

1 UNITED STATES PATENT AND TRADEMARK OFFICE
 2 BEFORE THE PATENT TRIAL AND APPEAL BOARD
 3 INTEL CORPORATION,) Case No.
) IPR2019-00047
 4 Petitioner,) IPR2019-00048
) IPR2019-00049
 5 vs.) IPR2019-00128
) IPR2019-00129
 6 QUALCOMM INCORPORATED,)
) U.S. Patent No.
 7 Patent Owner.) 9,154,356
 8
 9

10 CONTINUED DEPOSITION OF PATRICK FAY, PH.D.
 11 South Bend, Indiana
 12 Friday, January 10, 2020
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23 Reported by:
 24 RACHEL F. GARD, CSR, RPR, CLR, CRR
 25 JOB NO. 173903

1 P. FAY, PH.D.

2
3
4 January 10, 2020

5 9:05 a.m.

6
7 Deposition of PATRICK FAY, PH.D., at
8 Morris Inn, 1399 North Notre Dame Avenue,
9 South Bend, Indiana, pursuant to notice before
10 Rachel F. Gard, Illinois Certified Shorthand
11 Reporter, Registered Professional Reporter,
12 Certified LiveNote Reporter, Certified Realtime
13 Reporter, Indiana Notary Public.
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1 P. FAY, PH.D.

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18 BY: THOMAS RITCHIE, ESQ.

P. FAY, PH.D.

I N D E X

WITNESS

PAGE

PATRICK FAY, PH.D.

Cross-examination by Mr. Ritchie

99

E X H I B I T S

INTEL EXHIBIT

PAGE

Exhibit 1039 Declaration in
IPR2019-00047

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Exhibit 1139 Declaration in
IPR2019-00048

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Exhibit 1239 Declaration in
IPR2019-00049

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Exhibit 1339 Declaration in
IPR2019-00128

109

Exhibit 1439 Declaration in
IPR2019-00129

110

Exhibit 1001 U.S. Patent No. 9,154,356

114

Exhibit 1325 Kaukovouri reference

143

Exhibit 1024 Hirose reference

158

Exhibit 1004 3GPP TR 36.912

166

Exhibit 1335 Lee reference

180

QUALCOMM EXHIBIT

Exhibit 2013 U.S. Patent 9,161,254

145

Exhibit 2017 U.K. Patent Application
GB 2472978

151

1 P. FAY, PH.D.

2 (Witness sworn.)

3 WHEREUPON:

4 PATRICK FAY, PH.D.,
5 called as a witness herein, having been first
6 duly sworn, was examined and testified as
7 follows:

8 CROSS-EXAMINATION

9 BY MR. RITCHIE:

10 Q. Would you state and spell your name
11 for the record, please.

12 A. Yes. I am Patrick Fay. That's
13 P A T R I C K. And my last name is Fay, F A Y.

14 Q. And what's your current address,
15 Dr. Fay?

16 A. Yes. My address is 16045 Baywood
17 Lane in Granger, Indiana.

18 Q. And do you understand that you are
19 testifying under oath today?

20 A. Yes, I understand that.

21 Q. Any reason that you cannot testify
22 fully and truthfully today?

23 A. No, there's no reason.

24 Q. Please let me know if you don't
25 understand a question that I ask and I'll try

1 P. FAY, PH.D.

2 to clarify it for you. If you answer, I'm
3 going to assume you understand; is that fair?

4 A. Yes, that's fair.

5 Q. And if you need a break at any time,
6 please let me know. We can take a break as
7 long as there's no question pending at that
8 time.

9 Now, you understand this deposition
10 pertains to your second set of declarations for
11 U.S. Patent No. 9,154,356, correct?

12 A. Yes, that's my understanding.

13 MR. RITCHIE: And those matters for
14 the record are: IPR2019-00047, -00048,
15 -00049, -00128, and -00129.

16 Q. Now, I may refer to the patent, the
17 9,154,356 patent as the '356 patent. When I
18 say '356 patent, will you understand that I'm
19 referring to U.S. Patent No. 9,154,356?

20 A. Yes, I'll understand that.

21 (INTEL Exhibit Number 1039 for
22 identification.)

23 Q. All right. I'm handing you what's
24 been marked as Exhibit INTEL 1039. Do you
25 recognize Exhibit 1039 as a declaration you

1 P. FAY, PH.D.

2 submitted in IPR2019-00047?

3 MR. FERNANDEZ: Counsel, for the
4 record, my copy doesn't appear to have
5 color.

6 MR. RITCHIE: Okay. I think they're
7 all black and white.

8 A. Yeah, this does appear to be a
9 black-and-white version of this declaration.

10 Q. That's fair. Please let me know if
11 that causes any problem, and we'll see if we
12 can figure out a way to address that --

13 A. Okay.

14 Q. -- at some point during the
15 deposition.

16 Aside from being in black and white,
17 it appears to be complete otherwise?

18 A. It does appear to be complete, aside
19 from the color-coding being absent.

20 Q. And that's your signature on the
21 last page next to the date December 23, 2019?

22 A. Yes, that is my signature.

23 Q. Are you aware of any mistakes or
24 errors in the document?

25 A. There's one -- not so much a

1 P. FAY, PH.D.

2 mistake. There's a clarification I might like
3 to make.

4 Q. Sure.

5 A. And that is on -- in Paragraph 4, I
6 write that I have been informed that the '356
7 patent has a priority date of August 21, 2012.
8 In an earlier declaration, I had -- and, I
9 think, in fact -- this is, in fact, the filing
10 date for the '356 patent. In the earlier
11 declaration, previous declaration, I had
12 written it had an earliest priority date of --
13 if you have my earlier declaration or the '356
14 patent, I can refer to it, but ...

15 Q. There are all five of your earlier
16 declarations in that binder.

17 A. Excellent.

18 Q. Feel free to refresh your memory on
19 them.

20 A. Thank you.

21 MR. RITCHIE: For the record, I
22 handed the witness a binder that has a copy
23 of each of his five earlier declarations
24 that he's reviewing.

25 A. Yes. Here we go. In footnote 1 of

1 P. FAY, PH.D.

2 my original declaration for the 00047 IPR, on
3 Page 10, I indicate May 25th, 2012, to be the
4 earliest priority date for the '356 patent.

5 Q. So to be clear, I understand, so in
6 your second declaration, for example, in
7 Exhibit 1039, Paragraph 4, you're clarifying
8 that August 21, 2012, is the filing date of the
9 '356 patent?

10 A. And the earliest priority date.

11 Q. Is May 25, 2012?

12 A. Yes, that's correct.

13 Q. And that's the date that you
14 consider to be the date of the alleged
15 invention that you are --

16 A. The earliest priority date.

17 MR. FERNANDEZ: Objection. Form.

18 A. I consider -- I considered May 25th,
19 2012, to be the earliest priority date for the
20 '356 patent.

21 Q. Very good. Thank you.

22 Any other clarifications or mistakes
23 in this document, in Exhibit 1039?

24 A. If there are typos, I'm not aware of
25 them.

1 P. FAY, PH.D.

2 Q. Did anyone assist you in your
3 research, investigation, or testing in
4 preparing INTEL 1039?

5 A. I received clerical and support from
6 Intel's counsel in preparing the document.

7 Q. Did anyone assist you in formulating
8 your opinions in this declaration?

9 A. This declaration reflects my
10 opinions of the patented matter.

11 (INTEL Exhibit Number 1139 for
12 identification.)

13 Q. Handing you what's been marked as
14 INTEL 1139. Do you recognize Exhibit INTEL
15 1139 as a declaration you submitted in
16 IPR2019-00048?

17 A. Yes, I recognize this document
18 that's a black-and-white copy of the
19 declaration I prepared for the 00048 IPR.

20 Q. And, again, if it becomes an issue
21 that it's in black and white as opposed to
22 color, please let me know and we'll see if we
23 can figure out how to address that.

24 Is this your signature on Page 37
25 next to the date December 23, 2019?

1 P. FAY, PH.D.

2 A. Yes, that is my signature.

3 Q. Are you aware of any mistakes in
4 this document or clarifications that you'd like
5 to make?

6 A. Just as with the 00047, in
7 Paragraph 4, I quoted the filing date of August
8 21st, 2012, but for the purposes of my
9 analysis, consistent with my previous
10 declaration, I used an earliest priority date
11 of May 25th, 2012.

12 Q. March 25th?

13 A. May.

14 Q. Oh, I'm sorry. Okay.

15 A. Did I misspeak previously?

16 Q. You may or may not have. I notice
17 that both of those dates are in that footnote.
18 There's a March date and a May date in that
19 footnote. It's Page 10 of that declaration.

20 A. Thank you. Ah, yes, the footnote in
21 question reads: For purposes of this
22 declaration, I consider May 25th, 2012, to be
23 the earliest priority date of the '356 patent.
24 I have been informed and understand that the
25 patent owner has alleged a conception date of

1 P. FAY, PH.D.

2 March 25th, 2012, in a related matter. The
3 concepts I describe in this declaration were
4 known before that date.

5 Q. Thank you. Are you aware of any
6 other mistakes or clarifications that you'd
7 like to make in Exhibit INTEL 1139?

8 A. No, not that I can think of.

9 Q. Did anyone assist you in your
10 research, investigation, or testing in
11 preparing this declaration?

12 A. I had administrative support in
13 preparing the declaration.

14 Q. Did anyone assist you in formulating
15 your opinions for this declaration?

16 A. The opinions reflected in this
17 declaration are my own.

18 (INTEL Exhibit Number 1239 for
19 identification.)

20 Q. Handing you what's been marked as
21 Exhibit INTEL 1239. Do you recognize Exhibit
22 INTEL 1239 as a declaration you submitted in
23 IPR2019-00049? And I'll tell you I have a
24 printing problem in my version. I apologize.

25 A. Yeah, there's an issue.

1 P. FAY, PH.D.

2 Q. So starting at Page 17, the copy
3 switched to landscape mode and some of the
4 information is cut off at the bottom.

5 A. Yes, that seems --

6 Q. Starting from Paragraph 32 through
7 the end.

8 A. Yeah.

9 Q. Again, let's see what we can do.

10 A. Paragraph 31 is incomplete, right.
11 Well, no, I guess you're right. Paragraph 32
12 is the first one that's incomplete. My
13 mistake.

