

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD

4
5 COMCAST CABLE COMMUNICATIONS, LLC,

6 Petitioner,

7 v.

8 ENTROPIC COMMUNICATIONS, LLC,

9 Patent Owner.

10
11 Patent No. 8,284,690

12 Inter Partes Review No.: IPR2024-00430

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14
15 DEPOSITION OF JAMES BERTONIS

16
17 Palo Alto, California

18 Wednesday, November 13, 2024

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23 Stenographically Reported By:

24 Hanna Kim, CLR, CSR No. 13083

25 Job No. 7019578

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ENTROPIC EXHIBIT 2002

Comcast v. Entropic

IPR2024-00430

Page 2 1 UNITED STATES PATENT AND TRADEMARK OFFICE 2 _____ 3 BEFORE THE PATENT TRIAL AND APPEAL BOARD 4 _____ 5 COMCAST CABLE COMMUNICATIONS, LLC, 6 Petitioner, 7 v. 8 ENTROPIC COMMUNICATIONS, LLC, 9 Patent Owner. 10 11 Patent No. 8,284,690 12 Inter Partes Review No.: IPR2024-00430 13 _____ 14 15 Deposition of JAMES BERTONIS, taken on 16 behalf of the Patent Owner, at the law offices of 17 K&L Gates LLP, at 620 Hansen Way, Palo Alto, 18 California 94304, on Wednesday, November 13, 2024, 19 before Hanna Kim, CLR, Certified Shorthand Reporter, 20 No. 13083. 21 22 23 24 25	Page 4 1 INDEX OF EXAMINATION 2 3 WITNESS: JAMES BERTONIS 4 EXAMINATION PAGE 5 BY MR. GALLUZZO: 6 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25
Page 3 1 APPEARANCES OF COUNSEL: 2 3 For Petitioner: 4 BANNER & WITCOFF, LTD. 5 BY: CRAIG W. KRONENTHAL, ESQ. 6 BY: CAMILLE SAUER, ESQ. 7 1100 13th Street N.W., Suite 1200 8 Washington, D.C. 20005 9 202.824.3000 10 ckronenthal@bannerwitcoff.com 11 csauer@bannerwitcoff.com 12 13 14 For Patent Owner: 15 K&L GATES LLP 16 BY: VINCENT J. GALLUZZO, ESQ. 17 300 South Tryon Street, Suite 1000 18 Charlotte, North Carolina 28202 19 704.331.7400 20 vincent.galluzzo@klgates.com 21 22 23 24 25	Page 5 1 INDEX OF EXHIBITS 2 3 IPR EXHIBITS REFERENCED PAGE 4 IPR Exhibit 1002 10 5 IPR Exhibit 1001 14 6 IPR Exhibit 1013 66 7 IPR Exhibit 1007 84 8 IPR Exhibit 1010 116 9 IPR Exhibit 1011 116 10 (IPR Exhibits not attached hereto.) 11 --o0o-- 12 13 14 15 16 17 18 19 20 21 22 23 24 25

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Page 6 1 Palo Alto, California 2 Wednesday, November 13, 2024 3 9:03 a.m., Pacific Standard Time 4 --o0o-- 5 6 JAMES G. BERTONIS, 7 having been duly administered an oath, 8 was examined and testified as follows: 9 10 EXAMINATION 11 BY MR. GALLUZZO: 12 Q. Good morning, Mr. Bertonis. 13 A. Good morning. 14 Q. I'm Vince Galluzzo. I represent Entropic 15 on these matters -- or, I guess, this one matter. 16 I understand you've been deposed recently 17 in the Entropic matters; is that right? 18 A. Yes. 19 Q. That was in Washington, D.C.? 20 A. Yes. Two weeks ago. 21 Q. Now, I'll go over a couple of ground 22 rules, but they're going to be the same as the one 23 that my colleague Mr. Halverson told to you. 24 The first one, which I think is the most 25 important, is I'm going to try to ask questions with	Page 8 1 A. No reason. 2 Q. Mr. Bertonis, what is a probe? 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: In the realm of networking? 5 BY MR. GALLUZZO: 6 Q. In the context of the '690 patent, what is 7 a probe? 8 A. Well, I can give examples. That's the 9 best way I can define it. 10 Q. Sure. Give me some examples. 11 A. So assessing the network environment. It 12 could also be used for looking for users on the 13 network in the context of probing to find users. 14 Generally it's used to assess the network 15 environment. 16 Q. And what do you mean "used to assess the 17 network environment"? 18 A. Testing the communications path. 19 Q. What do you mean by "communications path"? 20 A. Well, I guess I can give examples. 21 Q. Sure. 22 A. If there was a noisy environment, you 23 would probe to a user on the network and look for an 24 answer. And in some cases that answer would -- 25 would be the probe response. So that would be an
Page 7 1 as much clarity as I can. 2 If you don't understand one of my 3 questions or need clarification, I'd ask you to 4 please ask me. 5 Do you understand that? 6 A. Yes. 7 Q. Okay. And if I ask you a question and you 8 answer it, can I correctly assume that you 9 understood my question enough to answer it? 10 A. I -- yes. 11 Q. There's a court reporter taking down every 12 word we say. That's the written record. 13 I will try my best not to speak over you. 14 I'd ask that you do the same. 15 Is that fine? 16 A. That's fine. Thank you. 17 Q. We can go for however long as you want; 18 but if you need a break, please just ask for one. 19 The only rule is if there's a question 20 pending, you need to answer before we go off the 21 record. 22 Is that okay? 23 A. Yes. 24 Q. Is there any reason you can't give full, 25 fair, and truthful testimony here today?	Page 9 1 example of a probe. 2 Q. I'm sorry, I asked what you meant by 3 "communications path." 4 A. Oh, okay. 5 Q. Can you answer that question? 6 A. Yeah. A communications path would be the 7 environment that the signal travels over. So it 8 could be a cable. It could be a wireless 9 environment. It could be a -- a wire -- twisted 10 pair of wire. That's what I meant by communications 11 path. 12 Q. And when you testified that Generally it 13 is used -- and "it" being a probe -- to assess the 14 network environment and then later testified 15 "Testing the communications path," what -- what did 16 you mean? 17 MR. KRONENTHAL: Objection. Form. 18 THE WITNESS: I -- I guess I'm not sure -- 19 I -- I -- I guess I'm not sure what you're asking. 20 BY MR. GALLUZZO: 21 Q. In your opinions in this case, you have 22 analyzed the claims of the '690 patent against 23 various prior art references. 24 Do you agree with that? 25 A. Yes.

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Page 10 1 Q. And you agree that the '690 patent claims 2 recite a probe? Do you agree with that? 3 A. Yes, they -- they involve a probe, 4 correct. 5 Q. What was your understanding of the 6 word "probe" that you used in your analysis in this 7 case? 8 A. Well, it would be the same understanding 9 that I had of probe in general, which is used -- a 10 signal used to assess the communications path. 11 Q. And that's the plain and ordinary meaning 12 of a probe as it's used in the '690 patent? 13 MR. KRONENTHAL: Objection. Form. 14 THE WITNESS: I'm -- I'm not sure what 15 you're asking. 16 BY MR. GALLUZZO: 17 Q. I see in front of you you have your 18 declaration. I'm guessing that's Exhibit 1002? 19 A. Yes. 20 (IPR Exhibit 1002 referenced.) 21 BY MR. GALLUZZO: 22 Q. To your understanding, is that an 23 unaltered copy? 24 A. Yes. 25 Q. And complete?	Page 12 1 MR. KRONENTHAL: Objection. Form. 2 MR. GALLUZZO: Hold -- hold on with that. 3 I wasn't finished. 4 BY MR. GALLUZZO: 5 Q. And then in your answer you gave a general 6 meaning of probe. 7 Are you telling me that there are three 8 potential meanings of probe, or am I just 9 misunderstanding and there are only two? 10 A. I -- 11 MR. KRONENTHAL: Objection. Form. 12 THE WITNESS: Yeah, I don't think I'm -- 13 I'm limiting it to any number of -- of examples. 14 BY MR. GALLUZZO: 15 Q. Okay. So as I understand from your 16 answers, you have a definition for probe; there's a 17 meaning in the '690 patent for the understanding of 18 probe. 19 Are there any other understandings? 20 We're going to iterate through them. I 21 just want to capture the list at the outset. 22 MR. KRONENTHAL: Objection. Form. 23 THE WITNESS: You're asking me what other 24 people's understanding of probes are or -- I'm -- 25 I'm not sure what you're...
Page 11 1 A. Yes. 2 Q. Okay. So if you go to Paragraph 123 of 3 your declaration -- 4 THE COURT REPORTER: Counsel, can you say 5 that again? What paragraph? 6 MR. GALLUZZO: I'm sorry, 123. 7 THE WITNESS: Okay. I see it. 8 BY MR. GALLUZZO: 9 Q. In that first sentence you state, "My 10 analysis below applies the plain and ordinary 11 meaning of this term," "this term" being probe. 12 A. Yes. 13 Q. I'm asking you what the plain and ordinary 14 meaning of "probe" is. 15 A. So are you -- are you asking what my 16 definition of probe is, or are you asking what was 17 the meaning in terms of the '690 patent? 18 Q. Are the two different? 19 A. Well, I -- I think in -- in general probes 20 can be used for lots of things. And -- and so I 21 would say in the sense that there's a general 22 meaning of probe, that they would be different. 23 Q. So you distinguished between your 24 definition of probe and the meaning in terms of the 25 '690 patent.	Page 13 1 BY MR. GALLUZZO: 2 Q. Well, let's -- let's take it easy, and 3 let's start, what is your definition of a probe? 4 A. Again, I can best give it by example, so I 5 would say assessing a network environment. And -- 6 and, you know, that would be an example of a -- of a 7 probe, what it's used for. 8 Q. Would the meaning of probe, as it's used 9 in the '690 patent, be any different? 10 A. So you're asking me how the -- the '690 -- 11 the -- the '690 patent defines a probe? 12 Q. I'm asking you whether the definition you 13 just gave is any different from the way the '690 14 patent uses the word "probe." 15 A. Well, the '690 patent has examples of -- 16 of probe in the patent, so I think they would be 17 included in assessing network environment. 18 Q. Can I under- -- understand your testimony 19 to mean that the examples of probes in the '690 20 patent are used in assessing the network 21 environment? Is that what you're saying? 22 A. They -- they could be, yes. 23 Q. What is the meaning of probe as it's used 24 in the '690 patent separate and apart from anybody 25 else's understanding or -- or yours outside of the

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Page 14 1 context of the '690 patent? 2 A. Well, can I -- 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: Can -- can I look through 5 the '690 patent and maybe give some examples? 6 BY MR. GALLUZZO: 7 Q. Yeah, of course. 8 I'm handing you Exhibit 1001, which is the 9 '690 patent. 10 (IPR Exhibit 1001 was referenced.) 11 BY MR. GALLUZZO: 12 Q. And as you're looking, my question is a 13 bit broader than examples. So I'll give you the 14 chance to look, but I just want to make sure we're 15 grounded. 16 My question is, what is the plain and 17 ordinary meaning of probe as it's used in the '690 18 patent? 19 A. (Witness reviews.) 20 So generally I would say the -- the probe 21 is a transmission in response to a request from the 22 node that would be receiving the probe. 23 Q. And where do you get that from in '690? 24 A. According -- so I'm looking at page 8, 25 "BRIEF SUMMARY," "According to various embodiments	Page 16 1 applied "the plain and ordinary meaning of the 2 term." [As read] 3 What meaning did you apply in your 4 analysis? Can you provide me with that definition? 5 MR. KRONENTHAL: Objection to form. 6 THE WITNESS: Okay. I'm sorry, can you 7 repeat your question? 8 BY MR. GALLUZZO: 9 Q. In Paragraph 123 of your declaration -- 10 A. Yes. 11 Q. -- you say that you applied "the plain and 12 ordinary meaning of the term." [As read] 13 A. Yes. 14 Q. What meaning did you apply in your 15 analysis? 16 MR. KRONENTHAL: Objection. Form. 17 THE WITNESS: Okay. I -- I would say a 18 request sent by one network node to another network 19 node that specifies the form of the probe to be 20 generated and transmitted. 21 Again, with respect to the '690, I believe 22 you're asking. 23 BY MR. GALLUZZO: 24 Q. Yes. 25 'Cause your analysis was about the '690
Page 15 1 of the disclosed method and apparatus, nodes on a 2 network are programmed to generate a probe 3 transmission in response to a request from the nodes 4 that will be receiving the probe." 5 Q. So it's your testimony that a probe is 6 simply a transmission in response to a request? 7 MR. KRONENTHAL: Objection. Form. 8 THE WITNESS: Well, you're asking me in 9 the context of the '690 patent. 10 Is your -- is your question you just asked 11 in response to the '690 or generally in defining a 12 probe? 13 BY MR. GALLUZZO: 14 Q. In context of '690 patent. 15 A. Generally in the '690 patent, it's a 16 response from the node. It's generating a probe 17 response in -- at -- to a request from the node that 18 will be receiving the probe. That's, in general, my 19 understanding of the context of the '690. 20 Q. Forgive me, but that seems like kind of a 21 circular definition since you're using "probe" in 22 the -- in the definition. 23 A. Well, I'm just reading from the patent. 24 Q. I guess let me put it to you this way: In 25 Paragraph 123 of your declaration, you say that you	Page 17 1 patent. 2 Earlier when I -- we were talking about 3 the understanding of "probe" in the context of the 4 '690 patent, you had said it's a transmission in 5 response to a request. 6 Do you remember that testimony? 7 MR. KRONENTHAL: Objection. Form. 8 THE WITNESS: Probe is a transmission 9 with -- in response to a probe request, correct. 10 BY MR. GALLUZZO: 11 Q. Oh, in response to a probe request. 12 So a probe isn't just any type of message; 13 right? 14 A. I think there's -- the -- the term is 15 widely used, so I'm not sure what you're asking. 16 Q. I'm asking whether a probe is just a 17 message or whether it's a particular kind of 18 transmission or message. 19 MR. KRONENTHAL: Objection. Form. 20 THE WITNESS: It could be very simple. It 21 could be more complex. So I'm not -- I'm not sure 22 how to answer your question. 23 BY MR. GALLUZZO: 24 Q. Are all messages probes? 25 A. Of cour- -- no.

