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# Transcript of Daniel Patrick Foty, Ph.D.

**Date:** November 8, 2019

**Case:** Intel Corporation -v- Qualcomm Incorporated (PTAB)

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Intel 1340  
Intel v. Qualcomm  
IPR2019-00128

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UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE PATENT TRIAL AND APPEAL BOARD

- - - - -x  
INTEL CORPORATION, : Case Nos. IPR2019-00047  
Petitioner, : IPR2019-00048  
v. : IPR2019-00049  
QUALCOMM INCORPORATED, : IPR2019-00128  
Patent Owner. : IPR2019-00129  
- - - - -x U.S. Patent No. 9,154,356

Deposition of DANIEL PATRICK FOTY, PhD  
Chicago, Illinois  
Friday, November 8, 2019  
9:00 a.m.

Job No.: 271446  
Pages: 1 - 111  
Reported by: Melanie L. Humphrey-Sonntag,  
CSR, RDR, CRR, CRC, FAPR

1 Deposition of DANIEL PATRICK FOTY, PhD, held at  
2 the location of:

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13 Pursuant to notice, before Melanie L.  
14 Humphrey-Sonntag, a Certified Shorthand Reporter,  
15 Registered Diplomat Reporter, Certified Realtime  
16 Reporter, and a Notary Public in and for the State  
17 of Illinois.  
18  
19  
20  
21  
22

1 A P P E A R A N C E S

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5	(Retained by counsel.)		
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1 P R O C E E D I N G S

2 MR. LANTIER: Good morning, Dr. Foty. How  
3 are you?

4 THE WITNESS: Good morning, Counselor.

5 MR. LANTIER: Nice to see you again.

6 THE WITNESS: Likewise.

7 DANIEL PATRICK FOTY, PhD,  
8 having been duly sworn, testified as follows:

9 EXAMINATION BY COUNSEL FOR THE PETITIONER  
10 BY MR. LANTIER:

11 Q Could you please state your full name for  
12 the record.

13 A My name is Daniel Patrick Foty.

14 Q Could you spell that for us?

15 A All three or just the surname?

16 Q I think the surname would be sufficient.

17 A F, as in "foxtrot," -o, as in "Oscar,"  
18 -t, as in "tango," -y, as in "yankee."

19 Q What's your current address?

20 A 452 Black Mountain Road, Fletcher,  
21 Vermont.

22 Q Do you understand that you're under oath

1 today?

2 A I understand that, yes.

3 Q And do you understand that you must answer  
4 truthfully and fully as if you were in a court or  
5 administrative hearing here; correct?

6 A Yes, I understand that.

7 Q Is there any reason you feel that you may  
8 not be able to provide your best and most complete  
9 testimony today?

10 A Not to my knowledge, no.

11 Q Now, you and I have met prior to today;  
12 correct?

13 A That is correct.

14 Q And I took your deposition in connection  
15 with an International Trade Commission proceeding  
16 that involved the same '356 patent that's at issue  
17 in the IPR proceedings; right?

18 A That's my recollection, yes.

19 Q Did you testify accurately at your ITC  
20 deposition?

21 A I believe that I did, yes.

22 Q Are you aware of any testimony you gave at

1 your ITC deposition that you'd like to retract or  
2 change?

3 A Not at this point, no.

4 Q You also testified at the ITC hearing in  
5 Investigation No. 337 TA 1093.

6 Do you recall that?

7 A Is that the same investigation we were  
8 just discussing?

9 Q It's the investigation involving the  
10 '356 patent, yes.

11 A The one we did last year?

12 Q Correct.

13 A I'm not -- the number, of course, is  
14 something I don't remember. But if you're  
15 referring to the ITC matter we just discussed,  
16 yes, that was -- I'm familiar with that.

17 Q And you were under oath at your ITC -- at  
18 the ITC hearing when you gave your testimony;  
19 right?

20 A That is correct, yes.

21 Q And you testified truthfully and  
22 accurately in that proceeding; correct?



1           A   Yes, I did.

2           Q   Is there any testimony that you gave in  
3 the ITC proceeding that you'd like to change or  
4 retract?

5           A   No, there's not.

6           Q   I'll go over the deposition rules, but  
7 I know from experience that you're fairly familiar  
8 with the process.

9                   You're here today to answer my questions.  
10 Do you understand that?

11          A   I understand that, yes.

12          Q   And it's my goal that my questions will be  
13 clear enough for you to provide fair and accurate  
14 answers. And so if at any point you're not sure  
15 what I'm asking, please ask me to clarify. Okay?

16          A   I will do so, yes.

17          Q   And if you answer my question, I'm going  
18 to assume that you have understood the question.  
19 Is that fair?

20          A   That's fair, yes.

21          Q   I don't think we'll have a problem with  
22 this, but as you know, the court reporter is

1 recording each of my questions and each of your  
2 answers, so it will be important that we don't  
3 speak over one another. Okay?

4 A I understand that, yes.

5 Q Do you have any questions about the  
6 deposition process?

7 A Unless something has changed in the last  
8 few weeks, no, I do not.

9 Q Okay. And about how many times have you  
10 been deposed over the course of your career?

11 A I stopped counting quite a while ago when  
12 it got into the teens. I believe at this point  
13 it's something like the Vermont spring weather,  
14 upper 20s, low 30s. So I've done this -- this is  
15 not my first rodeo.

16 Q And when's the last time you were deposed?  
17 What's the most recent time you were deposed?

18 A About a month ago.

19 Q How many times have you been deposed in a  
20 matter where you were providing testimony in  
21 support of Qualcomm?

22 A I believe the only time I've been deposed

1 is -- I believe it was only last year I was  
2 deposed in the ITC matter and today's deposition  
3 are the only two.

4 Q Do you understand that we're here today to  
5 discuss your declarations in connection with five  
6 separate instituted IPR trials?

7 A That's my understanding, yes.

8 Q What I'm going to do now is hand you a  
9 copy of each of your declarations just so we can,  
10 hopefully, streamline things as we go forward  
11 today and not have to ask every question five  
12 times.

13 A We'll see what happens.

14 Q So this may take a moment.

15 First, I'm handing you a document that's  
16 titled "Declaration of Dr. Daniel Foty in Case  
17 IPR2019-00047." And --

18 A Oops.

19 Q I apologize.

20 This has been marked as Qualcomm  
21 Exhibit 2024.

22 ///

1           (Exhibit 2024, previously marked, was  
2 proffered to the witness.)

3           A I believe that's correct, yes.

4           And will this be marked as Exhibit 1?

5           Q Because the documents are already marked  
6 with exhibit numbers, we typically will just use  
7 the exhibit number on the document to make the  
8 record easier to follow.

9           A Okay. One note is, how should I refer to  
10 these, then, if it's not an Exhibit 1? Should  
11 I refer to it as -- just so we're clear on that  
12 count.

13          Q What I was hoping to do, if it's okay with  
14 you, is refer to this document -- assuming that  
15 you confirm it's your declaration from Case  
16 IPR2019-00047, I was planning to refer to this as  
17 "your 047 declaration."

18          A That's fine. Because I know that each  
19 exhibit of the -- each of the five declarations  
20 have the exhibit number 2024 so we'd have to find  
21 something else.

22           I'm fine with referring to this as "the

1 0047 declaration" if you're fine with that.

2 Q I think that's the easiest because  
3 otherwise we're introducing yet another exhibit  
4 number into the record, and it will just get more  
5 confusing.

6 A That's fine.

7 Q So why don't we refer to this as "the 047  
8 declaration."

9 The question, then, is, is the document  
10 that's been placed in front of you marked as  
11 IPR2019-00047 Qualcomm 2024 the declaration that  
12 you submitted in the 047 IPR matter?

13 A It appears to be, yes.

14 Q Is that your signature on page 1 of your  
15 047 declaration?

16 A Yes, that's my signature.

17 Q Next, I will hand you a document that's  
18 titled "Declaration of Dr. Daniel Foty" in  
19 Case IPR2019-00048 on Patent No. 9,154,356.

20 And at the bottom right-hand corner of  
21 this document, it's marked "IPR2019-00048 Qualcomm  
22 2024 P1."

1           (Exhibit 2024, previously marked, was  
2 proffered to the witness.)

3           Q Do you recognize this document?

4           A Yes, I do.

5           Q Is this the declaration that you submitted  
6 in IPR2019-00048?

7           A It appears to be, yes.

8           Q And if I refer to this as "the 048  
9 declaration" during today's deposition, will you  
10 understand that I'll be referring to this  
11 declaration?

12          A That should work for us, yes.

13          Q Next, I am handing you a document entitled  
14 "Declaration of Dr. Daniel Foty," IPR2019-00049,  
15 and at the bottom right-hand corner of the  
16 first page it is marked "IPR2019-00049 Qualcomm  
17 2024 P1."

18           (Exhibit 2024, previously marked, was  
19 proffered to the witness.)

20          Q Do you recognize this document as the  
21 declaration you submitted in connection with  
22 IPR2019-00049?

1           A   That appears to be what it is, yes.

2           Q   And today if we refer to this as "the  
3   049 declaration," will you understand that we're  
4   referring to the declaration you submitted in  
5   connection with IPR2019-00049?

6           A   That should, again, work for us.

7           Q   I am now handing you a document  
8   entitled "Declaration of Dr. Daniel Foty,"  
9   Case IPR2019-00128 on Patent 9,154,356. The  
10   bottom right-hand corner of the first page of this  
11   document is marked "IPR2019-00128 Qualcomm 2024 P1."

12               (Exhibit 2024, previously marked, was  
13   proffered to the witness.)

14          Q   Do you recognize this document as the  
15   declaration you submitted in connection with  
16   IPR2019-00128?

17          A   It appears to be that declaration, yes.

18          Q   And today if I refer to this document as  
19   "the 128 declaration" or "your 128 declaration,"  
20   will you understand that I'm referring to the  
21   declaration you submitted in connection with  
22   IPR2019-00128?

1           A   As before, I think that should work for us.

2           Q   And then, finally, I am handing you a  
3 document entitled "Declaration of Dr. Daniel  
4 Foty," Case IPR2019-00129, Patent 9,154,356. The  
5 bottom right-hand corner of the first page of  
6 this document is labeled "IPR2019-00129  
7 Qualcomm 2024 P1."

8                   (Exhibit 2024, previously marked, was  
9 proffered to the witness.)

10          Q   Do you recognize this document as the  
11 declaration you submitted in connection with  
12 IPR2019-00129?

13          A   Again, it appears to be the declaration  
14 I submitted.

15          Q   And today if I refer to this as "the 129  
16 declaration" or "your 129 declaration," will you  
17 understand that I am referring to the declaration  
18 you submitted in Case IPR2019-00129?

19          A   Once again, I think that will work for all  
20 five of these in this one.

21          Q   Great.

22               Now, I have never done a deposition that



1 covered quite this many IPR proceedings at one  
2 time, and I hope that we won't need to make it  
3 more complicated than it has to be.

4 There are a number of sections in your  
5 declarations that are the same; for example,  
6 background, sections on the law and other items.  
7 If I ask you a question about one declaration and  
8 the identical statement appears in another  
9 declaration, is it fair to understand, barring  
10 some comment from you to the contrary, that your  
11 testimony would apply equally to the other  
12 declarations that have the identical statement?

13 A I think that is the case. If something  
14 specific comes up, I will raise the point. But  
15 I think that's a reasonable starting point.

16 Q Absolutely. And if there's any reason why  
17 it would be different or your counsel thinks it  
18 would be different, then that could certainly be  
19 the subject of redirect, as well, but I don't  
20 expect we'll have any controversy in that regard.

21 A We'll see.

22 Q We'll see. Let me know, though, if you do

1 think that the answer might be different if we  
2 were talking about a different declaration on my  
3 questions.