14 Q. So again, let's -- we'll see what we
15 can do with this. If it becomes an issue, we
16 will -- we'll stop and see if I can get a
17 corrected copy. But for the moment, the last
18 page does have a signature and a date.

19 And, again, I recognize that this
20 version is not complete from Paragraph 32 on.
21 But is that your signature at the end dated
22 December 23, 2019?

23 A. That is my signature.

24 Q. And from what you can tell with
25 respect to the document that I've handed you,

1 P. FAY, PH.D.

2 are you aware of any mistakes or omissions or
3 clarifications in this document that you'd like
4 to make?

5 MR. FERNANDEZ: Objection. Form.

6 Foundation.

7 A. At least with respect to the first
8 31 paragraphs, I'd just make the same note that
9 I have on the other two IPRs that in
10 Paragraph 4, I reference a priority date of
11 August 21st, which is the filing date and that
12 I -- consistent with our previous discussion of
13 the 00048 and 00047 IPRs, that I considered the
14 earliest priority date to be May 25th, 2012.

15 Q. Any other mistakes or clarifications
16 that you'd like to make?

17 A. Not that I'm aware of.

18 Q. Did anyone assist you in your
19 research, investigation, or testing in
20 preparing the declaration that's marked as
21 Exhibit INTEL 1239?

22 A. I received administrative support
23 from Intel's counsel.

24 Q. Did anyone assist you in formulating
25 the opinions you've expressed in Exhibit

1 P. FAY, PH.D.

2 INTEL 1239?

3 A. The opinions I have expressed in
4 this declaration are my own.

5 (INTEL Exhibit Number 1339 for
6 identification.)

7 Q. I'm handing you what's been marked
8 as exhibit Intel 1339. Do you recognize
9 exhibit Intel 1339 as a declaration you
10 submitted in IPR2019-00128?

11 A. Yes, I recognize this as a
12 black-and-white copy of the declaration I
13 prepared in response to the 00128 IPR.

14 Q. And that's your signature on Page 27
15 next to the date November 27th, 2019?

16 A. Yes, Page 27 bears my signature.

17 Q. Are you aware of any mistakes or
18 clarifications you'd like to make in this
19 document?

20 A. As with the other, the previous
21 three, on Paragraph 4, I have indicated a
22 priority date of August 21st, 2012, which is
23 the filing date of the patent. But for the
24 purposes of the analysis I did, I used an
25 earliest priority date of May 25th, 2012.

1 P. FAY, PH.D.

2 Q. Did anyone assist you in your
3 research, investigation, or testing in
4 preparing this declaration?

5 A. I received administrative support
6 from Intel's counsel.

7 Q. Did anyone assist you in formulating
8 the opinions you've expressed in Exhibit INTEL
9 1339?

10 A. The opinions expressed in this
11 declaration are my own.

12 (INTEL Exhibit Number 1439 for
13 identification.)

14 Q. Handing you what's been marked as
15 Exhibit INTEL 1439. Do you recognize Exhibit
16 INTEL 1439 as a declaration you submitted in
17 IPR2019-00129?

18 A. It appears to have a serious
19 printing flaw.

20 Q. It does. I will note for the record
21 that again starting at -- here this one starts
22 at Paragraph 33, the print switches to
23 landscape mode and the bottom of each page is
24 cut off from Paragraph 33 onward. So again,
25 Dr. Fay, I apologize. We'll do what we can

1 P. FAY, PH.D.

2 with this. If that becomes an issue,
3 throughout my questions, we will stop and
4 figure out how to deal with obtaining a
5 corrected version.

6 MR. FERNANDEZ: Counsel, if you'd
7 like to go off record for a brief moment
8 and discuss this issue, we will be fine
9 with that.

10 MR. RITCHIE: Yeah, let's go off the
11 record for a moment.

12 (A discussion off the record.)

13 MR. RITCHIE: Let's go back on the
14 record.

15 Q. From what you can tell from the
16 document, which is obviously misprinted from
17 Paragraph 33 onward, are you aware of any
18 mistakes or omissions in this document that
19 you'd like to correct?

20 MR. FERNANDEZ: Objection. Form.
21 Foundation.

22 A. Through the first 32 paragraphs, I
23 am aware of the same issue with this
24 declaration, which is that I have written in
25 Paragraph 4 a priority date of August 21st,

1 P. FAY, PH.D.

2 2012, when in my previous declaration, as we
3 discussed with respect to the 00047 IPR, the
4 earliest priority date, according to the
5 patent, was May 25th, 2012.

6 Q. Are there any other mistakes or
7 clarifications that you're aware of with
8 respect to INTEL 1439?

9 A. None that I'm aware of.

10 Q. Did anyone assist you in your
11 research, investigation, or testing in
12 preparing Exhibit INTEL 1439?

13 A. I received administrative support in
14 the preparation of the document.

15 Q. Did anyone assist you in formulating
16 your opinions that are expressed in INTEL 1439?

17 A. The opinions expressed in this
18 exhibit are my own.

19 Q. All right. I'd like to talk to you
20 about the term "carrier aggregation." And if
21 you want for reference, we can turn to INTEL
22 1039, Paragraph 14. Now, in Paragraph 14 of
23 INTEL 1039, you state that carrier aggregation
24 means simultaneous operation on multiple
25 carriers, correct?

1 P. FAY, PH.D.

2 A. What I state in Paragraph 14 is that
3 it's my conclusion that the broadest reasonable
4 interpretation of carrier aggregation is
5 simultaneous operation on multiple carriers.

6 Q. And you go on to state that the
7 specification defines the term "carrier
8 aggregation," correct?

9 A. Yes. What I say in Paragraph 14 is
10 this construction comes directly from the
11 specification which defines the term, and then
12 I provide a quote from column 1, Lines 32 and
13 33: A wireless device may support carrier
14 aggregation, which is simultaneous operation on
15 multiple carriers.

16 Q. Now, what is the basis for your
17 opinion that the specification defines the term
18 carrier aggregation?

19 A. Can you clarify for me what you mean
20 by when you say "basis"?

21 Q. As we just noted, this sentence
22 states that the specification defines the term.
23 And what I'm looking for is the analysis, your
24 reasons what led you to conclude that the
25 specification defines the term.

1 P. FAY, PH.D.

2 A. As I state here in Paragraph 14,
3 this comes directly from the specification,
4 which defines the term. And you can see the
5 sentence I've quoted here from column 1, Lines
6 32 to 33: Where the patent writes expressly, a
7 wireless device may support carrier
8 aggregation, which is simultaneous operation on
9 multiple carriers.

10 Q. You've referred to a sentence at
11 column 1, rows 32 to 33. Is there any other
12 references in the specification that you're
13 relying on for your conclusion that the
14 specification defines the term?

15 A. The specification also provides
16 additional support for this interpretation.
17 And would it be possible for me to have a copy
18 of the '356 patent?

19 (INTEL Exhibit Number 1001 for
20 identification.)

21 Q. Certainly. I'm going to hand you
22 what's been marked as Exhibit INTEL 1001. Do
23 you recognize this as the U.S. Patent -- U.S.
24 Patent No. 9,154,356 that is the subject of
25 these IPRs?

1 P. FAY, PH.D.

2 A. Yes, I recognize this as the '356
3 patent.

4 Q. All right. Now, you may refer to
5 that, and I'll repeat my question that I asked.

6 You referred to a sentence at
7 column 1, Row 32 and 33, as defining the term
8 as support for your conclusion that the
9 specification defines the term "carrier
10 aggregation." And my question was: Are there
11 any other references in the specification that
12 you're relying on for your conclusion that the
13 specification defines the term "carrier
14 aggregation"?

15 A. Yes. There are two other areas in
16 the specification that I cite also in
17 Paragraph 14 that support this interpretation.
18 I provide a citation to column 2, rows 53 to
19 54, where it states: Wireless device 110 may
20 support carrier aggregation, which is operation
21 on multiple carriers. And also line -- or,
22 excuse me, column 2, Line 54 and 55: Carrier
23 aggregation may also be referred to as
24 multi-carrier operation.

25 Q. Okay. So if I heard you correctly,

1 P. FAY, PH.D.

2 I think what you said was the sentence at
3 column 1, row 32 and 33 define the term and the
4 other two references at column 2, 53/54 and
5 column 2, 54/55 support that interpretation; is
6 that correct?

7 MR. FERNANDEZ: Objection. Form.
8 Foundation.

9 A. That's a little bit different than I
10 intended to convey.

11 Q. Please clarify. And, again, the
12 base of my question is: What is the basis for
13 your opinion that the specification defines the
14 term carrier aggregation?

15 A. It's my conclusion that the broadest
16 reasonable interpretation of carrier
17 aggregation is simultaneous operation on
18 multiple carriers because the specification
19 defines it. You see the definition in column
20 1, rows 32 to 33, and a very similar disclosure
21 in column 2, 53 to 54 and -- column 2, 53 to
22 54.

23 Q. So where does the specification
24 define the term carrier aggregation
25 specifically?

1 P. FAY, PH.D.

2 MR. FERNANDEZ: Objection. Form.

3 A. It's my position that these
4 statements that I've quoted here in
5 Paragraph 14 are where the specification
6 defines the term.

7 Q. So the sentence at column 1 defines
8 the term; is that correct? 1, 32 to 33?

9 MR. FERNANDEZ: Objection. Form.

10 A. The citation, column 1, 32 to 33,
11 but also column 2, 53 to 54 serves as a
12 definition.

13 Q. So the definition is repeated twice
14 in the specification; is that correct?

15 A. The author reiterates what he means
16 by carrier aggregation and uses, as you can see
17 from these quotes, slightly different
18 characterizations. But in reading the entirety
19 of the specification, it becomes clear that the
20 definition in column 1 is the most complete one
21 that he provides.

22 Q. What do you mean by it's the most
23 complete definition in the context of the
24 entirety of the specification?

25 A. My understand- -- well -- could you

1 P. FAY, PH.D.

2 please repeat your question?

3 Q. You stated: In reading the entirety
4 of the specification, it becomes clear that the
5 definition in column 1 is the most complete one
6 that he provides.

7 What do you mean by it's the most
8 complete definition with respect to the
9 entirety of the specification?

10 MR. FERNANDEZ: Objection. Form.

11 A. In my original declaration at
12 Paragraph 28, I describe -- since I'm not a
13 lawyer, I describe my understanding of the
14 broadest reasonable interpretation standard as
15 was conveyed to me by petitioner's counsel.

