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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

INTEL CORPORATION
Petitioner,

v.

QUALCOMM INCORPORATED
Patent Owner.

IPR 2019-00128
IPR 2019-00129
Patent 9, 154, 356 B2

Record Of Oral Hearing
Held: February 27, 2020

Before MICHELLE N. WORMMEESTER, AMANDA F. WIEKER, AARON W. MOORE, *Administrative Patent Judges.*

APPEARANCES:

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The above-entitled matter came on for hearing on Thursday, February 27, 2020, commencing at 1:00 p.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Donna Jenkins, Notary Public.

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P R O C E E D I N G S

JUDGE WORMMEESTER: Please be seated. Good afternoon, everyone. We have our final hearing in Cases IPR 2019-00128 and IPR 2019-00129, Intel Corporation v. Qualcomm, Incorporated, which concerns US Patent No. 9,154,356. I'm Judge Wormmeester. With me is Judge Moore, and Judge Wieker is appearing remotely. Let's get the parties' appearances, please. Who do we have for Petitioner?

MR. LANTIER: Good afternoon, Your Honors. My name is Greg Lantier and I represent Intel Corporation along with my partner, Ben Fernandez. Participating remotely from the San Jose office is Brad Law, associate general counsel at Intel. Not participating, I should say listening, not participating.

JUDGE WORMMEESTER: Okay. Thank you. And who will be presenting the argument?

MR. LANTIER: Your Honor, I would like to present the argument today.

JUDGE WORMMEESTER: Okay. Thank you. And for Patent Owner, who do we have?

MR. COCHRAN: Good afternoon, Your Honor. Steve Cochran on behalf of the Patent Owner, Qualcomm. With me today is my colleague, Tom Ritchie, and also with us here in the courtroom is Steve Wurth, who is a representative of Qualcomm.

JUDGE WORMMEESTER: Welcome. And who will be presenting?

MR. LANTIER: I will, Your Honor.

JUDGE WORMMEESTER: Thank you. We set forth the procedure for today's hearing in our trial order, but just to remind everyone the way this will work, each party will have 60 minutes to present arguments. Petitioner has the burden and will go first and may reserve time for rebuttal. Patent Owner will then have the opportunity to present its response and may reserve time for surrebuttal. Please remember that the demonstratives you submitted are not part of the record. The record of the hearing will be the transcript. Also, when referring to any demonstrative, please state the slide number so that Judge Wieker can follow along, and also so that the record is clear.

Are there any questions before we proceed?

MR. LANTIER: No, Your Honor.

JUDGE WORMMEESTER: And counsel, will you be reserving time today?

MR. LANTIER: I'd like to reserve 15 minutes for rebuttal.

JUDGE WORMMEESTER: 15 minutes. Okay. I'll set the clock. And you'll have a five-minute warning when the light turns yellow. Is that okay?

MR. LANTIER: Yes.

JUDGE WORMMEESTER: Okay. Great. You may begin when you're ready.

MR. LANTIER: Thank you, and good afternoon again, Your Honors. My name is Greg Lantier and I am here on behalf of Petitioner, Intel Corporation. We are here today for the first two of five instituted IPR trials concerning the 356 Patent, which is assigned to the Patent Owner,

Qualcomm, Incorporated. I'll be referring to these two proceedings as the 128 and 129 IPRs as we proceed today.

On Slide 2 of the demonstratives, I've set forth a brief agenda that follows the format that most hearings follow. I'll start with a very brief introduction into the technology background of the 356 Patent, some of the prior art, and then quickly move into the disputed issues so that we can discuss those.

Moving on to Slide 4, I've set forth the grounds that are at issue in the trials today. The 128 IPR consists of three grounds. Ground 1 is an anticipation ground by Lee -- the Lee reference and that would take care of all the challenged claims with respect to that petition, should the Board agree with Intel's positions on that anticipation ground. We have alternative grounds of obviousness in Grounds 2 and 3. There is, likewise, an anticipation ground for Lee with respect to Claims 2 through 6 in the second IPR proceeding, and for Claim 10, we are relying on an obviousness combination. I'm going to get -- in Grounds 3 and 4 we have we have these alternate grounds.

Slide 5 summarizes the disputes that are between the parties today, and as Your Honors are no doubt aware, the primary dispute is one of claim construction. And particularly what is the proper broadest reasonable interpretation of the term "carrier aggregation" as that term is used in the 356 Patent. And while it's not binding on Your Honors, there has been a prior decision on that particular issue, and that was from the United States International Trade Commission in the ITC proceeding between Qualcomm, the Patent Owner, and Apple, Inc. -- Incorporated. I will not --

JUDGE MOORE: You're referring to the claim construction decision in that case?

MR. LANTIER: -- I am, Your Honor, yes. And also the final written decision -- I'm sorry, the initial determination of Administrative Law Judge McNamara, which found that the independent claims of the 356 Patent, Claims 1 and 17 were anticipated by the Lee reference.

JUDGE MOORE: Was the -- was the ID filed as an exhibit in this case?

MR. LANTIER: The ID in its entirety was not filed as an an exhibit, Your Honor, and that was due to confidentiality restrictions. We did file a notice with the Board when the ID issued, which was after when we had filed our petition, and I believe -- and I'll double-check my exhibit list here -- that it was attached -- that a portion of the ID was attached as an Exhibit to that notice.

JUDGE MOORE: And there was no final Commission decision?

MR. LANTIER: That's correct, Your Honor. And the reason that there was no final Commission decision is that a publicly announced settlement was reached between Apple and Qualcomm subsequent to the initial determination issuing, so Intel was not a party to the ITC proceeding, so it terminated at that point in time.

JUDGE MOORE: Okay. And while you're checking for the ID, you might also check a copy of the Claim Construction Decision that was filed because it appears to me, at least the one that's in our record is missing pages from the discussion of carrier aggregation in the Appendix.

MR. LANTIER: I don't believe that's true. I don't think that's -- and

certainly, that wasn't the intention, Your Honor. I -- the Claim Construction Order itself was arranged in such a way that most of the discussion was in a -- just in a table form. There was not --

JUDGE MOORE: I understand. The table appears, at least on the copy that I looked at in our records, to jump from page 21 to page 24.

MR. LANTIER: Okay. I apologize for that, Your Honor.

JUDGE MOORE: And I think there's another page or two missing as well.

MR. LANTIER: With your permission, we would correct that, Your Honor, but I understand if there was an error made, I apologize for the error. If there was, it was unintentional.

I'll skip the discussion -- I won't review with Your Honors in the interest of time the specifics of what ALJ McNamara said on the claim construction issue, although I'd be happy to discuss it further. Instead, I'll briefly review the technology background here so that we can move along.

On Slide 9, we've displayed Figure 1 of the 356 Patent, and this is an illustration of a wireless network. At the high level, the 356 Patent concerns transceivers that operate within a wireless network. And Item 110 is a representation of a transceiver. It's shown as receiving signals from multiple different sources, including base stations and from a radio tower as well as satellite.

Now, while this transceiver can, of course, both transmit and receive signals over the wireless system, the particular focus of the 356 Patent is on receiver hardware. And turning to Slide 10 of the demonstratives, in particular, the receiver hardware that is the focus of the 356 Patent has to do

with what's called the radio frequency front end or the RF front end for short. In a nutshell, it's sort of the hardware that begins with -- begins after the antenna, which receives signals, and then processes the signal before it's passed along to the base band phase where it will be -- it will then be utilized by the device.

The antenna's job is to capture whatever signals are coming over the airwaves and that are received on that antenna. That will include signals that the device wants to receive and signals that the device does not particularly care to receive and is not going to use. There is then some form of a coarse filter here. We've got a band pass filter that will eliminate some of the unwanted signals but not all. And after that, there will be an amplification of the remaining signals by low-noise amplifier. The low-noise amplifier is the focus of the claims in the 356 Patent, but after the low-noise amplifier, there is an additional stage that is referred to as the down conversion stage, where a mixer or a set of mixers will extract from the remaining signals that have been amplified the particular carrier that the device wants to have passed along to the base band processor.

Now on Slide 10, we are showing a basic RF front end, and this RF front end will be capable of processing a single carrier. That's because the RF front end has a single mixer that's using a single local oscillator signal and, therefore, it can only extract one frequency range.

If we turn to Slide 11, we get into the types of RF front ends that are able to process carrier-aggregated signals. That is, a received signal where there are multiple frequency ranges that we'd like to pass along to the digital data path. And Slide 11 is a reflection of Exhibit 1325, Figure 15. This is

the Kaukovuori reference that the examiner considered. And as we can see in Figure 15, there are essentially two parallel received paths, each a separate amplifier stage, that will receive signals from the antenna and after the coarse filtering has been applied will amplify them.

We can see in Slide 11 that there are two different local oscillator signals, Local Oscillator Signal 1 and Local Oscillator Signal 2. And therefore, this device is able to extract two different carriers or two different frequency ranges to be passed along down the line.

Now, I want to come back to this piece of prior art because it was the last piece of prior art that the examiner based their objection on prior to allowing the claims. And the one thing I would note about this piece of prior art, Kaukovuori, Exhibit 1325 from the 128 proceeding, is that there is no mechanism in Kaukovuori for turning on or turning off an individual amplifier. Instead in Kaukovuori, either they are both on or they're both off, regardless of whether you're trying to receive one carrier or you're trying to receive and process multiple carriers.

JUDGE MOORE: Is that the argument that overcame that reference?

MR. LANTIER: It is, Your Honor. There was an amendment made to the claims that I will get to in just a moment that overcame the reference and was the reason that the examiner allowed the claim.

JUDGE MOORE: Did the claims include the carrier- aggregation language at that point?

MR. LANTIER: They did at this point, and the examiner expressly found carrier aggregation was taught by Kaukovuori. That was not challenged by the Patent Owner at the time.

So if we then jump just a few slides ahead in the interest of time, I wanted to discuss the 356 Patent very briefly. It's titled, "Low-Noise Amplifiers For Carrier Aggregation," and we've talked a little bit about what the low-noise amplifiers look like.