4 For the sake of using an example to talk  
5 about some of these background sections, would you  
6 look at your 048 declaration.

7 A I have it in front of me.

8 Q I wanted to start with paragraph 3 of your  
9 declaration here. Do you see that it -- at the  
10 top it says, "In preparing this declaration  
11 I considered all materials cited in the body of  
12 this declaration, which includes but is not  
13 limited to the following"?

14 A I see that, yes.

15 Q And then there's a list of certain  
16 documents, but it's not every document that you  
17 cite in your declaration. There's extrinsic  
18 evidence, for example, that you cite that is not  
19 listed here in paragraph 3.

20 Is it fair to assume that you have  
21 reviewed each of the documents that is cited in  
22 the body of your declaration?

1           A   You're referring to the -- for example --  
2   the footnotes that -- when you say "in the body,"  
3   you mean items that are not listed here in  
4   paragraph 3?

5           Q   Correct. So I could probably give you an  
6   example.

7           A   That would be helpful so that we're  
8   careful about this.

9           Q   Sure.

10           So, for example, if you turn to page 65 of  
11   your declaration and paragraph 107 --

12          A   I'm there.

13          Q   -- and you can see that there is reference  
14   there made to an Internet webpage that you cite.

15           Do you see that?

16          A   Yes, I see that.

17          Q   And that Internet webpage is not listed in  
18   paragraph 3 of your declaration as something that  
19   you considered; right?

20          A   I'm sorry. What was that question again?

21          Q   The Internet website that's cited at  
22   Footnote 23 in paragraph 107 of your

1 declaration --

2 A Yes, Footnote 23.

3 Q Yes.

4 That document is not listed at -- or let  
5 me say -- that material is not listed as one of  
6 the materials you considered in paragraph 3 of  
7 your declaration?

8 MR. RITCHIE: Objection; form.

9 A It's not listed there. But as I say in 3,  
10 "all materials cited in the body."

11 So this is a reference, for example, when  
12 I say "cited in the body," of something  
13 I considered.

14 Q Exactly. And so is it fair to assume that  
15 anything that you cited in the body of this  
16 declaration is something that you read and  
17 considered prior to offering your opinion?

18 A Yes. I read and considered this  
19 reference, for example, and the others that are  
20 referenced as footnotes in the body.

21 Q And if something is referenced in the text  
22 versus in the body, you're not trying to draw a

1 distinction there; right?

2 A By "the body," I meant the text. I'm not  
3 sure. Does it have different meaning to you?

4 I'm not being flippant. I just was  
5 curious.

6 Q Sometimes we -- I was unclear, I think, on  
7 how you were using the word "text." I wasn't sure  
8 if you were referring only to the text of  
9 paragraph 3 or to the text of the entire report.

10 If you were referring only to the text of  
11 paragraph 3, I was just making sure that you  
12 weren't drawing a distinction there.

13 A Okay. Sorry for any confusion.

14 Basically, I think -- again -- that I --  
15 I just -- maybe I'll just start again and see if  
16 this works.

17 In preparing -- and I considered the  
18 materials listed in paragraph 3, the A through G,  
19 and I considered materials that are footnoted  
20 throughout the body of the report, of the  
21 declaration.

22 Q And how did you select what materials to

1 cite in your declaration?

2 A Are you referring to the items listed in  
3 paragraph 3 or the footnotes or both or --

4 Q Let's start with the footnotes.

5 How did you select what items to cite in  
6 footnotes in your declaration?

7 A I believe most of them came from just  
8 simple searching that I did that found some of  
9 these references.

10 Q Did you find the references in the first  
11 instance, or did attorneys working for Qualcomm  
12 find those references?

13 A There may have been two or three  
14 references that one of the Qualcomm attorneys  
15 found, but most of them I found myself.

16 Q And when you prepared your declarations in  
17 the five IPR proceedings here, were there any time  
18 constraints placed upon you that limited the  
19 amount of time you could spend preparing your  
20 opinions?

21 A No limits were imposed by Qualcomm's  
22 attorneys, no.

1           Q   And is there anything more you would have  
2   done before submitting your declarations if you  
3   had had more time?

4           A   I don't believe so.   I think it's fine  
5   as is.

6           Q   Okay.   And you understood, at the time  
7   that you submitted your declarations in these five  
8   proceedings, that it was important that you  
9   include all the support for your opinions that you  
10   intend to present in connection with these  
11   proceedings in the declarations; correct?

12          A   Yes.   My understanding is the declaration  
13   had to be a complete exposition of my opinions.

14          Q   Okay.   And your declarations contain all  
15   the opinions that you're offering in connection  
16   with these IPRs?

17          A   Yes, they do.

18          Q   Do you have any current plan to supplement  
19   any of your declarations?

20          A   Not at this point, no.   But, of course,  
21   I reserve the right, if something is produced that  
22   I'm not expecting, to respond to it.

1           Q   And at this point in time, do you have any  
2   plan to change any of the opinions you've offered  
3   in your declarations?

4           A   No, I do not, not that I'm aware of.

5           Q   Are there any mistakes in any of your  
6   declarations that you'd like to correct?

7           A   Not to my knowledge, no.

8           Q   We've mentioned before that you had  
9   offered testimony in connection with the  
10   International Trade Commission proceeding on  
11   US Patent No. 9,154,356.

12           Have any of your opinions about the  
13   validity of the '356 patent changed since you  
14   offered that testimony?

15          A   No, they have not.

16          Q   Have any of your opinions about the scope  
17   of the '356 patent claims changed since you  
18   offered that testimony?

19          A   No, they have not.

20          Q   Have any of the opinions that you offered  
21   in connection with infringement of the '356 patent  
22   changed since you've offered that testimony?



1 MR. RITCHIE: Objection; form.

2 A Well, obviously, infringement is not  
3 formally in play in these proceedings but --  
4 I have not revisited them since last year, but  
5 I don't see any reason I would have changed those  
6 opinions since then.

7 Q And with respect to the opinions that you  
8 offered on Qualcomm's domestic industry in the  
9 '356 patent, have you changed any of those  
10 opinions since you gave that testimony?

11 MR. RITCHIE: Objection; form.

12 A Once again, I did not review that for  
13 these proceedings because that was not an issue.  
14 That was an ITC issue. But I don't believe my  
15 opinions have changed.

16 Q And do you continue to stand behind the  
17 expert reports that you submitted in the ITC?

18 A Yes, I do.

19 Q I wanted to ask a little bit about the  
20 "Relevant Legal Standards" section of your  
21 declarations.

22 And, again, just as an example -- and I'm

1 not intending to ask this about all of the IPR  
2 proceedings that we're talking about here today.

3 Could you look in the 048 declaration, at  
4 the section that begins with paragraph 6 under the  
5 heading "Relevant Legal Standards"?

6 A I'm open to that page.

7 Q If we look at paragraph 7, you state that  
8 you have requested that the attorneys from  
9 Jones Day who represent Qualcomm provide you with  
10 guidance as to the applicable patent law in this  
11 matter.

12 Do you see that?

13 A Yes, I do.

14 Q And did the attorneys from Jones Day  
15 supply you with the understandings of patent law  
16 that are set forth at paragraphs 8, 9, 10, 11, 12,  
17 13, 14, and 15 of the 048 declaration?

18 A Could you give me the first part again?  
19 Because you ran a long string of numbers and,  
20 obviously, I lost track of the original question,  
21 so just the first part is all I need.

22 Q I'll restate the whole question just for

1 ease of the record.

2 The question was this: Did the attorneys  
3 from Jones Day supply you with the understandings  
4 of patent law that are set forth at paragraphs 8  
5 through 15 of the 048 declaration?

6 A Yes, they did.

7 Q And you faithfully applied the  
8 understandings that they supplied to you; correct?

9 A It's my belief that I did, yes.

10 Q Are there any understandings of patent law  
11 that were supplied to you by the attorneys at  
12 Jones Day that you chose not to include in this  
13 portion of your declaration?

14 A I don't believe that's the case.  
15 I believe this was the complete understanding  
16 I was provided for the matter at hand.

17 Q Turning to paragraph 8, it states,  
18 "The patent office must construe the claim by  
19 giving the claim its broadest reasonable  
20 interpretation, consistent with the  
21 specification."

22 Do you see that?

1           A    I see that, yes.

2           Q    And that's your understanding of how the  
3                claims are to be construed in these IPR  
4                proceedings; correct?

5           A    That's my understanding, yes.

6           Q    If we turn to the next page, I wanted to  
7                ask some questions about the following paragraph,  
8                which is paragraph 9 in the 048 declaration.  
9                I think it may have slightly differing  
10               paragraph numbers in other declarations.

11                Do you see that it says "My understanding  
12                is that there are at least two circumstances where  
13                the words in a patent claim may differ from and  
14                not be given their plain and ordinary meaning"?

15          A    I see that, yes.

16          Q    And you say, "One circumstance is when the  
17                applicants act as their own lexicographer by  
18                clearly setting forth a definition of a claim term  
19                that may differ from the plain and ordinary  
20                meaning it would otherwise possess."

21                Do you see that?

22          A    I see that, yes.

1           Q    Could you explain what you mean by that  
2   circumstance?   How would the applicant act as  
3   their own lexicographer?

4           MR. RITCHIE:   Objection; form.

5           A    My understanding is a patentee may use  
6   words differently than they would be commonly  
7   understood.   That's a possibility that the law  
8   recognizes.   That's my understanding.

9           Q    And how would an applicant express that  
10   they were acting as their own lexicographer?

11          MR. RITCHIE:   Objection; form.

12          A    I'm not sure I understand the question  
13   because someone I don't think would put something  
14   specifically flagging that.   They would just have  
15   the text they put in.

16          Q    So, for example, if a patent specification  
17   said "I am defining the word 'blue' to mean 'sky  
18   blue,'" would that be acting as lexicographer for  
19   the word "blue" in that patent?

20          MR. RITCHIE:   Objection; form.

21          A    I have not considered that sort of a  
22   scenario, so I don't understand that specific

1 scenario. I'm not an attorney.

2 Q Can you give me any examples that, in your  
3 view, would reflect a situation in which a  
4 patentee has acted as its own -- an applicant has  
5 acted as its own lexicographer?

6 A Well, a patentee might do something, for  
7 example, that '"The phase of two signals' refers  
8 to the current flowing in opposite directions  
9 rather than to the sinusoidal phase."

10 That's an example.

11 Q In that example, if the patentee had said  
12 '"The phase of two signals' refers to the current  
13 flowing in opposite directions," you would agree  
14 that the patentee had acted as its own  
15 lexicographer with respect to the phrase "the  
16 phase of two signals"; correct?

17 MR. RITCHIE: Objection; legal conclusion.

18 A Again, I'm not an attorney, so I don't  
19 know exactly how that's defined. But as an  
20 engineer, you may see a term that you expect to  
21 mean one thing and then you realize the patentee  
22 has said something else somewhere in the

1 specification.

2 That's all I'm familiar with on that count  
3 from experience.

4 Q So if the patentee says "This term means  
5 this," that's an example of acting as its own  
6 lexicographer; correct?

7 MR. RITCHIE: Objection; legal conclusion.

8 A Well, again, I'm not an attorney, so  
9 I can't get in too deep to this. But as I said,  
10 my understanding is that there are situations  
11 where, as the example I gave, a patentee may use a  
12 phrase and a reader -- an engineering reader --  
13 may interpret it to mean one thing because that's  
14 what he's used to. And he may find somewhere in  
15 the specification it states that it means  
16 something else.

17 That's all I'm familiar with, and I'm  
18 familiar with that more from my experience doing  
19 this kind of work. But an engineer reading  
20 a patent may make particular assumptions about  
21 phrases used in the patent.