16 I understand that that is the --
17 that the broadest reasonable interpretation
18 standard refers to the broadest reasonable
19 interpretation that a person of ordinary skill
20 in the art would give to a claim term in light
21 of the specification.

22 So by "complete," I meant taking
23 that definition, which he provides in column 1,
24 lines 32 to 33, and interpreting it in light of
25 the entire -- interpreting that in light of the

1 P. FAY, PH.D.

2 specification.

3 Q. Okay. I'm focused on the "defines
4 the term" part of your opinion in the second
5 declaration here. Is there something about the
6 rest of the specification that tells you that
7 the sentence at column 1, row 32 to 33 is a
8 definition?

9 A. The remainder of the specification
10 describes the purported invention and its use
11 cases, its structure, and that is consistent
12 with what I would say is a definitional
13 statement in column 1, Lines 32 to 33.

14 Q. So focused on the statement at
15 column 1, row 32 and 33, it's your opinion that
16 that statement is a definition of the term
17 carrier aggregation; is that correct?

18 A. It is my conclusion that a person of
19 ordinary skill in the art reading the sentence
20 that we reference in column 1, Lines 32 through
21 33, would interpret that as the author of the
22 patent's definition of carrier aggregation.

23 Q. And now let's turn to the second
24 reference that you pointed to there, the one at
25 column 2, row 53 to 54. Is it your opinion

1 P. FAY, PH.D.

2 that that statement is also a definition of the
3 term?

4 A. Line -- or column 2, Lines 53 to 54
5 where it states, "wireless device 110 may
6 support carrier aggregation, which is operation
7 on multiple carriers," is also another
8 definition of carrier aggregation that's
9 contained within the patent.

10 Q. So the patent includes two -- in
11 your opinion the patent includes two
12 definitions of the term carrier aggregation; is
13 that correct?

14 MR. FERNANDEZ: Objection to form.

15 A. The -- I would -- I think that
16 mischaracterizes my opinion a little bit, yes.

17 Q. Please. Please, can you clarify for
18 me? What are those two sentences that we're
19 referring to there?

20 A. The -- I believe a person of
21 ordinary skill in the art reading the
22 specification would see column 2, Lines 53 to
23 54 as a reiteration of the definition provided
24 earlier in column 1, Lines 32 to 33.

25 Q. So are you saying the statement at

1 P. FAY, PH.D.

2 column 2, row 53 to 54 is not a definition of
3 the term carrier aggregation?

4 A. No.

5 Q. No, it is not a definition or --

6 A. Oh, I'm sorry. Can you repeat your
7 question? Perhaps I didn't answer the correct
8 question.

9 Q. Yeah, and I might have phrased it in
10 the negative. Let me say it in the
11 affirmative.

12 Are you saying that the statement at
13 column 2, row 53 to 54 is a definition of the
14 term carrier aggregation?

15 A. It's my position that -- I should
16 say I am saying that the statement in column 2,
17 Lines 53 to 54, is a reiteration of the earlier
18 definition provided in column 1, Lines 32 to
19 33.

20 Q. So the sentence in column 1 is a
21 definition, correct?

22 A. The sentence in column 1, lines 32
23 to 33, where he writes, "A wireless device may
24 support carrier aggregation, which is
25 simultaneous operation on multiple carriers,"

1 P. FAY, PH.D.

2 is a statement that a person of skill -- of
3 ordinary skill in the art would consider to be
4 a definition of carrier aggregation provided by
5 the authors of the patent.

6 Q. And the sentence at column 2, row 53
7 to 54 reiterates support for that earlier
8 definition; is that correct?

9 MR. FERNANDEZ: Objection. Form.

10 Q. Is -- scratch that sentence.

11 The sentence at column 2, row 53 to
12 54 is not a separate definition of the term
13 carrier aggregation; is that correct?

14 MR. FERNANDEZ: Objection. Form.

15 A. A person -- it's my position that a
16 person of skill in the art reading the
17 specification encountering the statement at
18 column 1, Lines 32 to 33, and then subsequently
19 encountering the statement in column 2, 53 to
20 54, would see that statement as a reiteration
21 of the definition provided in column 1.

22 Q. And why isn't the sentence at
23 column 2, row 53 and 54 a definition standing
24 on its own?

25 A. In the abstract, devoid of context,

1 P. FAY, PH.D.

2 perhaps a sentence like that could be
3 considered to be a definition. But my
4 understanding of the law is that the broadest
5 reasonable interpretation of the claim terms,
6 which is what I'm discussing in my Paragraph 14
7 and 15 of my declaration, is directed towards
8 the broadest reasonable interpretation, which
9 is, as I stated earlier, what a person of
10 ordinary skill in the art, a meaning that a
11 person of ordinary skill in the art would give
12 to a claim term in light of the specification.
13 So the context in light of the specification is
14 important.

15 Q. And can you be more specific about
16 how the specification provides context for you
17 to conclude that the statement at column 2, row
18 53 to 54 is not a definition standing on its
19 own?

20 MR. FERNANDEZ: Objection to form.

21 A. The statement at column 1 provides a
22 modestly more complete definition by including
23 the word "simultaneous." And we also see
24 reading the more technical parts of the patent
25 that there's a great deal of discussion of

1 P. FAY, PH.D.

2 simultaneous operation on multiple carriers
3 that would inform a person of ordinary skill in
4 the art's understanding of the term.

5 Q. And when you say there's a great
6 deal of discussion of simultaneous operation on
7 multiple carriers, specifically where are you
8 referring to?

9 A. There's quite a lot of it. As just
10 one example, in column 8, Lines 36 through 44
11 describes operation of the circuitry disclosed
12 in Figure 6B in a carrier aggregated mode --
13 no, yeah, yeah, 6B in carrier aggregation mode.

14 Q. And so you're saying that that
15 reference that you just identified shows that
16 the carrier aggregation that is referred to in
17 the patent is in the context of simultaneous
18 operation; is that correct?

19 A. I'm sorry. You lost me in the
20 middle of the question. Could you please
21 repeat it?

22 Q. We were talking about the word
23 "simultaneous" with respect to operation on
24 multiple carriers. And you indicated an
25 example was in Figure 6B at column 8, Lines 36

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2 through 44. And you're saying that provides
3 context that the operation on multiple carriers
4 that's discussed in the patent is simultaneous;
5 is that correct?

6 MR. FERNANDEZ: Objection. Form.

7 A. The operation of the circuitry in
8 Figure 6B showing the operation in the carrier
9 aggregation mode of LNA, 640a is shown in this
10 text and the illustration in Figure 6B to be
11 operating on -- to be simultaneous operation on
12 multiple carriers.

13 Q. So we were talking about the
14 sentence at column 2, row 53 to 54, and that
15 sentence does not use the word "simultaneous."
16 Correct?

17 A. The word "simultaneous" does not
18 appear in the sentence in column 2, Lines 53 to
19 54, that is correct.

20 Q. But as you read the rest of the
21 specification, including the example you cited,
22 you understand that what that sentence really
23 means is simultaneous operation on multiple
24 carriers; is that correct?

25 A. I think it would be inappropriate

1 P. FAY, PH.D.

2 for me to speculate as to what the authors of
3 the patent may have meant beyond what's
4 included here directly on the page. But with
5 respect to my interpretation of the broadest
6 reasonable interpretation of the claim term
7 carrier aggregation, as I understand the
8 broadest reasonable interpretation standard as
9 explained to me by Intel's counsel, it's my
10 position that simultaneous operation on
11 multiple carriers is the broadest reasonable
12 interpretation.

13 Q. To reach your conclusion on the
14 broadest reasonable interpretation, you did not
15 rely on the sentence at column 2, row 53 to 54
16 as a definition, then; is that correct?

17 A. I guess I wouldn't quite agree with
18 that, no.

19 Q. To reach your conclusion on the
20 broadest reasonable interpretation of the term
21 "carrier aggregation," you did rely on the
22 sentence at column 2, row 53 to 54 as a
23 definition; is that correct?

24 A. The sentence in column 2, rows 53 to
25 54, I believe supports the definition in column

1 P. FAY, PH.D.

2 1, rows 32 to 33 as a reiteration or
3 recapitulation of the same theme. Whether that
4 constitutes a definition is not so clear to me.

5 Q. What is a definition to you?

6 A. I have to admit, I haven't
7 formulated a detailed opinion about the meaning
8 of the word "definition." Colloquially -- see
9 if I can say this word. In colloquial usage,
10 it might be a phrase that provides the meaning
11 of another word or phrase.

12 Q. Here's my problem. We're talking
13 about two sentences. One says carrier
14 aggregation, which is simultaneous operation on
15 multiple carriers. The other sentence says
16 carrier aggregation, which is an operation on
17 multiple carriers. How do you know that one is
18 a definition and one is merely reiterating
19 support for the other?

20 MR. FERNANDEZ: Objection. Form.

21 A. It's my position that a person of
22 skill in the art reading this -- reading the
23 patent specification would see the statement in
24 column 1, rows 32 to 33, which is a bit more
25 specific, read what's then in column 2, which

1 P. FAY, PH.D.

2 reiterates the same theme and then reads the
3 rest of the specification, which clearly
4 supports the notion that simultaneity is an
5 important feature of carrier aggregation and
6 would thus not be confused.

7 Q. Earlier you said that the sentence
8 in column 1, row 32 to 33 was the most complete
9 definition of the term in the specification.
10 Is it, in fact, a complete definition of the
11 term? Is the sentence at column 1, row 32 to
12 33, a complete definition of the term carrier
13 aggregation?

14 MR. FERNANDEZ: Objection. Form.

15 A. It's my understanding that the
16 authors of the patent are free to be their own
17 lexicographer and thus supply their
18 definitions. That disclosure in column 1,
19 Lines 32 to 33, my conclusion is that that
20 disclosure is their definition of carrier
21 aggregation acting as their own lexicographer.

22 Q. And in your opinion, is the patentee
23 acting as a lexicographer with respect to the
24 sentence at column 2, row 53 to 54?

25 A. Not independently, no. It's my

1 P. FAY, PH.D.

2 position that they are merely reiterating what
3 they've said earlier for the benefit of the
4 reader.

5 Q. In your declaration in Exhibit INTEL
6 1039 at paragraph 14, which contains the
7 subject we've been discussing about the
8 definition of the term carrier aggregation,
9 there's a third sentence that you refer to.
10 That third sentence that you refer to is at
11 column 2, row 54 to 55. Is the patentee acting
12 as a lexicographer with respect to the sentence
13 that is at 2, column 2, 54 to 55?

