean to you as a person of ordinary skill in the art?

A. A sub-mount is -- well, mounts, sub-mounts, generally speaking, that the -- could be -- could be various things, but, you know, one example would be where something is -- is placed on top.

Q. So a sub-mount supports a component mounted on it; correct?

A. I think a sub-mount --

MS. CAROTHERS: Objection. Form.

THE WITNESS: So out -- outside the context of the '116, the sub-mount or any sub-mount -- not the sub-mount of Lee, but any sub-mount -- may -- there may be something that's on top of it and that, outside the context of the '116, may be supporting it.

Q. BY MS. BHATTACHARYYA: So the '116 patent does not mention the term "sub-mount," or at least I don't think it does, so let's keep that aside.

As a person of ordinary skill in the art, when you see the word "sub-mount" in a reference such as Lee, would you consider the sub-mount as a supporting base or structure for the component that is mounted on the sub-mount?

A. So outside the context of the '116, that if something is mounted onto something else, then one could, in

a very broad sense, say that it supports it. But, again, that's outside the context of the '116.

Q. Earlier, you testified that in the context of the '116 patent, the term "substrate" means "a supporting base."

Do you recall that?

A. I believe I said --

MS. CAROTHERS: Objection. Form.

THE WITNESS: Yeah. I -- I wasn't giving a definition, I don't believe. I think I was giving you an understanding of -- I -- that was my understanding that -- that was all I needed to -- to understand in order to be able to give the opinions that I did. That it's a supporting base for -- within the context of the AWG chip. And I think I specifically said that although it's in a supporting base, you would -- I would not, in the worst case, say all supporting bases would be substrates. And so I -- I want to be very careful about how I -- it's being defined, and I only used the -- the understanding that was necessary in order to be able to render my opinions.

Q. BY MS. BHATTACHARYYA: You -- in your declaration, Dr. Willner, you have not provided any specific definition of the term "substrate" as it appears in the '116 patent; correct?

A. So I believe my declaration says I -- I tried to apply a plain and ordinary meaning.

Q. And as a person of ordinary skill in the art, what is the plain and ordinary meaning of the term "substrate" in the context of the '116 patent?

A. So I -- in the context of the '116 patent, I did not need to -- to define it any -- any more in order to give my opinions than it's the supporting base of -- of the AWG chip. But that's -- you know, that right -- I didn't have to -- I didn't feel that there was any need to go further in terms of any -- any additional definitions, such as trying to define that all supporting bases may not be substrates. That -- I don't think that would make much sense.

Q. Okay. So going back to the Lee reference, the sub-mount 140 is a supporting base of the PLC 110; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the Lee reference has -- says that 110 can be mounted on a separate sub-mount 140, and in the general understanding, outside the context of the '116, that 140, 1 could say, supports 110.

MS. CAROTHERS: So, Counsel, we've been going a little more than an hour. Whenever you get to a convenient break, maybe we could have five or ten minutes.

MS. BHATTACHARYYA: Sure. How about we -- we could take a break now. Let's make it, like, five minutes. I don't think I have too much left, so we can --

MS. CAROTHERS: That's -- that's fine. Thank you,

though.

MS. BHATTACHARYYA: Let's just say let's be back at 2:00.

MS. CAROTHERS: Okay. Perfect. Thank you.

THE VIDEOGRAPHER: We're off the record at 1:54 p.m.

(Recess taken from 1:54 p.m. to 2:01 p.m.)

THE VIDEOGRAPHER: We're back on the record at 2:01 p.m.

Q. BY MS. BHATTACHARYYA: Dr. Willner, during the last break that we took, did you have any conversation with Counsel about the testimony you have given in the deposition thus far and the testimony that you may be giving in the deposition?

A. No.

Q. Going back to the Lee reference, which is Exhibit 1004, Lee describes optical fibers 130 or cores 1 -- cores 130 in -- in the PLC chip.

Do you see that? And I can specifically refer you to paragraph 60 and paragraph 69 of Lee.

A. So I -- you want me to look at paragraphs 60 and 69?

Q. I want you to refer to the term "optical fiber 130" in Lee, which appears in various paragraphs, including paragraph 43, paragraph 60, paragraph 69.

Do you see that?