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Page 18 1 Q. So -- withdrawn. 2 What is a probe request? 3 MR. KRONENTHAL: Objection to form. 4 THE WITNESS: A request to send a probe. 5 BY MR. GALLUZZO: 6 Q. Is that the understanding or the plain and 7 ordinary meaning of that term you applied in your 8 analysis? 9 A. Yes. 10 Q. Can you provide -- I'm sorry, were you 11 finished? 12 A. Yeah. I mean, yes, it's -- it's -- yes. 13 Q. Can you provide me a definition for either 14 "probe" or "probe request" that doesn't use the 15 word "probe"? 16 MR. KRONENTHAL: Objection to form. 17 THE WITNESS: So you're asking can I give 18 a definition of a probe or a probe request without 19 using the word "probe"? 20 BY MR. GALLUZZO: 21 Q. Yeah, I'll break it down for you if that's 22 easier. 23 A. Sure. 24 Q. Can you give me a definition of probe that 25 doesn't use the word "probe" as used in the context	Page 20 1 you'd like. 2 MR. GALLUZZO: Yeah, please. Save you 3 some typing. 4 (Record read back by the reporter as 5 follows: 6 Question: "Can there be a probe request 7 in the '690 patent that requests a signal 8 other than for assessing the 9 communications path in the network?") 10 THE WITNESS: (Witness reviews.) 11 Well, I would say that generally all the 12 claims involved the signal path. 13 BY MR. GALLUZZO: 14 Q. What do you mean "the signal path"? 15 A. Path between nodes. 16 Q. I'm not following. 17 What do you mean when you say it would 18 involve the signal path? 19 A. Well, for instance, a claim saying -- 20 identifying a hidden node that would still be going 21 over the signal path and the node could be hidden 22 because of problems on that signal path. 23 Q. If you'd turn back to Paragraph 123 of 24 your declaration, please, the second sentence 25 discusses construction that the Court, in the
Page 19 1 of the '690 patent? 2 A. Signal assessing a network. 3 Q. What part of a network? 4 A. The communications path of the network. 5 Q. Can you give me a definition of probe 6 request that doesn't use the word "probe," and, 7 again, as it's used in the context of the '690? 8 A. A message requesting a signal be sent 9 back. 10 Q. And "a signal" meaning a signal for 11 assessing the communications path in the network? 12 A. Generally, but not limited to. 13 Q. Can there be a probe request in the '690 14 patent that requests a signal other than for 15 assessing the communications path in the network? 16 A. Are you talking about the claims or the -- 17 the -- overall in the -- in the patent discussion -- 18 Q. In the claims. 19 A. -- background? 20 And can you repeat the question again? 21 What? 22 Q. Sure. 23 MR. GALLUZZO: Is it easier for you if I 24 read it or if you read it back? 25 THE COURT REPORTER: I can read it back if	Page 21 1 Charter case, gave. 2 Are you familiar with that construction? 3 A. I've seen it mentioned. 4 Q. Yeah. And I think -- I think you actually 5 have it written here in full, so I'll just give you 6 a moment -- 7 A. Yeah. Okay. 8 Q. -- to read it, and then you let me know 9 when you're ready for the next question. 10 A. Reading Paragraph 123? 11 Q. To yourself. 12 A. Okay. 13 Q. The second sentence. 14 A. Okay. 15 Q. Do you agree that that construction is one 16 way of describing the plain and ordinary meaning of 17 the word "probe"? 18 A. Well, I understand that that case 19 construed it that way. 20 Q. Do you agree? 21 A. You're asking me to comment on that case 22 or -- 23 Q. I'm asking you to comment on that 24 construction. 25 A. Ba- -- basically I was told that the

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Page 22 1 Charter case has that construction, so I guess -- 2 I'm not sure what you're asking. 3 Q. Well, you're -- you're an expert in this 4 field; right? 5 A. In communications, yes. 6 Q. And in the field of probes and probe 7 responses? 8 A. Yes. 9 Q. And you've analyzed the '690 patent in 10 detail? 11 A. Yes. 12 Q. You've analyzed the prior art in detail? 13 A. Yes. 14 Q. You've given assessments of what is and 15 what is not a probe? 16 A. Yes. 17 Q. So with all of that, are you able to tell 18 me whether the construction from the Charter court 19 that you've copied in Paragraph 123 is one way of 20 correctly describing the plain and ordinary meaning 21 of a probe in the '690 patent? 22 A. Well, all I can say is that's how it was 23 described in the Charter case. That doesn't 24 necessarily -- it's not a limitation that I myself 25 have.	Page 24 1 Is there any part of the Charter case's 2 construction of probe that you disagree with that 3 you think is not a proper characterization of what a 4 probe is in the '690 patent? 5 MR. KRONENTHAL: Objection. Form. 6 THE WITNESS: I did not study the Charter 7 case, so I -- I don't have an opinion on a case I 8 didn't study. 9 BY MR. GALLUZZO: 10 Q. Let's forget about the Charter case. 11 Let's just look at the quoted language in Paragraph 12 123 starting "a signal" and ending "was 13 transmitted." 14 Do you see that? 15 A. "A signal transmitted" under -- in quotes, 16 yes. 17 Q. Yeah, that -- that whole quoted portion, 18 do you see that? 19 A. Yes. 20 Q. Forget about the Charter case for a 21 moment. I want you to just focus on that language 22 for a minute. 23 Are you with me? 24 A. Okay. 25 Q. Do you agree that that language is an
Page 23 1 Q. Can you give me any assessment of that 2 construction? Withdrawn. 3 Do you agree with that construction? 4 A. I mean, I don't have an opinion one way or 5 the other on that construction. 6 Q. Do you disagree with that construction? 7 A. I don't agree or -- I just have no 8 opinion. 9 Q. So you don't agree or disagree? 10 A. Again, I understood it was used in that 11 case. But other than that, my opinion would be 12 there could be a reference signal, or there doesn't 13 have to be a reference signal, if -- if that's what 14 you're asking. 15 Q. Yeah, maybe we can break it down because 16 the meaning of the word "probe" I think is important 17 in this case. 18 And what I'm trying to figure out is, do 19 you have an opinion on that beyond what you've 20 stated in Paragraph 123? Are we going to see new 21 opinions later? 22 I want to know what -- what your thoughts 23 are. So that's not a question. That's me telling 24 you why I'm getting at this. 25 So -- so here's my question.	Page 25 1 appropriate way of describing the plain and ordinary 2 meaning of what a probe is in the '690 patent? 3 A. Well, I would say a reference signal's not 4 required, so... 5 Q. Okay. So can I take that to mean you 6 disagree with the inclusion of a reference signal? 7 A. Not necessarily. I -- I think you could 8 have a reference signal in a probe, but it's not 9 re- -- a requirement. 10 Q. Is there anything else in that language 11 that is not a requirement of the probe? 12 A. (Witness reviews.) 13 I'm -- I'm not sure if this answers your 14 question, but having a -- a signal compared to a 15 reference signal is not a requirement for a probe. 16 So I would -- I would say -- I -- I'm not 17 sure if that answers your question. 18 Q. Would you agree that probes in the '690 19 patent are used "to determine characteristics of the 20 channel on which the signal was transmitted"? 21 That's the latter portion of that quote 22 there. 23 A. You're asking a -- a signal to determine 24 characteristics of the channel that the probe was 25 transmitted on? Is that your question?

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Page 26 1 MR. GALLUZZO: Would you mind reasking the 2 question? 3 (Record read back by the reporter as 4 follows: 5 Question: "Would you agree that probes in 6 the '690 patent are used 'to determine 7 characteristics of the channel on which 8 the signal was transmitted'? That's the 9 latter portion of that quote there.") 10 THE WITNESS: Generally, yes. 11 BY MR. GALLUZZO: 12 Q. Now, the last sentence of Paragraph 123 13 you say, "However, this does not change my analysis 14 below." 15 Can you point me to anywhere in your 16 declaration where you analyze the prior art against 17 the '690 patent in relation to a reference signal? 18 A. I -- I'd have to look through and see. 19 Q. Are you familiar with the content of your 20 declaration? 21 A. Yes. 22 Q. Did you write it? 23 A. Yes. 24 Q. Every word? 25 A. Well, it was -- it was a collaboration.	Page 28 1 A. That could be. 2 Q. You said it was a collaboration. What did 3 you mean? 4 A. We -- it would go back and forth. 5 Q. With whom? 6 A. With my -- the lawyers and my team. 7 Q. Who's your team? 8 A. Craig and Camille. 9 Q. I'm sorry. You said, the -- the lawyers 10 and my team, are those different two entities? 11 A. No, I meant, I was referring -- 12 Q. Okay. 13 A. -- to the lawyers here present with me as 14 my team. 15 Q. You don't have someone else apart from 16 lawyers that's working with you on this matter? 17 A. With me, no. 18 Q. Do you have other people at your company 19 that help you with expert witnessing matters? 20 A. No. 21 Q. Since your declaration was submitted, if 22 it helps, the date was February 15th of this year, 23 how much time approximately have you spent on this 24 particular matter? 25 A. I'm just going to -- again, I don't have
Page 27 1 Q. How long did that collaboration take? 2 A. Well, months. 3 Q. How many hours did you spend on this 4 particular declaration? 5 A. I -- I haven't calculated my hours. I -- 6 I don't know the exact number. 7 Q. How about a ballpark? 8 A. Including -- so are you saying actually 9 drafting it or background work that went into it? 10 Q. For this particular case -- 11 A. Yes. 12 Q. -- on the '690 patent? 13 A. Yes. 14 Q. All work up until the date it was 15 submitted. How long did that take? 16 A. Okay. So all work, including re- -- 17 patent reviews and research and -- 18 Q. Correct. 19 A. I'm just ballparking this 'cause I don't 20 have the number. But I'll say 60 to 100 hours. 21 Q. How many of that 60 to 100 hours did you 22 spend preparing, meaning actually drafting or 23 revising this declaration, Exhibit 1002? 24 A. Half. Just ballparking. 25 Q. So somewhere from 30 to 50?	Page 29 1 the exact number for you. I'd say somewhere between 2 30, 40 hours. 3 Q. What -- 4 A. And honestly, that's -- I'm just trying to 5 guess. 6 Q. That's fine. Is -- is it a -- is it a 7 reliable approximation at least? 8 A. To the best I can answer to you right now. 9 Q. That's all I'm asking for. 10 A. Yes. 11 Q. What did you do with that 30 to 40 hours? 12 A. And this is since -- since February you're 13 asking? 14 Q. Correct. Since the declaration in this 15 matter was submitted, what -- what did you do with 16 that 30, 40 hours on this case? 17 A. Yeah. So I read the -- I'm not sure of 18 the legal term, the report from the patent board. 19 So I reviewed that and had meetings with -- with the 20 attorneys on my team, who you see here. And 21 prepared for my deposition, which is why I'm here, 22 so, you know, prepared for today. 23 Q. Are you engaged in any other matters 24 adverse to Entropic? 25 A. I am.

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Page 30 1 Q. How many more? 2 A. Two. 3 Q. Two others? 4 A. Yes. 5 Q. So three total? 6 A. Yes. 7 Q. Collectively, across all three of those 8 matters, approximately how much time have you spent 9 in total? 10 A. I'm going to have to think for a second -- 11 Q. Please. 12 A. -- because one of them is sort of -- I'm 13 not active on one of them, and one of them I 14 completed. 15 So total hours from day of engagement to 16 today -- 17 Q. Correct. 18 A. -- on all three? 19 I -- I'm just throwing out a -- again, I'm 20 not prepared with any analysis. I don't have 21 invoices in front of me. 22 I'll just say total 200 hours, and there's 23 a wide margin. 24 Q. How wide a margin? 25 A. I -- I don't know. I'm not trying to --	Page 32 1 agreements have you been a part of on the Entropic 2 matters? 3 A. So when you ask retention agreements, I 4 think I only signed one agreement, and it -- and it 5 covered all of my work. 6 Q. Who did you sign that agreement with? 7 A. Well, I worked through an agency, so I 8 don't know the form I signed, but it went through 9 the agency that I am employed through. 10 Q. Who's that? 11 A. Teklicon in San Jose. 12 Q. Very familiar with them. 13 A. Okay. 14 Q. Who do you issue your invoices to? 15 A. To Teklicon. 16 Q. Do you know who Teklicon passes your 17 invoices to? 18 A. I would believe it's to (indicating) 19 Connor -- Ban- -- Ban- -- I'm sorry, Banner Witcoff. 20 MR. KRONENTHAL: Banner Witcoff. 21 BY MR. GALLUZZO: 22 Q. The lawyers? 23 A. The lawyers. 24 Sorry. Thank you. 25 Q. It's entirely possible I missed it. Do
Page 31 1 honestly, I'm not trying to be evasive. I -- I 2 don't know. I can tell you I recently submitted a 3 [verbatim] invoice, and it was approximately 4 90 hours for last month, and that was fairly 5 intensive across two patents. 6 Q. Why was -- 7 A. And it -- it included some of this work 8 and work on the patent that I was deposed for in 9 Washington two weeks ago. 10 Q. Why was last month fairly intensive? 11 A. Because I was preparing for two 12 depositions, this one and the one in Washington two 13 weeks ago. 14 Q. And this isn't particularly a memory test 15 on your invoices. It's not, you know, something 16 that you need to have here with you today. But to 17 the best of your ability, sitting here today, is 18 200 hours a reasonably approximate estimate of the 19 amount of time you spent across the three matters 20 you've been adverse to Entropic? 21 A. As -- as best I can estimate. 22 Q. When were you engaged? 23 A. I believe it was December of last year, 24 December 2023. 25 Q. How many retentions or retention	Page 33 1 you state in your declaration what your hourly rate 2 is? 3 A. I'm not sure. But I can -- my hour -- I 4 can tell you my hourly rate is \$350 per hour. 5 Q. Do you know if Teklicon charges a 6 different rate for your time? 7 A. I'm almost certain they do. 8 Q. Do you know what their markup is? 9 A. I believe I'm going to -- again, I don't 10 know this factually because I'm not privy to the 11 business agreement between the law firm and 12 Teklicon. But generally, it's 50 percent. And I'm 13 going to -- with the caveat that I don't see that, 14 I'll just say, probably it's 50 percent. 15 Q. Yes or no, have you had communications 16 with lawyers regarding these Entropic matters? 17 A. With -- I have -- 18 Q. With any lawyers. 19 A. Well, with the lawyers at Banner Witcoff, 20 yes. 21 Q. Have you had communications with lawyers 22 other than at Banner Witcoff? 23 A. On this matter? 24 Q. On any of the Entropic matters. 25 A. No.

Page 34 1 Q. Have you had communications with anyone 2 who you understood to be at Comcast? 3 A. No. 4 Q. Have you had communications with anyone 5 who you understood to be at Cox? 6 A. No. 7 Q. Have you had communications with any 8 attorneys you understood to be representing Cox? 9 A. No. 10 Q. Have you exchanged any e-mails other than 11 with the attorneys at Banner Witcoff relating to 12 this case? 13 A. No. 14 MR. KRONENTHAL: And -- 15 THE WITNESS: Oh, I'm sorry. 16 MR. KRONENTHAL: Just to make sure, 17 don't -- yeah. 18 MR. GALLUZZO: Yeah, it's a yes -- 19 MR. KRONENTHAL: Don't share the content 20 of the communications. But you can answer the 21 question as stated. 22 MR. GALLUZZO: Thank you. I'm sorry I 23 didn't mean to overtalk. I'll just re-ask the 24 question. 25 BY MR. GALLUZZO:	Page 36 1 Q. -- as Exhibit 1002, or 1002. Sometimes I 2 might refer to it as that. I'll just call it your 3 declaration. 4 Are you there with me at Paragraph 123? 5 A. Yes. 6 Q. Okay. In your declaration, did you apply 7 in your analysis the plain and ordinary meaning of 8 the term "probe" as we've been discussing, did you 9 apply the construction in the Charter case, or did 10 you apply something else? 11 MR. KRONENTHAL: Objection. Form. 12 THE WITNESS: Well, I applied the plain 13 and ordinary meaning of the term "probe." 14 BY MR. GALLUZZO: 15 Q. So you did not apply the construction in 16 the Charter case; is that correct? 17 MR. KRONENTHAL: Objection. Form. 18 THE WITNESS: Well, if you're re- -- 19 referring to a reference signal, I -- I wasn't 20 taking that as a requirement. 21 BY MR. GALLUZZO: 22 Q. So you weren't applying in your analysis 23 whether a reference signal needed to be present in 24 the prior art? 25 MR. KRONENTHAL: Objection. Form.
Page 35 1 Q. Yes or no, did you exchange communications 2 with anyone other than attorneys at Banner Witcoff 3 about the Entropic matters? 4 A. Other than billing to Teklicon, no. 5 Q. All right. 6 We got here because we were at Paragraph 7 123 talking about your analysis in relation to the 8 construction in the Charter case. I'll try to ask a 9 more simple question. 10 In your declaration, Exhibit 1002, did you 11 apply the plain and ordinary meaning of "probe" as 12 we've discussed it? 13 A. Can I refer to Exhibit 1002? Do you know 14 what page that's on? 15 Q. Yes. I'm sorry. Paragraph 123. It's the 16 same one -- 17 A. Oh, okay. 18 Q. -- that you're on. 19 A. Okay. 20 Q. I'll start over. 21 A. Oh, so you were referring to the overall 22 dec- -- not an exhibit in the declaration. Okay. 23 Q. Yeah. I'm sorry. The declaration itself 24 is marked in the case -- 25 A. Yes.	Page 37 1 THE WITNESS: Well, I wasn't requiring a 2 reference signal, if that's what you're asking. 3 BY MR. GALLUZZO: 4 Q. I think that answers my question. 5 A. Okay. 6 Q. All right. 7 If you could go to the next section, it's 8 Paragraph 124 and 125 of your declaration. It's 9 talking about "physical layer probe." 10 Do you see that? 11 A. Which -- which paragraph? 12 Q. 125. 13 A. Okay. I'm looking at 125. 14 Q. This -- this paragraph states in the last 15 sentence, "Accordingly, I have applied the plain and 16 ordinary meaning of this term." This term being 17 "physical layer probe." 18 What is the plain and ordinary meaning of 19 physical layer probe? 20 MR. KRONENTHAL: Objection. Form. 21 THE WITNESS: If I'm reading the same 22 section, I don't see where it says "physical layer." 23 It just says, "the Court's construction of 'probe' 24 applies. Accordingly, I have applied the plain and 25 ordinary meaning of this term." [As read]