14 A. It's my opinion that the sentence in
15 question in column 2, rows 54 to 55, which
16 reads: Carrier aggregation may also be
17 referred to as multi-carrier operation,
18 supports the definition provided earlier.

19 But a person of skill in the art
20 would understand that to be providing a --
21 what's the word I want? A linkage to how
22 others have -- may have referred to carrier
23 aggregation. He says may also be referred to
24 as multi-carrier operation, by which I -- it's
25 my conclusion that that means he's -- when

1 P. FAY, PH.D.

2 other people speak about multi-carrier
3 operation, they are talking about carrier
4 aggregation.

5 Q. So that sentence is not defining the
6 term carrier aggregation then; is that correct?
7 And by that sentence, I mean the sentence at
8 column 2, rows 54 to 55.

9 A. I believe this sentence provides
10 insight into what the phrase carrier
11 aggregation means and so, therefore, has
12 definitional sorts of qualities. But
13 whether -- but again, what I was looking to do
14 was not analyze these as definitions but rather
15 construe the broadest reasonable interpretation
16 in light of the specification and these three
17 statements all support, I believe, my -- my
18 interpretation of the term carrier aggregation.

19 Q. Now, in the last sentence of the
20 paragraph, Paragraph 14 of your declaration in
21 INTEL 1039, you stated that this meaning is
22 consistent with the understanding of the term
23 by a POSITA, correct?

24 A. The last sentence of Paragraph 14 in
25 this exhibit does say: This meaning is

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2 consistent with the understanding of the term
3 by a POSITA.

4 Q. At the time of the alleged invention
5 in 2012 when you analyzed this, a POSITA would
6 have recognized the term carrier aggregation,
7 correct?

8 A. Yes. A person of ordinary skill in
9 the art would have recognized the term carrier
10 aggregation, especially given the disclosure in
11 the patent.

12 Q. The term carrier aggregation was not
13 used for the first time in the '356 patent;
14 that was -- that term was known in the art?

15 A. My understanding is that the term
16 carrier aggregation had been used by other
17 authors and in other contexts prior to the '356
18 patent.

19 Q. At the time, a POSITA would have had
20 an understanding of what carrier aggregation
21 means, correct?

22 MR. FERNANDEZ: Objection. Form.

23 A. Yes. A person of ordinary skill in
24 the art at the time of the alleged invention of
25 the '356 could have had an understanding of the

1 P. FAY, PH.D.

2 meaning of carrier aggregation, at least in
3 some contexts.

4 Q. And what would a POSITA have
5 understood the term carrier aggregation to mean
6 at the time of the alleged invention of the
7 '356 patent?

8 A. A person of ordinary skill in the
9 art reading the '356 patent would understand
10 the term, the term carrier aggregation to mean
11 simultaneous operation on multiple carriers.

12 Q. No, that wasn't my question. We
13 established that a POSITA would have had an
14 understanding of what carrier aggregation means
15 at the time. Setting the '356 patent aside,
16 I'm asking you what would a POSITA have
17 understood the term carrier aggregation to mean
18 at the time of the alleged invention of the
19 '356 patent?

20 MR. FERNANDEZ: Objection. Form.

21 A. I have not formulated an opinion
22 about what a person of ordinary skill in the
23 art would have thought independent of the '356
24 patent.

25 Q. I want to make sure I understand.

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2 You're saying you do not have an opinion as to
3 what a POSITA would have understood the term
4 carrier aggregation to mean at the time of the
5 alleged invention of the '356 patent; is that
6 correct?

7 A. Could you rephrase? Or maybe not
8 rephrase. Restate your question for me. I
9 don't think I remember it all.

10 Q. Do you have an opinion as to what a
11 POSITA would have understood the term carrier
12 aggregation to mean at the time of the alleged
13 invention of the '356 patent?

14 A. My opinion is that a person of
15 ordinary skill in the art at the time of the
16 '356 patent would have understood carrier
17 aggregation to mean simultaneous operation on
18 multiple carriers.

19 Q. And just to be clear, that's not in
20 the context of the '356 patent; that's the
21 meaning a person of ordinary skill in the art
22 would have had independent of the '356 patent?

23 MR. FERNANDEZ: Objection. Form.

24 A. While -- independent of the '356
25 patent, while a person of ordinary skill in the

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2 art may be -- may have expressed or provided a
3 different literal definition of carrier
4 aggregation, a person of ordinary skill of the
5 art at the time of the '356 patent would have
6 understood carrier aggregation to mean
7 simultaneous operation on multiple carriers.

8 Q. And so in the last sentence of
9 Paragraph 14 of Exhibit INTEL Exhibit 1039,
10 when you said the meaning, and you were
11 referring to simultaneous operation on multiple
12 carriers, when you said that meaning is
13 consistent with the understanding of the term
14 by a POSITA, you mean that the '356 patent is
15 using that term consistent with the
16 understanding that a person of ordinary skill
17 in the art would have had at that time; is that
18 correct?

19 A. That's taking that sentence out of
20 context a little bit.

21 Q. Okay. What do you mean by -- in the
22 last sentence of Paragraph 14 of INTEL 1039,
23 what do you mean by "the understanding of the
24 term by a POSITA"?

25 A. Paragraph 14 is directed to my

1 P. FAY, PH.D.

2 discussion of the broadest reasonable
3 interpretation of carrier aggregation within
4 the context of the '356 patent. And as I say,
5 given the clear -- in the sentence preceding
6 that, given the clear guidance in the
7 specification, carrier aggregation should be
8 construed as simultaneous operation under
9 multiple carriers under the broadest reasonable
10 interpretation, BRI, claim construction
11 standard. This meaning is consistent with the
12 understanding of the term by a person of
13 ordinary skill in the art.

14 Q. All right. Let's break that down.
15 You have said that a person of ordinary skill
16 in the art at the time of the '356 patent would
17 have understood carrier aggregation to mean
18 simultaneous operation on multiple carriers.
19 Is that correct?

20 A. I am saying that at the time of the
21 '356 patent's alleged invention, a person of
22 ordinary -- the construction of carrier
23 aggregation to mean simultaneous operation on
24 multiple carriers would be consistent with the
25 understanding of that term by a person of

1 P. FAY, PH.D.

2 ordinary skill in the art.

3 Q. And I'm focused on what the
4 understanding of that term meant separate from
5 the '356 patent. And I think you've said that
6 separate from the '356 patent, a person of
7 ordinary skill in the art at the time would
8 have understood carrier aggregation to mean
9 simultaneous operation on multiple carriers.

10 Do I understand that correctly?

11 A. Yes.

12 Q. And so what we have in Paragraph 14
13 is you've referenced a statement at column 1,
14 row 32 to 33, that defines the term the same as
15 a person of ordinary skill in the art would
16 have understood the term independent of the
17 '356 patent; is that correct?

18 A. No, the word I used was consistent
19 with.

20 Q. You used the word consistent. But
21 the definition that you reference in the
22 specification says simultaneous operation on
23 multiple carriers. And you've told me that a
24 POSITA would have understood the term to mean
25 exactly the same thing; is that correct?

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2 MR. FERNANDEZ: Objection. Form.

3 A. I'd have to go back and look at my
4 answer more carefully, but I believe what I
5 told you was that while a person of ordinary
6 skill in the art might not have used the same
7 literal words, they would have encompassed the
8 same meaning. They are consistent.

9 Q. So the statement at column 1, row 32
10 and 33 is defining the term carrier aggregation
11 consistent with the understanding of a --
12 understanding of the term by a person of
13 ordinary skill in the art? I didn't say that
14 well. Let me repeat that.

15 You've stated that there's a
16 definition at column 1, row 32 to 33. And now
17 what you're telling me is that definition is
18 consistent with the understanding of the term
19 as it was used in the art by a person of
20 ordinary skill?

21 MR. FERNANDEZ: Objection.

22 Q. Do I have that right?

23 MR. FERNANDEZ: Objection. Form.

24 A. Could you repeat it for me? The
25 pause was too long for me.

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2 Q. I will try. It's your opinion that
3 the definition at column 1, 32 to 33 in the
4 patent specification is consistent with the
5 understanding of the term by a person of
6 ordinary skill in the art?

7 A. Yes, it is my opinion that the
8 broadest reasonable interpretation of carrier
9 aggregation I put forth, simultaneous operation
10 on multiple carriers, is consistent with the
11 understanding of this term by a person of
12 ordinary skill in the art.

13 Q. You didn't answer my question.
14 You've testified that there's a
15 definition at column 1, row 32 to 33, correct?

16 A. Yes. As I say in Paragraph 14 of my
17 declaration, this construction, referring to
18 simultaneous operation on multiple carriers,
19 comes directly from the specification which
20 defines the term. And we see that term in
21 column 1, Lines 32 to 33.

22 Q. And it's your opinion that that
23 definition is consistent with the usage of the
24 term in the art by a person of ordinary skill?

25 A. It's my position that the phrase

1 P. FAY, PH.D.

2 simultaneous operation on multiple carriers is
3 a meaning of carrier aggregation that is
4 consistent with the understanding of that term
5 by a person of ordinary skill in the art.

6 Q. It's 10:30. Want to take a short
7 break, stretch your legs?

8 A. Sure. That would be fine. Thank
9 you.

10 (A short break was taken.)

11 Q. Welcome back.

12 A. Thank you.

13 Q. In Paragraph 21 of Exhibit INTEL
14 1039, the second sentence, you said: A POSITA
15 would not consider patent owner's arguments
16 about these references to limit the BRI of the
17 term carrier aggregation given the clear
18 definition of that term in the '356 written
19 description.

20 Did I read that correctly?

21 A. I'm not sure if you read it
22 correctly or not. I was glancing at an earlier
23 part of the paragraph.

24 Q. You've stated that a POSITA would
25 not consider patent owner's arguments about

1 P. FAY, PH.D.

2 these references to limit the BRI of the term
3 carrier aggregation given the clear definition
4 of that term in the '356 written description,
5 correct?

6 A. That's the second sentence of
7 Paragraph 21 in my declaration, yes.

8 Q. And when -- in that sentence when
9 you say "these references," I believe you are
10 referring to Exhibits 2016, 2017, and 1025 from
11 the prior paragraph; is that correct?