22 Q In your litigation/intellectual property

1 consulting experience, have you ever offered an  
2 opinion that an applicant had acted as its own  
3 lexicographer?

4 A I'm not sure if I have or haven't. It's  
5 been a long time.

6 Q Now, sticking with the same paragraph, you  
7 say another circumstance in which the words of  
8 a patent claim may differ from their plain and  
9 ordinary meaning is "when the applicant includes  
10 or provides an intentional disclaimer, or  
11 disavowal, of claim scope."

12 Do you see that?

13 A I see that.

14 Q And what does that mean?

15 MR. RITCHIE: Objection; form.

16 A Well, again, I'm not an attorney, but my  
17 understanding from when I was preparing this  
18 paragraph and otherwise is that there are  
19 situations where an applicant may say something  
20 that, as it says here, provides an intentional  
21 disclaimer or disavowal of the claim scope. That  
22 can be a situation that arises. It's rare but it



1 can arise.

2 Q And in connection with your opinions on  
3 the correct meaning of "carrier aggregation" in  
4 these IPRs, is it your position that there was an  
5 intentional disclaimer or disavowal of claim  
6 scope?

7 MR. RITCHIE: Objection; form.

8 A I believe it's my opinion that there  
9 was not.

10 Q So in your opinion, there was no  
11 intentional disclaimer or disavowal of claim scope  
12 with respect to the term "carrier aggregation";  
13 correct?

14 A Yes. I don't think there's a disavowal of  
15 that or disclaimer.

16 Q And in your opinion, did the applicant act  
17 as its own lexicographer with respect to the claim  
18 language "carrier aggregation"?

19 A No, I don't think they did. I think they  
20 used plain and ordinary meaning.

21 Q And that view is the basis -- or is one of  
22 the bases for your opinions on the proper

1 interpretation of the term "carrier aggregation"  
2 in these IPRs; correct?

3 A Yes, as I just described in the previous  
4 answer.

5 Q I am going to place in front of you  
6 a document titled "United States Patent  
7 9,154,356 B2," and this particular copy at the  
8 bottom has the designation "Intel 1001."

9 (Exhibit Intel 1001, previously marked,  
10 was proffered to the witness.)

11 Q Do you recognize the document that I've  
12 placed in front of you as US Patent 9,154,356?

13 A It appears to be, yes.

14 Q And if I refer to it as "the '356 patent"  
15 today, will you understand that I'm referring to  
16 this United States patent?

17 A That should work, yes.

18 Q As I noted, the copy that I've placed  
19 before you has the exhibit number 1001, and it's  
20 the -- I'll represent to you it's the exhibit that  
21 Intel attached to the petition in IPR2019-00047.  
22 Okay?

1           A   So we'll refer to this as "the  
2   '356 patent" from here?

3           Q   That's what I was getting to. I think --  
4   can we refer to it as "the '356 patent" and  
5   understand that in connection with the 047 IPR  
6   proceeding it has one exhibit number, in the other  
7   IPR proceedings it has differing exhibit numbers,  
8   but it's the same '356 patent in all the IPR  
9   proceedings?

10          A   Yes. My understanding is that in each of  
11   Intel's petitions this exhibit had a different  
12   number.

13                So if it's easier we just refer to "the  
14   '356 patent" for all five of those exhibits, I'm  
15   fine with that.

16          Q   That's great. And that was what I was  
17   hoping we could do.

18               MR. LANTIER: For the record only, in  
19   connection with IPR2019-00048 the '356 patent was  
20   labeled as Exhibit 1101. In connection with  
21   IPR2019-00049 the '356 patent was labeled as  
22   Exhibit 1201. In connection with IPR2019-00128

1 the '356 patent was labeled as Exhibit 1301. And  
2 in connection with IPR2019-00129 the '356 patent  
3 was labeled as Exhibit 1401 in Intel's IPR  
4 petition.

5 Q Just as a ballpark, approximately how many  
6 times do you think you've read the '356 patent at  
7 this point?

8 A Maybe something like 10. It's been -- as  
9 you know -- I'm sure it's the case with you --  
10 we've been looking at this patent for a year and  
11 a half or two years now.

12 Q And at a high level, what's the invention  
13 that is described in the '356 patent?

14 MR. RITCHIE: Objection; form.

15 A I think it's captured quite nicely by the  
16 title, "Low Noise Amplifiers for Carrier  
17 Aggregation."

18 Q And you would agree with me, I assume,  
19 that the scope of the claimed invention is  
20 reflected in the claims of the '356 patent.  
21 Correct?

22 A I believe that to be the case, yes.

1           Q   If we turn to Claim 1 of the '356 -- and  
2   this is at Column 20, beginning at about line 43.

3           A   I'm sorry. I was finding the section in  
4   the declaration. What was your reference in  
5   the patent specification again?

6           Q   I was turning us to -- or orienting us to  
7   Claim 1 at Column 20, beginning at about line 43.

8           A   I'm there. Sorry.

9           Q   You're there.

10           So do you see that Claim 1 is directed to  
11   an apparatus?

12           A   It begins "An apparatus comprising."

13           Q   And the first limitation of that claim  
14   begins with the words "a first amplifier stage  
15   configured to be independently enabled or  
16   disabled."

17           Do you see that?

18           A   I see that phrase, yes.

19           Q   What does the term "amplifier stage" mean  
20   to you?

21           MR. RITCHIE: Objection; form.

22           A   It means signals come in, are amplified,

1 and they go out the other side. Pretty  
2 straightforward. Again, we didn't construct that  
3 term, but that's just my engineering  
4 understanding.

5 Q And when we call it a -- or strike that.

6 The term "stage" in particular, what does  
7 that denote?

8 A To me, it denotes, again, what I just  
9 said. It's an amplifier where signals come in,  
10 are amplified, and go out the other side.

11 Q So the stage, then, is the -- a portion  
12 where a signal comes in, is amplified, and then  
13 exits?

14 A Well, it could be a signal or multiple  
15 signals.

16 Q Okay.

17 A It's -- there's a signal that comes in --  
18 signals come in, are amplified, and go out, one or  
19 more signals.

20 Q But a "stage," then, refers to some  
21 portion of circuitry that results in the  
22 amplification of one or more signals?

1           A   Well, it's the entire apparatus that  
2           performs that, usually by circuitry, but there is  
3           some form of signals come in, are amplified, and  
4           then go out the other side.

5           Q   And where it says that it's "configured to  
6           be independently enabled or disabled," what does  
7           that language mean to you?

8           A   Actually, in my declarations your expert,  
9           Dr. Fay, gave what I thought was an excellent  
10          definition of that. It's a footnote if we can  
11          find it.

12          I've actually found this. It's --  
13          I found it in petition -- I'm sorry -- my  
14          Declaration 00049 at paragraph 152.

15          I'll let you get there.

16          Q   Yes. I think this is also paragraph 159  
17          of -- or the same text as paragraph 159 of your  
18          048 declaration.

19          A   Let me confirm that. For some reason  
20          I could not find it in 048, but I found it in 049.

21          And it was, you said, paragraph --

22          Q   159.

1           A    -- 159.

2                   I'm at paragraph 159 if you were waiting  
3   for me.

4           Q    So where are you referring in  
5   paragraph 159?

6           A    Beginning at the third line it says, "The  
7   petitioner's expert testified that he understands  
8   the claim phrase, quote, 'independently [sic] or  
9   disabled,' unquote, to mean that, quote, 'the  
10   amplifier stages'" -- dot, dot, dot -- "had to be  
11   configured to enable or disable each amplifier  
12   stage independently of whether or not any other  
13   amplifier stage is enabled or disabled."

14          Q    And you agree with that definition of the  
15   phrase "configured to be independently enabled or  
16   disabled"?

17          A    It seems to be fine to me.  It serves the  
18   purpose.

19          Q    Do you agree that that's the right  
20   understanding of that claim language in the  
21   '356 patent?

22          A    It seems to me to be sufficient, yes.



1           Q   So you agree that that's the correct  
2   interpretation and understanding of the claim  
3   language "configured to be independently enabled  
4   or disabled"; correct?

5           A   I believe, as I said, that's sufficient to  
6   understand, that is correct.

7           Q   And you're not going to offer some other  
8   understanding or definition of that claim language  
9   in the future; correct?

10          A   I don't see any reason to. This was fine,  
11   so I don't see any reason to contradict it or  
12   change it or modify it.

13          Q   If you could turn to Figure 6A of the  
14   '356 patent.

15                  Are you there?

16          A   Oh, yes. I'm sorry. I'm there.

17          Q   Do you agree that Figure 6A is an  
18   embodiment of Claims 1 and 17 of the '356 patent?

19          A   I believe that it's an embodiment that the  
20   claim refers to, yes.

21          Q   What's shown in Figure 6A?

22          A   What's shown is you have two amplifier

1 stages with an RF input coming in through an  
2 input-matching circuit and you have two amplifier  
3 stages that then output an RF output and send it  
4 to two load circuits.

5 Q Now, in Figure 6A is Amplifier Stage 1  
6 configured to be independently enabled or  
7 disabled?

8 A Consistent with the -- with Claim 1, it  
9 appears to be, yes, configured so.

10 Q How so?

11 A The cascode transistor has a switch on it  
12 attached to the gate of the cascode transistor  
13 which can connect the transistor either to its  
14 cascode voltage where it will operate as a cascode  
15 or it can be connected to ground. And assuming  
16 that it's an enhancement mode transistor, that  
17 would turn the transistor off and prevent current  
18 flow through that path and disable Amplifier  
19 Stage 1.

20 Q And this may be a little bit higher level.

21 Fair to say that Item 658A in Figure 6A is  
22 a switch; correct?

1           A    The patentee so calls it that at Column 8,  
2   line 1.  They refer to a switch, 658A.  So I would  
3   agree with the patentee's characterization which  
4   they've provided for us.

5           Q    And at line 12 of Column 8, it says  
6   "Amplifier stages, 650A, may be independently  
7   enabled or disabled via switches, 658A and 658B";  
8   correct?

9           A    That's what it says, yes.

10          Q    When the switch, 658A, is in the position  
11   shown in Figure 6A, then Amplifier Stage 1 in that  
12   figure is enabled; correct?

13          A    From my understanding of the circuitry and  
14   assuming that there is a cascade -- excuse me --  
15   cascode voltage present -- v casc -- then bias  
16   current would be flowing through the circuit and  
17   it would be described as being enabled.

18          Q    And conversely, if the switch, 658A, was  
19   in the opposite position as is shown in Figure 6A,  
20   then Amplifier Stage 1 would be disabled; correct?

21          A    I assume by the other "position" you mean  
22   it's connected not as shown but to the lower dot.

1 Q Correct.

2 A That's correct? Thank you.

3 Under that assumption, if that switch is  
4 connected to ground -- and, again, assuming that  
5 transistor, 658A, is an enhancement mode  
6 transistor -- then the gate would effectively be  
7 closed, no bias current would flow through the  
8 amplifier, and it would effectively be disabled.

9 Q So in Figure 6A Amplifier Stage 1 is  
10 configured to be independently enabled or disabled  
11 because of the existence of the switch, 658A;  
12 correct?

13 A Well, it's configured to be -- that one is  
14 configured to be enabled or disabled by that  
15 switch. It's independently enabled or disabled  
16 consistent with what Dr. Fay said that we cited  
17 because this stage can be disabled or enabled  
18 regardless of the state of other amplifier stages.

19 Q And if it didn't have the switch, 658A,  
20 then Amplifier Stage 1 would not be configured to  
21 be independently enabled or disabled; correct?

22 MR. RITCHIE: Objection; form.

1           A   Well, if you pulled the switch out, we'd  
2   have to describe what the -- that is connected to.

3           Q   Well, is there something else that could  
4   be used there to independently enable or disable  
5   Amplifier Stage 1?