A. I would need time to read this.
Q. You can go ahead and read the paragraphs that I mentioned.
A. Sorry. Could you -- could you repeat those? I --
Q. Paragraph 43, paragraph 60, paragraph 69.
A. I -- I'm going to -- ha ha ha.
Q. You can go ahead and mark it in your paper.
A. Is that all right?
Q. Yeah. Yeah. You can circle the paragraph numbers, 43, 60, 69.
A. So I -- I marked those three paragraphs. Do -- do you want me to read them?
Q. Yeah, you can go ahead and read them.
A. Okay. I, at least on the surface, familiarized myself with what was there.
Q. Okay.
A. But I -- I may need to look back. I didn't memorize it, so I may need to look back once you ask a question.
Q. Okay. What is the function of the optical fibers 130 in the context of Lee's disclosure?
A. So the -- I'd have to -- I mean, the function -- it's -- the fibers -- I'm not quite sure what the question is. Sounds -- sounds like a pretty broad question.
Q. Lee's PLC 110 includes optical fibers 130;

correct?

A. Well, when I look at Lee, I look at claim 1, and then I look at claims 2 and 3 as being two dependent claims where those are two different dependent claims of claim 1.

Q. Are you looking at the claims of Lee?

A. Oh, yeah.

Q. Okay.

A. Yeah.

Q. Let me ask you a different question: If you go to paragraph 45 of Lee...

Lee discloses specifically that PLC 110 includes a core 113.

Do you see that?

A. Which paragraph are we looking at, again?

Q. Paragraph 45.

A. Okay. I'm -- I'm -- I was -- I was just looking at -- you know, trying to familiarize myself. Please repeat the question.

Q. Lee discloses that PLC 110 includes a core 113; correct?

A. So in -- in paragraph 45 of Lee, it shows that...

That there is a -- that there is a core 113 of the PLC 110.

Q. And then, if you look at para -- at Figure 6 of Lee, it shows that the PLC 110 includes multiple cores 113;

right?

A. The PLC 110 in Figure 6 seems to show multiple cores 113.

Q. And these cores 113 in PLC 110 of Lee are separate optical waveguides through which light can travel; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So the cores 113 -- they are meant for light to be transmitted through them.

Q. BY MS. BHATTACHARYYA: And cores 113 -- they are waveguides through which light travels; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: So outside the context of the '116, the -- the cores 113 of Lee are meant for light to go through, and they seem to be waveguides.

Q. BY MS. BHATTACHARYYA: Dr. Willner, I put the IPR petition into the chat box. Can you download that?

Is that a hard copy of the petition that you just pulled up?

A. So I downloaded what you had put in. I also have in front of me a hard copy of the petition. I have not yet looked through it to confirm that there are no markings, so if you wish, I can do that right now.

Q. I'm just -- I'm going to take you to a very specific page of the petition. Maybe you can just confirm for me that there is nothing written on that page; okay?

So let's go to page 20 of the petition.

A. Would it be all right if I -- if I was looking at page 20, to go to 19 and 21, or --

Q. Sure. Sure.

A. Okay. Because I'd be more than happy to just look through it. Could take me just one to two minutes, and then -- and then there wouldn't be the issue.

Q. Sure. That's fine.

A. As far as I can tell, there are no markings on this hard copy.

Q. So going to the petition at page 20 -- let me know when you're there.

A. Oh, I'm there.

Q. The petition says in the third paragraph on that page that Lee's optical unit 300 and sub-mount 140, wherein PLC 110 is modified in view of Kim to have AWG structure and functionality, together form an AWG chip.

Do you see that?

A. Yes.

Q. So the IPR petition states that PLC 110 of Lee is modified in view of Kim to have AWG structure and functionality; right?

A. I -- I think you were reading from paragraph -- from -- from the page 20.

Q. Yes.

A. So that's -- that's the petitioner's position.

Q. Yes. So you understand Petitioner's position is that the PLC 110 of Lee is modified in view of Kim to have AWG structure and functionality; is that right?

A. I -- I believe that's what is stated in -- on -- on page 20 of the petitioner's -- of the petition.

Q. Okay. So you agree that the petition states that PLC 110 of Lee is modified in view of Kim to have AWG structure and functionality; correct?

A. My apologies. I'm just trying to put away some of the other documents that were out.

So Petitioner looks to Kim, which discloses an optical receiver module, which includes an optical connecter, a de-multiplexer, an optical device, a photodetector, a pre-amplifier, and so on. Petitioner argues that a person of ordinary skill would know to combine the structures in Lee and Kim.