12 A. By "these references," in
13 Paragraph 21 of my declaration, I am referring
14 to the references that Dr. Foty used and that I
15 discuss in Paragraph 20, which are
16 Exhibits 2016, 2017, and 1025.

17 Q. What is the basis for your opinion
18 that a POSITA would not consider the evidence
19 in Exhibits 2016, 2017, or 1025 in order to
20 understand the meaning of the term carrier
21 aggregation?

22 MR. FERNANDEZ: Objection. Form.

23 A. Paragraph 21 lays out the reasons
24 why I believe that a -- why it's my conclusion
25 that a person of ordinary skill in the art

1 P. FAY, PH.D.

2 would not consider these arguments to limit the
3 broadest reasonable interpretation of the term
4 carrier aggregation.

5 Q. And would you just reiterate those
6 for me, those reasons?

7 A. Yes. One of the reasons is that
8 none of these references include the claim
9 term -- include the construction proposed by
10 the patent owner combined as a single virtual
11 channel or to provide higher bandwidth.
12 Another is that the description in these
13 references are various instances of carrier
14 aggregation that are all encompassed by the
15 broadest reasonable interpretation of the term
16 simultaneous operation on multiple carriers.

17 And a person of ordinary skill in
18 the art reading the file history would see that
19 the evidence that the patent owner uses for, as
20 I call it, parts 2 and 3 of the proposed
21 construction were not discussed during the
22 prosecution of the '356 patent.

23 And, further, the discussion with
24 respect to rejecting the claims over the
25 Kaukovouri reference, a person of ordinary

1 P. FAY, PH.D.

2 skill in the art would not have understood that
3 the examiner was limiting the examiner's
4 interpretation of carrier aggregation based on
5 the Kaukovouri reference, and further the
6 additional two references that Dr. Foty
7 identifies as intrinsic were among two
8 references among approximately 350 other
9 references that are not part of the prosecution
10 file wrapper but are merely listed on the face
11 of the patent.

12 Q. Anything else?

13 A. I'm not sure. I could review the
14 older declaration, if you'd like me to make
15 sure -- well, perhaps I should do that.

16 Yes, there is one additional thing
17 which I could point out, which is from
18 Paragraph 62 of my original declaration, which
19 is Exhibit INTEL 1002. I point out that
20 carrier aggregation is commonly understood --
21 or I'm sorry. I started in the wrong place.

22 Carrier aggregation is known to have
23 multiple uses and is not limited to any
24 particular use.

25 Q. Okay. Anything else?

1 P. FAY, PH.D.

2 A. That -- hmm. Could you please
3 repeat your question so I make sure I'm
4 answering it properly?

5 Q. Sure. What is the basis for your
6 opinion that a POSITA would not consider the
7 evidence in Exhibits 2016, 2017, or 1025 in
8 order to understand the meaning of the term
9 carrier aggregation?

10 MR. FERNANDEZ: Objection. Form.

11 A. There may be other reasons I've
12 articulated in other parts of the declaration,
13 but those are what I can recall at the moment.

14 Q. Are you familiar with the Kaukovouri
15 reference?

16 A. By which you mean Patent No.
17 8,442,437?

18 Q. That's correct.

19 A. Yes, I'm familiar with that patent.

20 (INTEL Exhibit Number 1325 for
21 identification.)

22 Q. I'm handing you a copy of what's
23 marked as INTEL 1325, which is I believe the
24 Kaukovouri reference that you're referring to;
25 is that correct?

1 P. FAY, PH.D.

2 A. This is a copy of the Kaukovouri
3 reference that we've been referring to, yes.

4 Q. If you turn in the Kaukovouri
5 reference to column 1 and starting at row 26 --

6 A. Let's see.

7 Q. And starting there at row 26, it
8 says: LTE Advanced -- are you with me there?

9 A. Yes, I see this place.

10 Q. LTE Advanced proposes the
11 aggregation of multiple carrier signals in
12 order to provide a higher aggregate bandwidth
13 than would be available if transmitting via a
14 single carrier signal. This technique of
15 carrier aggregation requires each utilized
16 carrier signal to be demodulated at the
17 receiver where after the message data from each
18 of the signals can be combined in order to
19 reconstruct the original data.

20 Did I read that correctly?

21 A. Yes, you read those two sentences
22 correctly.

23 Q. Are those sentences consistent with
24 a POSITA's understanding of the term carrier
25 aggregation at the time of the alleged

1 P. FAY, PH.D.

2 invention of the '356 patent?

3 A. The passage that you read from
4 Kaukovouri describes a specific use of carrier
5 aggregation within the context of LTE Advanced.
6 Elsewhere in Kaukovouri he describes in more
7 detail how these -- how this operates and,
8 taken together, those are consistent with how a
9 person of ordinary skill in the art would
10 understand carrier aggregation -- actually, I
11 should say this, no -- would fall within what a
12 person of ordinary skill in the art would
13 understand to be carrier aggregation.

14 Q. You can set that aside.

15 (Qualcomm Exhibit Number 2013 for
16 identification.)

17 Q. I'm handing you what's been marked
18 as Exhibit Qualcomm 2013. This is U.S. Patent
19 No. 9,161,254. Are you familiar with Exhibit
20 Qualcomm 2013?

21 A. Yes, I've reviewed this exhibit in
22 the past.

23 Q. And you would agree that
24 Exhibit 2013 discloses carrier aggregation,
25 correct?

1 P. FAY, PH.D.

2 A. This patent discusses carrier
3 aggregation, among many other things.

4 Q. I'd like you to turn to column 3 and
5 focus your attention starting at row 19. Are
6 you there?

7 A. Column 3, row 19, yes, I'm there.

8 Q. And that paragraph states, and I
9 will read it here: One technique for providing
10 additional bandwidth capacity to wireless
11 devices is through the use carrier aggregation
12 of multiple smaller bandwidths to form a
13 virtual wideband channel at a wireless device,
14 in parentheses, e.g., UE, end parentheses. In
15 carrier aggregation, multiple components --
16 multiple component carriers can be aggregated
17 and jointly used for transmission to/from a
18 single terminal.

19 Did I read that correctly?

20 A. You left out some parentheticals.

21 Q. Let me try again.

22 That paragraph states: One
23 technique for providing additional bandwidth
24 capacity to wireless devices is through the use
25 carrier aggregation of multiple smaller

1 P. FAY, PH.D.

2 bandwidths to form a virtual wideband channel
3 at a wireless device, and in parentheses, e.g.,
4 UE, in carrier aggregation, parenthetical, CA,
5 end parenthetical, multiple component carriers,
6 parenthetical, CC, end parenthetical, can be
7 aggregated and jointly used for transmission
8 to/from a single terminal.

9 Did I read that correctly?

10 A. You left out one of the parentheses.

11 Q. My third and final attempt.

12 One technique for providing
13 additional bandwidth capacity to wireless
14 devices is through the use carrier aggregation
15 of multiple smaller bandwidths to form a
16 virtual wideband channel at a wireless device
17 parentheses, e.g., UE, parentheses, in carrier
18 aggregation, parentheses, CA, end parentheses,
19 multiple component carriers, parentheses, CC,
20 end parentheses, can be aggregated and jointly
21 used for transmission to/from a single
22 terminal.

23 Did I read that correctly?

24 A. I believe so.

25 Q. Are those statements consistent with

1 P. FAY, PH.D.

2 a POSITA's understanding of the term carrier
3 aggregation at the time of the invention of the
4 '356 patent?

5 A. I don't think they can be because
6 this patent was -- if I understand it properly,
7 the provisional application was filed in
8 September 28th of 2012.

9 Q. I understand this application was
10 filed on September 28th, 2012, as you've
11 indicated.

12 My question is not about when this
13 was filed. My question is: Are those
14 statements consistent with a POSITA's
15 understanding of the term carrier aggregation
16 earlier at the time of the alleged invention of
17 the '356 patent?

18 MR. FERNANDEZ: Objection to form.

19 A. The excerpt that you read for me
20 discloses a particular use case of carrier
21 aggregation within the context of time division
22 duplex systems. That particular use case falls
23 within the -- might fall within -- falls within
24 a person of ordinary skill of the art's
25 understanding of carrier aggregation. But as I

1 P. FAY, PH.D.

2 indicated earlier and as supported by my
3 declaration, this is only one possible use case
4 of many possible uses and so does not define
5 carrier aggregation.

6 Q. Yeah, I'm not -- just to be clear,
7 I'm not asking you if this defines carrier
8 aggregation. My question is: Is this
9 consistent with a POSITA's understanding of the
10 term at the time of the alleged invention of
11 the '356 patent?

12 A. This, this fairly narrow specific
13 use case that's described is captured within
14 the broadest reasonable interpretation that
15 I've put forth and that is consistent -- and
16 is, therefore, consistent with a person of
17 ordinary skill in the art's understanding of
18 carrier aggregation.

19 Q. Direct your attention down to the
20 paragraph that begins in the same column of
21 Exhibit 2013 at row 45, and I will read that
22 paragraph. Carrier aggregation, parentheses,
23 CA, parentheses, enables multiple carrier
24 signals to be simultaneously communicated
25 between a user's wireless device and a node.

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2 Multiple different carriers can be used. In
3 some instances, the carriers may be from
4 different permitted frequency domains. Carrier
5 aggregation provides a broader choice to the
6 wireless devices enabling more bandwidth to be
7 obtained. The greater bandwidth can be used to
8 communicate bandwidth-intensive operations such
9 as streaming video or communicating large data
10 files.

11 Did I read that correctly?

12 A. Yes, as near as I can tell, you read
13 that correctly.

14 Q. Are those statements in that
15 paragraph consistent with a POSITA's
16 understanding of the term carrier aggregation
17 at the time of the alleged invention of the
18 '356 patent?

19 A. As I state in Paragraph 26 of my
20 declaration, these extrinsic sources are not
21 inconsistent with the petition's proposed
22 construction of carrier aggregation, which is
23 broad enough to encompass each of the differing
24 examples of carrier aggregation provided in
25 patent owner's extrinsic evidence sources. The

1 P. FAY, PH.D.

2 specific use case described here is -- falls
3 within -- is not inconsistent with the proposed
4 construction.

5 Q. And, therefore, the statements in
6 the paragraph beginning at column 3, row 46 are
7 consistent with a POSITA's understanding of the
8 term at the time of the alleged invention?