6           A   Well, what -- the reason I'm asking is  
7   because what you have there -- I want to be very  
8   careful so the record is clear.

9                    You have a switch between two things.   And  
10   if we remove the switch, presumably you'd have to  
11   connect one of those two things on the left to the  
12   gate of the transistor, 656A.

13                   And so the conventional practice would be  
14   that it would be connected to the cascode bias,  
15   which would cause the circuit to be active.   If  
16   the cascode bias -- if for some reason that was  
17   connected to ground, then it would have the  
18   function of disabling it.

19           Q   What if, instead of the cascode transistor  
20   being shown, there was just a control signal that  
21   was being supplied to the -- that was being -- in  
22   the place of the switch, 658A?   Would that allow

1 for independently enabling or disabling Amplifier  
2 Stage 1?

3 MR. RITCHIE: Objection; form.

4 A I have to back up because the first part  
5 of your question didn't make engineering sense.

6 You said something about no cascode  
7 transistor. I'm confused by that because that  
8 would change the circuit completely. It would not  
9 be a proper amplifier anymore if you did that.

10 Q Okay. And what I'm trying to find out is,  
11 is it your testimony that the reason that the  
12 circuitry in Figure 6A is configured to be  
13 independently enabled or disabled is that there is  
14 a switch, 658A, or would a person of skill in the  
15 art understand that, even in the absence of such a  
16 switch, the circuitry could be configured to be  
17 independently enabled or disabled?

18 A Well, again, the embodiment here is  
19 showing one -- a particular instance where, by the  
20 switch, you're able to switch between the cascode  
21 bias and the ground. And assuming there is a  
22 cascode bias present when you connect to the upper

1 part of that switch, 658A, and connect to the  
2 proper cascode bias, the amplifier stage is  
3 enabled. And if you connect to the lower one, the  
4 amplifier stage is disabled.

5 So it's teaching a specific teaching for  
6 enabling or disabling this particular amplifier  
7 stage.

8 Q Are there other ways you could configure  
9 an amplifier stage to be independently enabled or  
10 disabled?

11 A There may be but I only considered the  
12 assertions in the petition and in Dr. Fay's  
13 declaration specifically with regard to the  
14 teachings of the '356 patent.

15 Q And so, sitting here today, you can't  
16 think of any other way a person of skill in the  
17 art would understand that an amplifier stage could  
18 be configured to be independently enabled or  
19 disabled; correct?

20 A I didn't consider them if they were  
21 outside the bounds of the petition or Dr. Fay's  
22 declarations.

1           Q   If we turn back to Claim 1 of the  
2   '356 patent, do you see that the first claim  
3   limitation requires that the first amplifier stage  
4   is further configured to receive and amplify an  
5   input radio frequency signal and provide a first  
6   output RF signal to a first load circuit when the  
7   amplifier stage is enabled?

8           A   I see that, yes.

9           Q   What does that limitation mean to you?

10          MR. RITCHIE:  Objection; form.

11          A   Well, consistent with what I said earlier,  
12   it means that you have this -- what is designated  
13   now as the first amplifier stage, which, as --  
14   meets the qualifications we discussed earlier for  
15   an amplifier.

16               And, again, signals come in, are  
17   amplified, and then, in this particular case, just  
18   as it says, there's an output signal, which may  
19   contain one or more RF signals, and those are  
20   provided to a load circuit, a first load circuit,  
21   when the first amplifier stage is enabled.  To me,  
22   it's quite straightforward as stated.



1           Q   Is it your view that the claim requires  
2           that the first amplifier stage provide the first  
3           output RF signal only to a first load circuit when  
4           the first amplifier stage is enabled?

5           A   I don't believe I considered that level of  
6           detail. Again, I was responding to the petitions  
7           in Dr. Fay's declarations, and so I would only  
8           respond to that in the context that was asserted  
9           in the petitions of the declarations.

10          Q   Focus just on the claim language. You  
11          would agree that the claim does not require the  
12          first amplifier stage to provide a first output  
13          RF signal only to a first load circuit when the  
14          first amplifier stage is enabled; correct?

15          A   The word "only" does not appear in the  
16          claim. That's facial. I'll agree with that.

17          Q   Are you interpreting Claim 1 to require --  
18          or excuse me. Strike that.

19               Are you interpreting Claim 1 to implicitly  
20          include the word "only"?

21          A   I believe I'm just reading the claim  
22          that's stated, and the word "only" does not appear

1       there, so I would not interpret that that way.

2               But, again, I'm only referring in my  
3       declarations to responding to the petitions in  
4       Dr. Fay's assertions. And so if those were not  
5       asserted there, then I can't -- I would have to,  
6       you know, go consider that because that's  
7       something that was not provided previously.

8               Q   If we look down to the claim limitation  
9       that begins with "A second amplifier stage" in  
10      Claim 1, could you take a moment to read that one  
11      to yourself?

12              And just let me know when you have.

13              A   I've read that part of the patent.

14              Q   A portion of that limitation says "the  
15      second amplifier stage further configured to  
16      receive and amplify the input RF signal and  
17      provide a second output RF signal to a second load  
18      circuit when the second amplifier stage is  
19      enabled."

20              Do you see that?

21              A   I see that, yes.

22              Q   The claim does not say that "the second

1 amplifier stage is further configured to receive  
2 and amplify the input RF signal and provide a  
3 second RF signal only to a second load circuit  
4 when the second amplifier stage is enabled";  
5 correct?

6 A The word "only" does not appear. I agree  
7 with that.

8 MR. LANTIER: All right. We've been going  
9 about an hour. Why don't we take a break.

10 THE WITNESS: Sure.

11 (A recess was taken from 10:03 a.m. to  
12 10:21 a.m.)

13 BY MR. LANTIER:

14 Q Let's go back to the '356 patent. And all  
15 the way back to the beginning of the written  
16 description at Column 1.

17 Do you see at Column 1, lines 38 to 39,  
18 there's a sentence that says "A carrier may also  
19 be referred to as a component carrier (CC), a  
20 frequency channel, a cell, et cetera"?

21 A I see that language, yes.

22 Q What is "a frequency channel"?

1           A   I didn't specifically consider exactly  
2   what that term means.

3           Q   What's "a cell"?

4           A   I'm familiar with the term as used in  
5   wireless communication, but I don't know -- I did  
6   not consider specifically what it refers to in  
7   this particular sentence.  Again, I was replying  
8   to the petitions of Dr. Fay, and I don't think  
9   this was raised.  I didn't consider it.

10          Q   Turning -- or moving up a little bit --  
11   the beginning of that paragraph states, quote, "A  
12   wireless device may support carrier aggregation,  
13   which is simultaneous operation on multiple  
14   carriers."

15               Do you see that?

16          A   I'm sorry.  I went to the prior paragraph  
17   since they both begin with the same phrase, of  
18   course.

19               So are you referring to the beginning of  
20   like around line 32?

21          Q   Yes.

22          A   Okay.

1 Q I was referring to lines 32 to 33.

2 Do you see the sentence that says "A  
3 wireless device may support carrier aggregation,  
4 which is simultaneous operation on multiple  
5 carriers"?

6 A I see that sentence, yes.

7 Q The "which is simultaneous operation on  
8 multiple carriers" is language that the applicant  
9 chose to include as the description of carrier  
10 aggregation in these lines of the patent  
11 specification; correct?

12 A That's what they stated in these specific  
13 particular lines, yes.

14 Q And in this sentence, "carrier  
15 aggregation" is defined to mean "simultaneous  
16 operation on multiple carriers"; correct?

17 MR. RITCHIE: Objection; form.

18 A Well, again, this is simply the wording  
19 that appears in this particular sentence.

20 Q But in this particular sentence, in the  
21 '356 patent specification, the applicant chose to  
22 define "carrier aggregation" to mean "simultaneous

1 operation on multiple carriers"; correct?

2 MR. RITCHIE: Objection; form.

3 A Well, again, that's what they simply state  
4 here. That's the statement they've made here.

5 Q And you would agree in this particular  
6 instance that "carrier aggregation" is being  
7 defined as "simultaneous operation on multiple  
8 carriers"; correct?

9 MR. RITCHIE: Objection; form.

10 A It's the description they choose to use in  
11 this particular sentence. There are, of course,  
12 other pieces of evidence in the file --

13 THE COURT REPORTER: I'm sorry. "There  
14 are other pieces of evidence" --

15 THE WITNESS: I'm sorry. My voice is a  
16 little rough today.

17 THE COURT REPORTER: "There are, of  
18 course, other pieces of evidence in the file" --

19 A (Continuing.) -- in the file history that  
20 I considered besides simply this sentence.

21 THE COURT REPORTER: Thank you.  
22 I'm sorry.

1 BY MR. LANTIER:

2 Q And I think what I'm asking is slightly  
3 different. I want to make sure I know one way or  
4 the other what the basis for your opinion is here.

5 So the question is this: At Column 1,  
6 lines 33 to 34, do you agree that the applicant  
7 defined "carrier aggregation" as "simultaneous  
8 operation on multiple carriers"?

9 A Again, I'm not sure what you mean by  
10 "define," but they've stated this here in this  
11 particular sentence that we see.

12 Q Do you dispute that this sentence is  
13 providing a definition of "carrier aggregation"?

14 A It's providing one of the conditions  
15 associated with carrier aggregation, and there are  
16 numerous others that the file history makes clear.

17 Q Do you agree that Column 1, at lines 33 to  
18 34, provides a definition of "carrier  
19 aggregation"?

20 MR. RITCHIE: Objection; form.

21 A The lines you just gave me don't appear to  
22 be the ones you perhaps mean. I believe you said

1 "33 to 34," which begins, for example, "A carrier  
2 may refer to," et cetera.

3 Is that what you're referring to or is --  
4 the phrase "carrier aggregation" does not appear  
5 in there.

6 Q I was referring to the sentence, quote,  
7 "A wireless device may support carrier  
8 aggregation, which is simultaneous operation on  
9 multiple carriers," period, closed quote.

10 Do you see that one?

11 A Yes. That's lines 32 to 33. That's why  
12 I was confused a moment. I see that sentence,  
13 yes. We're on the same sentence.

14 Q Do you agree that in that sentence the  
15 applicant provided a definition of the term  
16 "carrier aggregation"?

17 MR. RITCHIE: Objection; form.

18 A I agree they provided one of the  
19 conditions of carrier aggregation, but I don't  
20 believe this is the complete definition. And,  
21 again, I refer to the file history as extrinsic  
22 evidence and my declarations.



1           Q   And so then it sounds like it's fair to  
2   say that the basis for your opinions with respect  
3   to carrier aggregation is that this sentence at  
4   lines 32 to 33 is not providing a definition of  
5   "carrier aggregation."   Correct?

6           A   It's providing a necessary condition.   As  
7   I said, I don't regard it as a complete  
8   definition, which is why the file history has so  
9   much further information.

10          Q   I want to be clear on what your opinion is  
11   here.

12                You said you don't regard it as a complete  
13   definition.   What did you mean by that?

14          A   What I mean is that the term has meaning.  
15   And in order to understand the meaning, we can  
16   refer to a great deal of intrinsic evidence in the  
17   file history to clarify what the patentee meant by  
18   "carrier aggregation."

19          Q   And so your opinion is when the patentee  
20   said "Carrier aggregation, which is simultaneous  
21   operation on multiple carriers," it was not  
22   defining "carrier aggregation" in that sentence?

1           A   As I said a moment ago, it was providing a  
2   description of one of the functionalities. But to  
3   clarify what they meant, I refer to the file  
4   history since the file history had such  
5   extensive -- or further discussion of that term.