On Slide 16, I've portrayed Column 1, lines 32 to 40 of the 356 Patent, which I think is a very important passage that I think will be the focus of both parties' discussions today. This is in the background section of the patent, and what the Patent Owner wrote was, "A wireless device may support carrier aggregation, which is simultaneous operation on multiple carriers" and then went on to say, "A carrier may refer to a range of frequencies used for communication and may be associated with certain characteristics." So it's defining a carrier as a range of frequencies and saying it can be a range of frequencies as a carrier.

And then a couple sentences later, it says, "A carrier may also be referred to as a component carrier, a 'frequency channel,' a cell, et cetera." And so the written description of the patent itself is making it clear we're not limiting our use of "carrier" here to a particular type of carrier such as a component carrier. It would also refer to any frequency channel, a cell, et cetera. And I think that that is thematic of the 356 Patent overall. At every turn in the patent, we see the Patent Owner broadening out and making it clear that it's not a constrictive usage of the term "carrier aggregation" that's being used, and we're not restricting the application of this invention solely to LTE.

And a good example of that is on Slide 18, which illustrates the language set forth in Column 2, lines 40 to 45 of the 356 Patent, where the

Patent Owner made clear that it was not limiting wireless devices to cellular technologies, but also wanted it to be broad enough to encompass other technologies, such as Bluetooth and laptops and other things that are not ordinarily connected using cellular communications protocols to the wireless network.

JUDGE WORMMEESTER: What's the difference between component carrier and frequency channel and cell?

MR. LANTIER: So I think what you will hear, Your Honor is that you'll hear Qualcomm argue that the term "component carrier" refers to the situation where you have two carriers that are transmitted from a single source, where a single piece of information has been divided and spread across the two components. So those two components are both required to receive on the other end the transmission, and then those two components can be reassembled on the other side.

A frequency channel just refers to a range of frequencies, a channel that is open over a wireless network that has a range of frequencies. And I would say a cell, Your Honor, there is -- the testimony in the record is that Patent Owner's expert did not consider this -- this portion of the specification when offering his opinions on the meaning of "carrier aggregation," but -- so I don't have expert testimony from him on what a "cell" means, but to me, it means a cell is in the sort of cellular communications areas. So you might refer to a frequency -- a carrier as a cell and then maybe there would be another communication, for example, that's occurring over a different thing, such as a Bluetooth transmission.

But it is clear that they're not limiting the meaning of "carrier" to just

a component carrier. And in some of the evidence you'll see that's been offered by the Patent Owner, you'll see that when carrier aggregation is discussed it is limited in those cases to component carriers. That's unlike what the 356 Patent says in Column 1.

Another portion -- I don't have it on the slide, but I think is relevant to come back to it is Column 2, lines 46 to 53, and that's where -- and and we cite in our papers, the 356 Patent says we're not just talking about wireless devices that use LTE or receive signals using the LTE communications standard. Instead, it makes clear that LTE is just one of numerous examples of communications protocols to which the patent applies, and other examples that were included are various CDMA protocols, the GSM protocols and the Wi-Fi protocol 802.11.

JUDGE MOORE: Does it say anywhere that you would use two of those at the same time?

MR. LANTIER: It does say in places, Your Honor, that it could be one or more of those protocols. So in that sense, it does. It does not say -- I don't want to -- I want to be exact about this. It does not say, for example, you, as a preferred embodiment or as an embodiment, here's an example where we're using Bluetooth and Wi-Fi. The patent just doesn't go to that level of detail. It doesn't say, "Here's an example specifically in the context of a figure where we are using LTE" either. It just doesn't say.

So if we skip ahead, I did want to address first, and I'll jump back to the claim, Figure 6A of the 356 Patent. And this is now returning to the issue of how did this -- how did these claims come to be allowed by the examiner. Figure 6A is displayed on Slide 22, and the important thing about

Figure 6A is it's depicted differently, but in structure, it's very similar to Kaukovuori in the sense that it's two different amplifier stages, 650A and 650B, both commonly connected to an antenna processing these signals.

But the distinction between Figure 6A and Kaukuvuori is what we've highlighted in the yellow boxes here in Figure 6A on Slide 22, and that -- those are the portions labeled 658A and 658B. Those are switches that allow the individual amplifier stages in Figure 6A to be turned on or turned off.

And what happened during prosecution is that the examiner twice rejected the claims as they existed over Kaukovuori as anticipated. And it was only after amendment to add the language "configured to be enabled or disabled" -- sorry, "configured to be independently enabled or disabled" with respect to each of the amplifier stages that the examiner allowed the claims after an examiner interview.

JUDGE MOORE: And what is the reason for that feature in the 356 Patent?

MR. LANTIER: So there's not a crisp statement of why that particular feature has been official. If we look at the stated solution and benefits, it is not clear. It says they may be -- they may have higher performance. From expert testimony, it would save power, so that if you're not using -- if you don't need both because you're only going to be receiving the one carrier that you care about, you could turn the other amplifier off and you're not running power and burning power unnecessarily because you don't need that second amplifier stage at that particular point in time.

JUDGE MOORE: So you don't need a stream in two channels. So

you don't need -- you're not streaming video or something, so you can -- you can mix it up with lower bandwidth. You would just use the one channel?

MR. LANTIER: Exactly. That's exactly right, Your Honor. And in any communications setting, it's very common that the majority of the communications really don't require two different channels, but sometimes you need it, and therefore you have the ability to do it when -- when you use this invention or this alleged invention.

Jumping back for just a moment to Slide 19 -- I apologize for the jog back and forth -- we have Claim 1 set forth on that slide, and we can see that the key language that resulted in issuance of the claim says, "A first amplifier stage configured to be independently enabled or disabled" -- "the first amplifier stage further configured to receive and amplify an RF signal" is then described as "employing carrier aggregation."

The employing carrier aggregation had been in the patent specification -- had been in the claims for multiple iterations with back and forth between Patent Examiner and the Applicant. What ultimately led to issuance is this switching on and off independently.

Claim 17, which we now have on Slide 20, is a method claim. For purposes of these IPR proceedings, there is no meaningful distinction between Claims 1 and Claim 17. Neither party has argued that there is a difference in the application or the outcome with respect to those two claims.

With that, let me provide a very brief overview of the primary piece of prior art we'll be talking about today, which is the Lee reference. I'll start on Slide 22 with Figure 6A of the 356 Patent again, and just a reminder that

what's happening here is we have these two amplifier stages. They can be independently turned on and turned off.

Slide 23 depicts Figure 2 of Lee, which is Exhibit 1335, and it's undisputed that all of the hardware that is described in the claims of the 356 Patent is contained within Figure 2 of the Lee reference. The only dispute -- and the language that's used in Lee, because I'm sure we'll use it today, is "shared mode" when the Lee device is only using one of the amplifiers and has turned the other one off, and "combo mode" when it's using both amplifiers at the same time.

The only dispute between the parties is whether the signal that is received by the Lee hardware is a carrier-aggregated signal or is not. And the basic dispute is the preferred embodiment in Lee is a Wi-Fi signal and a Bluetooth signal at the same time, and Qualcomm -- Patent Owner Qualcomm contends that that falls outside of the proper scope of the meaning of "carrier aggregation" as it's used in the 356 Patent.

JUDGE MOORE: What is the reason for the ability to switch in Lee?

MR. LANTIER: It's the same reason, Your Honor. It's a more efficient system. So if you were -- if you need both amplifiers at one time, because you're receiving -- for, as an example, Bluetooth and Wi-Fi, you use both. If you're only receiving a Bluetooth signal, you can turn the other off and you would save power, so efficient device.

JUDGE MOORE: Well, that's a little different, right? Because in Lee, you switch if you don't need that type of signal, right? So you've maybe -- I mean, the point of Lee, I think, is that they're trying to save some hardware by sharing the LNA, right? And so they said, well we're going to

use the one LNA where you can receive, I guess, Wi-Fi and Bluetooth through that LNA, and if we don't need one or the other, we can turn it off. So they're turning it off, it seems to me, because they don't need that type of signal, not because they don't need that additional data.

MR. LANTIER: I would take issue with that, Your Honor, in the following sense. It's true that the equipment sharing is an -- it is a reason for what Lee has done, but really what's shared is the antenna and the coarse filter, right. In Lee, you still need two separate amplifier stages, each with its own LNA just like in the 356 Patent. And I think based on the record before Your Honors, receiving two different carriers that happen to both be associated with, let's say LTE, as opposed to receiving two different carriers that happen to be associated with Bluetooth and Wi-Fi, from the receiver standpoint, is no different, right. The signal comes in off the airwaves, it's collected by the antenna, whatever signals are there are collected, and they are then passed through coarse filtering and some other components before they reach these LNA stages. And so just like in the 356 Patent in Lee, the idea is let's not keep them both on if we're not using both of them, we can turn one off.

So because there is no -- there are no disputes about the particulars of what's disclosed in Lee versus what's disclosed in the 356 Patent with respect to the hardware, I'd be happy to answer any questions on it, but I would jump right to the key dispute if that would be amenable to Your Honors.

JUDGE WORMMEESTER: That's fine.

MR. LANTIER: So I'll turn then to Slide 27, and the key dissent in

25 -- 29 will make it easier. On Slide 29, we've set forth a listing of the disputed issues. This carries over onto Slide 30 for the alternative arguments. We'll go through each one at least briefly this afternoon, but the primary dispute is this issue of what is the proper, broadest reasonable interpretation of carrier aggregation.

And on that point, turning to Slide 32, the parties have competing proposed constructions. Intel --

JUDGE MOORE: Is that a term of art?

MR. LANTIER: Carrier aggregation? I think, as used in the 356 Patent, it's not being used as a term of art. I think there are contexts in which carrier aggregation is used as a term of art, and you've seen some of those, and when they're -- when they're limiting it to, for example, a document that's limited to LTE, at this point in time, you might be able to say, well, with respect to LTE, carrier aggregation is a term of art.

At the time of the application for the 356 Patent, which was early on and before LTE was known generally in the art -- well, before it was widely adopted, it was when they were still developing some of the releases, there is no evidence in the record, I don't think, that shows that it was a term of art with a very specific meaning at that point in time.

JUDGE MOORE: So it was coined then, in some sense at least, for this patent?