9 A. A person of ordinary skill in the
10 art would see this specific use case laid out
11 in this reference, Exhibit Qualcomm 2013 as
12 falling within their understanding of carrier
13 aggregation.

14 Q. Consistent with their understanding
15 of carrier aggregation?

16 A. This specific use case would -- I'm
17 most comfortable saying that this use case
18 falls within a person of ordinary skill in the
19 art's understanding of carrier aggregation.

20 Q. You can set that aside.

21 (Qualcomm Exhibit Number 2017 marked
22 for identification.)

23 Q. I'm handing you what's been marked
24 as Qualcomm 2017. This is U.K. Patent
25 Application GB 2472978. Are you familiar with

1 P. FAY, PH.D.

2 GB 2472978?

3 A. Yes, I am familiar with this
4 reference.

5 Q. And you would agree that Qualcomm
6 2017 discloses carrier aggregation?

7 A. Among other topics, carrier
8 aggregation is discussed in this reference.

9 Q. I'd like to direct your attention,
10 it's on the first page in the abstract section
11 that's noted by the No. 57 in parentheses. Are
12 you with me there?

13 A. I am.

14 Q. And in the second sentence, and I'll
15 read it for you, the second sentence reads: In
16 the carrier aggregation mode, data has been
17 multiplexed across multiple carrier frequencies
18 and each carrier is received by a different
19 respective antenna.

20 Did I read that correctly?

21 A. I believe you did.

22 Q. Is that statement consistent with a
23 POSITA's understanding of the term carrier
24 aggregation at the time of the alleged
25 invention of the '356 patent?

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2 A. What is described is a specific use
3 case or implementation of carrier aggregation,
4 specifically devoted to reuse of MIMO hardware.
5 But I would say the use case that's described
6 would fall within what a person of ordinary
7 skill in the art would understand to be a
8 carrier aggregation being simultaneous
9 operation on multiple carriers.

10 Q. You can set that aside.

11 In Paragraph 22 of your declaration,
12 and I'm referring to INTEL 1039, you stated
13 that you've reviewed the prosecution history of
14 the '356 patent, correct?

15 A. Yes, I have reviewed the prosecution
16 history.

17 Q. And it's your opinion that there was
18 no disavowal or disclaimer of claim scope with
19 respect to carrier aggregation during the
20 prosecution of the '356 patent; is that
21 correct?

22 A. As I say in Paragraph 22, reviewing
23 the prosecution history of the '356 patent, I
24 agree there is -- I agree that there was no
25 disavowal or disclaimer of claim scope with

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2 respect to carrier aggregation where the "I
3 agree" refers to a statement Dr. Foty made in
4 his deposition.

5 Q. How did you reach the conclusion
6 that you agree with that statement?

7 A. In Paragraph 10 of my declaration, I
8 lay out some of the legal -- well, I lay out
9 the legal principles as I understand them with
10 respect to disclaimer that were provided to me
11 by Intel's counsel. I applied the principles
12 laid out here in Paragraph 10 that statements
13 made during prosecution without -- excuse me.
14 I should read the whole sentence.

15 I have been informed and understand
16 that an applicant for a patent can disclaim or
17 disavow claim scope via statements made during
18 prosecution without an express amendment but
19 only if such statements of disavowal or
20 disclaimer are clear, unmistakable,
21 unambiguous, and unequivocal.

22 Q. So on your review of the prosecution
23 history of the '356 patent, is it fair to say
24 that with respect to the term carrier
25 aggregation, you know -- you saw no statements

1 P. FAY, PH.D.

2 that were clear, unmistakable, unambiguous, and
3 unequivocal as to that term's meaning?

4 A. That's not quite what I said. The
5 statements of disavowal or disclaimer must be
6 clear, unmistakable, unambiguous, and
7 unequivocal.

8 Q. So on your review of the prosecution
9 history of the '356 patent, you found no
10 statements of disavowal or disclaimer that were
11 clear, unmistakable, unambiguous, and
12 unequivocal with respect to the term carrier
13 aggregation; is that correct?

14 A. Could you say your question again
15 for me to make sure I have it correctly?

16 Q. So on your review of the prosecution
17 history of the '356 patent, you found no
18 statements of disavowal or disclaimer that were
19 clear, unmistakable, unambiguous, and
20 unequivocal with respect to the term carrier
21 aggregation; is that correct?

22 A. Yes, that's correct.

23 Q. In Paragraph 26 of your declaration,
24 INTEL 1039, you refer to extrinsic evidence
25 that was cited in the patent owner's response,

1 P. FAY, PH.D.

2 correct?

3 A. Yes, Paragraph 26 refers to
4 extrinsic evidence supplied by the patent
5 owner -- supplied in the patent owner's
6 response.

7 Q. And you reviewed the extrinsic
8 evidence cited in patent owner's response,
9 correct?

10 A. Yes, I did review the extrinsic
11 evidence cited in the patent owner's response.

12 Q. And you stated in Paragraph 26 that
13 that extrinsic evidence is not inconsistent
14 with the petition -- the petitioner's proposed
15 construction of carrier aggregation, correct?

16 A. What I say in Paragraph 26 is that
17 in any event, these extrinsic sources are not
18 inconsistent with the petitioner's proposed
19 construction of carrier aggregation, which is
20 broad enough to encompass each of the differing
21 examples of carrier aggregation provided in
22 patent owner's extrinsic evidence sources.

23 Q. In your opinion, is the extrinsic
24 evidence referred to here consistent with the
25 understanding of a POSITA at the time of the

1 P. FAY, PH.D.

2 alleged invention of the '356 patent?

3 MR. FERNANDEZ: Objection. Form.

4 A. There were many extrinsic evidence
5 sources cited. Would you like me to review
6 them? If you have a copy of the -- copy of
7 them, I'm happy to review them to ensure
8 that ...

9 Q. So you haven't formed an opinion as
10 to whether the extrinsic evidence is consistent
11 or inconsistent with the understanding of a
12 person of ordinary skill at the time of the
13 alleged invention?

14 A. I have formed an opinion that these
15 extrinsic sources are not inconsistent with the
16 petition's proposed construction of carrier
17 aggregation.

18 Q. And I think we established earlier
19 that the petition's proposed construction is
20 consistent with the understanding of a POSITA
21 at the time of the alleged invention?

22 A. Yes. The proposed construction is
23 consistent with the understanding of a person
24 of ordinary skill in the art's understanding at
25 the time of the invention.

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2 Q. So by extension, then, I'm asking is
3 the extrinsic evidence consistent with the
4 understanding of a person of ordinary skill in
5 the art at the time of the alleged invention of
6 the '356 patent?

7 MR. FERNANDEZ: Objection. Form.

8 A. It is not inconsistent with the --
9 the extrinsic evidence is not inconsistent with
10 the understanding of a person of ordinary skill
11 in the art at the time of the invention.

12 (INTEL Exhibit Number 1024 for
13 identification.)

14 Q. Handing you what's marked as INTEL
15 1024. This is U.S. Patent 7,317,894. We've
16 referred to this as the Hirose, H I R O S E,
17 reference. Are you familiar with the Hirose
18 reference?

19 A. Yes, I'm familiar with this
20 reference.

21 Q. Hirose describes three different
22 carriers, correct?

23 A. In the Hirose reference, three
24 different carriers are disclosed.

25 Q. In your opinion, does Hirose's

1 P. FAY, PH.D.

2 disclosure of three carriers result in an
3 increased aggregated data rate?

4 A. Can you please repeat your question?
5 I want to be sure I have it correct.

6 Q. In your opinion, does Hirose's
7 disclosure of three carriers result in an
8 increased aggregated data rate?

9 A. No, it does not. And I explain that
10 in Paragraph 25 of my declaration.

11 Q. Why does it not result in an
12 increased aggregated data rate?

13 A. As I write in Paragraph 25, Hirose's
14 transmission of, quote, same signals over
15 different paths, close quote, does not increase
16 aggregated data rate because it, quote, results
17 in redundant data at a common data rate, close
18 quote.

19 Q. If the data that were transmitted
20 over Hirose's three carriers was not redundant,
21 would that result in an increased data rate --
22 would that result in an increased aggregated
23 data rate?

24 A. Could you please state the question
25 again for me, please?

1 P. FAY, PH.D.

2 Q. If the data transmitted over
3 Hirose's three carriers was not redundant,
4 would that result in an increased aggregated
5 data rate?

6 A. Yes. If Hirose's simultaneous
7 signals contain non-redundant -- that is to
8 say, different data -- then the aggregated data
9 rate would have increased.

10 Q. In your opinion, does -- scratch
11 that.

12 Would a person of ordinary skill in
13 the art at the time of the alleged invention of
14 the '356 patent understood that carrier
15 aggregation results in an increased aggregated
16 data rate?

17 A. Could you please repeat your
18 question for me?

19 Q. Would a person of ordinary skill in
20 the art at the time of the alleged invention of
21 the '356 patent have understood that carrier
22 aggregation results in an increased aggregated
23 data rate?

24 A. As I say in Paragraph 62 and 63 of
25 my original declaration, in response to this

1 P. FAY, PH.D.

2 IPR proceeding, carrier aggregation is known to
3 have multiple uses and is not limited to any
4 particular use. An increased aggregated data
5 rate is one possible use for carrier
6 aggregation but is -- but does not encompass
7 the entire scope of what's meant by carrier
8 aggregation.

9 Q. So an increased aggregated data rate
10 is consistent with the term carrier aggregation
11 as understood by a person of ordinary skill in
12 the art at the time of the alleged invention of
13 the '356 patent?

14 A. As I explain in Paragraph 40 of my
15 original declaration, carrier aggregation --
16 increased speeds, transmission speeds are one
17 of the uses of carrier aggregation. There are
18 several others that I outlined.

19 So an increased aggregated data rate
20 falls within the possible use cases of carrier
21 aggregation, but there are others.

22 Could I take a short break?

23 MR. RITCHIE: Absolutely. Let's go
24 off the record.

25 (A short break was taken.)

1 P. FAY, PH.D.

2 Q. We were talking about the reference
3 Hirose. In your opinion, does Hirose disclose
4 carrier aggregation?

5 A. I did not form an opinion whether
6 Hirose discloses carrier aggregation or not.

7 Q. In your opinion, does Hirose's
8 disclosure of three carriers provide an
9 increased bandwidth?

10 A. Yes. In Paragraph 89 of my
11 declaration, this is specifically the INTEL
12 1002 declaration, I describe how bandwidth is
13 the amount of spectrum available for data
14 transmission. A receiver that operates
15 simultaneously on multiple carriers increases
16 bandwidths because the carriers occupy
17 frequency ranges and transmitting data over
18 multiple carriers increases bandwidth to the
19 sum of the carriers' frequency ranges as would
20 have been understood by a person of ordinary
21 skill in the art.