6           Q   You would agree that the applicant chose  
7   the wording of the sentence at lines 32 to 33 of  
8   Column 1; correct?

9           A   Well, I presume that the applicant wrote  
10   this sentence, yes.

11          Q   And you would presume that the applicant  
12   had their reasons for writing this sentence in  
13   this manner; correct?

14          MR. RITCHIE: Objection; form.

15          A   I presume they had reasons, yes.

16          Q   If you could turn to Column 2 of the  
17   '356 patent and line 53, do you see the sentence  
18   "Wireless device, 110, may support carrier  
19   aggregation, which is operation on multiple  
20   carriers"?

21          A   I see that, yes.

22          Q   And then there is a sentence immediately

1 following that says '"Carrier aggregation' may  
2 also be referred to as 'multicarrier operation';  
3 correct?

4 A I see that, yes.

5 Q Do you agree with that second sentence?

6 A Again, it seems to describe one of the  
7 features I would associate with carrier  
8 aggregation, yes.

9 Q Do you agree that it's fair to call  
10 "carrier aggregation" "multicarrier operation"?

11 A It's, again, one of the characteristics of  
12 carrier aggregation, which is why I -- as I said,  
13 I consulted the file history to clarify what the  
14 patentee intended -- or the applicant intended or  
15 however you phrased that.

16 Q Just standing alone, do you agree with the  
17 statement, quote, '"Carrier aggregation' may also  
18 be referred to as 'multicarrier operation,'"  
19 closed quote?

20 A Well, again, in the context of what does  
21 "multicarrier operation" mean and further  
22 clarifying that, as I stated earlier, the

1 sentence, again, gives insight into what "carrier  
2 aggregation" means, and further insight to that  
3 sentence can be found from the file history.

4 That's my opinion.

5 Q Can you answer the question of whether you  
6 agree with the statement standing alone that  
7 "'Carrier aggregation' may also be referred to as  
8 'multicarrier operation'"?

9 A I agree within the context of then you  
10 have to go examine what "multicarrier operation"  
11 exactly means.

12 Q And do you agree with the statement  
13 standing alone that "carrier aggregation" is  
14 "simultaneous operation on multiple carriers"?

15 A Well, again, as I said earlier, we have  
16 the stand-alone statement in the patent, and  
17 I agree with it in the context of investigating  
18 what -- some of the specific terms.

19 In this case, this first sentence of the  
20 three we looked at refers to simultaneous  
21 operation and examining further what that meant.

22 Q If you turn to paragraph 176 of your

1 048 declaration -- are you there?

2 A Sorry. Yes.

3 Q The second sentence of that paragraph  
4 says, "As explained above, however, 'carrier  
5 aggregation' means more than just 'simultaneous  
6 operation on multiple carriers.'"

7 Do you see that?

8 A I see that, yes.

9 Q So you just disagree with the sentence  
10 that is set forth at Column 1, lines 32 to 33, of  
11 the '356 patent; correct?

12 A I don't think I disagree with it. As  
13 I said, it means more than just what's stated  
14 there.

15 Q Your opinion's based on a view that the  
16 sentence appearing at Column 1, lines 32 to 33,  
17 is not a complete definition of "carrier  
18 aggregation"; correct?

19 A It provides one of the characteristics,  
20 but, again, word phrases like "simultaneous  
21 operation" lead one to dig deeper into the file  
22 history, the intrinsic evidence, the file history

1 to further understand what that means.

2 Q I'm turning to Figure 2 of the  
3 '356 patent. Do you agree that Figure 2 shows  
4 examples of different types of carrier  
5 aggregation?

6 A This figure depicts different scenarios  
7 for carrier aggregation, depending on which  
8 particular carriers are being aggregated in  
9 carrier aggregation. That's what's depicted here.  
10 These are scenarios.

11 Q So, for example, in 2A you could have  
12 carriers that are adjacent to one another in the  
13 low band being received, and that would be carrier  
14 aggregation; correct?

15 A Well, what it's showing here is a case  
16 where you can do carrier aggregation with -- here  
17 it shows four component carriers that are all in  
18 the low band and very close together, and you can  
19 use those for carrier aggregation. It's  
20 consistent with the LTE-A specification with  
21 regard to carrier aggregation.

22 Q And looking at Figure 2D, carrier

1 aggregation can also include carriers that are in  
2 different band groups; correct?

3 A What 2D shows is another scenario where  
4 it's possible to practice carrier aggregation  
5 where you have signals in very different bands  
6 which are then aggregated together to perform  
7 carrier aggregation.

8 Q So you could have carrier aggregation  
9 where you have one signal that's in the low band  
10 and one signal that's in the high band; correct?

11 A There's a scenario where you could perform  
12 carrier aggregation with two or more carriers that  
13 would be widely separated in the bands that they  
14 are in.

15 Q And that's stated in Column 3 of the  
16 '356 patent at lines 35 to 38; correct?

17 A Yes. It says carrier aggregation may be  
18 supported for these different scenarios that we  
19 were discussing. We discussed some of the  
20 scenarios, not all of them.

21 But it shows that carrier aggregation can  
22 be supported in this case. And, again, that's

1 consistent with the LTE-A specification for  
2 carrier aggregation.

3 Q What do you believe the broadest  
4 reasonable interpretation of the term "carrier  
5 aggregation" is in the claims of the '356 patent?

6 A I believe I state this in my declaration,  
7 in the 048 declaration at -- particular -- 048 at  
8 paragraph 82.

9 Q Could you state what that definition is?

10 A As I say here, "The broadest reasonable  
11 interpretation of this claim element in light of  
12 the '356 patent specification and file history is  
13 simultaneous operation on multiple carriers that  
14 are combined as a single virtual channel to  
15 provide higher bandwidth."

16 Q Those words don't appear in the text of  
17 the '356 patent itself; correct?

18 A Part of that does; not all of it does.  
19 But, again, this is my conclusion of the broadest  
20 reasonable interpretation of this claim element in  
21 light of both specification and the file history,  
22 as well.



1           Q   And the words that appear in the text of  
2   the '356 patent are "simultaneous operation on  
3   multiple carriers"; correct?

4           A   That phrase appears at least once, maybe  
5   twice.

6           Q   Now, the words "that are combined as a  
7   single virtual channel," those don't appear in the  
8   '356 patent itself; correct?

9           A   Not in the specification, but that appears  
10   quite heavily in the file history.

11          Q   Let's make sure we have this clear.  The  
12   words "that are combined as a single virtual  
13   channel" do not appear anywhere in the written  
14   description of the '356 patent; correct?

15          A   They don't appear in the text of the  
16   '356 patent itself.  But --

17          Q   And --

18          A   -- as I said, I regard -- what I was doing  
19   here was, as I said, the broadest reasonable  
20   interpretation.

21          Q   And the words "that are combined as a  
22   single virtual channel" don't, themselves, appear

1 anywhere in the '356 patent file history, either;  
2 correct?

3 A The exact words may not appear, but one of  
4 skill in the art at the time examining the file  
5 history would reach an interpretation of this form  
6 of very similar -- regarding what the phrase  
7 means -- what the words "carrier aggregation"  
8 mean.

9 Q And the words "that are combined as a  
10 single virtual channel" narrow the meaning of  
11 "carrier aggregation," in your opinion; correct?

12 A I wouldn't say they narrow them. They  
13 just provide the broadest reasonable  
14 interpretation of the plain and ordinary meaning  
15 that a skilled artisan of the time reviewing  
16 the patent and the file history would have  
17 reached, this or something quite similar.

18 Q Let me push a little bit on whether they  
19 narrow or not.

20 Would it be okay with you if, in  
21 determining these IPR proceedings, the Board  
22 omitted the phrase "that are combined as a single

1 virtual channel" when they analyzed the meaning of  
2 "carrier aggregation"?

3 A I'm not sure I understand the question.  
4 What's the question again?

5 Q The question is, would you object if the  
6 Board, when it determines whether the claims are  
7 invalid, omits the requirement that the multiple  
8 carriers are combined as a single virtual channel?

9 A I would have to see what the Board said in  
10 association with that. It's kind of hypothetical  
11 at this point. I'd have to see more details about  
12 what -- that happened -- if it happened and it  
13 hasn't, obviously, happened yet.

14 Q Is it your opinion that the multiple  
15 carriers are combined in a single virtual channel  
16 is a requirement of "carrier aggregation"?

17 A I think the boldface phrase in 82 captures  
18 nicely that, in order to be carrier aggregation,  
19 two or more carriers are being used as component  
20 carriers to give you what, to the user, is a  
21 single channel which provides higher bandwidth  
22 and, therefore, faster data rate.

1 I believe that that is a key  
2 characteristic to point to something as being  
3 carrier aggregation, something that's being  
4 aggregated together.

5 Q And your opinions in this case depend on  
6 that interpretation of "carrier aggregation" being  
7 applied; correct?

8 MR. RITCHIE: Objection; form.

9 A I believe my opinions are consistent, as  
10 I said earlier, with what -- the file history and  
11 the plain and ordinary meaning that would be  
12 attributed by a skilled artisan at the time of  
13 the patent in 2012 if the patentee were looking --

14 THE COURT REPORTER: I'm sorry. The end  
15 of that? "Attributed by a skilled artisan at the  
16 time of the patent in 2012" --

17 THE WITNESS: -- "or thereabouts."  
18 I believe I made some qualifier.

19 I apologize. My throat's a little dry  
20 today.

21 Q Let me try to come at this a different  
22 way.

1           Your opinion is that the broadest  
2     reasonable interpretation of the phrase "an input  
3     RF signal employing carrier aggregation" is  
4     "simultaneous operation on multiple carriers that  
5     are combined as a single virtual channel to  
6     provide higher bandwidth"; correct?

7           A   Yes.  It's my opinion, as I said, how a  
8     skilled artisan at the time would have interpreted  
9     the phrase, in particular in light of the patent  
10    specification and the file history.

11          Q   And when you later offered opinions that  
12    certain prior art does not meet that claim  
13    requirement, you were applying your definition --  
14    excuse me -- your opinion regarding the broadest  
15    reasonable interpretation of that claim element;  
16    correct?

17          A   I believe that to be the case, yes.

18          Q   And the definition, again, is, quote,  
19    "simultaneous operation on multiple carriers that  
20    are combined as a single virtual channel to  
21    provide higher bandwidth"; correct?

22          A   That, I believe, is the broadest

1 reasonable interpretation, something like this or  
2 quite similar.

3 Q And each of the requirements embedded in  
4 that interpretation are important to your  
5 opinions; correct?

6 A I believe that based on the file history  
7 and the needs of networks, as I explained in my  
8 declarations, this gives you a reasonable idea of  
9 what "carrier aggregation" means and, as I said  
10 earlier, would have meant to a skilled artisan  
11 in 2012.

12 Q So let's go through the different parts of  
13 that claim construction. The first part is  
14 "simultaneous operation on multiple carriers."

15 From where did you get that requirement  
16 for "carrier aggregation"?

17 A That first part, the first five words, are  
18 explicitly found in the specification. That part  
19 is found.

20 Q The second part is "that are combined as a  
21 single virtual channel." From where did you get  
22 that requirement for "carrier aggregation"?

1           A   As I explained in my declaration, that is  
2   from a large amount of intrinsic evidence in the  
3   file history that I explained, and there's also a  
4   considerable amount of extrinsic evidence that  
5   I found and also described in my declaration,  
6   again reflecting what one of skill in the art in  
7   2012 would have interpreted "carrier aggregation"  
8   to mean.

9           Q   I'd like to focus just on the intrinsic  
10   evidence for a moment.

11          A   That's fine.

12          Q   What intrinsic evidence did you rely on?

13          A   Three specific items I provided for the  
14   intrinsic record. These are references that were  
15   provided by the applicant. That's my  
16   understanding of how this works.