Page 38 1 Okay. The ti- -- the Title B says 2 "physical layer probe," but it's -- that wording was 3 not in 125. So I was a little thrown off. 4 BY MR. GALLUZZO: 5 Q. You agree with me that in Paragraph 125 6 the reference of "this term" refers to physical 7 layer probe? 8 A. Because it's under B, "physical layer 9 probe," then -- then yes. 10 Q. Okay. So then I'll re-ask. 11 What is the plain and ordinary meaning of 12 "physical layer probe" that you refer to in 13 Paragraph 125? 14 A. Well, again, I -- I can give examples, 15 which -- 16 Q. I want -- I'm sorry. 17 I want the plain and ordinary meaning that 18 you applied in your analysis. Can you give me that? 19 A. Excuse me. 20 Again, it's -- it's -- the easiest way I 21 can do it is -- is giving examples because it's such 22 a general term, it's -- it's difficult to express 23 with -- without giving examples of probes. 24 Q. Okay. Please give me the examples that 25 you know of a physical layer probe that apply to	Page 40 1 that. 2 BY MR. GALLUZZO: 3 Q. So then what meaning do the 4 words "physical layer" have to you as used in that 5 term? 6 A. The probe -- the probe travels on the 7 physical layer. 8 Q. Would that be true of all probes? 9 MR. KRONENTHAL: Objection. Form. 10 THE WITNESS: I'd have to think if it's -- 11 if -- if there's any probe that didn't use the 12 physical layer, but I would say, generally, probes 13 are physical layer probes. 14 BY MR. GALLUZZO: 15 Q. In all of the communication systems that 16 you're an expert in, do any transmissions fail to 17 traverse the physical layer? 18 A. Well, the probe could fail. 19 Q. I'm sorry. Good que- -- good -- good 20 point. 21 In all the communication systems that you 22 are an expert in, are there any transmissions that 23 do not go over the physical layer? 24 A. Well, if it's a network and there's a 25 transmission, it has to go over the physical layer.
Page 39 1 your analysis in this case. 2 A. So a -- a signal that is sent by one node 3 to another network node and generally used to assess 4 the communications channel. 5 Q. That sounds a lot like the plain and 6 ordinary meaning of probe that we discussed earlier. 7 How -- withdrawn. 8 Can you give an example of a physical -- 9 I'm sorry, of a probe that would not be a physical 10 layer probe? 11 MR. KRONENTHAL: Objection. Form. 12 THE WITNESS: Well, all probes need to 13 navigate the physical channel, so they would all, in 14 that sense, be physical layer because even if the -- 15 the probe was generated in the Mac layer, it has to 16 travel over the physical layer. 17 BY MR. GALLUZZO: 18 Q. Well, that's true of all transmissions; 19 right? You don't get somewhere without transversing 20 the physical layer? 21 A. Correct. 22 Q. So are you saying that the words "physical 23 layer" have no meaning? 24 MR. KRONENTHAL: Objection. Form. 25 THE WITNESS: I don't think I'm saying	Page 41 1 Q. So are there any probes, in your mind, 2 that would not be a physical layer probe? 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: Well, I have to -- you're 5 making me have to stop and think. But as the 6 word "probe" is generally used, it would imply going 7 over the physical layer. I'm -- I'm not sure if 8 that answers your question. But -- 9 BY MR. GALLUZZO: 10 Q. In -- in the analysis you applied in this 11 case, did you take "physical layer probe" to have 12 the same meaning as the word "probe" by itself? 13 A. I think generally, yes. 14 MR. GALLUZZO: Let's go off the record. 15 (Short recess taken.) 16 BY MR. GALLUZZO: 17 Q. All right. 18 Mr. Bertonis, I'd like to talk to you 19 about some of the claims of the '690 patent. You've 20 got that in front of you. 21 If you could flip back to the claims. And 22 I I'd like to start with Claim 3. 23 Are you there with me? 24 A. Yes. 25 Q. So this claim lists a number of

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Page 42 1 parameters. 2 A. Excuse me. 3 Q. I'm curious, your view on this claim, does 4 it require all of those parameters A through G; or 5 does it require one of the parameters A through G? 6 A. Well, as I read Claim 3, it says, "at 7 least one of the probe parameters includes," [as 8 read] and then there's A through G. 9 Q. It also has an "and" between F and G. 10 Do you see that? 11 A. Yes. 12 Q. So with the -- with that in mind, is it -- 13 or withdrawn. 14 I'll ask again, what is your view of the 15 scope of this Claim 3? Does it require all of the 16 parameters or just one of them -- or at least one of 17 them, I guess I should say. 18 A. I would say at least one. 19 Q. And that's how you conducted your analysis 20 in the declaration that you've submitted in this 21 case? 22 A. Yes. 23 Q. All right. 24 Let's look at Claim 5. Claims 10 and 18 25 are similar. So feel free to look at any of them.	Page 44 1 noise ratio, timing problems, which would be related 2 to collisions, timing collisions. Those would all 3 be examples of network problems. 4 Q. Is there a difference between a connection 5 problem and a network problem? 6 A. I guess it would depend on the context of 7 how they were being referred. 8 Q. Is that distracting you? 9 A. No. 10 Q. Are all connection problems network 11 problems as well? 12 A. I -- I don't think so. 13 Q. Why not? 14 A. Well, if you're simply not connected, then 15 that's a -- I think there's overlap, but it's -- 16 it's -- can you -- can you repeat your question, 17 I'm -- I'm sorry. 18 Q. Are all connection problems network 19 problems as well? 20 A. I -- I would say not necessarily so. 21 Q. Why not? 22 A. Because you could have a su- -- if -- if 23 you're simply not powered on, that would be a 24 connection problem. But it would be irrelevant of 25 anything occurring over the network.
Page 43 1 But I would like to focus on the word "emulates." 2 Are you there with me? 3 A. Yes. 4 Q. In your analysis in this case, what did 5 you take the word "emulates" to mean? 6 A. I would say "use." 7 Q. And that's true for Claims 5, 10, and 18? 8 A. Yes. 9 Q. All right. 10 I'd like to focus on now Claim 7. Again, 11 Claims 15 and 23 are similar. So feel free to look 12 at those. I'd like to focus on the phrase "network 13 problem." 14 What did you take as the meaning of 15 "network problem" as used in Claims 7, 15, and 23 in 16 your analysis in this case? 17 A. Would you like me to give examples of 18 network problems? 19 Q. Is that the only way you can respond? 20 A. Well, it's the best way. 21 Q. Okay. Let's start there. 22 A. Noise, interference, reflections, hidden 23 users because of connection problems. 24 Q. Any other examples you can come up with? 25 A. Distortion in the signal, poor signal to	Page 45 1 Q. Can you give me any examples of problems 2 in a communication network that you would not 3 consider to be a network problem? 4 MR. KRONENTHAL: Objection. Form. 5 THE WITNESS: Sure. 6 Equipment failure. 7 BY MR. GALLUZZO: 8 Q. Any others? 9 MR. KRONENTHAL: Objection. Form. 10 THE WITNESS: Equipment not turned on. 11 BY MR. GALLUZZO: 12 Q. Any others? 13 MR. KRONENTHAL: Objection. Form. 14 THE WITNESS: I would say anything that 15 caused one node or the other not to operate, that 16 would create a cr- -- connection problem 17 irrespective of the network. 18 BY MR. GALLUZZO: 19 Q. Am I correct in understanding that you 20 view network problem as any problem inherent to the 21 network? 22 MR. KRONENTHAL: Objection. Form. 23 THE WITNESS: I wouldn't say any problem. 24 But generally relating to -- I mean, network 25 problems relate to problems on the network. I'm not

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Page 46 1 sure what you're asking. 2 BY MR. GALLUZZO: 3 Q. You understand the concept of a 4 communications link? 5 A. Generally, yes. 6 Q. You understand the concept of a channel? 7 A. Generally, yes. 8 Q. Would problems in the communication link 9 be considered a network problem in your mind? 10 A. If those problems occurred over the 11 network, yes. 12 Q. Would problems in a channel be considered 13 a network problem in your mind? 14 A. Generally, yes. 15 Q. Is there an exception where it wouldn't? 16 MR. KRONENTHAL: Objection. Form. 17 THE WITNESS: Well, it -- it really gets 18 into how an individual defines the term "channel" 19 and defines the term "network." I guess every 20 engineer might have nuances on how they refer to 21 those terms. 22 BY MR. GALLUZZO: 23 Q. As used in the '690 patent, how do you 24 understand the term "network"? 25 A. Well, I think it's used fairly generally.	Page 48 1 understand and apply the meaning of that last clause 2 to relate to just the form for the probe, or could 3 those probe parameters also comprise a form of other 4 transmissions as well? 5 MR. KRONENTHAL: Objection. Form. 6 THE WITNESS: I'm sorry, can you repeat 7 the question back? 8 MR. GALLUZZO: Could you read it back, 9 please. 10 THE WITNESS: It's... 11 (Record read back by the reporter as 12 follows: 13 Question: "In your analysis in this case, 14 did you understand and apply the meaning 15 of that last clause to relate to just the 16 form for the probe, or could those probe 17 parameters also comprise a form of other 18 transmissions as well?") 19 MR. KRONENTHAL: And I'll maintain our 20 objection to form. 21 THE WITNESS: So you -- you're asking is 22 the modulation profile just in the probe or is it 23 being used elsewhere? 24 I'm trying to understand the question. 25 BY MR. GALLUZZO:
Page 47 1 So I would say it encompasses the channel, but it 2 can -- the term can extend beyond the actual 3 physical channel. So in many cases, it's just 4 referring to the -- to the -- in some cases, it's 5 referring to the overall service. 6 Q. I'd like to turn to Claim 9. Are you 7 there with me? 8 A. Yes. 9 Q. Under 9 a), the last clause says, "the 10 first plurality of probe parameters comprising a 11 form for the probe including a modulation profile 12 for the probe." 13 Do you see that? 14 A. Yes. 15 Q. In your analysis in this case, did you 16 read that to be limited to the form for the probe, 17 or did you read that to allow the form for the probe 18 and also other communications or transmissions? 19 MR. KRONENTHAL: Objection to form. 20 THE WITNESS: Can you repeat your 21 question? 22 BY MR. GALLUZZO: 23 Q. Yeah. I'll try to ask it a better way. 24 A. Thank you. 25 Q. In your analysis in this case, did you	Page 49 1 Q. Sure. We could take it like that. 2 A. So the probe indicates the modulation 3 profile. That doesn't mean that that same profile 4 couldn't be used beyond the probe. 5 Q. So you read this as saying the first 6 plurality of probe parameters comprising a form for 7 at least the probe; is that right? 8 MR. KRONENTHAL: Objection to form. 9 THE WITNESS: Well, I -- I mean, I take it 10 as it's -- as what it says. "Com-" -- "comprising a 11 form for the probe including a modulation profile 12 for the probe," so I take that claim at face value. 13 BY MR. GALLUZZO: 14 Q. So if a probe parameter comprised a form 15 for all transmissions going forward, including the 16 probe, would that meet that claim requirement -- 17 requirement in your mind? 18 MR. KRONENTHAL: Objection. Form. 19 THE WITNESS: Well, you could use that 20 same modulation profile elsewhere, if that's what 21 you're asking. 22 BY MR. GALLUZZO: 23 Q. I'm not quite sure whether that's what I'm 24 asking. I'll try again. 25 Let's assume a probe parameter told the

Page 50 1 node, use this modulation profile for the probe and 2 also all communications you're going to send me from 3 here on out. 4 Q. Would that satisfy that claim limitation? 5 A. You're saying that the probe request said 6 use this modulation profile both for the probe and 7 elsewhere? 8 Q. If the probe request said use this 9 modulation profile for everything going forward. 10 MR. KRONENTHAL: Objection. Form. 11 THE WITNESS: But it still said use it for 12 the probe, then -- then -- I guess I'm -- I'm not 13 sure how to read that because if the -- if the -- if 14 the parameter su- -- comprising a modulation profile 15 and you use that modulation profile for the probe, 16 then are you asking, could you use that modulation 17 profile elsewhere? 18 BY MR. GALLUZZO: 19 Q. I'll try to ask it a different way. 20 If the probe request said use this 21 modulation profile for everything going forward, 22 would that meet that claim requirement, as you've 23 understood it, in your analysis in this case? 24 MR. KRONENTHAL: Objection. Form. 25 THE WITNESS: Well, if it's still being	Page 52 1 Q. In the network communications that relate 2 to the '690 patent, is the OSI layer model 3 applicable? 4 A. I would say generally, yes. 5 Q. What is the PHY layer? 6 A. The PHY layer is the physical layer. 7 Q. And what does that mean? 8 A. Generally it refers to the layer where the 9 transmission reception occurs, where the circuitry 10 is. There's generally electronic circuitry, and 11 that resides at the physical layer. 12 Q. What is the MAC layer? 13 A. The MAC layer is the media access control 14 layer. That would be the next layer up. 15 Q. How is that different from the physical 16 layer? 17 A. Well, a MAC layer is controlling, is doing 18 media access control. 19 Q. What is media access control? 20 A. By definition, it's -- it's controlling 21 the media. It's the next layer from physical 22 where -- where the data comes from or progresses to. 23 Q. "Media" being the -- the communications 24 medium or media being something else? 25 A. Well, that's a little confusing because
Page 51 1 used in the probe, then it would meet the 2 requirements for the claim. 3 BY MR. GALLUZZO: 4 Q. And that's how you've analyzed that 5 requirement in this case? 6 MR. KRONENTHAL: Objection. Form. 7 THE WITNESS: I guess I would say I 8 understood it to say you're putting -- you're 9 specifying the modulation profile for the probe, but 10 that modulation could be used for other -- that 11 profile could be used for other transmissions. 12 BY MR. GALLUZZO: 13 Q. Are you familiar with the OSI model? 14 A. Layer model? 15 Q. Yes. 16 A. Yes. 17 Q. What is it? 18 A. It's a layer of network -- network layer 19 definitions. 20 Q. Is that OSI layer model applicable to the 21 '690 patent claims? 22 A. I'm not sure what you mean by 23 "applicable." 24 It's a -- because it's applicable to most network 25 communications used presently.	Page 53 1 the physical layer has -- is -- is the medium. So 2 it's -- it's -- you know, I don't have a diagram of 3 OSI in front of me to go through the definitions. 4 Q. I think it is in your declaration if you 5 go to Paragraph 50. 6 A. Okay. 7 Q. Okay. With that in front of you, how is 8 the MAC layer different from the physical layer? Or 9 withdrawn. Let's just start from some baselines. 10 Here's my question. Is the MAC layer 11 something different from the physical layer? 12 A. With the respect to the OSA -- OSI model, 13 yes. 14 Q. The OSI model is an abstraction; it's not 15 like they are different physical communications 16 mediums? 17 A. I'm not sure what your question was. 18 Q. Do you agree that the OSI layer model is 19 an abstraction? 20 A. What do you mean by "abstraction"? 21 Q. Do you agree that the physical layer and 22 the MAC layer are different conceptual layers, not 23 different physical communication mechanisms? 24 A. Well, I'm -- I guess I'm trying to figure 25 out your question.