22 Q. And so you answered yes, Hirose's
23 disclosure of three carriers provides an
24 increased bandwidth?

25 A. Yes, for the reasons I lay out in

1 P. FAY, PH.D.

2 Paragraph 89 of my original declaration.

3 Q. And so your conclusion for those
4 reasons, as you just read, you conclude it
5 provides an increased bandwidth because
6 Hirose's receiver operates simultaneously on
7 multiple carriers, correct?

8 A. Hirose's receiver operates
9 simultaneously on multiple carriers.

10 Q. Okay. You can set that aside.
11 I'd like to talk to you about
12 cascode amplifiers, and it will be useful to
13 refer to your declaration that's Exhibit 1439.
14 And I'll note for the record that there was
15 problems printing a portion of Exhibit 1439, so
16 I'm going to place an electronic copy that's on
17 an iPad of Exhibit 1439 and maybe we can work
18 that way, if that's all right with you?

19 A. It's okay with me.

20 Q. Directing your attention to
21 Paragraph 47 of Exhibit 1439, and I'm going to
22 paraphrase. But you would agree that a cascode
23 amplifier stage consists of a cascade of a
24 common source transistor and a common gate
25 transistor, correct?

1 P. FAY, PH.D.

2 A. Yes. A cascode amplifier -- one way
3 of describing a cascode amplifier is as a
4 cascade of common source followed by common
5 gate transistor.

6 Q. And sometimes the common source
7 transistor is referred to as the gain
8 transistor, correct?

9 A. That is one way that some authors
10 refer to the common source transistor, yes.

11 Q. And some authors would also refer to
12 the common gate transistor as the cascode
13 transistor, correct?

14 A. Yes, the common gate transistor may
15 also be referred to as a cascode transistor.

16 Q. What is the Miller effect?

17 A. The Miller effect is an electrical
18 effect that if you have a bridging admittance
19 or bridging impedance between the input and the
20 output or between two nodes of a circuit and
21 you know the gain between those two nodes, you
22 can for the purposes of simplifying the circuit
23 analysis do a transformation whereby the
24 bridging element is eliminated and you replace
25 it with two non-bridging elements that are

1 P. FAY, PH.D.

2 scaled according to the gain.

3 Q. Now, in Paragraph 41, you stated
4 that mitigation of the Miller effect is not a
5 defining feature of the cascode --

6 A. I don't see it.

7 Q. Paragraph 41.

8 A. Oh, I was in the wrong paragraph.
9 Excuse me.

10 Q. Paragraph 41. I'll wait till you're
11 there.

12 A. I'm there. Thank you.

13 Q. You state that mitigation of the
14 Miller effect is not a defining feature of a
15 cascode transistor; is that correct?

16 A. Yes. I state here that mitigation
17 of the Miller effect is not a defining feature
18 of cascode.

19 Q. And when you say "defining feature,"
20 what do you mean by defining feature?

21 A. I mean that if you were to -- a
22 circuit that mitigates the Miller effect does
23 not mean it's cascode.

24 Q. Do you agree that a cascode circuit
25 suppresses the Miller effect?

1 P. FAY, PH.D.

2 A. A cascode circuit can suppress the
3 Miller effect under some circumstances but not
4 in all cases.

5 Q. Would you agree that the Miller
6 effect is less significant in cascode
7 amplifiers than in common source stages?

8 A. Not in all cases, no.

9 Q. You can set that aside.

10 (INTEL Exhibit Number 1004 for
11 identification.)

12 Q. I'm handing you what's been marked
13 as INTEL 1004. This is titled: 3GPP TR
14 36.912. And we've referred to it -- sorry,
15 you've referred to it in your declaration as
16 the Feasibility Study, I believe. Do you
17 recognize INTEL 1004 as the Feasibility Study
18 from your declarations?

19 A. Yes, this is the Feasibility Study
20 that was cited in my declarations.

21 Q. Now, I'm going to refer to -- keep
22 that in mind. But I'm going to refer to your
23 declaration, and I've selected INTEL 1339. And
24 if you turn to Paragraph 47 --

25 A. Okay.

1 P. FAY, PH.D.

2 Q. -- and I'm going to direct your
3 attention to the last sentence of Paragraph 47.
4 And you stated there: Feasibility Study does
5 disclose an amplifier circuit in the form of
6 automatic gain control, correct?

7 A. Yes. The last sentence of
8 Paragraph 47 reads: Furthermore, Feasibility
9 Study does disclose an amplifier circuit in the
10 form of automatic gain control.

11 Q. And you've got a citation there to
12 Page 26 of the Feasibility Study as support for
13 that statement, correct?

14 A. Yes. There's a citation to Page 26
15 where automatic gain control is discussed.

16 Q. Okay. And I want to focus on what
17 part of Page 26 discloses an amplifier circuit.
18 So can you explain to me what part of Page 26
19 or where on Page 26 an amplifier circuit is
20 disclosed?

21 A. In at least -- one location is under
22 Option A. It says an RF front end. And within
23 the parenthetical, AGC is included. A person
24 of ordinary skill in the art seeing the letters
25 AGC in this field would understand that to be

1 P. FAY, PH.D.

2 an amplifier with automatic gain control.

3 Q. So AGC refers to an amplifier with
4 automatic gain control; is that correct?

5 A. That is what a person of ordinary
6 skill would -- how a person of ordinary skill
7 in the art seeing that term in that list of
8 objects, how they would interpret it, yes.

9 Q. So it's not the other parts of that
10 sentence there, RF front end or mixer or ADC
11 that disclose an amplifier; you're focused in
12 on AGC discloses amplifier circuit; is that
13 correct?

14 A. Well, the paragraph says the RF
15 front end, and then in parentheses, mixer, AGC,
16 ADC. So these are elements within -- I
17 interpret that to mean that these are elements
18 within RF front end.

19 Q. But an RF front end by itself is not
20 an amplifier circuit, correct?

21 A. An RF front end by itself contains
22 an amplifier.

23 Q. Is a mixer an amplifier circuit?

24 A. A mixer can provide amplification
25 but would not conventionally be called an

1 P. FAY, PH.D.

2 amplifier circuit.

3 Q. And ADC, that term stands for
4 analog-to-digital conversion; is that correct?

5 A. I would say in this list, it should
6 be interpreted as analog-to-digital converter.

7 Q. Converter. And an analog-to-digital
8 converter is not an amplifier circuit, correct?

9 A. No, that is not an amplifier.

10 Q. So you're focused in on the acronym
11 AGC as the Feasibility Study's disclosure of an
12 amplifier circuit, correct?

13 A. In -- on Page 26, correct.

14 Q. Is there anywhere else in the
15 Feasibility Study that you find the disclosure
16 of an amplifier circuit?

17 A. Yes.

18 Q. Where?

19 A. They are mentioned in other places.
20 For example, on Page 24, there are power
21 amplifiers disclosed.

22 Q. And the power amplifiers that are
23 disclosed on Page 24 are amplifiers that are
24 used in the transmit chain?

25 A. Yes, that's correct.

1 P. FAY, PH.D.

2 Q. The amplifier that's the subject of
3 the '356 patent is used in the receive chain,
4 not in the transmit chain, correct?

5 MR. FERNANDEZ: Objection. Form.

6 A. The low-noise amplifier which is the
7 subject of the '356 patent is described -- its
8 use is described in the context of an RF
9 receiver.

10 Q. So the reference that you've pointed
11 to of a power amplifier on Page 24 is used in a
12 different application than the '356 patent?

13 MR. FERNANDEZ: Objection. Form.

14 A. It depends on how you define
15 application. It is certainly used in the
16 application of wireless communications.

17 Q. It's used in the application of
18 wireless transmissions, the power amplifiers
19 are used in wireless transmissions, whereas the
20 amplifier in the '356 patent is directed to
21 receiving wireless transmissions?

22 MR. FERNANDEZ: Objection. Form.

23 Q. Did I get that right?

24 A. I think that you characterized that
25 reasonably.

1 P. FAY, PH.D.

2 Q. Is there anywhere else in the
3 Feasibility Study that an amplifier circuit is
4 disclosed that is relevant to the problem
5 addressed by the '356 patent?

6 MR. FERNANDEZ: Objection to form.

7 A. Yes, you can also see at the very
8 bottom of Page 26, second bullet point, AGC is
9 included on Page 7 and AGC is included, the
10 last bottom -- the last bullet point before
11 Section 11.3.3.5.

12 Q. And each of those discloses the
13 three-letter acronym AGC, correct?

14 A. Those two are examples of the AGC
15 being disclosed as an amplifier, yes.

16 Q. Aside from the Feasibility Study's
17 disclosure of the three-letter acronym AGC, is
18 there any other disclosure of an amplifier
19 circuit that is relevant to the problem
20 addressed by the '356 patent?

21 MR. FERNANDEZ: Objection to form.

22 A. It's possible that there are
23 additional references to amplifiers but nothing
24 on which I rely in my declaration.

25 Q. Do you teach amplifier circuits in

1 P. FAY, PH.D.

2 the courses that are offered here at the
3 university?

4 A. I teach the design of amplifier
5 circuits, yes.

6 Q. And do you sometimes ask your
7 students to design an amplifier circuit as part
8 of their coursework?

9 A. Yes.

10 Q. If you had asked a student to design
11 an amplifier circuit and they handed you a
12 piece of paper with the letters AGC on it,
13 would you expect that they've disclosed to you
14 an amplifier circuit design?

15 A. I'm not sure I understand your
16 hypothetical situation.

17 Q. If you had asked a student to define
18 an amplifier circuit for you as part of their
19 coursework and they handed back to you a piece
20 of paper with just three letters on it and the
21 letters being AGC, would they have satisfied
22 your expectations for the design of an
23 amplifier circuit?

24 A. Without knowing what my assignment
25 was, it's not clear to me whether that would be

1 P. FAY, PH.D.

2 satisfactory or not.

3 Q. In Paragraph 44 of Exhibit INTEL
4 1339, near the -- near the end of that
5 paragraph, you stated that Lee teaches the
6 exact type of receiver that the Feasibility
7 Study recognizes would work with signals
8 employing carrier aggregation, correct?