17               The applicant provided a new -- a number  
18   of references, and there were three specific ones  
19   which I mentioned, one at paragraph 90, which  
20   I believe is an application or a patent for LG,  
21   the Korean company.

22               At paragraph 91 I discuss a reference

1 provided by the applicant which is either a patent  
2 or a patent application in the United Kingdom,  
3 which I believe was assigned or was about  
4 Vodafone.

5 And the third piece of intrinsic evidence  
6 that I cited comes from a US patent or application  
7 which -- I believe it was to Renesas systems, and  
8 that's the famous Kaukovuori reference.

9 THE COURT REPORTER: Thank you.

10 Q And pardon me. Did you say that was at  
11 paragraph 92?

12 A The Kaukovuori reference is discussed  
13 beginning at paragraph 93 in the 048 declaration.

14 Q And the paragraph numbers for all of those  
15 that you were just referring to, those are from  
16 the 048 declaration?

17 A Yes. For clarity, the same material  
18 should appear in the other four.

19 I can't certify that the path -- the  
20 paragraph numbers are exactly the same. I believe  
21 they are. But the content -- if it's  
22 different-numbered paragraphs, I'm referring to



1 the same identical content for all five  
2 declarations.

3 Q And that is the extrinsic evidence --  
4 excuse me.

5 That is the intrinsic evidence that you  
6 relied upon for the portion of your claim  
7 construction that requires that multiple carriers  
8 are combined as a single virtual channel; right?

9 A Those are the three intrinsic references  
10 from the file history that I cited, yes.

11 Q And then the third portion of your claim  
12 construction is "to provide higher bandwidth."

13 A Yes.

14 Q From where did you derive that requirement  
15 of your claim construction?

16 A There are two features I'll note. One  
17 is -- one is a skilled artisan reading these  
18 things would interpret the purpose of carrier  
19 aggregation would be to provide a higher bandwidth  
20 or a higher data rate. And, essentially, this  
21 also appears as a paragraph that I quote from the  
22 Kaukovuori reference -- which I apologize. That

1 begins at paragraph 92, not 93.

2 But there's a paragraph I quote at the end  
3 of my paragraph 93 from that reference where he  
4 explicitly says "to provide a higher aggregate  
5 bandwidth."

6 There may be other references to the  
7 phrase "higher bandwidth" in some of the other  
8 references.

9 Q I thought you said a moment ago that there  
10 were two features you would note.

11 Did you just note both features, or was  
12 there a second thing that you were going to refer  
13 to in terms of intrinsic evidence that -- on which  
14 you based your claim construction requirement of  
15 providing higher bandwidth?

16 A My apologies if I wasn't clear. I was  
17 referring to -- the second one was the specific  
18 phrase that does appear in the Kaukovuori  
19 reference, and the first one was, again, how a  
20 skilled artisan would interpret the various pieces  
21 in those intrinsic pieces of evidence, and that  
22 led me to the construction that you see here in

1 paragraph 82.

2 Q And when you referred to "the various  
3 pieces in those intrinsic pieces of evidence," was  
4 that a reference to those three patents or patent  
5 applications you mentioned a few moments ago?

6 A Yes. That refers to the three intrinsic  
7 references I referred to that we discussed.

8 Q And then in addition to that intrinsic  
9 evidence, you noted that you relied on a fair  
10 amount of extrinsic evidence, as well; correct?

11 A That is correct. I cited quite a bit of  
12 extrinsic evidence, as well.

13 Q I'm handing you a document with the title  
14 "3GPP TR 36.912 V9.1.0, 2009-12." It's marked at  
15 the bottom of it with the label "Intel 1004."

16 (Exhibit Intel 1004, previously marked,  
17 was proffered to the witness.)

18 Q And this is the exhibit that was  
19 introduced as part of the 047 IPR proceeding, but  
20 the same exhibit is introduced in -- or is part of  
21 the other IPR proceedings, as well.

22 Do you recognize this document?

1           A    I recognize this as a document that  
2   I believe we're calling -- everyone's been calling  
3   the feasibility study.  There are several --  
4   actually -- documents from this organization.

5                So I presume we can call it the  
6   feasibility study for clarity.

7           Q    I was hoping we could.

8           A    I'm fine with that.

9           Q    Can we refer to this as "the feasibility  
10   study"?  Which is, I think, the title that  
11   both you and Dr. Fay had given to it in your  
12   declarations.

13          A    I believe that's the case, and I believe  
14   throughout this entire matter everyone has  
15   referred to it that way.

16                So if we refer to this as "the feasibility  
17   study," I don't think anyone will have any excuses  
18   for saying they're not -- they don't understand  
19   what it is.

20          Q    Now, you agree that the feasibility study  
21   does disclose carrier aggregation even under your  
22   claim construction of that term; correct?

1           A   The feasibility study discusses carrier  
2   aggregation. My understanding is this is where  
3   the first pieces of upgrading LTE to LTE-A -- one  
4   of which features is to add carrier aggregation  
5   capability to LTE -- occurred, at this document or  
6   a similar time.

7           Q   And if you turn to page 2 of the  
8   feasibility study, do you see that there are  
9   keywords listed towards the top of the document?

10          A   I assume you're referring to the -- page 2  
11   at the top here. This --

12          Q   That's correct.

13          A   -- this document -- I wanted to make sure  
14   this wasn't one of these where there were  
15   different page 2s that we're discussing.

16                I think in this document there's only one  
17   set of page numbers, and I see a page with a  
18   copyright notification at the bottom. I assume  
19   that's the page you're talking about.

20          Q   That's correct. And I agree.

21          A   Excellent.

22          Q   I have examined the document, and there is

1     only one page 2.

2           A   That's my understanding, as well.

3                   And to answer your question, I see at the  
4     top a keywords section.

5           Q   What's the purpose for including keywords  
6     in a document like the feasibility study?

7                   MR. RITCHIE:  Objection; form.

8           A   Well, they don't say here specifically why  
9     this organization provided keywords.  Oftentimes  
10    that's done for purposes of providing terms to  
11    make the document findable under searches, for  
12    filing the document or things of that nature.  
13    They don't explain why they provided this set of  
14    keywords.

15          Q   Are keywords sometimes used to make the  
16    document locatable when computer searches are run?

17          A   As I said a moment ago, that is known to  
18    be a purpose.  They don't state that here, but one  
19    could assume that might be a purpose they had in  
20    mind.

21          Q   And one of the keywords that is  
22    included -- excuse me -- is associated with the

1 feasibility study is the term "LTE"; right?

2 A That's one of the two keywords, yes.

3 Q But the other keyword is "radio"; correct?

4 A That is correct, as well.

5 Q Now, if you could -- I'm back now on  
6 your 048 declaration. And could you turn to  
7 paragraph 60?

8 A (Complied.)

9 Q In paragraph 60 you talk about the  
10 importance of power consumption in the context of  
11 affordable and mobile technologies; correct?

12 A I talk about that. Specifically I refer  
13 to "passive power consumption," yes.

14 Q What do you mean by "passive power  
15 consumption"?

16 A A good example of that would be the  
17 particular technology discussed in the '356 patent  
18 of amplifiers. A circuit of that sort, even if  
19 it's not being used, in order to be operable if a  
20 signal comes in, it has to be powered up with a  
21 bias current going through it in order to have it  
22 be able to receive a signal if it comes in. It

1 has to actually be powered up.

2 So this refers to power consumption which  
3 occurs even when the circuitry is not actually  
4 performing a particular function. That's not the  
5 case with digital circuitry, but it is with analog  
6 and RF circuitry.

7 So I was particularly noting here that  
8 passive power consumption in particular is an  
9 issue, but, again, power consumption overall is a  
10 bigger issue.

11 Q And another example of that would be the  
12 Lee reference; correct?

13 A I would have to examine it. I don't  
14 recall if the Lee reference specifically refers to  
15 power consumption. It refers to Wi-Fi and  
16 Bluetooth technology.

17 Q It's -- but it would be a -- it's a  
18 portable device that's -- the receiver in Lee is a  
19 portable receiver; correct?

20 A Well, Lee actually doesn't necessarily  
21 have to be a portable receiver because the Wi-Fi  
22 and Bluetooth are implemented in equipment that's



1 connected to power bands.

2 So in that sense, we can look at Lee, what  
3 Lee specifically says. He refers to mobile  
4 lifestyles. We can -- I was -- I was looking at  
5 some of what I said about Lee. That's why  
6 I paused, to make sure.

7 I don't believe Lee explicitly discusses  
8 power consumption. Lee is referring to Wi-Fi and  
9 Bluetooth in the same receiver, and unlike LTE  
10 bands, these are -- frequently appear in power  
11 equipment.

12 So this is not necessarily a requirement  
13 for Wi-Fi and Bluetooth -- they're very commonly  
14 used in nonmobile equipment or when it's used  
15 connected to main's power.

16 Q The receiver described in Lee could be  
17 used in mobile equipment; correct?

18 A If Lee is talking about Wi-Fi or  
19 Bluetooth, those are implemented in mobile  
20 devices, yes.

21 Q If you'd turn to paragraph 63 --

22 A Of which declaration?

1 Q Of the 048 declaration.

2 A I have two open now. I wanted to make  
3 sure.

4 Q Yes. And we can switch over to a  
5 different one if it's better for you. I'm not  
6 going to ask questions specific to Lee here, so it  
7 probably doesn't matter which declaration  
8 we're in.

9 In the 048 declaration, do you see  
10 paragraph 30 -- 63?

11 A I have it in front of me, yes.

12 Q The beginning of that paragraph begins,  
13 "This divergence between the wonders of Moore's  
14 Law and the unpleasant realities of the humble  
15 battery has provided very strong motivation for  
16 the development of power-savings techniques in  
17 portable and mobile devices."

18 Do you see that?

19 A Yes. I believe you said "power-savings"  
20 and it says "power-saving." Just picky but to  
21 make sure the record is clear.

22 Q I appreciate that and I apologize for the

1 misstatement.

2 A No problem.

3 Q You say in your declarations, quote, "This  
4 divergence between the wonders of Moore's Law and  
5 the unpleasant realities of the humble battery has  
6 provided very strong motivation for the  
7 development of power-saving techniques in portable  
8 and mobile devices"; correct?

9 A That's exactly what the sentence says, yes.

10 Q And you stand by that opinion; correct?

11 A I stand by that as something that I would  
12 regard as well-known in the art as a challenge.

13 Q And it's a very strong motivation for the  
14 development of power-saving techniques in portable  
15 and mobile devices; correct?

16 A Yes. That's what I stated there, and,  
17 again, that's consistent with what is known in  
18 the art.

19 (Exhibit Intel 1003, previously marked,  
20 was proffered to the witness.)

21 Q I next would like to hand you a document  
22 with the title "United States Patent Application

1 Publication No. US 2011/0217945 A1," and it's  
2 titled "Dual Carrier Amplifier Circuits and  
3 Methods" and identifies as the first named  
4 inventor a Gregory Uehara.

5 Take a moment to review the document I've  
6 handed you. My question is, do you recognize this  
7 document as the prior art reference that  
8 everybody's been referring to as "Uehara"  
9 throughout these IPR proceedings?

10 A This appears to be what we have been  
11 calling "the Uehara reference."

12 Q And during the course of your work in  
13 these matters and previously, you've had the  
14 opportunity to review the Uehara publication;  
15 correct?

16 A I've had a chance to review this  
17 reference, yes.

18 Q Could you turn to Figure 3 of Uehara?

19 A (Complied.)

20 Q And just at a high level, what does  
21 Figure 3 of Uehara depict?

22 A Well, it depicts an antenna, and then

1     there are -- is a differential signal that comes  
2     in, and it can be routed to two amplifier stages  
3     in some form, and then the output of those  
4     amplifier stages goes to a current combiner  
5     circuit, which has two possible outputs for the  
6     differential signals, and the differential  
7     signal -- each differential signal can be routed  
8     to a differential mixer in order to produce the  
9     outputs.