MR. LANTIER: No, that's not what I meant to say, Your Honor. What I was saying is, carrier aggregation was not a term that was invented or first used with respect to LTE. Carrier aggregation just meant aggregating carriers. I think since that point in time, it has been associated with LTE,

and so depending on what Your Honor means by a term of art and what point in time you were referring to, it may be different now than it was then. But certainly in the context of the 356 Patent and at the time of the 356 Patent, I would say it was not a term of art in this field.

JUDGE MOORE: Is there any -- is there any evidence of record, any prior art that shows the term "carrier aggregation" used to refer to a combination of different types of signals?

MR. LANTIER: We do not have any example of that in the record of the use of that specific term to refer to a combination of signals from different -- using different protocols. It was, of course, known you could do that because Lee discloses that you could do that, but they did not use the term "carrier aggregation" in that context.

JUDGE MOORE: Is there anything that shows that term being used outside of the LTE context?

MR. LANTIER: There's nothing in the record using that specific phrase outside the LTE context other than the 356 Patent itself, which makes very clear that it's not limiting itself to the LTE context.

And turning to Slide 35, let me start with Intel's proposed construction of carrier aggregation, which is simultaneous operation on multiple carriers. That appears in the 356 Patent at Column 1, lines 32 to 33. There are very similar descriptions of what carrier aggregation is at Column 2, lines 53 to 55, and elsewhere in the 356 Patent as it's set forth in our papers.

JUDGE WORMMEESTER: In the prosecution history, though, that reference, is it Hirose?

MR. LANTIER: Yes, Your Honor, I call it Hirose, but I'm not sure that's correct.

JUDGE WORMMEESTER: Okay. Would your proposed construction cover what was distinguished there by the Applicant?

MR. LANTIER: I think that's -- I think, Your Honor, that that is a potentially close call. I will acknowledge that. The answer I would say is no, it would not, and the reason I say it would not is what the Patent Applicant said about Hirose is Hirose is transmitting redundant signals. It's the same exact information that's being transmitted across different channels. And they said that's not carrier aggregation because carrier aggregation isn't redundant information.

I think that in our proposed construction, simultaneous operation on multiple carriers means that you are not just really receiving one carrier's worth of information. It's nonredundant information. But to Your Honor's point, because you're going to have to make the claim construction decision, I think if it were the case that you said, you know, simultaneous operation on multiple carriers is a little bit too broad because it doesn't account for the distinguishing over Hirose, then the construction you would reach -- and we have this -- this is in our reply brief, would be something that says it's not to be non-redundant data on the carriers because that was the basis on which the Patent Owner distinguished Hirose, and if that were the conclusion that Your Honors reached, it wouldn't change the outcome because it's undisputed that the -- sorry, we just lost our slide, let's go back. It's undisputed that in the Lee reference, the data would not typically be redundant, and that's in Exhibit 1302, paragraph 83 and elsewhere in the

record.

JUDGE MOORE: Does the data in the two streams at least have to be for the same purpose, for the same use?

MR. LANTIER: No, Your Honor.

JUDGE MOORE: Or is it completely -- completely unrelated?

MR. LANTIER: It can be completely unrelated data, Your Honor. That says it's "simultaneous operation on multiple carriers." There's nothing -- and I can jump to the correct slide to talk about Hirose if that would be helpful, but what the Patent Applicant said when it distinguished Hirose didn't say anything about the origins of the data and whether they had to be -- whether the original information had to be the same or different. And it makes complete sense that it wouldn't because from the receiver's standpoint, it doesn't know whether the data is related to each other or not.

JUDGE MOORE: What does the aggregation piece mean, then? What is aggregation?

MR. LANTIER: So I would say the aggregate -- so I think, Your Honor, this is in our papers and in Dr. Fay's declaration as well, but the aggregation in this sense is, unlike in Hirose, for example, where -- and this is what the Applicant said during -- unlike in Hirose where there's the same data being transmitted over multiple carriers, so you get a what they call a "common data rate" with the same information, you're not getting information any faster because of the multiple carriers being used.

In the example in Lee, and under our construction, the data is aggregated. When it's received on the RF input, it is more data than a single carrier; the two carriers are being aggregated so that there's more

information there, and that's present in Dr. Fay's declaration as well.

JUDGE MOORE: Yeah, but if you have a Bluetooth stream that's doing one thing and a Wi-Fi stream that's doing something completely different, it's aggregated because it's coming in together?

MR. LANTIER: That's correct. And being processed simultaneously.

JUDGE WORMMEESTER: So doesn't that mean they need to be related somehow because if -- if you're looking at them in isolation, like just the Bluetooth stream and then the Wi-Fi stream, you never combined them as Patent Owner would suggest needs to happen, how is that data coming in any faster? You know, if you do the Bluetooth first and then the Wi-Fi first and you're looking at them separately, and then you do them at the same time, you're still looking at them separately, you've still got them in the same amount of time.

MR. LANTIER: So I think in your example, Your Honor, let's say you are streaming video over the Wi-Fi and you're, let's say, receiving text messages over Bluetooth, there's two different things, they're not related to one another, if you don't have a receiver that can process those two things simultaneously, then you've got to choose, right? You've got to either be processing the video that you're receiving over Wi-Fi or be processing the text messages that you are receiving over Bluetooth. If you have a receiver that can simultaneously operate to process both those signals, then -- then you are receiving both sets of information more quickly. And that's exactly what the Patent Owner said when it distinguished the Hirose reference. It said, "The claimed invention recites 'Carrier aggregation results in an

increased aggregated data rate. In contrast, Hirose transmits the same signals over different paths in a redundant' -- I'm sorry 'in redundant data at a common data rate,'" And that's Exhibit 1315, page 8. It's also on slides -- at Slide 44.

I think, Your Honors, if we skip ahead here, Intel's proposed construction -- I'll pause one moment on Slide 35 -- comes directly from the 356 Patent specification, and in this IPR proceeding, as Your Honors know, the broadest reasonable interpretation applies. We would submit that where a patent specification specifically states what a claim term means, the broadest reasonable interpretation has to be broad enough to cover it. We think that the statements in the 356 Patent specification are lexicography statements and that the Patent Owner defined "carrier aggregation" there.

But I would like to say because I know the Patent Owner disputes that, that even if you were to determine that the words "which is" are not firm enough to set forth a definition, which I think would be an unusual reading of that language, it doesn't lead you down the path that the Patent Owner would like you to go. Even if these statements are not definitional, they certainly would be considered as highly relevant to a person of ordinary skill in the art when reading the 356 Patent to understand what is meant by the term "carrier aggregation."

JUDGE WORMMEESTER: And I don't think Patent Owner disputes that. I think, you know, Patent Owner made clear that was a feature of the carrier aggregation, but not -- maybe in their view, it wasn't the definition, but it was just a feature. So I don't -- I don't view the briefing to suggest that Patent Owner would lead us away from that.

MR. LATHAM: Okay. Your Honor, I think I did read it to -- I interpreted their argument to be, if it's not lexicography, then we should -- we should go and start looking for other sources of meaning for this claim term under the broadest reasonable interpretation. And I should say, to be clear, we certainly don't dispute that "carrier aggregation" has been used in the -- in the way that the Patent Owner suggests. It's just that's not the way the 356 Patent uses it. It makes very clear that it was using its broad meaning of "carrier aggregation," which is not limited just to the LTE example of the way that you can perform carrier aggregation. And so I think --

JUDGE WORMMEESTER: I have a quick question about that, too.

MR. LANTIER: Yes.

JUDGE WORMMEESTER: But you know, the examiner in an advisory action -- I'm looking at Exhibit 2001 -- I guess that would be page 3 -- page 3 of the exhibit -- the examiner is referring to the newly amended, or newly added term during the amendment, employing carrier aggregation as a new feature that required a new search, and that's why we have the RCEs that follow. So the examiner looking at this seemed to also agree that there's got to be something more to just multiple or simultaneous operation on multiple carriers because that language was already in the claim.

And the Applicant didn't come up -- come back and dispute this, you know. The Applicant said, okay, well you know, we'll file an RCE. And then the examiner then relied on -- I might not say the name correctly, but, the Kaukovuori reference, okay. And if you, I think, went into Figure 15 at some point, let's see, well, we can -- we can look at Figure 14, which

appears above Figure 15 or we can go back to Figure 1 and Figure 2.

So maybe let's look at Figure 1 and Figure 2 of that reference there. So here, we have, I think, according to the specification, there's three signals operating on three carriers, and the reference refers to them as the "carrier aggregated signals," but then there's this other signal that's coming in at the same time. It's a fourth signal operating on a fourth carrier. I think the reference never refers to this fourth signal as being part of the aggregated signals. Do you consider all these four signals to be aggregated under the meaning of the claim --

MR. LANTIER: Your honor, I will, if I could come back to it on the rebuttal, because I'm trying to visualize Figures 1 and Figure 2 of Kaukovuori, and so --

JUDGE WORMMEESTER: Oh, do you not -- you don't have --

MR. LANTIER: I do have it with me.

JUDGE WORMMEESTER: Okay.

MR. LANTIER: I just don't have it standing here at the podium, Your Honors, but I would say this in response to what Your Honor is asking, I think. Kaukovuori uses -- does disclose an LTE-style carrier aggregation. It's an LTE reference. And so that's why there was no dispute -- and that is why in this proceeding there can't be any dispute from Patent Owner that it discloses carrier aggregation because they're trying to limit carrier aggregation just to LTE. I think that by pointing to the supplemental search that the examiner chose to do after the amendment was made to add that language and say that means that the examiner and everybody agreed that "carrier aggregation" was limited to this very specific meaning of "carrier

aggregation" is reading too much into the examiner's decision to perform supplemental search. I think it makes sense that the examiner did perform a search using that exact phrase, but I don't think it means that the examiner was making a finding that that was a specific claim construction that was being applied. Even in Kaukovuori, I don't -- the language that Qualcomm now asks Your Honors to import into "carrier aggregation" doesn't appear. That particular language doesn't appear in any of the references that are before -- are before the Board.

And I would like to focus specifically on what Patent Owner is trying to add into carrier aggregation, and if we turn to Slide 38, carrier aggregation -- in addition to what they acknowledge is what's stated in the 356 Patent itself, they're trying to add two additional requirements. One, that "the carriers are combined as a single virtual channel," and two, "that those carriers combined as a single virtual channel provide higher bandwidth." And as we've pointed out in our papers, the terms "single virtual channel" and "bandwidth" don't appear at all in the 356 Patent specification.