9 A. I haven't found it yet.

10 Q. Oh, I'm sorry. Page 22.

11 A. Thank you.

12 Q. It's about a little past halfway
13 down, Lee thus teaches?

14 A. Thank you.

15 Q. So again there, it states: Lee
16 teaches the exact type of receiver that the
17 Feasibility Study recognizes would work with
18 signals employing carrier aggregation, correct?

19 A. Yes. In Paragraph 44, I do write
20 that Lee thus teaches the exact type of
21 receiver that the Feasibility Study recognizes
22 would work with signals employing carrier
23 aggregation.

24 Q. What type of receiver is it that the
25 Feasibility Study recognizes would work with

1 P. FAY, PH.D.

2 signals employing carrier aggregation?

3 A. As I say a little higher in this
4 paragraph, the Feasibility Study recognizes
5 that wireless mobile devices can be configured
6 to operate with input RF signals employing
7 carrier aggregation, and then it goes on to
8 say: The feasibility further suggests that an
9 ideal receiver for non-contiguous intraband and
10 interband carrier aggregation would have
11 multiple RF front ends.

12 Q. So the type of receiver that it's
13 teaching for those applications is the type of
14 receiver that would have multiple RF front
15 ends?

16 A. Yes, that's correct.

17 Q. And are there receivers that have
18 single RF front ends?

19 A. In what context?

20 Q. In the art. Just in the --

21 A. Yes, there are receivers on the
22 planet with a single RF front end.

23 Q. And so focusing on the distinction
24 of RF front ends, there are receivers with
25 single front ends, RF front ends, and receivers

1 P. FAY, PH.D.

2 with multiple RF front ends? That covers the
3 spectrum, right?

4 A. With respect to that one dimension.

5 Q. And so Feasibility Study is saying
6 with respect to that one dimension of RF front
7 ends, multiple RF front ends will work for
8 non-contiguous intraband and interband carrier
9 aggregation, correct?

10 A. The feasibility tells us that
11 non-contiguous intraband and interband carrier
12 aggregation is best supported by receivers with
13 multiple RF front ends.

14 Q. Now, at the time the Feasibility
15 Study was drafted, RF front ends were known,
16 correct?

17 A. There were certainly designs, and RF
18 front ends existed, yes.

19 Q. RF front ends were not a novel thing
20 that was disclosed in the Feasibility Study?

21 A. I don't understand your question.
22 I'm sorry.

23 Q. Persons of ordinary skill in the art
24 at the time understood that a receiver would
25 have an RF front end?

1 P. FAY, PH.D.

2 A. Persons of ordinary skill in the art
3 at the time of the drafting of the Feasibility
4 Study would have understood that receivers
5 needed an RF front end, at least one.

6 Q. And persons of ordinary skill in the
7 art at the time of drafting of the Feasibility
8 Study would have understood that receivers
9 could have multiple RF front ends, correct?

10 A. I am not certain how widespread the
11 appreciation for the potential for multiple RF
12 front ends was as of the writing of this
13 document.

14 Q. You would agree that every wireless
15 RF receiver has at least one RF front end,
16 correct?

17 A. No, I am aware of wireless receivers
18 that do not have RF front ends, at least as RF
19 front end is meant in this document.

20 Q. And what application is it that you
21 are envisioning when you say that you are aware
22 of that?

23 A. A crystal radio, as one example, is
24 a wireless receiver that does not contain any
25 of these elements.

1 P. FAY, PH.D.

2 Q. Around what time frame was the
3 crystal radio that you are speaking of
4 developed?

5 A. I don't know.

6 Q. When did wireless RF receivers begin
7 to use RF front ends as they are used in the
8 context of the Feasibility Study?

9 A. The RF front end as disclosed here
10 in the Feasibility Study implies a digital
11 receiver, but I am not prepared to say when
12 those first were presented.

13 Q. Would you say that every wireless
14 digital RF receiver has an RF front end
15 associated with it?

16 A. No, there are examples of digital
17 front ends that also do not contain all of
18 these elements.

19 Q. What elements don't they contain?

20 A. I am aware of examples that don't
21 include a mixer. I am aware of examples that
22 don't include an automatic gain control
23 amplifier. Some of them have such primitive
24 ADCs that one might not recognize them as ADCs,
25 one-bit converter. Some people would not call

1 P. FAY, PH.D.

2 that an analog-to-digital converter.

3 Q. So by RF front end, you're referring
4 to something that includes a mixer, an AGC, and
5 an ADC; is that correct?

6 A. What is the context?

7 Q. When you say -- we were referring to
8 the sentence that you said the Feasibility
9 Study recognizes the exact type of receiver
10 that's used in Lee, you were referring to a
11 receiver with an RF front end that includes
12 each of a mixer, and ADC, and AGC, correct?

13 A. No, I was -- when I say the
14 Feasibility Study is indicating the ideal
15 receiver, I'm referring instead to the --
16 suggest that, as I say in Paragraph 45, the
17 Feasibility Study further suggests that an
18 ideal receiver for a non-contiguous intraband
19 and interband carrier aggregation would have
20 multiple front ends.

21 Q. And those front ends would include a
22 mixer, an AGC, and an ADC?

23 A. That's one possible front end; but
24 not all front ends, as we've discussed,
25 necessarily contain all of these elements.

1 P. FAY, PH.D.

2 Q. And it's your opinion that Lee
3 teaches a receiver that has multiple RF front
4 ends; is that correct?

5 A. As I say in Paragraph 44, Lee
6 teaches multiple amplifier blocks providing
7 output to different receivers and, therefore,
8 Lee thus teaches the exact type of receiver
9 that the Feasibility Study recognizes would
10 work within signals employing carrier
11 aggregation.

12 Q. Does Lee teach multiple RF front
13 ends?

14 A. Lee teaches multiple amplifier
15 blocks providing output to different receivers
16 and the outputs go to receivers. The output of
17 each of the blocks go to receivers.

18 Q. Does that mean Lee is teaching
19 multiple RF front ends or Lee is not?

20 A. As I say in Paragraph 64 of my first
21 declaration for the 128 IPR, INTEL 1302, in
22 Paragraph 64, describing how the amplifier
23 blocks of Lee interface with the larger
24 receiver, I say in Paragraph 64: Each
25 amplifier block supports a radio connection by

1 P. FAY, PH.D.

2 providing output to a different radio signal
3 processing system. This different radio
4 processing signal -- different radio signal
5 processing system is what a person of skill in
6 the art would understand to be an RF front end
7 as described in the Feasibility Study.

8 Q. So the output of the circuit from
9 Lee is supplied to different RF front ends?

10 MR. FERNANDEZ: Objection. Form.

11 A. Do you have a copy of the Lee patent
12 for me to refer to, please? Thank you.

13 (INTEL Exhibit Number 1335 for
14 identification.)

15 Q. Handing you what's been marked as
16 INTEL 1335. This is U.S. Application
17 Publication, US 2012/0056681. And, Dr. Fay, I
18 believe you referred to this as the Lee
19 reference in your declaration.

20 A. Yes, this is the Lee reference.

21 Could you please repeat your
22 question?

23 Q. I was trying to summarize what you
24 had said earlier, make sure I understood. And
25 I think what you're saying is the output from

1 P. FAY, PH.D.

2 the circuit from Lee is supplied to different
3 RF front ends; is that correct?

4 MR. FERNANDEZ: Objection. Form.

5 A. Paragraph 29 of Lee discloses that,
6 for example, the output port Pout_1 is coupled
7 to a first radio processing signal,
8 parentheses, e.g. a WiFi receiver/transmitter,
9 parentheses, and the outport port Pout_N is
10 coupled to a second radio signal processing
11 signal, parentheses, e.g., a Bluetooth
12 receiver/transmitter, close parentheses,
13 period.

14 So he is disclosing not only the
15 amplifier but the receiver transmitter as well.

16 Q. And the output of the amplifier from
17 Lee goes to a WiFi RF front end and a Bluetooth
18 RF front end; is that correct?

19 MR. FERNANDEZ: Objection. Form.

20 A. Those are two examples that he cites
21 since he says e.g., and he characterizes them
22 as receivers. But an RF front end is part of a
23 receiver.

24 Q. But would you say that the circuit
25 of Lee that you're referring to there itself is

1 P. FAY, PH.D.

2 an RF front end?

3 MR. FERNANDEZ: Objection. Form.

4 A. The circuit of Lee is a low-noise
5 amplifier. Whether that is considered to be
6 part of the RF front end or not part of the RF
7 front end is subject to some -- different
8 authors draw the boxes in different places,
9 so it's -- some authors would consider the LNA
10 to be part of the RF front end and others would
11 not.

12 Q. I asked you a number of questions
13 today. Did you provide complete and truthful
14 responses to each of my questions?

15 A. I believe I did.

16 Q. Is there anything further that you
17 would like to add to clarify or correct any of
18 your responses?

19 A. Not that I can think of.

20 MR. RITCHIE: Subject to any
21 redirect from counsel, I have no further
22 questions at this time.

23 MR. FERNANDEZ: No redirect.

24 MR. RITCHIE: We're off the record.

25 (Witness excused, 12:34.)

P. FAY, PH.D.

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PATRICK FAY, PH.D.

Subscribed and sworn to before me
this _____ day of _____ 2020.

1 P. FAY, PH.D.

2 C E R T I F I C A T E

3 STATE OF ILLINOIS)

) ss.:

4 COUNTY OF COOK)

5 I, RACHEL F. GARD, CSR, RPR, CLR, CRR,
6 within and for the State of Illinois do hereby
7 certify:

8 That PATRICK FAY, PH.D., the witness whose
9 deposition is hereinbefore set forth, was
10 duly sworn by me and that such deposition
11 is a true record of the testimony given by
12 such witness.

13 I further certify that I am not
14 related to any of the parties to this
15 action by blood or marriage; and that I am
16 in no way interested in the outcome of this
17 matter.

18 IN WITNESS WHEREOF, I have hereunto
19 set my hand this 13th day of January, 2020.

20 *Rachel F Gard*

21 -----
22 RACHEL F. GARD, CSR, RPR, CLR, CRR

ERRATA SHEET

Case Name:

Deposition Date:

Deponent:

Pg.	No.	Now Reads	Should Read	Reason
6	_____	_____	_____	_____
7	_____	_____	_____	_____
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