10       Q   What does "LO1" refer to in Figure 3?

11       A   My understanding is it refers to -- "LO"  
12     is "local oscillator," and the 1 is an index  
13     number.

14       Q   And what does "LO2" refer to?

15       A   It's referring to another local  
16     oscillator, a second identified one.

17       Q   In the context of Figure 3 of Uehara, what  
18     is the purpose of using LO1 and LO2?

19       A   The purpose of the local oscillator is to  
20     take a signal that's some sort of a modulated  
21     radio frequency sinusoid and what is known in the  
22     business as -- assuming it's a direct conversion

1 receiver, which I believe that it is, but I would  
2 qualify that if it isn't but -- is to step that  
3 down, as the phrase in the art goes, so that now  
4 you've removed the radio carrier part and  
5 extracted the information that was modulated onto  
6 that radio signal or radio signals on the transmit  
7 side.

8 Q Why use two different local oscillator  
9 frequencies in Figure 3?

10 A Well, actually, I can't assume from just  
11 looking at that figure that they are different or  
12 must be different.

13 What you're showing here is you have two  
14 radio signal paths and you have two separate  
15 mixers with two separate oscillators that operate  
16 on the two separate signals. This figure in and  
17 of itself does not stipulate that they have  
18 different frequencies, just that there's two  
19 different mixers with two -- their own -- each  
20 mixer has its own local oscillator is what's  
21 depicted.

22 Q Would there be any benefit to using

1 different frequencies for the different  
2 oscillators?

3 A I wouldn't think of it as a benefit,  
4 per se. If -- again, assuming it's direct  
5 conversion, you tune -- in direct conversion you  
6 tune the frequency of the local oscillator to  
7 match the frequency of the carrier wave that  
8 you're stepping down and demodulating. And  
9 eventually demodulating.

10 Q Maybe this will be easier.

11 If you turn to paragraph 47 of Uehara --  
12 it's on page 4 -- there's a description of  
13 Figure 3.

14 Just take a minute there to read that to  
15 yourself, let me know when you're finished.

16 A I have read paragraph 47.

17 Q Do you see that within that  
18 paragraph there's a sentence or two that read,  
19 "Mixer, 304, may receive the dual carrier signal  
20 and a local oscillator signal having a frequency  
21 equal to one of the two carriers in the RF signal,  
22 i.e., L01"?

1           A    I see that, yes.

2           Q    And then it says, "Accordingly, mixer,  
3   304, down converts one of the channels of the  
4   RF signal to baseband. Similarly, mixer, 305, may  
5   receive the dual carrier signal and another local  
6   oscillator signal having another frequency equal  
7   to the other of the two carriers in the RF signal,  
8   i.e., LO2. Accordingly, mixer, 305, down converts  
9   the other channel of the RF signal to baseband."

10          A    I see that, yes.

11          Q    Does that provide information as to  
12   whether in Figure 3 LO1 and LO2 are different  
13   frequencies?

14          A    The description he provides here in  
15   paragraph 47 stipulates, for the reasons he  
16   discusses, why he puts them at different  
17   frequencies.

18          Q    And why does he do that?

19          A    Basically, when you mix the local  
20   oscillator with the carrier, the output of the  
21   mixer will have a frequency equal to the  
22   difference between the frequency of the carrier



1 wave and the mixer.

2 So by making the frequency the same as a  
3 particular carrier, that carrier will be stepped  
4 down to baseband, to a frequency of zero, and then  
5 it can be processed as an analog baseband signal  
6 and a digital baseband signal for that chosen  
7 carrier frequency.

8 Q I'm trying to find it in your  
9 declarations. And maybe you can help me.

10 You offer the opinion that Uehara does not  
11 disclose the claim requirement of employing  
12 carrier aggregation under your claim construction  
13 because it's disclosing a dual carrier input  
14 signal, not a carrier aggregated input signal; is  
15 that correct?

16 A I apologize. Could I have the question  
17 repeated when you're ready?

18 Q You absolutely could, and I have located  
19 it. So I think we're in your 047 declaration,  
20 beginning at approximately paragraph 170.

21 But what I had asked was -- you offered  
22 the opinion that Uehara does not disclose the

1 claim requirement of an RF input signal employing  
2 carrier aggregation under your claim construction  
3 because it's disclosing a dual carrier input  
4 signal, not a carrier aggregated input signal? Do  
5 I have that correct?

6 A I don't believe I stated the first part of  
7 what you said. But I do offer the opinion that  
8 Uehara -- first of all, the term "carrier  
9 aggregation" does not appear in Uehara. And he  
10 discusses nothing about aggregating any signals  
11 together in order to practice carrier aggregation.

12 Q Okay. So I think -- I'm just trying to  
13 narrow down, if we can, the sort of scope of the  
14 dispute about what Uehara discloses as compared to  
15 what's in your claim construction for that claim  
16 language.

17 One thing you say is that Uehara does not  
18 use the exact words "carrier aggregation";  
19 correct?

20 A The phrase does not appear in Uehara, that  
21 is correct.

22 Q Uehara uses the phrase "dual or

1 multicarrier signal" to describe the input to its  
2 circuitry; correct?

3 A I believe he states that's a type of input  
4 that his circuitry could receive, yes.

5 Q And so what I'm trying to understand is,  
6 are you saying there is a difference between a  
7 dual carrier signal and a carrier aggregated  
8 signal? Or are you saying something else?

9 A Well, a dual carrier signal is not  
10 necessarily a carrier aggregation signal.

11 Q So a dual carrier signal could be a  
12 carrier aggregated signal, but it might not be a  
13 carrier aggregated signal; is that correct? Under  
14 your claim construction.

15 A Uehara discusses nothing about combining  
16 multiple input signals as part of the carrier  
17 aggregation capability.

18 Q You haven't offered an opinion that  
19 anything in Uehara teaches away from use of its  
20 described circuitry with a carrier aggregated  
21 signal; correct?

22 A That was extremely convoluted. Could I

1 have it repeated or rephrased?

2 Q I will try.

3 You have not offered an opinion that  
4 Uehara teaches away from use of a carrier  
5 aggregated signal; correct?

6 A Uehara simply fails to disclose that  
7 limitation or anything about carrier aggregation.  
8 And, again, I was replying to the petition and the  
9 declarations, and there was nothing provided to me  
10 in those that indicated that Uehara was  
11 contemplating carrier aggregation or would even be  
12 capable of dealing with a carrier aggregation  
13 signal.

14 There was nothing -- no evidence was  
15 provided for that.

16 MR. LANTIER: Let's take a break.

17 THE WITNESS: Okay.

18 (A recess was taken from 11:26 a.m. to  
19 11:51 a.m.)

20 BY MR. LANTIER:

21 Q If you could, I'd like to ask you a couple  
22 questions about your 047 declaration at

1 paragraph -- beginning at paragraph 176.

2 A You said "047"?

3 Q Yes, the 047 declaration.

4 A I was rummaging in the wrong one.

5 Q This portion of your 047 declaration  
6 addresses the combination of Uehara and a  
7 reference called Perumana; correct?

8 A That is correct. It's a journal paper,  
9 Perumana paper.

10 Q I'm handing you a document with the title  
11 "Resistive-Feedback CMOS Low-Noise Amplifiers for  
12 Multiband Applications" by a Bevin G. Perumana.

13 And the question is, is this the Perumana  
14 reference that's discussed in your declarations?

15 A This appears to be the reference that  
16 we've all been referring to as "the Perumana  
17 reference."

18 Q Very good.

19 Now, in Perumana, if you could begin on  
20 page 1218, which is the very first page of  
21 Perumana, in the last paragraph on that page do  
22 you see it says, "Hence, this approach can

1 potentially significantly reduce the cost of the  
2 wireless front-end implementation. Resistive-  
3 feedback LNAs achieve high gain and reasonably  
4 low NF"?

5 A I see that, yes. It goes over to the  
6 following page.

7 Q That's correct. What does "NF" refer to  
8 there?

9 A Assuming conventional in the art, it  
10 refers to the noise figure.

11 Q And in your declaration in the 047 IPR, at  
12 paragraph 177, you point to the next sentence in  
13 that paragraph and refer to it as an explicit  
14 admonition; correct?

15 A Yes. I call that an explicit admonition  
16 which appears in the very same paragraph, that and  
17 then the quote.

18 Q What is the admonition?

19 A The admonition is that -- what it says --  
20 "that 'novel circuit techniques are required to  
21 reduce power consumption and improve linearity.'"  
22 He's saying it's a challenge, is what's he's

1 basically saying there -- at least I interpret it  
2 that way.

3 Q And so the sentence is saying that novel  
4 circuit techniques are required in order to reduce  
5 power consumption and improve linearity; correct?

6 A With respect to the types of circuits he's  
7 discussing, yes.

8 Q And then the next sentence after that  
9 states that this paper, the Perumana paper,  
10 provides such techniques; correct?

11 A Are you referring to the next sentence in  
12 my declaration? I lost track.

13 Q That's a good question.

14 And that was confusing.

15 I was, in fact, referring to the next  
16 sentence in the Perumana reference.

17 A This -- are you referring to this  
18 "However, novel circuit technique" sentence or the  
19 one following that?

20 Q Let me back up and, hopefully, keep the  
21 record clear.

22 A Thank you.

1           Q   In your declaration you focus on the  
2 sentence that reads, "However, novel circuit  
3 techniques are required to reduce power  
4 consumption and improve linearity."

5                   And that's at paragraph 177 of your  
6 047 declaration; correct?

7           A   Yes. That is quoted from Perumana, as we  
8 just discussed.

9           Q   But in Perumana at page 1219 the following  
10 sentence notes that the Perumana paper presents  
11 circuit techniques that reduce power consumption  
12 and improve linearity; correct?

13          A   That presumably is the purpose of the  
14 paper and the circuit he later depicts.

15          Q   Going back to -- well, we can stay on your  
16 047 declaration or go back to the 048. It doesn't  
17 matter. I had a few questions about your  
18 background, which is at Appendix A.

19          A   I'm there. Please continue.

20          Q   Okay. So the first sentence, the summary  
21 of your qualifications, states that you have more  
22 than 25 years of engineering and management



1 experience in the mainstream of the technology  
2 industry.

3 Do you see that?

4 A I see that, yes.

5 Q When is the last time that you worked as  
6 an engineer?

7 A I'm continuing to work as an engineer  
8 even now.

9 Q And is that in connection with Gilgamesh?

10 A It's in connection with Gilgamesh and some  
11 projects I have going on in other parts of the  
12 world.

13 Q Are any of the projects that you're  
14 currently working on related to the design of  
15 RF receivers?

16 A Yes, they are.

17 Q Okay. What projects are you currently  
18 working on that relate to the design of  
19 RF receivers?

20 A I've had a long-running project to develop  
21 wireless infrastructure in Sub-Saharan Africa.  
22 I've had that going on for probably 15 years now

1 in one form or another. And dealing with the  
2 special challenges of the terrain, the weather,  
3 and the less-developed nature of that region,  
4 obviously.

5 Q Is that something you're doing through  
6 Gilgamesh Associates, or is it through something  
7 else?

8 A I'm more or less doing it through  
9 Gilgamesh Associates, yes.

10 Q Was Gilgamesh hired to work on that  
11 project? Or is there some other way you've come  
12 to be involved in it?

13 A I've just been involved with various  
14 activities down there for 15 years. And we've  
15 just been trying to come up with some ideas for  
16 developing particular technologies that would be  
17 very applicable to the infrastructure challenges  
18 there.