JUDGE MOORE: But do you know where it comes from?

MR. LANTIER: It's actually, there's a history, Your Honor, of how this discussion -- how this evolved. In the ITC, Patent Owner Qualcomm proposed a different construction of "carrier aggregation" that was broader than the one that it's proposing here. Over time, I think, to avoid some of the arguments that were being made about Lee actually increasing the bandwidth, they added the language of the "single virtual channel." It comes, as far as I know, from an extrinsic evidence source, a Qualcomm document from 2013. It's in the record, and I could get the citation for Your

Honor, where Qualcomm uses "single virtual channel" to describe a "carrier aggregation" in that particular document.

JUDGE MOORE: Okay. That's not in the feasibility study document?

MR. LANTIER: I don't -- no, Your Honor, I don't believe it to be in the feasibility study document. The feasibility study does use the term "component carrier" when it says what carrier aggregation is, but I don't think it uses "single virtual channel." So very briefly, if we turn to Slide 40, I just wanted to review the three arguments that Qualcomm Patent Owner makes based on the intrinsic record as to why the Board should make such a narrow construction of "carrier aggregation" in this proceeding.

One is, they point to portions of the 356 specification that refer to LTE as a potential embodiment of the claim's technology, but as we discussed earlier, the 356 Patent has expressed that it's not limited to devices that implement LTE, and the wireless device can support one or more radio technologies, including things like CDMA and Wi-Fi.

The second thing that Qualcomm points to in the intrinsic record is three references that were disclosed in IDSes. This is on Slide 41, Exhibit 1325, Exhibit 2016 and Exhibit 2017. Of those three references -- this is on Slide 42 -- only the Kaukovuori reference was ever discussed during prosecution of the 356 Patent, and the portion of Kaukovuori on which the Patent Owner now seeks to rely was never discussed during prosecution of the 356 Patent. There were about 350 references submitted in IDSes in connection with that prosecution.

JUDGE MOORE: Even though those weren't discussed during the

prosecution, it still might be evidence of what the term meant in the art if it was a term of art?

MR. LANTIER: Yes, Your Honor. I would agree with that. I think that they are -- they are evidence of meanings of "carrier aggregation" that were used in the -- I don't say -- they're not identical, but they don't use "carrier aggregation" identically either, I think. They certainly don't define it using Qualcomm's language. Intel's proposed construction, which we say is the broadest reasonable interpretation, would, of course, encompass all of the meanings of "carrier aggregation" that are set forth in these various pieces of evidence on which Qualcomm seeks to rely.

And then, finally, we've already discussed this in Slide 43 and following, but the distinction over Hirose, I don't think fairly can be construed as a prosecution history disclaimer that supports the claim construction that Patent Owner Qualcomm now seeks to have this Board impart. And I think it's -- their argument here is broad for really two reasons: one, the statements that were made by the Patent Owner, I don't think are clear enough -- and they certainly don't use the language "single virtual channel" or the language of Qualcomm's proposed construction -- to be amenable to an interpretation that that's what Qualcomm was distinguishing or was using to distinguish the claimed invention over the Hirose reference. And in fact, if there's any -- I'm on Slide 44 here again -- if there's any disavowal that was made, it's that Hirose disclosed the use -- disclosed the transmission and reception of redundant data, and that by including the language "carrier aggregation," the claims in the 356 Patent would not cover redundant data.

Our position, Your Honors, is -- and this is on Slide 44 -- we would say that the statements made during prosecution are not clear and unequivocal enough to be -- to amount to a disavowal, but if they are a disavowal, if they're clear and unequivocal, the only thing that they're clear and unequivocal about is that Hirose disclosed the transmission of redundant data at a common data rate, and that's not what was covered by the 356 claims.

So I would like to reserve my rebuttal time, but before I close out this discussion, just wanted to address a couple of final points on carrier aggregation. We're talking about applying the broadest reasonable interpretation in this proceeding. The Administrative Law Judge in the ITC proceeding was applying Phillips and still reached the conclusion that the correct Phillips construction is what Intel is proposing here. And when you're a patent applicant or if you're a patent owner and your patent has been placed into IPR, there is a very easy mechanism for making sure that if you want your claims to be narrower or construed more narrowly, that they are, and that is by amending your claim to make it clear this is what my claim covers. It's not covering the full scope of what my specification says it's talking about.

Unlike in some other proceedings, the Patent Owner here chose not to make any such amendment. It did set forth the single virtual channel to provide an increase in bandwidth language when it could have during prosecution. It hasn't done so here in this case.

JUDGE WORMMEESTER: What is "increased aggregated data rate"? Does that have to do with bandwidth?

MR. LANTIER: I think yes and no, Your Honor. Sorry to give you an answer like that, but I will explain. It does insofar as an increase -- when they distinguished Hirose and they said carrier aggregation results in an increased aggregated data rate, they're saying we're effectively increasing the bandwidth that the receiver -- that can be received by the receiver because now instead of a receiver that can only process one carrier, we've got one that can process two carriers carrying different information, and, therefore, our bandwidth or the amount of information we can receive is increased. It's not increased bandwidth in the sense of -- so that's the sense in which it's increased bandwidth. It's the -- it's the common -- it's the aggregated data rate as opposed to the common data rate issue. It's not increased bandwidth just in the sense of how many -- how many bands are we talking about, because Hirose, of course, was being transmitted over three different bands. So that would be a broader bandwidth in one sense than a single-band transmission.

I see I cut into my rebuttal time, but if there are any questions now, I'd like to address them. Thank you, Your Honor.

JUDGE WORMMEESTER: Thank you. Counsel, will you be reserving time?

MR. COCHRAN: Yes, I'd like to reserve 15 minutes, please.

JUDGE WORMMEESTER: Okay.

MR. COCHRAN: I believe were going to switch over to --

JUDGE WORMMEESTER: When you're ready.

MR. COCHRAN: We're waiting for it to get -- to switch over.

JUDGE WORMMEESTER: Okay. That's right. Sorry. Yeah.

Thank you.

MR. COCHRAN: Or I could continue with Mr. Lantier's argument. We're going to try a backup laptop to get this to work. Just bear with us a second. You have our slides --

JUDGE WORMMEESTER: Yes, we do.

MR. COCHRAN: -- in front of you. So I would suggest, given the technology issues that we're having, if we could just proceed and I'll tell you what slide that I'm referring to so that you can -- you can see the slide. And I assume Judge Wieker also has the slides with her?

JUDGE WIEKER: Yes, I have them. Thank you.

MR. COCHRAN: I'm going to start with Slide 8. The -- and I'm going to jump right to the claim construction issue because that is -- that is the key issue that we have to decide here in the case today. And I would submit that the Petitioner's construction, which is simultaneous operation on multiple carriers, cannot -- and the reason it can't be right is because it's contrary to the other claim language that's already in the claim and in the claim as it was filed before it was amended. That's number one.

Number two, it's contrary to the written description of the 356 Patent, which distinguishes carrier aggregation from other forms of multicarrier operation like multiband operation, like Hirose or Lee. Those are both multiband devices.

Number three, it's contrary to the filing history. And we know from the presentation here this morning that the phrase carrier aggregation was added specifically to overcome the Hirose reference.

But foremost -- so this is number four -- their construction,

Petitioner's construction fails to give any meaning at all to the word "aggregation," and therefore, I would submit for all those reasons, it cannot be correct.

Going on to Slide 9. Slide 9, we've shown, this is a picture of part of Claim 1, where we took the Petitioner's proposed construction for carrier aggregation and substituted that in for the rest of the claim language. And you can see that with their construction, the claim would read, "The input RF signal employing simultaneous operation on multiple carriers comprising transmissions sent on multiple carriers." One more time, "The input RF signal employing simultaneous operation on multiple carriers comprising transmissions sent on multiple carriers."

So you can see the added language that corresponds to Petitioner's construction is redundant. The claim as filed already included the concept of multi-carrier operation without any reference to carrier aggregation. That's how the claim was filed. So if we add Petitioner's construction into Claim 1, it doesn't add any meaning to the claim. And it effectively reads carrier aggregation out of the claim.

Now Slide 10.

JUDGE MOORE: Well, I guess it's a little bit different, right? I mean, you could have multiple carriers and then -- but they have nothing on them I guess, and then you could also have transmission sent on those carriers.

MR. COCHRAN: I don't think it really is changing the meaning at all. The transmission is the operation, and the claim already has it built into it the concept that those transmissions include multiple carriers, which

means they're at the same time. So it's not adding any meaning to the claim whatsoever.

If we go on to Slide 10 --

JUDGE WORMMEESTER: But counsel --

MR. COCHRAN: Yes.

JUDGE WORMMEESTER: -- Petitioner argues that when you have the two signals coming in at the same time, that's the aggregation. That's the aggregation.

MR. COCHRAN: Yeah.

JUDGE WORMMEESTER: So what's your response to that?

MR. COCHRAN: I don't think that makes any sense whatsoever. If I have an antenna, and I stick it up in the air, I'm receiving all kinds of RF signals, radio frequency signals, television signals, and you've got a satellite signal. Those signals, no one would say that those signals are being aggregated because they're received at the antenna at the same time. They're just separately being received. "Aggregation" means to combine together, to collect groups of things and to put them into a whole. That's what it means to aggregate. "Aggregate" doesn't mean just receive multiple signals simultaneously.

JUDGE MOORE: But they're received and then they're piped through the LNA together, right?

MR. COCHRAN: The signals are received together.

JUDGE MOORE: Whatever the antenna is receiving --

MR. COCHRAN: Correct.

JUDGE MOORE: -- it goes into the LNA?

MR. COCHRAN: Correct.

JUDGE MOORE: That's just not everything that's in the air, that's whatever the antenna plucked out of the air.

MR. COCHRAN: Which is a lot of stuff, and it could be -- it could be a massive bandwidth of stuff.

JUDGE WORMMEESTER: So why isn't all of that aggregated, considered to be aggregated?

MR. COCHRAN: Those are all separate things. Nothing's being combined at that point. They're just being received at the same time. "Aggregation" means to combine together.