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Page 54 1 Can you repeat it again? Sorry. 2 Q. Sure. 3 MR. GALLUZZO: Do you mind reading it 4 back? 5 (Record read back by the reporter as 6 follows: 7 Question: "Do you agree that the physical 8 layer and the MAC layer are different 9 conceptual layers, not different physical 10 communication mechanisms?") 11 THE WITNESS: Boy, that's a -- they're -- 12 they're different layers. I don't know how to 13 answer that question. 14 BY MR. GALLUZZO: 15 Q. What's a layer? 16 A. Servicer -- services or responsibilities 17 within the network. 18 Q. So the physical layer has services and 19 responsibilities for the physical communications 20 medium; right? 21 A. Yes. 22 Q. What does the MAC layer have services and 23 responsibilities for? 24 A. Basically transferring the traffic to and 25 from the physical layer.	Page 56 1 the data link layer, so it would then go to the 2 network layer. 3 Q. What is the LLC layer? 4 A. The LLC layer controls data -- data flow. 5 Q. Is that a different layer from the PHY 6 layer? 7 A. Yes. 8 Q. And what services and responsibilities 9 does the LLC layer have? 10 A. Data flow. 11 Q. How is that different from media access 12 control? 13 A. The LLC layer, how is it different than 14 the MAC layer? 15 Q. Sure. That's another way of putting it. 16 A. Well, they're -- they're basically both 17 sublayers of the data link -- I mean, they're -- 18 they're -- they -- they're both in the data link 19 layer. 20 Q. But they are different, right, the LLC and 21 the MAC layers? 22 A. Well, you -- you can divide them 23 differently. 24 Q. So in your typical OSI model, what's the 25 difference in the services and responsibilities of
Page 55 1 Q. So communications, all of them, that are 2 transmitted in a communication network, they go over 3 the physical layer first; is that right? 4 A. Well, I don't -- I don't know if you can 5 say first and second or whatever. They -- it -- 6 the -- the medium is the physical -- is the physical 7 layer, if that's what you're asking. 8 Q. By "medium," we mean the cables or, for 9 wireless, the air? 10 A. Correct. 11 Q. When transmissions are received by a 12 component of the network -- let's call it a node -- 13 is the first services and responsibilities for that 14 taken over by the physical layer -- 15 A. Yes. 16 Q. -- the PHY layer, P-H-Y? 17 A. Yes. 18 Q. After that services and responsibilities 19 is completed at the PHY layer, is that now passed up 20 to the MAC layer services and responsibilities? 21 A. Yes. 22 Q. After that, where does that go, after the 23 MAC layer services and responsibilities are 24 complete? 25 A. Well, the MAC layer's a -- a sublayer of	Page 57 1 the MAC layer versus the services and 2 responsibilities of the LLC layer? 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: Are you asking what's the 5 difference between the LLC layer and the MAC layer? 6 BY MR. GALLUZZO: 7 Q. Yes. 8 A. Well, the best way I can put it is the LLC 9 controls data flow, and the MAC layer transfers the 10 traffic. And that's a ver- -- that's a big 11 generalization. 12 Q. What do you mean by "data flow"? Data 13 flow of what? 14 A. Data flow of the data. 15 Q. From where and to where? 16 A. Well, again, on that model, it's -- it's 17 working -- working between the MAC sublayer and the 18 next layer up, which would be the -- I believe the 19 network layer. 20 Q. I think we covered this already, but I 21 just want to lay the baseline again. 22 In all communications over a 23 communications network, everything goes over the 24 physical layer in transmission; right? 25 A. By "everything," if you mean the -- the

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Page 58 1 data that you're transmitting or receiving, then, 2 yes. 3 Q. Signals, data, anything that's transmitted 4 goes over the physical layer? 5 A. Yes. 6 Q. And through the physical medium? 7 A. Yes. 8 Q. Is there anything in the communications 9 networks that you're an expert on that is 10 transmitted, but not configured using a physical 11 layer parameter? 12 MR. KRONENTHAL: Objection. Form. 13 THE WITNESS: Yeah, when you say 14 "configured," some configuration can occur in the -- 15 in the MAC sublayer. 16 BY MR. GALLUZZO: 17 Q. That wasn't quite my question, so let me 18 try to rephrase. 19 We're talking about communication systems 20 that you're an expert in or assuming that a 21 transmission is being made. 22 Are all transmissions in one way or 23 another configured using physical layer parameters 24 although they might also be configured using other 25 parameters?	Page 60 1 Q. Always are configuring the transmission? 2 A. Not exclusively, but they're always 3 configuring. 4 Q. Earlier we talked about communication link 5 and channel and some other concepts. 6 What is a communication link? 7 A. In its simplest form, a link between two 8 nodes, two users. 9 Q. Where on the OSI model is the 10 communication link represented? 11 A. Well, the communication link would be 12 between the physical layer at one side and physical 13 layer at the other side. 14 Q. So you see the communication link as being 15 the physical link between two nodes? 16 A. The -- well, the phy- -- the physical link 17 is the link that connects the -- the -- the -- that 18 physically connects the two nodes. So I'm not sure 19 if that answers your question. 20 Q. In your analysis in this case, when you've 21 used the phrase "communication link," have you used 22 that to mean the physical connection link between 23 the physical layers of the nodes? 24 MR. KRONENTHAL: Objection. Form. 25 THE WITNESS: Yeah, I -- I guess I'd have
Page 59 1 MR. KRONENTHAL: Objection. Form. 2 THE WITNESS: Can you -- can you repeat 3 the question? 4 BY MR. GALLUZZO: 5 Q. I'll -- I'll re-ask it more simply. 6 A. Okay. 7 Q. Are all transmissions in a communication 8 network configured using physical layer parameters 9 at the very least? 10 A. Yes, they use physical layer parameters. 11 Q. Are there any transmissions in a 12 communication network that are not configured using 13 physical layer parameters at the very least? 14 MR. KRONENTHAL: Objection. Form. 15 THE WITNESS: Well, I -- I believe the MAC 16 sublayer can play a part in that. 17 BY MR. GALLUZZO: 18 Q. I understand. 19 But is -- if -- withdrawn. 20 Is there ever a transmission in a 21 communication network where the MAC sublayer 22 configures the transmission, but the physical layer 23 parameters do not? 24 A. Well, physical layer parameters always are 25 configuring parameters.	Page 61 1 to look at the context of where I cite it to better 2 answer your question. 3 BY MR. GALLUZZO: 4 Q. Yeah, we -- we will. We will. I promise. 5 In your mind, is the communication link 6 different from the channel? 7 A. Again, I'd have to look at the context 8 of -- of -- of -- you know, I'd have to look at 9 examples to see if they're analogous or not. 10 Q. Let's take a step back from your analysis 11 here. 12 In your normal work, do you use the 13 words -- or the phrases "communication link" 14 and "channel" interchangeably when referring to 15 communications? 16 A. I think sometimes I do. 17 Q. Are there times when you don't? 18 A. Well, that's a -- that's a tough question. 19 If I use one word or the other word, I guess I'm 20 referring it one way or another. I -- I'm not sure 21 how to answer your question. 22 Q. Sitting here today, do you understand 23 communication link and channel to be different 24 things or to be the same thing? 25 A. I think in some context they could be the

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Page 62 1 same thing. In some context they could be different 2 things. 3 Q. In what context could they be -- they be 4 different things? 5 A. Well, I -- I guess as an example the 6 communications channel might just be referring to a 7 particular frequency that you're communicating over, 8 and a link might imply that there's more going on. 9 I'm not saying it has to be that way, but 10 I guess that would be an example where the 11 communications link would imply some other thing's 12 going on. 13 Q. Such as an OFDM? 14 A. Sure, which requires a lot of 15 synchronization. 16 Q. So let's talk about OFDM. 17 Are you familiar with that? 18 A. Yes. 19 Q. What does it stand for? 20 A. Orthogonal frequency division. 21 Q. Like division multiplexing or -- 22 A. Well, modulation, and then MA would be 23 mul- -- OFDM multiple access. 24 Q. How many channels or subchannels can be 25 associated with an OFDM signal?	Page 64 1 Q. How do you understand communications link? 2 A. I generally don't use that term. 3 Q. In your normal work? 4 A. It doesn't come up. 5 Q. Okay. If you go to Paragraph 137 of your 6 declaration, the second sentence quotes the IEEE 7 WiMAX standard and uses the phrase "communication 8 link." 9 Do you see that? 10 A. Yes. 11 Q. What's your understanding of what that 12 phrase means there? 13 A. Communications connection. 14 Q. Is that different than the channel? 15 MR. KRONENTHAL: Objection. Form. 16 THE WITNESS: Well, I think they're using 17 link because it's a -- it's a descriptor because 18 OFDM is on many subchannels, so they're probably 19 choosing to use that word. 20 BY MR. GALLUZZO: 21 Q. WiMAX can utilize OFDM; correct? 22 A. Yes. 23 Q. And when WiMAX is utilizing OFDM, is there 24 more than one communication link between a base 25 station and a subscriber station?
Page 63 1 A. Well, I guess implicit, more than one. 2 It's usually a -- a large number. 3 Q. Thousands possibly? 4 A. Possibly. 5 Q. How many communication links can be 6 associated with an OFDM signal? 7 A. Boy, I guess that that depends on how the 8 particular engineer is defining communications link. 9 I mean, it's hard for me to answer that question. 10 Q. In -- 11 (Interruption in the room.) 12 THE COURT REPORTER: Could we take a real 13 quick pause? 14 MR. GALLUZZO: Yeah, let's go off the 15 record. 16 (Off the record.) 17 MR. GALLUZZO: Back on record. 18 BY MR. GALLUZZO: 19 Q. Just to get us back in the line of 20 questioning, I'll kind of re-ask my previous 21 question. 22 How many communication links could be 23 associated with an OFDM signal? 24 A. Can you define what you mean by 25 communications link?	Page 65 1 A. I think generally they're referring to one 2 link. 3 Q. And that's because any two nodes in a 4 WiMAX network -- that's W-I-M-A-X -- have only one 5 communication link between them even though they 6 might have multiple channels or subchannel; correct? 7 A. That's generally correct. 8 MR. GALLUZZO: I'm sorry, I think I 9 said Y. I meant W-I-M-A-X. 10 BY MR. GALLUZZO: 11 Q. All right. 12 Let's talk about that WiMAX standard. 13 I've got it here for you. You probably have 14 everything in your declaration, so if you need 15 something else, you let me know. I'm going to come 16 around for it. 17 A. Is it better in a binder if I have to 18 refer to a page? 19 Q. I'm happy for you to refer to whatever you 20 want. I didn't know whether we were going to have 21 copies, so I made one. But you tell me your 22 preference. 23 A. It depends how often I'm going to be 24 shuffling through pages. 25 Q. Why don't we just use the binder, then.

Page 66 1 So we're looking at Exhibit 1013. 2 (IPR Exhibit 1013 was referenced.) 3 BY MR. GALLUZZO: 4 Q. You have that there in front of you? 5 A. Yes. 6 Q. And to the best of your understanding, is 7 the copy you have an unaltered copy? 8 A. To the best of my understanding, yes. 9 Q. Okay. So I'd like to talk about ranging 10 in the WiMAX standard. And I think some of the 11 pages you refer to generally are pages 174 to 177, 12 just to give you a -- a guiding point. But don't 13 feel limited to those pages if you want to look 14 elsewhere. 15 THE COURT REPORTER: Mr. Bertonis, do you 16 mind scooching over just a little bit? 17 Thank you. Thank you. 18 THE WITNESS: (Witness reviews.) 19 Okay. Could -- could we take a bathroom 20 break? 21 MR. GALLUZZO: Yeah. Let's go off the 22 record. 23 (Short recess taken.) 24 BY MR. GALLUZZO: 25 Q. All right.	Page 68 1 Q. Now, ranging has a -- at least the way I 2 understand it, a distance connotation to it. 3 Does ranging have anything to do with 4 determining or accounting for distance in WiMAX? 5 A. Well, to the extent it's adjusting power 6 levels, distance would be a factor in power levels. 7 Q. Does WiMAX seek to account for distance by 8 adjusting power levels? 9 A. That could be an example. 10 Q. WiMAX is also used for making timing 11 offsets needed for communication; right? 12 A. I -- I think you meant ranging. You said 13 "WiMAX." 14 Q. I'm sorry, you're right. 15 Ranging is also used for making timing 16 offsets needed for communication; right? 17 A. Yes. 18 Q. When a power level change is made, that is 19 a -- essentially an increased -- withdrawn. 20 What is a power level change? 21 A. Change in the power. I'm not trying to be 22 funny. 23 Q. No. 24 Po- -- power of the transmission; correct? 25 A. Yes.
Page 67 1 Mr. Bertonis, I'd like to talk to you 2 about ranging and specifically ranging in the WiMAX 3 standard. 4 Can you explain to me at a high level what 5 ranging is? 6 A. In WiMAX? 7 Q. In WiMAX. 8 A. Can I use a blackboard? 9 Q. Can you explain to me in words? 10 A. Yeah, I'll try. 11 So as in any communications link, you want 12 to make optimizations. And so in -- in a basic 13 high-level form, a -- well, first of all, backing 14 up, in WiMAX we have a base station; we have 15 subscribers. 16 So at a very high level, a subscriber 17 would send a ranging request to the base station. 18 And base station would send a ranging response back 19 to the subscriber station. 20 And there -- in -- in that process, 21 there's adjustments made because, especially going 22 over a wireless link, it's important to adjust, for 23 instance -- and I just give them as examples -- 24 power and -- power level and timing. 25 So that would be a very high level.	Page 69 1 Q. So the transmitting node would increase 2 its power of transmission to the receiving node? 3 A. Or decrease. 4 Q. Or decrease. 5 But the transmitting node would change the 6 power level at which it is sending a transmission? 7 A. Yes. 8 Q. And a timing offset would be, again, the 9 transmitting node changing the timing or time slot 10 in which it is sending a transmission; right? 11 A. Yes. 12 Q. The physical channel between the first -- 13 the transmitting node and the receiving node stays 14 the same? 15 A. Can you -- can you repeat that? 16 Q. When -- when these adjustments to power 17 and timing offset are made, there's no change to the 18 communication or -- withdrawn. 19 There's no change to the -- hold on. I'll 20 start over. So I'll withdraw that. 21 In the WiMAX ranging process, when there 22 are adjustments to power and timing offset made, 23 there are no changes made to the physical channel 24 between the nodes; correct? 25 MR. KRONENTHAL: Objection. Form.