Q. And Kim specifically -- specifically discloses that de-multiplexer 120 may be an AWG de-multiplexer; correct?

A. Can you --

Q. Kim has also been provided to you. It's Exhibit 1005. If you want to pull it up and to confirm for yourself, that's fine.

A. Sure. I have a hard copy printout of Kim.

Q. Sure, go ahead.

A. During a previous break, I confirm -- I was able to confirm that there were no markings on this.

Q. Sure. Feel free to look at that, and I can specifically refer you to paragraphs 22, 23, and 24 of Kim.

A. Please -- so I -- I've familiarized myself.

Q. Okay. The Kim reference discloses a de-multiplexer 120, which may be an AWG de-multiplexer; correct?

A. So the Kim reference is disclosing a de-multiplexer 120 that may have an arrayed waveguide grating structure.

Q. And now going back to the petition, at paragraph 20, the petition states that PLC 110 of Lee is modified in view of Kim to have AWG structure and functionality; correct?

A. The petition is putting forward their opinion of -- of doing such a thing.

Q. And earlier, I misstated. I said the petition at paragraph 20. I meant the petition at page 20. In the third paragraph on page 20, states that the PLC 110 of Lee is modified in view of Kim to have AWG structure and functionality.

Do you see that?

A. I do.

Q. Okay. So according to the petition, PLC 110 of Lee is modified in view of Kim to have A -- AWG de-multiplexer structure; correct?

A. So I -- I -- I believe that page 20 of the petition is putting forward that as a possibility. They're asserting that -- that a person of ordinary skill, they're saying, would have known to consider Lee and Kim together, and then modified one in view of the other. I think that's their -- I think that's their position.

Q. Yeah. Now, let's go to your dec -- declaration at paragraph 78.

In paragraph 78 of your declaration, you state that Lee is directed towards a coupling scheme between a PLC optical waveguide, within parentheses, or waveguides, close parentheses, and converting an optical signal or signals into an electrical signal or signals.

Do you see that?

A. Yes.

Q. Okay. And then you go on to say that if Lee and Kim are combined, the AWG of Kim would be located upstream from Lee's optical waveguides and would not change any of the claimed elements of Lee.

Do you see that?

A. Yes.

Q. But the petition as we discussed states that PLC

110 of Lee is modified in view of the AWG of Kim; right?

A. Oh. I think what I'm getting to here is in terms of the motivation to combine. So I -- I understand that that's what the petition said.

Q. Mm-hm.

A. But I -- I think the issue here is about motivations to combine.

Q. I'm not talking about the motivation to combine. I'm just asking you, if the PLC 110 of Lee is modified in view of the AWG de-multiplexer of Kim, the AWG of Kim would not be located upstream of Lee's PLC; correct?

A. I'm not sure I understand the question.

Q. What do you mean when you say that Lee's optical waveguides, which are in the PLC 110, would be -- strike that.

What do you mean when you say in paragraph 78 of your declaration that the AWG of Kim would be located upstream from Lee's optical waveguides, which are in the PLC 110?

A. What I -- well, what this paragraph is trying to say is that Lee is about an architecture of converting an optical signal to an electrical signal that -- it -- it's -- it's dealing with -- with this sort of a -- a -- a problem, an issue, a challenge related to that.

Now, upstream of -- of Lee -- so Lee talks about what it does. But it would be sort of outside of what Lee is

really describing, that -- it would be a -- let's say an arrayed waveguide grating. That would be before the input to Lee, as -- as is being discussed and -- and claimed. So it's not really -- it's not dealing with the issues that -- that Lee is dealing with.

Q. Setting aside the issue of motivation to combine, the petition states that the PLC 110 of Lee is modified to function as an AWG de-multiplexer in view of Kim; correct?

A. I believe you -- did you just read from the petition?

Q. As we discussed the petition at page 20, the petition states that the PLC 110 of Lee is modified to -- in view of Kim to have AWG structure and functionality; right?

A. I'm just -- because I'm -- I'm having the two documents open in front of me, my declaration and the petition. I just want to make sure I have everything in front of me.

So the petition, that a person of ordinary -- ordinary skill would have known to consider Lee and Kim together, with various reasons, and that -- it states that Lee's PLC 100 looks -- pardon me -- PLC 110 would be modified in view of Kim to have AWG structure and functionality.