19 It's not paid work. That's why we never  
20 discuss it in terms of how my income comes in.  
21 It's a project that we'll see if someday will pay  
22 off or not, but it's definitely worth doing.

1           Q    Could you give me a little bit more  
2 background on specifically what technologies  
3 you're developing? I'm not looking for trade  
4 secret or proprietary information but just a  
5 high-level description.

6           A    Basically, one of the biggest challenges  
7 in much of the world is, essentially, the backhaul  
8 infrastructure. In my declaration I actually did  
9 discuss -- for what it's worth in the declarations  
10 in the technology background -- that in North  
11 America the way you typically get information to a  
12 base station, for example, would be use of  
13 fiber-optic cable. We have lots of that.

14               In other parts of the world it's difficult  
15 to put down fiber-optic cable, so we're looking at  
16 using extremely high-frequency radio to provide  
17 the backhaul instead of fiber. In much of the  
18 world that's done now actually with microwave, but  
19 microwave doesn't have enough natural bandwidth to  
20 do the kind of things you want to do.

21               In addition, there's things like distance  
22 learning, telemedicine, disaster response that fit

1       into that kind of infrastructure.

2           Q   Do you plan to employ carrier aggregation  
3       under your claim construction of that term in the  
4       work you're doing in Africa?

5           A   Perhaps.  Again, that carrier aggregation  
6       is a network feature, and it will depend on how  
7       much backhaul can be provided and kind of demand  
8       for the data services.  And the demand for data  
9       services in many parts of the world is very  
10      different than it is in North America.

11           I'll stop there for now.  It's an  
12      interesting story but I don't have to take your  
13      time.

14           Q   And when is the last time you had active  
15      involvement in this project in Africa?

16           A   It's been ongoing for 15 years.  It's  
17      still going on.

18           Q   When is the most recent time you had a  
19      telephone call about it?

20           A   A few weeks ago.

21           Q   Who are you working with?

22           A   Various people in South Africa and in

1 Zimbabwe and Zambia.

2 Q "People" being telecommunications  
3 companies or who are you talking about?

4 A There are people in the telecos. There  
5 are people at the universities, people in private  
6 companies. It's a wide variety there.

7 Q And has that work resulted in any physical  
8 equipment being created?

9 A Not yet.

10 Q Other than that project, are there other  
11 projects that you can identify you've worked on  
12 in the last 15 years that relate to the design of  
13 RF receivers?

14 A 15 years is a long time. I've had a  
15 couple of -- I've had at least one attempt to  
16 do -- within the past 15 years -- a possibility of  
17 doing a start-up company using some of these radio  
18 ideas, was one of the other things I was working  
19 on.

20 Q And what happened with that?

21 A Our designated CEO died.

22 Q And in connection with the potential

1 start-up, did you design an RF receiver?

2 A We were starting to sketch out what some  
3 of the technology was going to look like. We did  
4 not get far enough. Some of those ideas have  
5 migrated over to the African project just by  
6 osmosis.

7 Q Have you ever designed an RF receiver that  
8 was ever -- that was actually manufactured?

9 A I probably did maybe 20-plus years ago,  
10 but I don't recall specifically.

11 Q Can you recall ever designing an  
12 RF receiver that was actually manufactured?

13 A It's possible but if -- it was quite  
14 some time ago.

15 Q You have no recollection of doing such a  
16 thing sitting here today; correct?

17 A Not a specific one, no. Probably, as  
18 I said, 20, 25 years ago there was something, but  
19 that's a long time ago.

20 Q And your work with Gilgamesh Associates,  
21 has that resulted in any personal income to you?

22 A When you refer to the "work with Gilgamesh

1 Associates," I was confused. That covers a lot of  
2 sins, including what we're sitting here today  
3 doing.

4 Q Fair enough. Thanks for the  
5 clarification.

6 So Gilgamesh Associates is the entity  
7 through which you provide litigation consulting  
8 services; correct?

9 A It's the umbrella it goes under, yes.

10 Q And then, in addition to that, Gilgamesh  
11 is also involved, as you said before, in the  
12 project in Africa; correct?

13 A Yes. And we have some non-RF things  
14 going on in Eastern Europe, as well, but it's not  
15 RF related.

16 Q Aside from the income that you have  
17 received for litigation type of consulting work,  
18 have you received -- do you receive any other  
19 income from your work at Gilgamesh Associates?

20 A Gilgamesh Associates, that part, is --  
21 basically, the revenue in the past few years has  
22 all been from litigation consulting.

1 I also have a separate company in  
2 aviation, which is a totally different company,  
3 and then, of course, I have my personal  
4 investments that I have.

5 Q And by "personal investments," you're  
6 referring to passive income?

7 A I don't know if you'd call it "passive  
8 income" but things like equities. Equities  
9 provide dividend checks and things of that nature.

10 Q Yes. That's what I meant. It's not  
11 that -- not something where you receive a payment  
12 for going in and doing work? Rather, it's  
13 investment-type income?

14 A I wouldn't call it passive income. That's  
15 why I was confused, at least from my  
16 understanding. But it's just basically managing  
17 your own money and investing and reaping the  
18 rewards. And as I said, I also have a small  
19 aviation company.

20 Q What kind of work does the aviation  
21 company do?

22 A The aviation company I set up as a holding



1 company. As I mentioned in my CV, I'm an  
2 experienced pilot with pretty good ratings, the  
3 capabilities I have.

4 And one thing that's very common in flying  
5 is that instruction is -- the aircraft that are  
6 used in instruction are often leased back from  
7 owners. There's a very dire shortage of pilots  
8 emerging now, and there's a program at Vermont  
9 Technical College near Burlington -- there's a  
10 four-year aviation degree program. It may  
11 surprise many of us in this program, but aviation  
12 and pilots increasingly -- is becoming a  
13 four-year degree program.

14 And so I have an aircraft that I have  
15 leased back -- I own and I fly myself, but I lease  
16 it back to that program. The main function of  
17 this, which does tie into my engineering  
18 experience, is that it has extremely advanced  
19 avionics.

20 So the advanced students are able to use  
21 this aircraft as they develop their capability to  
22 be full-time professional commercial pilots. They

1 learn the avionics because that is the kind of  
2 avionics they will be encountering when they move  
3 into the jets.

4 So I own an aircraft; I lease it back to  
5 that program. I didn't do that to make money, but  
6 it does make money.

7 Q Let me make sure I have -- I have it,  
8 I think.

9 The aviation business you have, it derives  
10 income from leasing an aircraft that you own to a  
11 program that's in a university?

12 A It's the flight school which operates on  
13 contract from the college. Actually, it's Vermont  
14 Technical College. So whether you call it a  
15 college or university, it's a four-year program,  
16 and the income from that comes from the revenue  
17 when the aircraft is leased by the hour as part of  
18 the training program. And every month I get --  
19 I get the benefit of the leasing hours.

20 Q Okay. But it's -- you're not being  
21 compensated in connection with that work for any  
22 engineering work that you're doing on the aircraft

1 or with respect to its transmitters or receivers;  
2 correct?

3 A No. It's just an aircraft that I own, and  
4 the radios do sometimes have problems, but that's  
5 just part of the game. It's not a vehicle for  
6 RF activities, if you want to put it that way.

7 Q In connection with the opinions that you  
8 offered in these IPRs, did you model any of the  
9 prior art circuitry?

10 A When you say -- by "model," do you mean --  
11 what exactly do you mean?

12 Q I mean, did you use a simulator, for  
13 example, to re-create some of the prior art  
14 circuitry and use that to test whether, for  
15 example, combinations of prior art would be  
16 feasible or not feasible?

17 A First of all, again, I was responding.  
18 And Dr. Fay did not provide any such analysis, so  
19 I didn't have any -- I could not run anything he  
20 provided to check it.

21 So that was -- I was responding to  
22 Dr. Fay. And if Dr. Fay didn't provide a

1 simulation analysis, I had nothing to respond to.

2 Q So the answer is, no, you didn't do that;  
3 right?

4 A I didn't see the need to do it since,  
5 again, I was responding, I wasn't creating my own  
6 things, and there was no -- for example, if a  
7 simulation had been provided, I might have asked  
8 for the decs -- details so I could run that and  
9 check that. But since nothing was provided,  
10 I didn't run any simulations of my own in response.

11 Q Have you ever designed an attenuator  
12 circuit?

13 A I probably have at some point.

14 Q Can you remember ever designing an  
15 attenuator circuit?

16 A Not specifically. But, again, it's been a  
17 long career. So at some point -- that's a pretty  
18 generic circuit.

19 MR. LANTIER: All right. I don't think  
20 I have any further questions.

21 THE WITNESS: Sounds fine.

22 Sorry. I'm waiting for someone to say

1 "We're off the record at 12:00" -- whatever.

2 MR. LANTIER: Let's go off the record.

3 Sorry. Do you have redirect?

4 MR. RITCHIE: No redirect.

5 Dr. Foty would like an opportunity to  
6 review the transcript and sign that after it  
7 becomes available.

8 THE COURT REPORTER: And you'll both get a  
9 draft later today. And you don't know when you  
10 need your final yet?

11 MR. LANTIER: No. We have a deadline  
12 coming up, but it's not tomorrow or anything.

13 (An off-the-record discussion was held.)

14 THE COURT REPORTER: And is regular  
15 delivery fine for you, Mr. Ritchie?

16 MR. RITCHIE: That's fine.

17 MR. LANTIER: We will probably want it  
18 more quickly than that because of the deadlines in  
19 the case.

20 THE COURT REPORTER: If you can just check  
21 and let me know.

22 (Off the record at 12:12 p.m.)

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ACKNOWLEDGMENT OF DEPONENT

I, DANIEL PATRICK FOTY, PhD, do hereby  
acknowledge that I have read and examined the  
foregoing testimony and the same is a true,  
correct, and complete transcription of the  
testimony given by me and any corrections appear  
on the attached errata sheet signed by me.

\_\_\_\_\_  
(DATE)

\_\_\_\_\_  
(SIGNATURE)

1 CERTIFICATE OF COURT REPORTER - NOTARY PUBLIC

2  
3 I, MELANIE L. HUMPHREY-SONNTAG, Certified  
4 Shorthand Reporter No. 084-004299, CSR, RDR, CRR,  
5 CRC, FAPR, and a Notary Public within and for the  
6 State of Illinois, do hereby certify:

7 That DANIEL PATRICK FOTY, PhD, the witness  
8 whose deposition is hereinbefore set forth, was  
9 duly sworn by me before the commencement of such  
10 deposition and that such deposition was taken  
11 before me and is a true record of the testimony  
12 given by such witness.

13 I further certify that the adverse party,  
14 QUALCOMM, INCORPORATED, was represented by counsel  
15 at the deposition.

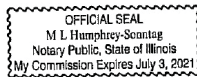
16 I further certify that the deposition of  
17 DANIEL PATRICK FOTY, PhD, occurred at the offices  
18 of Jones Day, 77 West Wacker Drive, Suite 3500,  
19 Chicago, Illinois, on Friday November 8, 2019,  
20 commencing at 9:00 a.m. to 12:12 p.m.

1 I further certify that I am not related to  
2 any of the parties to this action by blood or  
3 marriage, I am not employed by or an attorney to  
4 any of the parties to this action, and that I am  
5 in no way interested, financially or otherwise, in  
6 the outcome of this matter.

7 IN WITNESS WHEREOF, I have hereunto set my  
8 hand and affixed my notarial seal this 12th day of  
9 November, 2019.

10  
11 My commission expires: July 3, 2021

12   
13



14 NOTARY PUBLIC IN AND FOR THE  
15 STATE OF ILLINOIS  
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A			
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4:10, 83:1	28:10, 28:18,	5:5, 14:6,	58:17, 59:2,
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