JUDGE WORMMEESTER: Aren't they combining into a single signal that has these different components, for example the Wi-Fi component and a Bluetooth component?

MR. COCHRAN: I don't think they're being combined, I think they're just being received separately. They're on the same wire, that's true, but there's no combination of the information that's in those signals. They're just being received separately.

JUDGE WORMMEESTER: So is it that Petitioner is looking at this from a physical combination, and you're looking at this from the combination of the data?

MR. COCHRAN: Yeah, that's what carrier aggregation is, it's the logical combination of multiple component carriers. That's what that term means. That's a well-understood term of art, and our intrinsic and extrinsic evidence, I think, establishes that conclusively.

I'd like to go on to Slide 10. The Petitioner's construction is

particularly problematic because, as we discussed earlier, this claim term was added by amendment. So it must provide some additional meaning. And I don't think they've really disputed that -- I don't think they've really disputed this point that their -- their definition of "carrier aggregation" is, in fact, redundant to the rest of the claim language.

Slide 11. So at the very least, I think we have to -- in construing this phrase, at the very least, we have to include something that relates to the word "aggregation" or "aggregate." And we give one example definition here from the common dictionary that talks about "gathering together into a whole, to collect together, to assemble." This is the combination that we're proposing in our -- in our definition.

So Petitioner's construction leaves out even this most basic requirement of what it means to aggregate together. And their definition allows just multiple receipt of signals that have no relation to each other whatsoever. That's Hirose. That's Lee. They're the same thing. So nothing has been combined together under Petitioner's construction, and therefore the word "aggregated" isn't given any meaning. And I think that's primarily why it's incorrect.

JUDGE WIEKER: Do you have any intrinsic support in the patent itself for your understanding of aggregation?

MR. COCHRAN: Yes, and let me go ahead and jump to that. I'm going to have to jump to -- I'm going to jump to Slide 24. And I'm going to jump back because I want to make sure I go back to the Hirose stuff because that's really -- that's really critical. With respect to the intrinsic evidence -- and if you can jump on to Slide 26 -- the specification explains -- correct, the

specification explains, there's one sentence where it says, "Carrier aggregation is simultaneous operation on multiple carriers." And and that's where you start.

And we have that as part of our definition as well. We agree that that should be part of the definition of "carrier aggregation." But it's not enough because again, it doesn't give context to what it means to aggregate something together.

It will note two things here in the same paragraph, where it talks about carrier aggregation. It refers to "component carriers," and that's another term of art that is well known in this field. And when you're talking about component carriers, you're talking about components of the carrier-aggregated signal. You're trying to achieve a wider bandwidth, so you take the-- for a video, for example, you have a 120 MHz channel, you have a signal that's maybe 100 MHz wide, so you split it up into five 20 MHz component carriers, transmit those signals simultaneously over the wide area connection, receive them and then put them together, combine those component carriers back together into a whole. That's carrier aggregation. And that's what "component carrier" means in this context.

JUDGE MOORE: Is there something in the record that shows us that meaning for "component carrier"?

MR. COCHRAN: There are many -- there are many examples of that. There -- we've submitted -- well, the feasibility study, which is their primary -- their secondary reference for their obviousness combination, as the definition says, and it shows this explicitly, that "carrier aggregation" means to use component carriers to create a wider aggregated bandwidth. That's

the feasibility study. That's their secondary reference. There's tons of intrinsic evidence on this as well.

If you turn to the next slide, Slide 27 refers to the -- this is the 3GPP Technical Standard No. 36, which relates to long-term evolution or LTE. And there are many, many different versions of documents that go along with TS 36. It starts with No. 101 and then goes on to 900 and something. The version that they are using in their obviousness combination, I think, is No. 916, which is the feasibility study establishing that you could extend LTE to include carrier aggregation, but the original specification, which is referenced in the 356 Patent, which is 36.101, includes a definition or description of "carrier aggregation" that is identical to what's in the feasibility study, And it says, "Carrier aggregation where two or more component carriers are aggregated in order to support wider transmission bandwidths." So "component carrier" has a -- this is another term that has a well understood meaning, and that's why it's -- that's why it's italicized here in the document.

JUDGE MOORE: Well, it just comes back to what does "component carrier" mean, right, because they would say well, wider transmission bandwidth, that's what you get when you do Wi-Fi and Bluetooth at the same time. That's wider bandwidth because you have --

MR. COCHRAN: Except nobody would ever combine a Wi-Fi and a Bluetooth signal. There is no evidence that anyone would ever do that under any conditions. There's certainly no evidence in front of us.

JUDGE MOORE: Right. So you come back to whether it's required that they can be combined, the notion of combining.

MR. COCHRAN: Yeah, and that's what "aggregate" means. It means to combine together, to collect together into a whole. That's exactly what that term means.

JUDGE MOORE: That's what it means in the dictionary, but I'm understanding that it's a term of art that's not necessarily something that you find in the OED, so where are we to look in the art to find that definition, that combining of the carrier aggregation?

MR. COCHRAN: That's in the feasibility study. That's in the reference that they're using to try to invalidate the patent, and that's in the earlier version of the Technical Standard 36, which defines carrier aggregation the same way.

JUDGE MOORE: Is that in the feasibility study other than in paragraph -- or Section 5.1, where it says, "Two or more component carriers are aggregated in order to support wider bandwidth"? I mean it's something that says not just you're getting more bandwidth, but you're getting more bandwidth for one thing?

MR. COCHRAN: Yes. Yeah, it's a very -- it's a lengthy and a very technical document, but if you look at it -- if you look at it as a whole, that's exactly what it's describing. That's the whole -- the whole point of extending LTE to include "carrier aggregation" is so that you can do video, for example. So maybe you only have -- again, if you only have a 20 MHz signal channel and you're trying to send somebody a 50 MHz video, how do you do it? Carrier aggregation is the way. That's why we are now able to stream video to your cell phone, it's through advanced LTE that has carrier aggregation, so your combining -- the combining of things together is really

critical in terms of figuring out what does this term mean.

JUDGE MOORE: I hear what you're saying. So what I want to know is what is the best evidence that we could point to for the combining case? Not the more bandwidth case but the combining case.

MR. COCHRAN: As far as the intrinsic evidence, it's the technical specification. It's what -- it's what we were just looking at.

JUDGE WIEKER: But isn't that -- what you were just pointing to, that seems to be a definition of what this LTE Release 11 is, this, you know, this 36.101 specification, not of the broader term "carrier aggregation." We're not interested in construing the LTE aspect of it.

MR. COCHRAN: Yeah. There's -- this is essentially the first technical implementation, commercial implementation of carrier aggregation. This is where this term came from. This is where this term came from, is in the development of a long-term evolution and the extension of that to include multiple cellular connections. That's where this term came from, so it is, in fact, the best evidence we have of what the term means. That's why this term is italicized. It's effectively like a defined term in the specification.

JUDGE WIEKER: What do you make, though, of the fact that the patent is not limited to LTE, and carrier aggregation needs to be understood in the broader context of the patent?

MR. COCHRAN: Yeah, there's no question that the patent is written -- the specification is broad. But remember, the claim was specifically amended to include, to be limited to a carrier-aggregated signal, so although there are aspects of it that are broader than that, the claim in front of us is

limited to a carrier-aggregated signal.

JUDGE MOORE: Any LTE or any carrier aggregation?

MR. COCHRAN: It could be any carrier-aggregated signal, but that term emanated from the development of the LTE specification. That's why, when we look at the evidence here, you know, is there any evidence of record other than -- other than the specification of prior uses of this term, and the answer is no because that's where this term came from.

I want to go back if I could to the file history, and in particular, if you could turn to Slide 15, and I'm still under Construction. I mean, I've gone into why I think our construction is better, but I still want to really emphasize why their construction cannot be correct. And the main reason, in addition to the fact that it's redundant to the rest of the claim language, is that it's contrary to the file history. And we talked a little bit about this earlier, that the claim as filed did not include "carrier aggregation."

The claim was rejected over the Hirose reference, which is the satellite ground receiver. And actually if we turn to Slide 17, this shows Figure 2 of Hirose, and Hirose, as I said, was a combination, I think it was like for Sirius radio or XM. There was a time where they were having trouble with some of their satellite transmissions, so they also had a ground-based system, where you could, in addition to the satellite, you could get a terrestrial signal in case you were out of range or the satellite was having problems. That's what this is directed to.

And Hirose teaches a single wideband receiver, single receiver that can receive satellite and the ground signals. So Hirose clearly discloses simultaneous operation on multiple carriers. That's shown in Figure 2.

That's their definition. So that can't be correct because that interpretation would negate the amendment over Hirose. And I think for the first time today, I think Mr. Lantier disputed that the claim would read on Hirose if you adopted their construction, but I would submit that it would. And there's really no difference.

Remember, the only thing that happened after the Hirose rejection was the claim was amended to include carrier aggregation. And then yes, the Applicant argued about redundancy, but he also said because Hirose doesn't achieve an increased aggregated data rate, not just an increased data rate. All right. So if you have two unrelated channels, you could argue that that's an increased data rate. But in overcoming Hirose, the Applicant said you must have an increased aggregated data rate, again focusing on the word "aggregation," and then amended the claim. And then ultimately, the Hirose rejection was withdrawn, and then there was subsequent prosecution.

So I would suggest that their claim construction is contrary to the claim language, it's contrary to the specification, and it's contrary to the prosecution history. So what is the justification for this? Now I'm onto Slide 19.

JUDGE MOORE: I'm sorry, what slide?

MR. COCHRAN: Slide 19. So their only justification for this is they assert that the Patent Owner was a lexicographer, and they assigned a special term, special meaning to "carrier aggregation," different from its plain and ordinary meaning. They don't really get into what is the plain and ordinary -- I think maybe Judge Wormmeester, you may have asked that question, but they don't really -- they don't really, in their briefing, get into that. They

just say Patent Owner has been a lexicographer, therefore, you can ignore everything else, you can ignore the claim language, you can ignore the file history, ignore all the intrinsic and extrinsic evidence. But of course this argument ignores the, as we all know, the high burden that is required for you to find that someone was a lexicographer.