Q. The petition does not say that the AWG of Kim would be located upstream of Lee's PLC 110; right?

A. So I don't -- well, it -- it -- I'm not quite sure

that I understand the question, because I'm -- if -- if this is related to some extent to upstream as I've used it in 78 -- paragraph 78, I say that it's upstream from Lee's optical waveguides. I didn't use the word "PLC" there.

Q. In the first sentence in paragraph 78 of your declaration, you used -- say that Lee's directed towards a coupling scheme between a PLC optical waveguide or waveguides.

Do you see that?

A. Correct.

Q. The optical waveguides are in the PLC 110 of Lee; correct?

A. Well, the optical waveguides are -- so the PLC of -- of Lee has -- has optical waveguides, at least, in one embodiment.

Q. Mm-hm.

A. Lee has -- the PLC of Lee has optical waveguides.

Q. Yeah. So what do you mean when you say if Lee and Kim are combined, the AWG of Kim would be located upstream from Lee's optical waveguides and would not change any of the claimed elements of Lee?

A. So what Lee is trying to do is have a -- a coupling scheme between waveguides, output --

Q. Mm-hm.

A. -- and to convert the optical signal into an

electrical signal.

Q. Mm-hm.

A. Now, upstream -- what I'm saying here, upstream from those waveguides -- those waveguides are -- I shouldn't use my fingers. The waveguides are going to the -- to sort of the end and coming out. Or the light is coming out.

But upstream from those waveguides, one -- in -- if -- if one were motivated -- if they were -- to put a -- an -- an arrayed waveguide grating structure, that would be located upstream --

Q. Mm-hm.

A. -- from the waveguides that are being described in Lee.

Q. Mm-hm. Okay. So if Lee is modified to have an AWG de-multiplexer, the de-multiplex signals from the AWG would travel through the optical waveguides of the PLC towards the output end; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Is -- are we -- I'm not quite sure what we're construct -- constructing here. Is -- is there...

Q. BY MS. BHATTACHARYYA: Do you want me to repeat the question, Dr. Willner?

A. Well, I...

I -- I see -- I'm trying to familiarize myself -- we're -- we're starting to give details about how one might

implement this. Sound -- that's the sound -- it sounds like that.

Q. Sure. I'm just trying to understand what you said in your declaration. You said that if Lee and Kim are combined, the AWG de-multiplexer would be upstream of the optical waveguides; correct?

A. Correct. Yes.

Q. So the output of the AWG de-multiplexer would travel through the optical waveguides, which are downstream of the AWG de-multiplexer; correct?

A. So this is interesting. You're -- you're giving detail, and -- which I don't believe there was such detail given before. So there are various possibilities. It's upstream, which means that de-multiplexing by the -- by an arrayed waveguide grating would have been done before --

Q. Mm-hm.

A. -- and in terms of how that's connecting up to the waveguides of -- of Lee, we -- that -- that sounds like a detail that -- that would have been nice, had -- had that been included, in terms of motivations to combine, that wasn't.

Q. I'm not talking about motivations to combine. I'm talking about implementation, and specifically, I'm referring to your own words. You say that if Lee and Kim are combined, the AWG of Kim would be located upstream from

Lee's optical waveguides. Those are your own words in paragraph 78 of your declaration.

And so it would be correct to say that the de-multiplexed output signals from the AWG would connect to and travel through the optical waveguides that are downstream of the AWG; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: Yeah. So we're -- we're starting to say, like, what would -- what might be one possible implementation? The de-multiplexing would be done before --

Q. BY MS. BHATTACHARYYA: Mm-hm.

A. -- I've said. It's upstream.

Now, at some point, those signals would work their way to -- to the waveguides of Lee. In terms of the details of that, I'm -- I don't think I'm giving anything here about that, other than it's -- it's upstream. And I think -- yeah, it's some -- it would have been nice to have had more detail.

Q. Yeah -- and they -- it -- these are your own words. You have said it, that the AWG's upstream, and the optical waveguides of Lee are downstream, and I'm just asking, it is fair to say that -- or -- strike that. Strike that.

A POSITA would understand that the output of the AWG de-multiplexer that are upstream of the optical waveguides

would connect with and travel through the optical waveguides of Lee; correct?

MS. CAROTHERS: Objection. Form.