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Page 70 1 THE WITNESS: I -- I guess how -- in that 2 context, how are you referring to channel? It's -- 3 it's over the channel. 4 BY MR. GALLUZZO: 5 Q. The channel itself is re- -- remains 6 unchanged? 7 MR. KRONENTHAL: Objection. Form. 8 THE WITNESS: Yeah, that's a difficult 9 question because if you're making timing adjustments 10 and your definition of channel is, you know, this 11 megahertz to this megahertz, then that might shift 12 slightly, so you would be, in that example, shifting 13 the channel. So I'm not sure, maybe I -- I -- I 14 guess it's har- -- it's difficult for me to answer 15 that. 16 BY MR. GALLUZZO: 17 Q. And can -- can ranging be understood as a 18 negotiation of communication protocols between two 19 nodes? 20 A. I would change that to com- -- 21 communications parameters. 22 Q. Ranging can be understood as a negotiation 23 of communication parameters between two -- two 24 nodes? 25 A. I think that would be more accurate.	Page 72 1 So it would be sending map containing 2 initial ranging with a broadcast connection ID. 3 Q. The UL map isn't part of the ranging 4 request or the ranging response messages; is it? 5 A. I believe it occurs before. 6 Q. Step two, as shown in Table 115, is the 7 ranging request sent from the subscriber station to 8 the base station; correct? 9 A. That's correct. 10 Q. And that ranging request, at a high level, 11 is asking for some parameters to be changed in the 12 communications between the subscriber station and 13 the base station; right? 14 A. Well, the -- the parameters are changed 15 after the subscriber receives the ranging response. 16 Q. Yes. We're not quite there yet. 17 A. Okay. 18 Q. The ranging request is simply the request 19 to change some parameters; correct? 20 A. Well, that -- that's part of it. That's 21 part of the message, yes. 22 Q. That's the purpose of the message? 23 A. Can you repeat the question? I'm sorry. 24 Q. That's the purpose of the ranging request 25 is to request the base station to change some
Page 71 1 Q. In that process, the subscriber station is 2 asking the base station to change the communication 3 parameters? 4 MR. KRONENTHAL: Objection. Form. 5 THE WITNESS: Well, the -- the first step, 6 it's -- it's sending a ranging request. And -- and 7 then on the response, that can -- that -- once you 8 go through that process, parameters can then change. 9 BY MR. GALLUZZO: 10 Q. Step one is subscriber station sending a 11 ranging request to the base station; correct? 12 A. Yes. 13 Q. And that ranging request can include a 14 request to change to a different downlink burst 15 profile; correct? 16 A. I -- I'd have to refer to the spec to see 17 exactly what's in the ranging request. 18 So can you -- can you re- -- repeat the 19 question, please. 20 Q. Yeah. Let's -- let's look at pages 176 to 21 177. 22 A. That's where I am. 23 Q. Let's go through the steps here. That 24 first transmission, the "UL MAP," what is that? 25 A. (Witness reviews.)	Page 73 1 parameters of communication between the subscriber 2 station and the base station? 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: I'm sorry, can you repeat 5 the question? 6 BY MR. GALLUZZO: 7 Q. Isn't it true that the purpose of the 8 ranging request is for the subscriber station to ask 9 the base station to change certain parameters of the 10 communications between them? 11 MR. KRONENTHAL: Objection. Form. 12 THE WITNESS: Well, the par- -- the 13 parameters are getting adjusted on the subscriber 14 side. So I'm not sure what -- what you're asking. 15 BY MR. GALLUZZO: 16 Q. Isn't it true that the ranging request is 17 a message sent to ask for permission to change 18 communication parameters as between the SS and the 19 BS? 20 A. I don't know if I'd use the 21 word "permission." It's a process. 22 Q. Okay. And the point of that process is to 23 change the communication parameters as between the 24 SS and the BS; correct? 25 A. Yes.

Page 74 1 MR. KRONENTHAL: Objection. Form. 2 THE WITNESS: Oh, sorry. 3 BY MR. GALLUZZO: 4 Q. Yeah, give him a second to object. 5 A. Yeah. 6 Q. But your answer was "yes"? 7 A. Generally, yes. 8 Q. And the ranging response message is the 9 base station telling the SS what parameters to 10 adjust and how to adjust them; correct? 11 A. Yes. And then the subscriber would make 12 a -- would adjust parameters. 13 Q. And after the subscriber adjusts the 14 parameters, is that the end of the ranging process? 15 A. No. It could con- -- it could continue. 16 Q. Is that the end of the ranging process as 17 to that particular coupled ranging request and 18 ranging response? 19 MR. KRONENTHAL: Objection. Form. 20 THE WITNESS: Well, until it -- until it 21 does it again. 22 BY MR. GALLUZZO: 23 Q. Sure. 24 When a -- I'll -- I'll say it differently. 25 When a subscriber station receives a	Page 76 1 A. So your question is, is the subscriber 2 making additional adjustments beyond what was in the 3 ranging response? Is that what you're asking or... 4 Q. Yeah. Good clarification. 5 What I'm really trying to get at is -- 6 withdrawn. 7 I think we've actually gotten our answer. 8 Would it be right to characterize ranging 9 as synchronizing the base station and the subscriber 10 station? 11 A. That's one of the processes that occurs. 12 Q. Kind of like synchronizing watches? 13 A. Similar. 14 Q. You agree that the subscriber station does 15 not compare the ranging response to anything? 16 MR. KRONENTHAL: Objection. Form. 17 THE WITNESS: Yeah, I guess, what do you 18 mean by "compare"? 19 BY MR. GALLUZZO: 20 Q. It's not comparing the ranging response to 21 a known signal? 22 MR. KRONENTHAL: Objection. Form. 23 THE WITNESS: Are you talking about the 24 subscriber station? 25 BY MR. GALLUZZO:
Page 75 1 ranging response message, it changes the parameters 2 it's told to change in the way it was told to change 3 them, and then it does nothing else in relation to 4 that particular ranging response message; correct? 5 MR. KRONENTHAL: Objection. Form. 6 THE WITNESS: Well, if you're asking for 7 that particular sequence, does that complete the 8 sequence, then -- then, yes. 9 BY MR. GALLUZZO: 10 Q. Is there anything on the subscriber 11 station end that's done in response to receiving a 12 ranging response message other than changing 13 communication parameters as told to by the ranging 14 response message? 15 MR. KRONENTHAL: Objection. Form. 16 THE WITNESS: I -- I'd have to look 17 through the spec to definitively answer. I think 18 generally that's correct. But I'd -- I'd have to -- 19 if you -- if I want -- you want me to say 100 20 percent, I'd have to look through the whole entire 21 spec. 22 BY MR. GALLUZZO: 23 Q. The entire spec? 24 A. Well, this section of it. 25 Q. Sure. Why don't you look briefly.	Page 77 1 Q. Correct. 2 A. Is it comparing the ranging response to a 3 known signal? 4 Q. That's the question. 5 A. And by "known signal," you mean, I -- I 6 guess -- it's -- and I'm not trying to be funny, but 7 how do you -- how do you define a "known signal"? 8 Q. A signal that the SS already knows. 9 MR. KRONENTHAL: Objection. Form. 10 Is there a question there? 11 THE WITNESS: Yeah, I mean, he certainly 12 knows previous signals he's received. But I -- can 13 you -- can you repeat the question again? 14 BY MR. GALLUZZO: 15 Q. Does the subscriber station compare the 16 ranging response to a known signal? 17 A. Well, that's not the primary process of 18 the -- of the ranging. 19 Q. Is it any part of the process? 20 A. Well, I -- I'd only say in terms of 21 synchronization, obviously you're in process of 22 synchronization, you have time slots and you're 23 obviously comparing nominal plus and minus. But I'm 24 not sure if that's what you're asking. But, I mean, 25 if you're making a timing adjustment, plus or minus,

Page 78 1 that would be comparing to, say, nominal. 2 Q. You'd agree with me that there's nothing 3 in the ranging process whereby the subscriber 4 station compares the ranging response message it 5 receives to another message to determine the 6 differences between what it received and what it 7 expected to receive; right? 8 MR. KRONENTHAL: Objection. Form. 9 THE WITNESS: Well, I -- I would only say 10 if, for instance, it's -- it's told to move to a 11 frequency, in a sense that's a comparison. But 12 other than something like that, it's not doing like 13 a mapping comparison. 14 BY MR. GALLUZZO: 15 Q. In that example, it would be a comparison 16 of the frequency, not a comparison of a message; 17 correct? 18 A. I'd say generally correct. 19 Q. So as far as your understanding, there's 20 no comparison of messages in the ranging process -- 21 MR. KRONENTHAL: Objection. 22 BY MR. GALLUZZO: 23 Q. -- is there? 24 MR. KRONENTHAL: Form. 25 Sorry.	Page 80 1 Q. Paragraph 191, page 105. 2 A. Okay. I'm on page 105. 3 Q. Are you in Paragraph 191? 4 A. Yes. 5 Q. All right. 6 In this first sentence here, you say "The 7 Ranging Response message is the claimed 'physical 8 layer probe' at least because it is configured 9 to" -- quote -- "maintain the quality of the RF 10 communication link." End quote. [As read] 11 A. Yes. 12 Q. What do you mean when you say, "maintain 13 the quality of the RF communication link"? 14 A. Ad- -- for instance, making power and 15 timing adjustments. 16 Q. How do power and timing adjustments 17 maintain the quality of the RF communication link? 18 A. Well, they're important because power has 19 to do with maintaining the signal to noise, and 20 timing has to do with synchronization. 21 Q. So we're talking about maintaining the 22 ability of the SS and BS to effectively communicate? 23 A. Generally, yes. 24 Q. And that's being done by the timing and 25 power adjustments we've discussed?
Page 79 1 THE WITNESS: Well, that's not the primary 2 process. 3 BY MR. GALLUZZO: 4 Q. Is it any of the processes, primary or 5 not? 6 A. Well, I guess only in the sense that I 7 described making adjustments as referring to a 8 reference point. Other than that, then -- then no. 9 Q. What is CINR? 10 A. Can you re- -- refer to where it's in the 11 spec? 12 Q. If you go to page 13. 13 A. Of WiMAX? 14 Q. WiMAX. Actually, I think we can skip this 15 line of questions. So I'll withdraw the question. 16 Let's go to your declaration at Paragraph 17 191. 18 A. Okay. Can I close this page that I had 19 open for now? 20 Q. Sure. We can always come back to it. And 21 if at any point you need to refer to that exhibit -- 22 A. I better keep it handy. 23 Q. Feel free, yes. 24 A. Excuse me. 25 Okay, which page?	Page 81 1 A. Yes. 2 Q. You go on to say, "which is the PHY 3 layer." I assume you're referring to the RF 4 communication link; is that right? 5 A. Yes. 6 Q. What do you mean when you say the RF 7 communication link is the PHY layer? 8 A. Well, what I'm saying is, it's -- it's 9 maintaining effective communications over the link. 10 Q. I'm sorry. My question was slightly 11 different. 12 What do you mean when you say that the RF 13 communication link is the PHY layer? 14 A. Well, the RF communications, implicitly 15 radiofrequency, implies communications over the PHY 16 layer. 17 Q. But we established earlier that all 18 communications are over the PHY layer. So what is 19 it about the RF communications link that makes it 20 the PHY layer? 21 A. I guess I don't understand your question. 22 The RF communications is over the PHY layer. 23 Q. So is everything the PHY layer? 24 A. No. 25 Q. I'm just trying to understand what you

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Page 82 1 meant when you wrote this in your declaration. 2 A. Well, I'm referring to the ranging 3 response message. 4 Q. When you say "is the PHY layer," what are 5 you saying is the PHY layer in that sentence? 6 A. The RF communications link. 7 Q. What is the RF communications link? 8 A. I don't want to tell you it's the PHY 9 layer, but it's -- it's the communications over the 10 PHY layer. 11 Q. If you go to Paragraph 257 of your 12 declaration, and for context, this is in Element 13 11C, which is "wherein the first probe and second 14 probe are transmitted simultaneously using OFDMA." 15 A. Hold on. I got a -- you're saying 16 Paragraph 257? 17 Q. Yeah. But if you go to the previous page, 18 you can see the claim element it's in relation to. 19 Do you see that? 20 A. Okay. You're referring to "wherein the 21 first probe and second probe are transmitted 22 simultaneously using OFDMA"? Is that what you're -- 23 Q. Correct. 24 A. -- referring to? 25 Okay.	Page 84 1 rangings could be transmitted at the same time. Is 2 that -- is that your question? 3 BY MR. GALLUZZO: 4 Q. And the reason they could be transmitted 5 at the same time is by coincidence? 6 A. Well, I -- I guess not necessarily 7 synchronized between the two base stations, if 8 that's what you mean by "coincidence." 9 Q. Yeah, I -- to that point, I don't see 10 anything in Paragraph 257 or your surrounding 11 analysis that there is some synchronization going 12 on. What you're saying instead is that they are 13 both transmitting and therefore, at some times at 14 least, they might both transmit at the same time. 15 Is that correct? 16 A. I think that's generally correct. 17 Q. All right. 18 I'd like to talk about the Waxman 19 reference now and your opinions in relation to that 20 reference, which is Exhibit 1007. 21 (IPR Exhibit 1007 was referenced.) 22 I've got a copy of it here for you, if 23 you'd like. 24 BY MR. GALLUZZO: 25 Q. If you're looking for it in your
Page 83 1 Q. I'd like to talk to you about your 2 analysis in Paragraph 257. 3 Are you there with me? 4 A. Yes. 5 Q. The way I read this analysis is that 6 you're saying that sometimes by coincidence the two 7 probe responses might be transmitted simultaneously 8 and that that meets the claim requirements. Is that 9 a correct reading of your analysis? 10 A. Can -- can I read it? 11 Q. Yes, of course. 12 A. (Witness reviews.) 13 Okay. Can you repeat your question? 14 MR. GALLUZZO: Would you mind reading it 15 back. 16 (Record read back by the reporter as 17 follows: 18 Question: "The way I read this analysis 19 is that you're saying that sometimes by 20 coincidence the two probe responses might 21 be transmitted simultaneously and that 22 that meets the claim requirements. Is 23 that a correct reading of your analysis?") 24 THE WITNESS: Well, I'm -- I'm saying 25 because there's two base stations, that the two	Page 85 1 declaration -- 2 A. Yeah. 3 Q. -- I think your opinions begin, bottom of 4 page 190. 5 A. Okay. 6 Q. Are you familiar with the Waxman 7 reference? 8 A. Yes. 9 Q. Waxman describes a probe request and a -- 10 I think what it calls a probe response? 11 A. Yes. 12 Q. You'd agree with me that the probe request 13 in Waxman is an instruction for the AP, the access 14 point, to transmit using a different transmission 15 scheme? 16 A. Can I review it briefly? 17 Q. Yes. And I'll direct you to Paragraph 331 18 of your declaration -- 19 A. Okay. 20 Q. -- as one example. 21 A. Sure. 22 Okay. Can you -- sorry, can you repeat 23 the question? 24 Q. Do you agree with me that the probe 25 request in Waxman is an instruction for the AP to

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Page 86 1 transmit using a different transmission scheme? 2 A. Well, requested transmission scheme. 3 In -- in this way, the AP sends communications in 4 different transmission formats. So I think that's 5 generally answering your question. 6 Q. Maybe. Let me try to ask it more simply. 7 Is the probe request in Waxman similar to 8 the ranging request in WiMAX, in that it is a 9 request to adjust some transmission parameters 10 between the two nodes? 11 MR. KRONENTHAL: Objection. Form. 12 THE WITNESS: Well, it's making 13 adjustments, if that's what you're asking. Yeah. 14 BY MR. GALLUZZO: 15 Q. I understand what the nodes are doing. 16 I'm trying to focus on what the message is. So 17 what's the point of the probe request in Waxman? 18 A. What's -- what are they trying to achieve 19 or... 20 Q. Why does it exist? What is its purpose? 21 A. To -- it's generally to optimize a 22 wireless communication system extent -- I mean, they 23 use the word "extend connectivity range." 24 Q. So in Waxman when a probe request is sent, 25 it's sent by the AP; correct? Actually, I think I	Page 88 1 Question: "The purpose of the probe 2 request is for the station to request 3 different communication parameters as 4 between the station and the AP; correct?") 5 THE WITNESS: Well, generally, yes. 6 BY MR. GALLUZZO: 7 Q. The AP may send a response called a probe; 8 right? 9 A. Yes. 10 Q. At least what Wa- -- Waxman calls a probe? 11 A. Yes. 12 Q. And that probe is an acknowledgment 13 message? 14 A. From the AP? 15 Q. Correct. 16 A. Well, it's also using the requested 17 scheme, so it's more than just an acknowledgment 18 because you're using that transmission scheme. 19 Q. Sure. The -- the data conveyed in the 20 probe is no- -- nothing more than an acknowledgment; 21 correct? 22 MR. KRONENTHAL: Objection. Form. 23 THE WITNESS: Well, I think it's more than 24 acknowledgment because it's making changes. 25 BY MR. GALLUZZO:
Page 87 1 have that backwards. 2 A. Yeah, it's -- it's a little confusing. So 3 can you re-ask the question? 4 Q. Yeah. 5 In Waxman, the probe requests are sent by 6 the stations to the AP; is that right? 7 A. I believe that's more correct. 8 Q. And the probe request, the purpose of that 9 is for the station to request different transmission 10 scheme or different communication parameters as 11 between that station and the AP; correct? 12 MR. KRONENTHAL: Objection. Form. 13 THE WITNESS: I'm sorry, can you repeat 14 the question? 15 BY MR. GALLUZZO: 16 Q. The purpose of the probe request is for 17 the station to request different communication 18 parameters as between the station and the AP; 19 correct? 20 A. I'm sorry. Repeat the question. I'm just 21 going back and forth between the nodes. 22 MR. GALLUZZO: That's fine. Would you 23 mind reading it back. 24 (Record read back by the reporter as 25 follows:	Page 89 1 Q. Yes. 2 A. So it's doing things. 3 Q. Is there any information other than 4 acknowledgment conveyed by the probe from the AP to 5 the station? 6 MR. KRONENTHAL: Objection. Form. 7 THE WITNESS: (Witness reviews.) 8 Well, the tr- -- the AP is transmitting 9 data packets back, so... 10 BY MR. GALLUZZO: 11 Q. What's in those data packets other than 12 acknowledgment? 13 MR. KRONENTHAL: Objection. Form. 14 THE WITNESS: Well, for instance, there's 15 an example if it's using 802.11, that it could have 16 a lot of -- a lot of things in that Table 715. 17 But -- but -- but I can -- I can quote from 343 18 probe response includes a packet having a preamble 19 and a data portion. So that implies more than just 20 a simple acknowledgment. 21 BY MR. GALLUZZO: 22 Q. Does it? Can't an acknowledgment also 23 have a preamble and a data portion? 24 A. But that shows that it's more than a 25 simple acknowledgment.