And I'd refer to Slide 21 now. Now it's true in the background of the 356 Patent there is this one sentence, which we've talked about several times, which says, "A wireless device may support carrier aggregation, which is simultaneous operation on multiple carriers," and that's true. That's where you start. That doesn't mean that's a definition of the term exclusive of all other definitions. That doesn't mean you ignore the plain and ordinary meaning that actually gives meaning to the phrase or the word "aggregation." This is not -- this is not an attempt to depart from the plain and ordinary meaning.

And in fact, if you look down a little bit further on the slide, and Mr. Lantier also set this forth on one of their slides, they have -- there's two other statements, two other definitions perhaps that are different than the one that they're proposing. And the first one says, "Wireless device may support carrier aggregation, which is operation on multiple carriers." Well, so that's different. Now, it doesn't have to be simultaneous, it just has to be operation. And that language is verbatim in the claim as filed without the amendment. And then it goes on to say, well, you can also refer to it as "multicarrier operation." So I think when you look at these statements together, it's pretty hard to come to the conclusion that one of them has been a lexicographical definition over the others and that the Patent Owner, the

inventors, have defined the term in a way that's different from its plain and ordinary meaning.

JUDGE MOORE: You don't think "referred to as" could be definitional?

MR. COCHRAN: No, I don't, I think that's just giving an example of one aspect of carrier aggregation. These are all true statements, by the way. I'm not saying anything -- these are all true. These are all aspects of carrier aggregation. Carrier aggregation does include transmissions sent simultaneously on multiple carriers. That's true.

JUDGE MOORE: So the first two, I would agree with you there, but the third one seems a little -- a little tighter. It says, "Carrier aggregation may also be referred to as multicarrier operation," and that seems to me closer to a definition.

MR. COCHRAN: And that's also redundant of the claim described. All three of these are. All three of these are redundant of the claim language as filed prior to the amendment to overcome the Hirose reference. So I talked a little bit about -- in response to Judge Wieker's question about the intrinsic support, there is also significant extrinsic support for our construction, and I'd like to highlight just a couple of those.

If you could turn to Slide -- excuse me -- Slide 31, and we submitted, I don't know, seven, eight, a dozen pieces of extrinsic evidence, all in attempt -- patents, printed publications, Qualcomm publications, the feasibility study that they are relying on as technically extrinsic evidence even though the earlier version of it is intrinsic. We submitted 10 or 12 pieces of extrinsic evidence, all of which are consistent with the construction

that we are proposing, which captures two really important aspects of carrier aggregation. One is combined. The carriers must be combined. And two, for the purpose of creating a wider bandwidth channel.

JUDGE MOORE: Why do you need that base, the higher bandwidth base? Why do we need that in the construction?

MR. COCHRAN: That's the net effect of combining the channels together.

JUDGE MOORE: Why do we need in the construction, the net effect?

MR. COCHRAN: That's describing why you would combine the channels together.

JUDGE MOORE: Why do we need that in the construction?

MR. COCHRAN: Well, I think it gives you -- -- it gives you -- that tells you what is the purpose of carrier aggregation, right? It's to aggregate and combine the signals of the component carriers to achieve a wider bandwidth channel. That's the purpose of aggregation. I think it gives it more meaning if you add that in there.

JUDGE MOORE: Is that piece needed to distinguish over the art in this case?

MR. COCHRAN: No. No, because there's no -- this is needed in order to give it the proper definition, but then ultimately, you are right, to be able to distinguish over the anticipation ground over Lee. Because in the Lee reference, as we'll get to in a second, nothing is ever combined. The signals are completely separate all the way. So there is no combination of carriers. There are only separate carriers.

JUDGE WORMMEESTER: I mean, but could it be argued like in Lee at paragraph 17, Lee says, "The input signal VIN may include a plurality of radiofrequency signals." So there's a single signal that comprises multiple signals. Isn't that -- doesn't that mean they've been combined into one?

MR. COCHRAN: No. No. No more so than me sticking up, you know, my antenna in the air and receiving a television signal, several television signals, and some radio signals and run the signals through, they haven't been combined. There's nothing that's been combined at that point. They're still separate. And if you look at Lee, they're ultimately processed separately. There is no combination of signals.

JUDGE WORMMEESTER: So what does "combination" mean? Because I think if you have multiple things that have -- that comprise a single thing, that sounds to me like it's been combined.

MR. COCHRAN: Combined in this context of what is carrier aggregation, you're talking about combining the carriers together, what you're really talking about is combining the information that's in those carriers. Ultimately, after the signals are received, converted, you know, the radio processor will combine the data that is in those signals together to achieve the wider bandwidth channel. That's what's being combined. In carrier aggregation, that's what's being combined.

The signals -- in a carrier-aggregated signal, the signals are being received separately. They're processed, sometimes separately, sometimes at the same time, but ultimately, they're combined together by the processor in order to achieve the wider bandwidth channel. That's the entire purpose of

sending a carrier-aggregated signal.

So still on Slide 31, this is one -- one example of some of the extrinsic evidence that we put into play in the case. And this is one of the Petitioner's own patents. This is an Intel patent that has to do with a carrier-aggregated system, and we've highlighted some of the important language here, where the patent -- this is US 9161254 -- describes "carrier aggregation" as the "use of multiple smaller bandwidths to form a virtual wideband channel." So there was a question, I think, earlier about where does this virtual channel come from. It comes from their own patent. This is from an Intel patent.

JUDGE MOORE: Is that prior art?

MR. COCHRAN: This is not prior art. This was -- this came -- I think it was a couple months. It was pretty close, a couple months later. Certainly within the -- within the time of the prosecution of the 356 Patent. And so there's this one and there's more. On the next page, Slide 32, there's another Intel patent. And there's many of these. And what is this showing you, right? This shows you that the Petitioner's own inventors use the term "carrier aggregation" consistently with what we're proposing is the well understood meaning of that term in the art. And so --

JUDGE WORMMEESTER: How does -- like, so I'm looking at the 356 Patent where it says, "A carrier may also be referred to as a component carrier, a frequency channel, a cell." I can see how the component carrier supports your explanation, but what's a frequency channel and a cell?

MR. COCHRAN: Yeah, to me those two seem like they're broader terms. Those two seem like they're broader terms.

JUDGE WORMMEESTER: Okay. There's no -- the word

"component" isn't modifying them.

MR. COCHRAN: That's correct.

JUDGE WORMMEESTER: So there's a distinction between a component carrier and then some other sort of carrier that's not a component.

MR. COCHRAN: Right.

JUDGE WORMMEESTER: Right. So I mean, how does -- how does that support your construction?

MR. COCHRAN: Well, and that's why -- and I agree with everything you just said, and that's why we also refer to intrinsic support to to the -- to the earlier version of the feasibility study, which has the language that ties "component carrier" to "carrier aggregation" to assembling the components together to achieve a wider bandwidth channel. That's the best, I think, piece of intrinsic evidence we have that supports our construction versus the Intel construction.

JUDGE WORMMEESTER: Well, these terms, "frequency channel" and "cell," are they also used in the LTE context, or do those apply to different technologies?

MR. COCHRAN: Yeah, those are -- those are common terms and also (indiscernible) communications.

JUDGE WORMMEESTER: Oh. Okay.

MR. COCHRAN: Those are very, those are very broad, common terms. So I'd like to turn to a couple more -- couple more points, and this is -- I'm on Slide 36 now. When you come -- when you come to the proper construction of carrier aggregation, which I believe is our construction

because it gives meaning to that term "aggregation" and it's consistent with all of the intrinsic and extrinsic evidence, including the file history, the anticipation ground over Lee fails. Lee has nothing whatsoever to do with carrier-aggregated signals. It only describes a multiple radio receiver. There is no aggregation, there is no combining together to provide a higher bandwidth.

If you could turn to Slide 37, in addition to Lee never mentioning aggregation, never mentioning any kind of a combined channel, never saying anything about a higher bandwidth, Lee only gives two examples. He tells you about a Bluetooth signal and a Wi-Fi signal, but I think, you know, as we've discussed here this afternoon, the -- the presence of two carriers without something more cannot establish carrier aggregation, because again, nothing is being combined, nothing has been aggregated. And therefore, the anticipation ground over Lee should be rejected.

If you turn to Slide 39. So as a backup to their anticipation ground over Lee, the Petitioner argues that the POSA would combine Lee with the feasibility study, which is a later version of the LTE specification we talked about earlier. So it's Lee in view of the feasibility study. That's -- that's the ground. But Lee, and Slide 40, Lee, as we just discussed, only relates to a multiple radio device. And Lee addresses the problem. See Lee -- Lee, in the background section of Lee, he addresses this problem where he's like, you know, modern wireless devices have multiple radios.

You could have a Bluetooth radio, you have a Wi-Fi radio, you could have some other kinds of radios, and that's expensive, right, to have all these different RF front-end circuits. That's the problem the Lee invention is

directed to, and what Lee says is that you should -- instead of having multiple RF front ends, Lee says you should share the input stage circuitry, at least part of it -- he has multiple amplifier blocks -- but you share at least some of the input stage circuitry. And in fact, this is just like Hirose, right? This is just like if you look at the Lee RF front end and Hirose, they're very similar. And of course, Hirose was overcome during prosecution.

So on Slide 41, this is the feasibility study, which is TR36.912, and before, we were talking about 36.101, which is in the intrinsic record. The feasibility study relates to a single radio technology, long-term evolution. Wide area, high powered cellular communications. And in particular, the feasibility study is a theoretical study trying to establish that carrier aggregation would work in a variety of different environments within LTE. So it's a document that's submitted to the standards body to try to convince the wireless carriers that they should deploy this advanced LTE system in order to achieve higher bandwidth transmission using carrier aggregation.

So the question, on the obviousness ground -- the question that should be answered, or should have been answered, is what would've led the POSA from Lee which only teaches an amplifier from multiple radio technologies, to a theoretical study of improving bandwidth in a single radio technology, a cellular system? That's the question.

JUDGE MOORE: But isn't the combination as they phrase it the other way around, they say you start with the feasibility study and you add Lee?