THE WITNESS: I would say that there are -- if you had an arrayed waveguide grating de-multiplexer that exists upstream from the waveguides of Lee, that at some point, light will get into the waveguides of Lee, the details of which are -- are not clear. But at some point, light will get into the waveguides of Lee if -- if it's designed properly, and -- and then -- and then go through -- through Lee.

MS. BHATTACHARYYA: Okay. I think I'm almost done. Let's take a five-minute break. I just want to go through my notes to make sure if there's anything else I need to cover.

MS. CAROTHERS: Okay. So let's say back in five minutes, then.

MS. BHATTACHARYYA: Okay. Thank you.

THE VIDEOGRAPHER: We're off the record at 2:47 p.m.

(Recess taken from 2:47 p.m. to 2:54 p.m.)

THE VIDEOGRAPHER: We're back on the record at 2:54 p.m.

MS. BHATTACHARYYA: I have no further questions for Dr. Willner.

MS. CAROTHERS: And we have no questions for him.

MS. BHATTACHARYYA: Okay. Thank you, Doctor --

THE WITNESS: Thank you very much.

THE REPORTER: Ms. Carothers, do you need a copy?

MS. CAROTHERS: I would like a copy in due course. I don't need it expedited.

THE REPORTER: Great.

MS. BHATTACHARYYA: And I would definitely like a copy, but I don't know if we need -- we can go off the record and discuss the timing.

MS. CAROTHERS: Let's go off the record.

MS. BHATTACHARYYA: Yeah.

MS. CAROTHERS: And Dr. -- Professor Willner -- we can let him go; right?

THE WITNESS: Thank you very much. Bye-bye.

MS. BHATTACHARYYA: Yes. Thank you, Dr. Willner.

THE REPORTER: Karen, are we off the record?

THE VIDEOGRAPHER: Yeah, I said it when somebody started speaking.

(The proceedings concluded at 2:55 p.m.)

--oOo--

DECLARATION UNDER PENALTY OF PERJURY

---oOo---

I, the undersigned, declare under penalty of perjury that I have read the foregoing transcript, and I have made any corrections, additions or deletions that I was desirous of making; and that the foregoing is a true and correct transcript of my testimony contained therein.

EXECUTED this ___ day of _____, 2026.

_____

Alan Willner

WITNESS'S CHANGES OR CORRECTIONS

Deponent: Alan Willner

NOTE: If you are adding to your testimony, print the exact words you want to add. If you are deleting words from your testimony, print the exact words you want to delete. Specify with "Add" or "Delete" and sign below.

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C E R T I F I C A T E O F R E P O R T E R

I, EMMA KEETER, RMR, CRR, Ca. CSR NO. 14387, Certified Shorthand Reporter, certify:

That the foregoing proceedings were taken before me at the time and place set forth, at which time the witness was put under oath by me;

That the testimony of the witness, the questions propounded, and all objections and statements made at the time of the examination were recorded stenographically by me and were thereafter transcribed;

That the foregoing is a true and correct transcript of my shorthand notes so taken.

I further certify that I am not a relative or employee of any attorney of the parties, nor in any way interested in the outcome of the action.

I declare under penalty of perjury under the laws of California that the foregoing is true and correct.

IN WITNESS WHEREOF, I have hereunto set my hand this 19th day of AUGUST 2026.



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August 19, 2026

Alan Willner
c/o Jo Dale Carothers, Esq.
jcarothers@weintraub.com

Re: Accelight Technologies, Inc. v. Applied Optoelectronics, Inc.
Date of Deposition: August 12, 2026

The transcript of your deposition taken in the above-entitled matter has been transcribed. The original transcript will be held for 30 days from the date of this letter before it is sealed and forwarded to the noticing attorney.

You have the right to review, sign and make corrections to your transcript within the 30-day period. Please call the above number, or e-mail to make an appointment for your review. It is our policy not to release the original transcript and complimentary copies are not provided.

If you are represented by an attorney, we advise that you contact your attorney to discuss this matter. If you are an independent witness and have questions, please contact the attorney who requested you to testify or this office for further instructions.

If you wish to waive signature, please sign and date below and return this letter to the above address. In the event you have not read, corrected, and signed your deposition within (30) days of receipt of this letter, it may be used with the full force and effect as though it had been read, corrected, and signed.

Cc: All counsel

_____ _____
DATE Alan Willner

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ecaligiuri@weintraub.com (*1*)
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