23 (Pages 86 - 89)

Page 90 1 Q. Don't all messages have a preamble portion 2 and a data portion? 3 A. That's an open-ended question. You could 4 have a message that's just one bit, like, 1-0 or -- 5 that's still a message. 6 Q. Well, you're opining in relation to 802.11 7 right now in Waxman. 8 A. No, I was giving that as an example, but 9 343 doesn't require 802.11 in Paragraph 343 so I do 10 specify a preamble and data. 11 Q. In Waxman or in any of the communication 12 protocols that it can encompass, isn't it true that 13 all message transmissions have both a preamble 14 portion and a data portion? 15 MR. KRONENTHAL: Objection. Form. 16 THE WITNESS: I don't think you can say 17 that as a limitation. 18 BY MR. GALLUZZO: 19 Q. Name me one single message in any of the 20 communication protocols that Waxman can use where 21 the message doesn't have a preamble portion and a 22 data portion? 23 MR. KRONENTHAL: Objection. Form. 24 THE WITNESS: You're asking me to not find 25 something? Or I'm -- I'm not sure what you're	Page 92 1 response frame body. 2 Q. But you said you could have a message 3 that's 1, 0, 1, 0 without any preamble portion and 4 without any data portion. 5 How does your Paragraph 352 show that? 6 A. No, I was answering your question. I 7 wasn't referring to my declaration. 8 Q. What communication protocols do you 9 consider yourself to be an expert in? 10 A. By "protocols," you mean standards? 11 Q. Sure. 12 A. And generally speaking, because there's 13 revisions, there's new versions. 14 Q. Yeah. 15 When you say 802.11, you don't have to 16 say -- 17 A. The list [verbatim]. Yeah. 18 Q. So -- 19 A. 802.11. 20 Q. Okay. 21 A. 802.16. 22 Q. That's WiMAX? 23 A. Yes. 24 Q. Okay. 25 A. And DOCSIS.
Page 91 1 asking. 2 BY MR. GALLUZZO: 3 Q. Well, you're apparently confidently 4 opining that having a preamble portion and a data 5 portion means something. 6 A. Yes. 7 Q. I'm trying to determine whether you'll 8 agree with me that that's true of all messages in 9 these communication protocols. 10 MR. KRONENTHAL: Objection. Form. 11 BY MR. GALLUZZO: 12 Q. If you're not willing to agree with me to 13 that, I'd like you to show me an example where 14 that's not true. 15 A. Well, again, you could have a message 16 that's just 1, 0, 1, 0. 17 Q. Does that exist in these communication 18 protocols? 19 MR. KRONENTHAL: Objection. Form. 20 THE WITNESS: What -- what do you mean by 21 these communications [verbatim] protocols, I guess? 22 BY MR. GALLUZZO: 23 Q. Well, does it exist in 802.11? 24 A. Well, if you're referring to my Paragraph 25 352 on the 802.11, there's a pretty extensive probe	Page 93 1 Q. Any particular version? 2 A. Of DOCSIS? 3 Q. Yes. 4 A. 1, 1.1, and 2.0. 5 Q. You don't consider yourself an expert in 6 DOCSIS 3.0? 7 A. Not as much as 2.0. 8 Q. Do you consider yourself an expert in 9 DOCSIS 3.1? 10 A. Less so. 11 Q. Are you at least familiar with those 12 standards? 13 A. Only to the extent I cursory review, but 14 more extensive involvement in DOCSIS 1.0 and DOCSIS 15 2.0. 16 Q. Any other standards? 17 A. Probably. Can I refer to my CV? 18 Q. Sure. 19 A. Wire -- wire line communications, just -- 20 and that's -- I don't want to point to any given 21 protocol, though. 22 Q. Can we just call those the wire line 23 protocols? 24 A. Yeah. 25 Q. Does that include DSL?

Page 94 1 A. Generally, yeah. 2 Q. Of that nature? 3 A. Of that nature. 4 Q. In 802.11, if you're following the 5 standard, can you send a message that is simply 1, 6 0, 1, 0? 7 A. Well, when you say "a message," the -- the 8 payload in the message or, I mean -- that -- that 9 might be what you intended to send, and then you 10 could send it. I -- I guess it's -- it's hard to 11 answer your question. 12 I could -- I guess can you ask the 13 question again. I'm -- I'm not sure. 14 Q. Is there a single transmission that is 15 consistent with the 802.11 standard that does not 16 have both a preamble portion and a data portion? 17 MR. KRONENTHAL: Objection. Form. 18 THE WITNESS: Well, I believe if you're 19 using 802.11, there would be a -- a preamble and a 20 data portion. 21 BY MR. GALLUZZO: 22 Q. For everything? 23 A. There could be test modes where you're, 24 again, just simply sending 1, 0, 1, 0. 25 Q. Without a preamble and without a data	Page 96 1 Q. And that's because all packets do? 2 A. I don't want to be limiting. Generally. 3 Q. Generally, yes? 4 A. Generally, yes. 5 Can I just fill up my coffee? 6 MR. GALLUZZO: Yeah. Do you want to go 7 off the record? 8 MR. KRONENTHAL: Do you want to take a -- 9 THE WITNESS: I -- we don't have to. 10 I'm -- 11 MR. GALLUZZO: Hold on, guys. 12 THE WITNESS: We don't have to -- I just 13 wanted to put some more coffee in my cup. 14 MR. GALLUZZO: Sure. 15 BY MR. GALLUZZO: 16 Q. Are you good? 17 A. Yeah. Yeah. Thank you. 18 Q. All right. Let's go back to Waxman. 19 We got to where we were because we were 20 talking about the probe and what data it has in it. 21 Can you point me to anything in Waxman 22 that indicates that the probe has anything more than 23 a simple acknowledgment in it? 24 A. (Witness reviews.) 25 So you're referring to the probe response?
Page 95 1 portion? 2 A. Sure, you could force the device to just 3 do that. 4 Q. In 802.11, do all packets have a preamble 5 portion and a data portion? 6 A. I would say generally, yes. 7 Q. And that's true of all communications 8 standards; right? I mean, a packet must have a 9 preamble and a data portion; correct? 10 A. Well, I would say generally, but I don't 11 want to limit myself to various test modes or things 12 that you could have the product do that isn't 13 necessarily having that framing. 14 Again, you could have a test mode with a 15 very simple transmission format. 16 Q. Would you consider that test mode to also 17 include packets or transmit packets? 18 A. Could or it could not. 19 Q. Even if it's in a very simple transmission 20 format, it could still consis- -- include a packet? 21 A. It doesn't have to. 22 Q. If it does include a packet, it's still 23 going to have a preamble portion and a data portion; 24 correct? 25 A. Well, generally, yes.	Page 97 1 Q. I think it's just called a probe. But, 2 yes, pro- -- oh, I'm sorry, you're right, probe 3 response. 4 A. So the -- the probe response does include 5 content from the probe request in its payload. 6 Q. Where do you see that? 7 A. My page 200. I -- "A POSITA would have 8 understood that including content from the probe" -- 9 THE COURT REPORTER: Sir -- 10 THE WITNESS: Okay. 11 THE COURT REPORTER: -- sir, if you 12 could -- 13 THE WITNESS: Slow down? 14 THE COURT REPORTER: -- read a little 15 slower into the record. 16 THE WITNESS: Okay. Sorry. I forgot I'm 17 on the record. 18 BY MR. GALLUZZO: 19 Q. Why don't you just point me to the 20 sentence so you don't have to read it all in? 21 A. On page 200, in the beginning, "A POSITA." 22 Q. "A POSITA also would have understood"? 23 A. "A POSITA would have understood that 24 including content from the probe request in the 25 payload of the probe response." [As read]

25 (Pages 94 - 97)

Page 98 1 Q. Oh, I see, halfway down? 2 A. Correct. 3 Q. I understand that's your testimony that a 4 POSITA would have understood that. 5 What do you base that on in Waxman? Point 6 me to something in Waxman. 7 A. So, again, I'm referring to the probe 8 response. So you're asking me to show where's that 9 probe response in Waxman? Is that your question 10 or...? 11 Q. My question is, can you point me to 12 anything in Waxman that indicates that the probe 13 response has anything more in it than a simple 14 acknowledgment? 15 A. Well, the fact that those parameters would 16 be in it points to that it's more than just a simple 17 acknowledgment. 18 Q. Which parameters? 19 A. Parameters for the transmission scheme. 20 Q. Which ones? 21 A. Well, that would be the parameters such as 22 transmission antennas or communication schemes. 23 Q. You're basing that on the text you pointed 24 me to in Paragraph -- I'm sorry, page 200 of your 25 declaration; right?	Page 100 1 that is? 2 MR. KRONENTHAL: Objection. Form. 3 THE WITNESS: (Witness reviews.) 4 I guess I'd sum it up by saying including 5 the content in the probe request and the payload of 6 the probe response is basically more than a simple 7 acknowledgment. 8 BY MR. GALLUZZO: 9 Q. And the including of the content in the 10 probe request in the payload of the probe response 11 is based on your understanding of what a POSITA 12 would understand, not something that's actually 13 stated in Waxman; correct? 14 A. Yes. 15 Q. Okay. 16 MR. GALLUZZO: Let's go off the record. 17 (Lunch recess taken.) 18 BY MR. GALLUZZO: 19 Q. Okay. Mr. Bertonis, I'd like you to turn 20 to Paragraph 330 of your declaration, still talking 21 about Waxman. 22 Are you there with me? 23 A. Yes. 24 Q. The first sentence says, "Waxman describes 25 sending probe request packets over a wireless
Page 99 1 A. And 202. 2 Q. Yeah. 3 So point me to what in Waxman says that. 4 A. (Witness reviews.) 5 So I would say it's more than a simple 6 acknowledgment because if the AP is sending the 7 probe response back, the -- that -- that implicitly 8 shows setting -- setting values, weights, setting a, 9 in this case, beamforming scheme or algorithm. So 10 that's more than a simple acknowledgment. 11 Q. What are you looking at in Waxman? 12 A. I'm looking at my declaration. 13 Q. Where? 14 A. Page 205. 15 But I could also refer to if -- if Waxman 16 was to operate in accordance to 802.11, that if I 17 look at page 207, obviously there's a more extensive 18 frame body of what could be in a probe response. 19 And Waxman does reference 802.11. 20 Q. So when you pointed me to page 205 of your 21 declaration, it cites to Paragraph 26 through 28, 22 31, and 20 of Waxman; correct? 23 A. Yes. 24 Q. And those are the paragraphs that you 25 believe answer my question, the paragraphs of Waxman	Page 101 1 network in order to ascertain transmission 2 parameters of the receiver." 3 What do you mean by "ascertain"? 4 A. Well, the -- the probes are doing certain 5 things to optimize transmission, so that's what I 6 was referring to, opt- -- ascertain parameters and 7 specifying transmission schemes. 8 Q. Could another way of saying that be 9 negotiate transmission parameters? 10 A. I -- I suppose so. 11 Q. I mean, the way I see Waxman -- and please 12 disagree with me if you do disagree -- is that 13 Waxman sends a probe request to change the 14 transmission parameters. Waxman sends a probe 15 response to say, "Okay. You got it." And that's 16 the process. 17 There's no discovery, at -- at least is 18 the way I understand the word "ascertain," of 19 anything. 20 Do you agree with me? 21 MR. KRONENTHAL: Objection. Form. 22 THE WITNESS: Well, there's -- there's 23 discovery of -- of the scheme that was -- was used. 24 BY MR. GALLUZZO: 25 Q. Discovery of a transmission scheme?

26 (Pages 98 - 101)

Page 102 1 A. Yes. 2 Q. So negotiation of a transmission scheme? 3 A. In a way. 4 Q. When you say "discovery," what is being 5 discovered? 6 A. Did I just use this -- that word, or is it 7 in my declaration? 8 Q. You said in your testimony just now 9 there's discovery of the scheme that was used. 10 A. Ah. So what I meant is, is receiving 11 the -- the probe response, is what I was referring 12 to. 13 Q. Okay. And the -- and the receiving of the 14 probe response is receiving of an acknowledgment 15 and -- acknowledgment sent by the transmission 16 parameters requested? 17 MR. KRONENTHAL: Objection. Form. 18 THE WITNESS: Well, there's an 19 acknowledgment, but it's more than just a simple 20 acknowledgment because there is content in the probe 21 request. 22 BY MR. GALLUZZO: 23 Q. Yeah, I understand that's your opinion. 24 What I'm trying to get at is something 25 different.	Page 104 1 the transmission path. 2 Q. Based on what? 3 A. Based on the response that comes back 4 using -- using the requested transmission scheme. 5 Q. How's that an assessment? 6 A. Well, if the scheme doesn't work, that's 7 an assessment. 8 Q. I'm not following. 9 What do you-- what do you mean? Are you 10 saying if the message isn't received, then that's an 11 assessment? 12 A. That would be one case, yes. 13 Q. Okay. So it's your testimony that just by 14 reception of a message, that's an -- an assessment 15 of the network? 16 A. It -- it could be, but not limited to 17 that. 18 Q. Is it in Waxman? 19 A. Okay. Now we've got so many sub-questions 20 that I've lost track. So maybe you can re-ask the 21 question. 22 Q. I'll -- I'll just re-ask the one I just 23 asked. 24 A. Okay. 25 Q. Is the reception of the probe request --
Page 103 1 So the way I read Waxman is as if I say to 2 you, "Mr. Bertoni, let's talk in Mandarin." And 3 you respond to me in Mandarin and say, "Okay." You 4 and I aren't discovering anything. We're just 5 negotiating what language to speak in. 6 Do you see things the same way with 7 Waxman? 8 A. Well, it could be used for that. 9 Q. And that's what Waxman discloses that it 10 is used for? 11 A. I don't want to limit it to that, but you 12 could certainly use it for something like that. 13 Q. But, for example, Waxman isn't used for 14 assessing anything? 15 A. Well, I -- I wouldn't say that's true 16 because if you're -- what they're doing all play a 17 part in the transmissions -- in the transmission; in 18 other words, if you're changing to a different type 19 of beamforming antenna, that's taking into account 20 what works be -- best over that path. So it's a 21 little more than -- than-- it's a little more than 22 that, I would say. 23 Q. What, if anything, is Waxman's process 24 assessing? 25 A. Well, in -- in its process, it's assessing	Page 105 1 probe response in Waxman in your opinion an 2 assessment of the network? 3 MR. KRONENTHAL: Objection. Form. 4 THE WITNESS: Well, it could be. 5 BY MR. GALLUZZO: 6 Q. Is it? 7 A. Well, it -- it can be used for an 8 assessment, so I'd say yes. 9 Q. What assessments? 10 A. The communications path. 11 Q. What about the communications path? 12 A. If the requested scheme worked, then it-- 13 then that's -- and how well it worked, that's -- 14 that's -- you'd understand that that's information 15 you can use to maybe use those antennas or not use 16 those antennas. 17 Q. Where is that described in Waxman? 18 A. Well, they describe different antenna 19 schemes, so I'm giving that example. 20 Q. Where is it described in Waxman that you 21 would understand that whether and how well the 22 requested scheme work could be used to determine 23 whether those antennas should be used or not? 24 A. Well, I'm -- I'm saying that would be a -- 25 a logical -- I guess you could say a POSITA would