MR. COCHRAN: Yeah, and I think that -- that should tell you something, right? That should tell you something. They're going

backwards. Instead of starting with the primary reference and then arguing why you would motivate that with the secondary reference, they're -- they start with the secondary reference and then they plug that into the primary reference. I mean, no, there's no -- there's no federal circuit case that says you can't do that, but that is at least some evidence -- when you're doing the analysis backwards like that, that's at least some evidence I would submit that we are looking at a hindsight situation.

But let's look at their evidence in the petition because this is really, this is really critical. They have two -- there's -- they have two pieces of evidence, essentially. The first -- and this is on motivation and combined. In their first, their first piece of evidence, they say that the motivation comes from the references themselves. That's their pitch. And they say that -- this is on Slide 42 -- and the feasibility study has a sentence, which says that "an ideal receiver for non-contiguous intra-band and inter-band carrier aggregation" -- that's where you have one group of carriers here in frequency, and one over here, so they're not contiguous, they're not right next to each other. If they were right next to each other, you could, you could decode them with a single RF front end, a single -- a single down conversion.

Intra-band carrier aggregation, you've got one over here and you've got one over here, and the question is how do you -- how do you deal with those two signals. And the feasibility study says, well, you should have multiple RF front ends, multiple RF front ends, separate RF front ends. That's what the feasibility study is teaching you.

And then the Petitioner goes on to say or conclude that because Lee

has multiple amplifier blocks, that somehow that's the exact same type of receiver as the feasibility study, but that's just wrong. First of all -- and there's two reasons -- first of all, if you look at the feasibility study, when it talks about an RF front end, it says, "i.e." -- this is on Slide 42 -- "i.e. mixer, automatic gain control, analog-to-digital conversion." These are blocks in the RF front end that come after the low-noise amplifier. It's a well-known chain of blocks and RF receiver that come after the low-noise amplifier.

Now, of course the sentence before that, they turn it around and they say, "gain control, amplifier," -- which is not what that is -- "mixer and analog to digital converter." So that's what the feasibility says. Lee is directed to an amplifier, the low-noise amplifier, the very first block that comes after the (indiscernible) circuit. And that's what the 356 Patent is directed to. Feasibility study is talking about certainty that comes downstream from that, comes down afterwards. So that's -- that doesn't -- that doesn't work for them.

But the real problem is that Lee teaches a single RF front end. We just -- we just talked about that. Lee says having multiple RF front ends is bad. You don't want to have a separate RF front end for the Bluetooth receiver and a separate RF front end for the Wi-Fi receiver, so you should combine them together in a single circuit. So in fact, Lee's invention is getting away from having multiple front ends by having a common RF receiver. So I don't think -- I don't think that really would motivate anybody to combine these.

And then if you turn to Slide 43, the only other evidence they have in the petition to support the motivation to combine is this one paragraph that

I've set forth here. And this paragraph says that "carrier aggregation provides benefits," and then it lists out the benefits. And therefore, the POSA would have been motivated to combine Lee with the feasibility study to achieve these benefits. So in other words, the secondary reference provides benefits. Here they are. Therefore, the POSA would have been motivated to combine the primary reference with the secondary reference to achieve those benefits. And I would submit that that's about as generic as it gets. There's no analysis here, and this is -- this is the kind of generic analysis that -- I mean, there's hundreds of federal circuit cases on this. This is not -- this is not proper motivation combined. It's completely generic. And for that reason and other reasons we've discussed, the obviousness ground should also be rejected.

JUDGE WORMMEESTER: Well, they specify it's for the wider transmission bandwidth, so -- so if they're bringing that feature into Lee, what -- I mean, they're explicitly saying that, so what --

MR. COCHRAN: Yeah, but that's just -- that's like saying the benefits of the carrier aggregation are wider transmission bandwidth, more efficient operation, lower power operation, makes the channel faster. These are all just generic statements of features that you would want to achieve in a wireless system. There's no -- there's no analysis here whatsoever explaining why you would go from the feasibility study to Lee, or what they should've done is gone from Lee to the feasibility study, but they didn't do that. They went backwards, and that's, I think, fundamentally the problem with their analysis.

JUDGE WORMMEESTER: I'm just looking at the language there,

and they say that you would have used the multiple inputs in Lee -- you would apply that -- I mean, I'm sorry, not Lee, the feasibility study -- you would apply that to Lee, and then Lee would allow you to obtain the wider transmission bandwidths. So it would be like multiple Bluetooth or multiple Wi-Fi signals.

MR. COCHRAN: Yeah, no, that's -- that's what it says. My suggestion is that there's just no analysis as to why you would even want to do that. There's no evidence -- there's no evidence that Lee would work with the carrier-aggregated signal. There's -- there's speculation, there's attorney argument, there's conclusory expert testimony, but there's no evidence that Lee's RF front end for receiving Wi-Fi signal -- I mean, think about it, a Wi-Fi single and a Bluetooth signal, these are all short-range, low-powered signals, right? Therefore, if you have -- if you're taking your Bluetooth speaker and you go 20 feet from it, you don't even have a signal anymore. These are low-power signals. LTE, this is a high-powered, wide area cellular communication system that has the ability to transmit high-speed video over a long distance.

JUDGE WORMMEESTER: So you're saying that Bluetooth and Wi-Fi signals couldn't be aggregated?

MR. COCHRAN: They could, but there would be no reason to do that. There would be no -- there's no evidence in the record that anyone would ever do that.

JUDGE WORMMEESTER: So why would the Applicant want to capture that? Didn't the -- didn't the 356 Patent say it covered Wi-Fi technology?

MR. COCHRAN: It refers in there, yes.

JUDGE WORMMEESTER: Okay.

MR. COCHRAN: It does refer to that. I think it was --

JUDGE WORMMEESTER: So why does it capture that?

MR. COCHRAN: -- well, but I think it goes back to the point that I raised earlier, which is yes, the specification is written very broadly. As we all know, patent attorneys write specifications very broadly on purpose, but ultimately, during prosecution and, you know, by selecting certain claims and certain claim language, you don't always encompass everything that's in the specification. And particularly here, where the claims had to be amended to overcome Hirose. By adding the term "carrier aggregation," I mean, it effectively limited the claim such that it doesn't cover everything in the specification. I think that's all that -- all they're seeking.

So I'm going to apologize for the technical difficulties and reserve the remainder of my time.

JUDGE WIEKER: Before you step down, I'd like to just circle back to one thing from our earlier discussion. Regarding combining the characters -- I'm sorry, the carriers, you pointed me to the specification where it talks about the 3GPP, TS36.101. Is 36.101 in the record anywhere? You pointed to the feasibility study, but not 36.101 --

MR. COCHRAN: It's -- my colleague tells me that it's Exhibit 2026.

JUDGE WIEKER: Perfect. Thank you.

JUDGE WORMMEESTER: Okay. You'll have 13 minutes with a 5-minute warning.

MR. LANTIER: Thank you, Your Honor. If I could, I'd like to begin

with a slide that was used by the Patent Owner, and I don't have a copy electronically, so I'll rely on the paper version. This is Slide 27. And this is the argument that the specification supports the Patent Owner's construction of carrier aggregation, and on Slide 27, the Patent Owner points to the first sentence of section 5.1 of the feasibility study, where it says, "LTE advanced extends LTE Release 8 with support for carrier aggregation where two or more component carriers, CC's, are aggregated in order to support wider transmission bandwidths." I would submit, respectfully, that if that's the definition that the Patent Owner meant to have a person of ordinary skill in the art understand, that's what the Patent Owner would have said in the 356 Patent.

But instead, what we have is a series of statements that are clearly and deliberately broader than this particular definition of "carrier aggregation." And under the broadest reasonable interpretation, I don't think this is a difficult question. The broadest reasonable interpretation has to be broad enough to include what the specification itself describes as the meaning of "carrier aggregation."

JUDGE MOORE: But it's going to use that term as a person skilled in the art would understand it, right?

MR. LANTIER: As a person skilled in the art would understand it having read it in the patent specification.

JUDGE MOORE: And also having skill in the art that presumably included knowledge of LTE and such things?

MR. LANTIER: Absolutely, Your Honor. Yes.

JUDGE MOORE: And including their familiarity perhaps with the

term "carrier aggregation" as used in LTE?

MR. LANTIER: Yes, Your Honor, that is correct. And that person with skill in the art would have read the patent, read what it says in Columns 1 and Column 2 and Column 8, other places in the 356 Patent and said, oh, well, I know -- it might say, well I know in the context of LTE, "carrier aggregation" means one thing, but here in this patent, they've written it so that "carrier aggregation" is not limited to that one particularized meaning that I know of from LTE. Instead, they've said it's simultaneous operation on multiple carriers but I would like to --

JUDGE MOORE: Shouldn't it be really, really clear if the patent drafter is changing the meaning of that term of art?

MR. LANTIER: No, I don't -- I think, Your Honor, that we're getting-- holding to term of art when what really -- the evidence that you have before you on carrier aggregation from the Patent Owner is limited to one particularized use of carrier aggregation, which is the LTE use of carrier aggregation. We don't have in the record a statement from an expert that says this is the only way that carrier aggregation is understood by a person skilled in the art. In fact, Dr. Fay's declaration says that the broader construction -- broader interpretation of "simultaneous operation on multiple carriers" is consistent with how a person of ordinary skill in the art would understand the term.

JUDGE MOORE: And does he cite evidence for that or is that just his opinion?

MR. LANTIER: He's been -- Your Honor, he teaches this at Notre Dame University. He's been a tenured professor there for 20-plus years

teaching this to his students, and so it's based on his experience in the field and what he understands and has understood "carrier aggregation" to mean. I'd like to jump ahead, though, to Slide 68 and address some of the commentary that was made about the motivation to combine or the reasons to combine --

JUDGE WORMMEESTER: Slide 68 of whose demonstratives?

MR. LANTIER: Thank you, Your Honor. I've jumped back to Petitioner's set of demonstratives, which are Exhibit 1341, but, hopefully, I don't have that incorrect. But back to Petitioner's demonstratives and Slide 68, I wanted to address the issue of -- of obviousness if the Board were to reach the conclusion that Qualcomm's very narrow interpretation of "carrier aggregation" is the broadest reasonable interpretation of that term. And there were some comments that I don't really understand about it somehow being evidence of non-obviousness that -- that Petitioner started with the feasibility study rather than started with the -- the Lee reference. I don't -- I'm not aware of any analysis in any of the cases that would support that statement or the implication that there is something unusual about that.