Page 106 1 understand you could use it for that. 2 Q. It's your opinion that it would be a 3 logical extension? 4 A. I'd say logical use. 5 Q. It's not the only use, though; right? 6 A. No. 7 Q. There are other uses other than that one? 8 A. Yes. 9 Q. So it's not necessarily the fact that 10 someone would use it for that purpose; they just 11 could? 12 MR. KRONENTHAL: Objection. Form. 13 THE WITNESS: I'd say generally, yes. 14 BY MR. GALLUZZO: 15 Q. Let's go to Paragraph 343. 16 Are you here with me? 17 A. Yes. 18 Q. We talked a bit about this paragraph 19 before. I want to focus on the portion that begins 20 at the beginning of 343 and kind of goes to maybe 21 the top of the next page, page 200. 22 And I'll give you a chance to read, but my 23 question for you is whether it's your testimony that 24 Waxman's probe response is a physical layer probe 25 because it has packets with preambles and data.	Page 108 1 I'd like to skip ahead to Paragraph 427. 2 A. 427? 3 Q. Yes. We're still on Waxman. This time 4 we're talking about Dependent Claim 11. 5 Are you there with me? 6 A. Yeah. 7 Q. So I'm a bit confused here. I'm hoping 8 you can clear something up for me. I'm a bit 9 confused over what, between the stations and the 10 APs, meet the various nodes that are in this claim. 11 Can you help me out with that? 12 And I can break down my question, but 13 that's what I'm trying to get at. 14 Are you able to help me figure that out? 15 A. Well, can I also refer to Waxman? 16 Q. Yeah, of course. You should have it in 17 front of you. 18 A. And you're specifically talking about 19 Paragraph 426 of my declaration? 20 Q. I'm kind of just talking about Dependent 21 Claim 11 -- 22 A. Okay. 23 Q. -- but let's start with 427. 24 And, like I said, I'm going to break down 25 my question, but what I'm going to be asking you is
Page 107 1 A. So I'm reading it, but what's your 2 question again? 3 Q. My question is, is it your testimony that 4 Waxman's probe response is a physical layer probe 5 because it has packets with preambles and data? 6 A. Well, I would say it's a physical layer 7 probe because it goes over the physical layer. The 8 fact that it has preamble and data isn't necessarily 9 what makes it a physical layer probe, but it's a 10 physical layer probe because it's literally probing 11 over the physical layer. 12 Q. Are there any probes that don't go over 13 the physical layer? 14 A. Not in the context we're discussing, but I 15 suppose you could have, you know, in the realm of 16 software and firmware and different layers, you 17 could have presumably other things probing. I'm not 18 an expert in that field, so I don't -- I don't 19 really have an opinion there. I mean... 20 Q. In the field in which you are an expert, 21 though, you'd agree that all probes go over the 22 physical layer? 23 A. Yeah, the physical layer is involved in 24 the probe trans versus the physical layer. 25 Q. All right.	Page 109 1 to tell me what part of Waxman you contend meets 2 some of these elements; like, for example, the first 3 node. 4 A. (Witness reviews.) 5 Q. Are you waiting on a question? 6 A. No. I'm just reading -- trying to read 7 the information. So I think -- but you can -- 8 it's -- you can repeat your question. 9 Q. My first question is, for your analysis of 10 Claim 11, I understand you're saying a station meets 11 the first node requirement. 12 For 11a, what is that station transmitting 13 a probe request to? What is the third node? 14 A. So you're talking about sending a -- a -- 15 transmitting two probes simultaneously? Is that 16 what you're referring to? 17 Q. We'll get there eventually. I'm just 18 trying to figure out the lay of the land, what are 19 the pieces. 20 So I understand that the first node you 21 say is a station. I understand you say the second 22 node is the AP. 23 What's the third node? 24 A. Well, the third node is a third node. 25 Q. Is it an AP? Is it a station? Is it

Page 110 1 something else? 2 A. (Witness reviews.) 3 So if you're asking does Waxman explicitly 4 show two -- two APs, then it doesn't. But I'm 5 basically saying a POSITA would understand that you 6 could send two probes simultaneously. 7 Q. Yeah, that wasn't quite my question. I'm 8 just trying to figure out whether you believe the 9 third node is an AP or a station or something else. 10 If it helps, I think you think it's an AP, 11 but I want to make sure understand that and that's 12 your opinion. 13 A. Well, basically I'm -- I'm saying that you 14 could -- the station could receive a probe from 15 e- -- from two APs. 16 Q. Okay. So a third node would have to be an 17 AP, then? 18 A. I don't know if it would have to be; but, 19 yes. 20 Q. In your opinion, it is? 21 A. Yes. 22 Q. And then you say that this first station 23 would send a probe request to two different APs and 24 then that the APs would each send probe responses 25 back; is that right?	Page 112 1 Q. From two different sources? 2 A. Correct. 3 Q. Now, I understand it's your opinion that 4 OFDMA would have been obvious to using Waxman. This 5 is your analysis on Claim 10. It's at Paragraphs 6 422 to 425. 7 What about Waxman disclosing OFDM 8 communications makes OFDMA obvious? 9 A. I'm trying to parse your question. 10 So you -- you're asking what in Waxman 11 makes OFDM obvious or what makes OFDM obvious to use 12 in Waxman? 13 Q. I believe Waxman explicitly discloses 14 OFDM; is that right? 15 A. Let me just look through, but I -- I think 16 it's mentioned, yes. 17 Q. Waxman does not explicitly disclose OFDMA; 18 is that correct? 19 A. Can I just briefly look through? 20 Q. Sure. 21 A. Just -- just looking through, I don't see 22 OFDMA mentioned, so that's correct. 23 Q. So what is it about Waxman's disclosure of 24 OFDM that in your mind makes use of OFDMA obvious? 25 A. Well, just looking at Para- -- Paragraph 9
Page 111 1 A. I guess that would be one scenario. 2 Q. So the probe responses are coming from two 3 different locations? 4 A. Yes. 5 Q. And that's -- that's your opinion? Not 6 just one scenario, but your -- that's what your 7 opinion is? 8 A. Well, that it -- that it could receive the 9 two probes simultaneous, yes. 10 Q. The station could receive the probes 11 simultaneous? 12 A. From two different APs. 13 Q. Using OFDMA? 14 A. Presumably. 15 Q. But they would be different OFDMA 16 channels; correct? Withdrawn. 17 They would be different OFDMEA -- OFDMA 18 signals because they'd be coming from different 19 OFDMA sources? 20 A. Correct. 21 Q. So it's not your opinion that the first 22 probe and second probe are transmitted 23 simultaneously over the same OFDMA signal; correct? 24 A. Well, it would have to be two signals 25 from -- it would have to be two signals.	Page 113 1 on page 5 of Waxman, and I think you are kind of 2 pointing me to the section talking about the 3 different standards -- 4 Q. Mm-hmm. 5 A. -- so it lists FDM, OFDM -- 6 THE COURT REPORTER: I'm sorry, can you 7 start that sentence over. "So" what? 8 THE WITNESS: So -- so looking at page 5 9 of Waxman Paragraph 9, there's a section talking 10 about modulation standards, and I -- I agreed OFDMA 11 was not in there. 12 But I do see TDMA and CDMA, and it's 13 pretty easy to understand, you know, that OFDMA 14 could also be in there given that they do list TDMA 15 and CDMA and the WCCDMA and CDMA2000, that there's 16 no reason you wouldn't also say OFDMA could be in 17 there. 18 BY MR. GALLUZZO: 19 Q. If that's true, why didn't Waxman just 20 list OFDMA? 21 A. I can't answer that. 22 Q. There had to be a reason; right? 23 A. You're asking me to speculate on who wrote 24 the patent. I can't do that. 25 Q. Well, you are analyzing it in determining

Page 114 1 what one of skill in the art would have understood 2 from reading it. So if one of skill in the art is 3 reading this and sees that OFDMA is not listed, 4 wouldn't they think there was a reason it wasn't 5 listed? 6 MR. KRONENTHAL: Objection. Form. 7 THE WITNESS: I don't think so. 8 BY MR. GALLUZZO: 9 Q. So you're saying even though OFDMA is not 10 listed, even though a bunch of other communication 11 standards are, a person of skill in the art would 12 just put it in there anyway? 13 A. In particular, because other multiple 14 access schemes are, I would say yes. 15 Q. And it doesn't bother you at all that it's 16 not listed explicitly, even though it could have 17 been? 18 A. Not particularly. 19 Q. This patent application -- withdrawn. 20 Are there any drawbacks about u- -- using 21 OFDMA instead of OFDM? 22 A. By "drawbacks," you mean tradeoffs? 23 Q. Sure. 24 A. Well, it's another level of complexity. 25 Q. How much complexity?	Page 116 1 Q. Do you have any reason to disagree with 2 that? 3 A. That it's not in there? 4 Q. Correct. 5 A. No. 6 Q. All right. 7 Let's talk about your opinions on DOCSIS 8 2.0, specifically the testing -- 9 A. Okay. Can I -- 10 Q. -- analysis? 11 A. Are we finished with Waxman? Can I -- 12 Q. Yes. You -- 13 A. -- close those pages and -- 14 Q. Yes. 15 And I don't know if you'll need it or not, 16 but I've got Exhibits 1010 and 1011 for you. 17 A. Sure. 18 (IPR Exhibit 1010 referenced.) 19 (IPR Exhibit 1011 referenced.) 20 BY MR. GALLUZZO: 21 Q. If you have a binder copy, you're welcome 22 to use that. If not, I'll give you this. 23 MR. KRONENTHAL: We do. Do you want -- 24 THE WITNESS: Yeah. 25 MR. KRONENTHAL: Would you prefer that
Page 115 1 A. I can't measure it. It's -- it's -- 2 it's -- I -- I'm not sure how to answer you. I'm 3 not trying to be cute. I can't -- even though I 4 develop products and do engineering, I can't tell 5 you is it, you know, six more months of engineering 6 work, or -- or is it no more engineering work but 7 just the more -- more costly product, or is it a 8 more costly licensing fee. I mean, those could all 9 be parts of it. It's -- it's -- it's more complex 10 because it's allowing multiple access, as opposed 11 to, you know, more of a point-to-point type of 12 communications. 13 Q. Would there any -- be -- any -- withdrawn. 14 Would there be any reason to use OFDMA if 15 you were not taking advantage of multiple access? 16 A. Could be compatibility if you were 17 building a network that you want to be compatible 18 with OFDMA devices and products. 19 Q. Is there anything in Waxman that says that 20 OFDM is insufficient for its purposes? 21 A. I don't think Waxman gets into that. But 22 if you want to point me to something, I'd be glad to 23 look at it. 24 Q. I actually don't think it's in there. 25 A. Okay.	Page 117 1 or... 2 THE WITNESS: Yeah. 3 Can I give you back this one? 4 Oh, careful of the coffee. 5 BY MR. GALLUZZO: 6 Q. Okay. So for DOCSIS 2.0, you have, as I 7 read it, two different opinions. You have opinions 8 about the ranging procedure, and you have opinions 9 about the testing procedure. Is that right? 10 A. I think generally, yes. 11 Q. I'd like to focus on the testing 12 procedure. So if I ask you questions, unless I tell 13 you otherwise, I'm only asking about the testing 14 procedure. 15 Do you understand that? 16 A. Okay. 17 Q. I'd like to go to Paragraph 609. 18 Go ahead and give that a read and let me 19 know when you're ready for questions. 20 A. (Witness reviews.) 21 Okay. 22 Q. As I understand your testing procedure 23 analysis, you're saying that the test request 24 message is the probe request, and that there is an 25 upstream signal sent in response that is the probe.

Page 118 1 As a baseline, is that right? 2 A. That's correct. 3 Q. Now, you say the upstream signal assists 4 in diagnosing a problem with the CM, that's the 5 cable modem? 6 A. Okay. 7 Q. Is that correct? Is "CM" cable modem? 8 A. Yes. 9 Q. And you cite to pages 184 and 185 to prove 10 that that upstream signal assists in diagnosing a 11 problem with the CM. 12 I'll be honest with you, I've read over 13 pages 184 and 185, and I don't see that. 14 Can you point me what in those pages 15 you're looking at and relying on? 16 A. Okay. Can you -- yeah, I'm sorry. Can 17 you repeat your question? 18 Q. What in pages 184 and 185 of Exhibit 1010, 19 the DOCSIS 2.0 spec -- 20 A. Yeah. 21 Q. -- are you relying on to support your 22 proposition that "the upstream signal sent in 23 response to the Test Request message assists in 24 diagnosing a problem with the cable modem"? [As 25 read]	Page 120 1 is analyzing that information and, you know, 2 processing it, doing something. Otherwise, why 3 would you send it? 4 Q. You just testified that it talks about 5 changing modulation parameters. 6 Where's is that in pages 184 and 185? 7 A. Modulation rate, multiples of base rate. 8 Q. That's what you're referring to? 9 A. Also frequency, power. 10 Q. That's all part of the test request 11 message; correct? 12 A. Yes. 13 Q. That's not part of your upstream signal 14 that you call a probe? 15 MR. KRONENTHAL: Objection. Form. 16 THE WITNESS: Well, it's -- it's used by 17 that test message presumably. 18 BY MR. GALLUZZO: 19 Q. That data field is not in there? 20 MR. KRONENTHAL: Objection. Form. 21 THE WITNESS: Not in? 22 BY MR. GALLUZZO: 23 Q. The upstream signal, the one that you call 24 the probe. 25 MR. KRONENTHAL: Objection. Form.
Page 119 1 A. Okay. So -- well, first of all, in -- in 2 diagnosing a problem with the cable modem, basically 3 referring to communications with the cable modem. 4 So I'm not saying it's a process to say, go out and 5 buy a new cable modem, that's not what I'm 6 inferring. I'm inferring it's when the 7 communications from the cable modem to the CMTS, so 8 effectively the communications channel. 9 Q. You mean whether the communications can 10 even happen? 11 A. Or how it happens. 12 Q. Where's the how it happens in -- in the 13 spec? I don't see that. 14 A. Well, presumably, the cable modem is 15 analyzing that test signal, that's the purpose of 16 sending 1, negative 1; 1, negative 1, and presuming 17 that the -- the CMTS is analyzing that information. 18 Otherwise, why would you send it? 19 Q. You're presuming that, though; right? 20 A. Basically, yes. 21 Q. It doesn't say that in pages 184 and 185? 22 A. Well, it really doesn't say what the CMTS 23 necessarily has to do with that information, but it 24 talks about changing modulation parameters. And 25 presumably -- and I'm presuming that the CMTS is --	Page 121 1 THE WITNESS: Well, it's presumably being 2 used. 3 BY MR. GALLUZZO: 4 Q. Presume -- presumably based on what -- 5 withdrawn. 6 How does that data field modulation rate 7 talk about changing modulation parameters as you 8 testified? 9 A. Well, I can give you an example. 10 Q. I'd like you to tell me how DOCSIS 2.0 11 discloses that. 12 A. Well, Table A -- Table 8-22 shows channel 13 TLV parameters, and they include modulation rate, 14 frequency, power. 15 Q. That doesn't have anything to do with 16 changing modulation rate based on something about 17 the channel or based on something about the upstream 18 signal that you call the probe; correct? 19 MR. KRONENTHAL: Objection. Form. 20 THE WITNESS: Well, I'm an engineer that 21 works with these kind of things all the time. When 22 I transmit, a one -- a negative one signal that's 23 used to analyze the channel, and clearly the channel 24 TLV parameters are specifying, those are all 25 upstream parameters that are called out. So