Instead, I think it's important to remember a few things. One, there is no dispute that the feasibility study discloses carrier aggregation under Qualcomm, the Patent Owner's proposed construction. Two, the only element of the claim that we're relying on the feasibility study for is the makeup of the input RF signal. That's the only thing. It's just what is being received by the low-noise amplifiers. The feasibility study discloses and teaches that carrier aggregation provides great benefits, that this LTE-style carrier aggregation is being considered for inclusion in the next release of

the standard, and that you're going to need to have a receiver that can handle the carrier-aggregated signal. It says that you could do this by using one RF front end; it says you could do this by using multiple RF front ends. A person of skill in the art reading the feasibility study and thinking about how to design a receiver that can handle this type of LTE-type carrier aggregated signal is, of course, first going to think, is there already a ready-made RF front end circuit that I can use to do this. Do I -- is there something I can just plug in and it's -- and it can be used? And the answer here is yes, it's Lee. You don't have to add anything to Lee, you don't have to subtract anything from Lee in order to use it to process this LTE carrier-aggregated signal.

JUDGE MOORE: Why would that person choose Lee, which has the independently switchable channels, where carrier aggregation and LTE, at least as I understand it, you're always using all the channels? I mean, so it seems awfully convenient that the reference happens to have that feature, which is what you need for the claim, but I'm not understanding why someone using carrier aggregation under LTE would choose Lee.

MR. LANTIER: I'm glad you raised that because I think there may be a bit of a factual issue here. LTE does not usually use more than one carrier. Your average telephone call using LTE, you don't need to use multiple carriers to hear -- or to receive that -- that signal, right. You only need carrier aggregation and LTE when you're doing something like transmitting a high quality video stream, something that was way more data than 3G -- that GSM or 3G could handle. And so it's for the same reason that you know in your front end that a lot of the time, I'm not going to need

to have two different LNA stages or five different LNA stages operating at once because one is going to be perfectly sufficient for telephone calls, text messages, e-mails, all the things that I could already do using 3G before we have nest to the LTE standard, which allowed, of course, for additional -- additional capability of high-quality video, for example, but also still has us making phone calls and other things using -- using our mobile phone. So it's not the case that an LTE, you're normally using all of the -- or multiple different carriers to transmit a piece of information.

JUDGE MOORE: But where is the -- what is the motivation to use the independently switched segments in Lee in an LTE application?

MR. LANTIER: I would submit, Your Honor, that that comes directly from the references themselves, which indicate that there are benefits of being able to switch on and switch off. The Lee reference, that you have this capability to use one or use both. If you are a person of ordinary skill in the art and you are designing a receiver for LTE, which needs to include this LTE-style carrier aggregation capability, you know that a lot of the time you're not going to need it. Of course, I'd say to you you're trying to save power, you're doing all the things that normal designers do and you would certainly be interested in the ability not to have to run all of your amplifier stages when you don't need them.

JUDGE MOORE: But in Lee, you're turning off a segment for a type of radio that you're not using. You're not turning off segments within a certain type of radio signal.

MR. LANTIER: I think two responses to that, Your Honor. I think that is a very -- respectfully, I think that's a somewhat cramped reading of

what Lee -- and I don't mean that in a pejorative way, but Lee does use the -- does use an example that says "e.g. a Wi-Fi and Bluetooth signal," but it just -- it more generally says you can use this amplifier circuitry for multiple different -- they don't use the word "carriers," but that's what it means, being received by the same device and needing to be processed. And so I wouldn't -- I don't think it's right to think of Lee as being so limited that it's only Wi-Fi and Bluetooth.

The second answer, and perhaps hopefully also important to the Board is from the receiver standpoint, the hardware that's in this receiver, it makes no difference whether the two carriers are ones that are both originating from a device that's transmitting an LTE signal or originating from a Wi-Fi signal and a Bluetooth signal. As my opponent said, one of the things that carrier aggregation covers -- and this is described in the 356 Patent -- is intra-band carrier aggregation where the two carriers are distant from one another on the spectrum, they're not next to one another, they're not adjacent or even within the same, you know, mid-band/low-band/high-band. And from the receiver hardware standpoint receiving an intra-band carrier-aggregated signal is no different than receiving a signal that originated from Wi-Fi and from Bluetooth. Those two things are the same. And I would point the Board to Exhibit 1339 at paragraph 33 on this point, and this is -- this is Dr. Fay's testimony that it is not as though two carriers that somehow travel down a different side of the wire or do something else just because they are one originating from Bluetooth and one originating from Wi-Fi. They hit the RF input. They are on the same input together. And that's true whether they both originated as an LTE transmission or they originated as

Wi-Fi and Bluetooth transmission.

JUDGE MOORE: But they're using a different protocol. I mean, they're actually, at least in Lee, there are different types of signals going to different segments or different segments of the circuitry, right, and you're turning one or the other off to turn off an entire type of radio, not to slice up one type of radio signal?

MR. LANTIER: When you get to the digital base band, then there's going to be some distinction made. From the perspective of what's in the claims in the 356 Patent and what 356 Patent describes, no, that's not right. In terms of what the RF front end circuitry is going to do, it makes no difference, and the circuitry doesn't know what the origins of the original transmission were or whether they contain related information or not. And it also doesn't direct that information to where it's going to end up in the RF -- in the baseband circuitry based on its origin.

JUDGE MOORE: But I guess my question is in Lee, there is no teaching that you turn the segments off individually to turn off individual channels of one specific type of radio signal; is that right?

MR. LANTIER: In Lee, there is no express statement that you could use this for LTE or you could use this for a transmission that originates from a single video and you're transmitting it using a single communications protocol to reach this. But Lee does use broad language in describing that it can be used for the reception of multiple different radio signals.

I'm out of time, but I would like to address just two points that Your Honors raised that I said I would address when I came back to the rebuttal. One is on the factual question of whether the International Trade

Commission initial determination is in the record. The answer is no, and the reason behind that is that when we contacted the Board to alert it to -- to the issuance of the initial determination, the Board asked for the information but did not ask us to submit the initial determination itself, so that is not part of the record, and we were not asked to have that when we contacted the Board about that.

The second is on the Kaukovuori point, Your Honor, where you asked if we would consider the fourth transmission that's shown in Figure 1 to be a carrier-aggregated transmission. The answer would be -- the answer is yes, but the receiver in Kaukovuori is not simultaneous, as I read it, is not simultaneously processing that -- that fourth signal, it's only processing the three. And so from that perspective, it wouldn't be relevant to these claims, because these claims involve an apparatus that can process the signals at the same time.

JUDGE WORMMEESTER: Okay. Thanks. I have a follow-up question. Can you explain to me one more time how the signals in Lee are aggregated?

MR. LANTIER: Yes. So in, and I think it may be helpful to do the same -- use the same framing that -- that the Patent Owner Qualcomm used. Think about Hirose. Hirose is a system in which there are three transmissions being made over three carriers, but when those carriers reach the wireless device, because they're all the same information, they're not -- you're not getting aggregated data. You're not getting more data than you would have received if you -- if you had just transmitted one -- one carrier, right. You're getting the same amount of data, it's no additional. It's the

same information.

In Lee, you're not getting the same data, you're getting two different sets of information.

JUDGE WORMMEESTER: And that's -- and that's -- is that undisputed that it's two -- it's --

MR. LANTIER: That is, that was admitted by Patent Owner's expert, and it's in the record in -- in Dr. Fay's declaration. I think I read it in during the opening part there, so it should be in the transcript.

JUDGE WORMMEESTER: Thank you.

MR. LANTIER: And then in the 356 Patent -- I should say in the 356 Patent, we have the same thing as in Lee. In the 356 Patent, it says we -- what we will have is a receiver that has two different local oscillator signals, and that it will be able to take this collection of multiple carriers coming in with different information and output it to the baseband processor. So I would say that aggregation is the same. This is in Dr. Fay's declaration. It's in our reply, but the different carriers with different information are aggregated on the RF input in both Lee and in the 356 Patent in the same way.

JUDGE WORMMEESTER: Okay. Thank you. Okay. You'll have 19 minutes with a 5-minute warning.

MR. COCHRAN: Just a couple quick points for me. First, there's no evidence in the record of any other use of carrier aggregation at the time of the filing of the 356 Patent other than in the context of long-term evolution, LTE. There's no other evidence of that. So you should give that some context in terms of figuring out what does carrier aggregation mean. At the

time, the only evidence we have of record is it was used in that system, in that technical specification.

JUDGE WORMMEESTER: Would you say that the prosecution history supports disclaimer of all contexts aside from LTE?

MR. COCHRAN: No, because you could have some other type of -- I mean, LTE is one standard for transmitting cellular data. In Europe and Asia, they use different standards. So you could have a different standard that isn't LTE but which also uses carrier aggregation to create a wider bandwidth channel. That would not -- something like that would not have been disclaimed.

JUDGE WORMMEESTER: Okay.

MR. COCHRAN: The second point I want to make is Mr. Lantier said you would -- you would only use carrier aggregation in LTE if you were doing high-speed video communication or something like that. And I would submit that there is no evidence that Lee could possibly work with -- with that kind of signal. Lee only discloses a Bluetooth signal and a Wi-Fi signal. And the POSA, if we're going to start with the feasibility study, fine, if you just want to go backwards even though that's what they're doing, the POSA dealing with a wide area high-powered cellular communication system like LTE is not going to go looking for a reference that's directed to an amplifier in a reference that's directed to a low-power, short-range communications system, and that's Lee. And they speculate that while Lee's circuitry would work fine with the cellular signals, there's no evidence that that's true. There's just speculation. I would submit that if you have a Bluetooth radio in your cell phone, that it's probably not going to work with

a signal coming from a cell phone tower. With that I'll finish unless there's any questions.

JUDGE WORMMEESTER: No, thank you.

MR. COCHRAN: Thank you.

JUDGE WORMMEESTER: That concludes our hearing. Thank you to both parties for your time. The case is submitted and the hearing is adjourned.

(Whereupon, at 2:59 p.m., the oral hearing was concluded.)

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