Page 122 1 presumably, you're making tests and doing something 2 with it. 3 If you're asking, is it explicitly 4 described, what the CMTS does or what the program 5 that the network operator might have running behind 6 the CMTS, that may not be disclosed in this table, 7 but I see it as the purpose of the test mode. 8 THE WITNESS: Can I take a quick bathroom 9 break, like five minutes? 10 MR. GALLUZZO: Sure. 11 THE WITNESS: You're not in the middle of 12 a-- I'm not in the middle of answering a question; 13 correct? 14 MR. GALLUZZO: No. We can come back. 15 Thank you. 16 Off the record. 17 (Short recess taken.) 18 BY MR. GALLUZZO: 19 Q. Just before our break, you had testified 20 that those upstream signals are used to analyze the 21 channel. 22 In the paragraph we're looking at, though, 23 in Paragraph 609, it says that "the upstream signal 24 assists in diagnosing a problem with the cable 25 modem." [As read]	Page 124 1 Q. If it was your opinion that that upstream 2 signal is used to test the channel, why aren't those 3 the words you used in your declaration that you 4 spent 50 to 100 hours on? 5 A. Yeah. All I could say is, I was referring 6 to the cable modem generally. That's honestly what 7 I was referring to. That's all I can say. 8 Q. So in those 50 to 100 hours, you didn't 9 think it would be important to more clearly state 10 what you meant, other than "problem with the CM"? 11 A. I do now. 12 Q. Well, yeah, but back at the time of the 13 declaration you didn't? 14 A. I guess I wasn't parsing every sentence 15 with, you know, half an hour of analyzing. That was 16 beyond the -- so we'll probably find multiple 17 occurrences where maybe I abbreviated something to 18 that extent. 19 Q. Even though you weren't parsing every 20 sentence with half an hour of analyzing, you were 21 choosing your words carefully; weren't you? 22 A. Well, I -- I still think you can read the 23 problem with the cable modem as meaning as broadly 24 talking about problems that can occur either in the 25 cable modem or in the communications channel from
Page 123 1 You'd agree with me that analyzing the 2 channel and diagnosing a problem with the cable 3 modem are different things; correct? 4 A. Well, when I said cable modem, I was 5 referring to cable modem communications. As I said, 6 I wasn't referring to, do you need to replace your 7 cable modem. I was referring to the communications 8 from the cable modem. 9 Q. You don't say in this Paragraph 609 that 10 the upstream signal is used to analyze the 11 communications channel; do you? 12 A. Well, again, when -- when I said 13 diagnosing a problem with the cable modem, that's -- 14 that was a general reference. So it could mean 15 communications from the cable modem, it could mean 16 it -- you know, it could mean either one. But I 17 wasn't trying -- I wasn't trying to limit it to, you 18 know, literally, do you have to go out and replace 19 your cable modem. 20 I mean, maybe you do, but that's the -- 21 what I was saying is that that basically is testing 22 the channel, which could be -- you know, there's 23 lots of things that could happen in the channel. So 24 that's what I was referring to when I said a problem 25 with the cable modem.	Page 125 1 the cable modem. I mean, I -- I've worked in 2 DOCSIS, and we'd frequently say, hey, there -- 3 there's a problem on the cable modem side. And that 4 99 percent of the time is not the cable modem 5 itself; it's something in the channel. 6 MR. GALLUZZO: Objection. Nonresponsive. 7 BY MR. GALLUZZO: 8 Q. Even though you weren't parsing every 9 sentence with half an hour analyzing, you were 10 choosing your words carefully; weren't you? 11 A. I -- I wouldn't say I wasn't chosing 12 [verbatim] my words carefully. I -- I would say, in 13 retrospect, I could have added some more words in 14 that sentence. 15 Q. The words you did cho- -- choose were 16 important, though; right? You chose them with care? 17 A. Well, they're important now. All I can 18 say is, honestly, that was re- -- what I was 19 referring to. That's the only answer I can give 20 you. Looking you straight in the eye. 21 Q. Earlier, when we were talking about 22 various communication standards you are an expert 23 in, you didn't list MoCA. Are you familiar with 24 MoCA standard? 25 A. Only brief familiarity, not -- certainly

Page 126 1 not an expert. 2 Q. So do you know anything about probes in 3 MoCA networks? 4 A. Because I'm -- I don't know a lot about 5 MoCA, I would say I don't know a lot about the 6 probes in MoCA because I don't know a lot about 7 pretty much anything in MoCA. 8 Q. So if I were to ask you questions about 9 MoCA probes, that would be fruitless? 10 A. I would say yes. 11 Q. Okay. And then we'd also talked about 12 some of the DOCSIS standards. And you'd said that 13 you weren't as familiar with DOCSIS 3.1. 14 Are you familiar enough with it to know 15 whether there are probes in DOCSIS 3.1? 16 A. Yes. 17 Q. Are you aware that there are probes in 18 DOCSIS 3.1? 19 A. I am. 20 Q. And you're aware that they are actually 21 called probes, by that name? 22 A. I am. 23 Q. Are you also aware that probes weren't 24 introduced in DOCSIS -- into DOCSIS until DOCSIS 25 3.1?	Page 128 1 aware that DOCSIS 3.1 had a message called a 2 "probe"? 3 A. I was aware they used the word "probe" 4 yes. 5 Q. And you're also aware that the word 6 "probe" was not used to indicate a message prior to 7 DOCSIS 3.1? 8 A. Well, ranging was -- was not called a 9 probe in DOCSIS 2.0, if that's your question. 10 Q. My question was quite -- a little bit 11 different. 12 You were aware prior to issuing your 13 declaration that there were no messages called 14 probes in any DOCSIS iteration prior to 3.1? 15 MR. KRONENTHAL: Objection. Form. 16 THE WITNESS: Well, they didn't use the 17 word "probe." 18 BY MR. GALLUZZO: 19 Q. And that was something you were aware of 20 before issuing your declaration? 21 A. That the word "probe" was not in DOCSIS 22 2.0; correct. 23 Q. And you didn't think the fact that it was 24 absent from DOCSIS 2.0 but was inserted in DOCSIS 25 3.1 was relevant to your analysis in this case?
Page 127 1 A. No. I would say probes were in DOCSIS 2 previous versions; they just weren't literally 3 called probes. But -- 4 Q. So -- 5 A. -- in -- in some cases, they literally 6 called ranging the probing heartbeat of DOCSIS. And 7 so, it became more prolifically used as a term as 8 DOCSIS went on. I would say that they were still -- 9 in the meaning of probes, they were still probes. 10 It's just that the -- they just -- that word became 11 more widely used than DOCSIS 3 and DOCSIS 3.1. 12 Q. You think it was in DOCSIS 3? 13 A. I -- you know what, I'd have to check. 14 Don't -- don't quote me on that. But I -- I did -- 15 I will say that I -- I do, you know, in my process 16 of -- of, you know, researching this project, I 17 certainly found lots of the use of the word "probe" 18 in later versions of DOCSIS. Whether it was 3.1 or 19 3, I -- I'm not here to testify. It was one -- it 20 was at least 3.1. Whether it was in 3 or not -- in 21 the -- in the spec, I can't -- I'm not here to 22 testify. I can't answer that question. For sure it 23 was in DOCSIS 3.1. 24 Q. So as I understand your testimony, prior 25 to issuing your declaration in this case, you were	Page 129 1 A. No, I didn't think it was relevant. In 2 fact, I have -- I have articles that clearly call 3 ranging the probing heartbeat DOCSIS. 4 Q. Did you include those articles with your 5 declaration? 6 A. Because they refer to later versions of 7 DOCSIS, I didn't include that as supporting 8 information. 9 Q. They include -- withdrawn. 10 They refer to versions of DOCSIS later 11 than 2.0? 12 A. They refer to the process of ranging. And 13 they -- and I believe they refer to it in the 14 context of going back to DOCSIS 1.0, 1.1. 15 Q. These articles, what were their 16 publication dates? 17 A. I -- they're not part of my declaration, 18 so I didn't bring them. I don't recall the 19 publication dates. 20 Q. Were they after May 19th, 2009? 21 A. I -- honestly, I know -- I -- I don't 22 know. 23 Q. Were they after December 15th, 2008? 24 A. I don't -- I don't know. I -- I don't -- 25 I -- you're asking me to speculate.

Page 130 1 Q. Well, you're testifying about what was in 2 them. 3 A. Yes. 4 Q. So how can you testify about what was in 5 them without speculation? 6 A. Because it -- it jumped out at me so 7 clearly and explicitly that they were calling 8 ranging in earlier versions of DOCSIS the probing 9 heartbeat of DOCSIS. 10 Q. But you didn't provide us those 11 articles -- 12 A. Again -- 13 Q. Hold on. 14 You didn't provide us those articles so 15 that we could consider that testimony -- or your 16 testimony today in light of those articles? 17 A. Well, I didn't think you would ask me 18 about them. 19 Q. Do you -- do you think those articles are 20 relevant to your testimony in this case? 21 A. Not in the subject matter. 22 Q. What does that mean? 23 A. In other words, I'm basing my declaration 24 on DOCSIS 2.0. 25 Q. And those articles had to do with DOCSIS	Page 132 1 use the word "probe." So I -- I don't know if 2 that's answering your question. 3 Q. Is there anything else that you've 4 included with your declaration that I could go look 5 at that says that probing -- oh, withdrawn. 6 Is there anything else that you've 7 included with your declaration that I could go look 8 at that says ranging is the probing heartbeat of 9 DOCSIS? 10 A. Other than my declaration? Because I -- I 11 equate ranging with probing in my declaration. 12 That's in there. 13 Q. I understand that's what you're doing. 14 I'm asking for evidence that you gave us other than 15 your declaration. Do you have any of that? 16 A. Not in -- not in the DOCSIS spec, no. 17 Q. Or anything else? 18 A. Offhand, I don't believe so. 19 Q. Do you agree with me that DOCSIS 3.1 20 probes are of a known pattern? 21 MR. KRONENTHAL: Objection. Form. 22 THE WITNESS: Yeah, I'm not here to 23 testify on DOCSIS 3.1. 24 BY MR. GALLUZZO: 25 Q. I understand that.
Page 131 1 versions later than 2.0; correct? 2 A. No. They -- they included description of 3 all versions of DOCSIS. 4 Q. Including versions later than 2.0? 5 A. Earlier than 2.0, in fact. 6 Q. And versions later? 7 A. Yes. 8 Q. So if they included versions earlier than 9 2.0 and you're relying on 2.0, why didn't you give 10 us those articles? 11 A. Because I'm relying on DOCSIS 2.0, and 12 they -- they specifically were talking about 13 DOCSIS -- later versions of DOCSIS. It was -- it 14 was only an- -- ancillary, kind of in a -- in like 15 an opening discussion and not in the substance so -- 16 of the probes. 17 Q. Do you have anything that you can refer me 18 to that you did give us that refers to ranging in 19 DOCSIS as probing? 20 A. My testimony. 21 Q. Other than your own -- 22 A. And my declaration. 23 Q. Other than your own words, something 24 objective. 25 A. Well, as I said, the DOCSIS 2.0 doesn't	Page 133 1 But you did testify earlier that you are 2 aware of DOCSIS 3.1 enough to understand that it has 3 messages called probes. Am I correct there? 4 A. Yes. 5 Q. And do you also understand that those 6 messages it calls probes are of a known pattern? 7 MR. KRONENTHAL: Objection. Form. 8 THE WITNESS: I -- that's -- basically, I 9 did not study the probes of DOCSIS 3.1. 10 BY MR. GALLUZZO: 11 Q. Did you study what their purpose is? 12 A. No. 13 Q. Did you study what they are as a signal? 14 A. No. 15 Q. So if I were to say they're a wideband 16 physical layer signal, you couldn't disagree with 17 me? 18 A. I'm -- I'm not going to give an opinion 19 because I didn't review DOCSIS 3 or 3.1 prior to 20 coming here. 21 Q. Do you have any reason to disagree that 22 DOCSIS 3.1 probes are of a known pattern? 23 A. I don't have any opin- -- reason to 24 disagree or agree. 25 Q. Do you have any reason to disagree that

Page 134 1 DOCSIS 3.1 probes are sent upstream to check the 2 quality of the upstream OFDMA signal? 3 A. Again, I'm just going to answer it because 4 I haven't studied 3.1 probes, I have no opinion. 5 MR. GALLUZZO: I've got no further 6 questions. 7 THE WITNESS: That's it? 8 MR. GALLUZZO: That's it. Although, your 9 counsel might. 10 THE WITNESS: You don't want to ask my 11 background in -- 12 MR. GALLUZZO: I got it from the other 13 deposition. 14 THE WITNESS: Why I didn't get an 15 engineering degree? 16 Oh, he's saying shut up. 17 MR. KRONENTHAL: Well, no, I'm just saying 18 we can go off the record. We don't want to -- 19 THE WITNESS: Yeah. We're off the record. 20 MR. GALLUZZO: Hold on. Don't talk over 21 each other. 22 MR. KRONENTHAL: No questions either. 23 We'll just review and sign. 24 THE WITNESS: And we're off the record. I 25 was being goofy, but we're off the record hopefully.	Page 136 1 CERTIFICATE OF REPORTER 2 I, Hanna Kim, a Certified Shorthand 3 Reporter, do hereby certify: 4 That prior to being examined, the witness 5 in the foregoing proceedings was by me duly sworn to 6 testify to the truth, the whole truth, and nothing 7 but the truth; 8 That said proceedings were taken before me 9 at the time and place therein set forth and were 10 taken down by me in shorthand and thereafter 11 transcribed into typewriting under my direction and 12 supervision; 13 I further certify that I am neither 14 counsel for, nor related to, any party to said 15 proceedings, not in anywise interested in the 16 outcome thereof. 17 Further, that if the foregoing pertains to 18 the o sition in a federal 19 case, oceedings, review 20 of th s not requested. 21 e hereunto 22 subsc th day of November, 2024. 23 24 25 Hanna Kim CLR, CSR No. 13083
Page 135 1 That's off -- please make that off the record. I 2 said more than I should. 3 MR. GALLUZZO: Hold on. Just -- 4 Off the record, please. 5 (Proceedings concluded, 1:44 p.m., PST, on 6 November 13, 2024.) 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25	Page 137 1 Veritext Legal Solutions 2 1100 Superior Ave 3 Suite 1820 4 Cleveland, Ohio 44114 5 Phone: 216-523-1313 6 7 November 27, 2024 8 9 To: Craig W. Kronenthal, Esq. 10 11 Case Name: Comcast Cable Communications, LLC v. Entropic 12 Communications, LLC 13 Veritext Reference Number: 7019578 14 Witness: James Bertonis Deposition Date: 11/13/2024 15 16 Dear Sir/Madam: 17 18 Enclosed please find a deposition transcript. Please have the witness 19 review the transcript and note any changes or corrections on the 20 included errata sheet, indicating the page, line number, change, and 21 the reason for the change. Have the witness' signature notarized and 22 forward the completed page(s) back to us at the Production address 23 shown 24 above, or email to production-midwest@veritext.com. 25 If the errata is not returned within thirty days of your receipt of this letter, the reading and signing will be deemed waived. Sincerely, Production Department NO NOTARY REQUIRED IN CA

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Page 138 1 DEPOSITION REVIEW 2 CERTIFICATION OF WITNESS 3 ASSIGNMENT REFERENCE NO: 7019578 4 CASE NAME: Comcast Cable Communications, LLC v. Entropic 5 Communications, LLC 6 DATE OF DEPOSITION: 11/13/2024 7 WITNESS' NAME: James Bertonis 8 In accordance with the Rules of Civil 9 Procedure, I have read the entire transcript of 10 my testimony or it has been read to me. 11 I have made no changes to the testimony 12 as transcribed by the court reporter. 13 _____ 14 Date James Bertonis 15 Sworn to and subscribed before me, a 16 Notary Public in and for the State and County, 17 the referenced witness did personally appear 18 and acknowledge that: 19 They have read the transcript; 20 They signed the foregoing Sworn 21 Statement; and 22 Their execution of this Statement is of 23 their free act and deed. 24 I have affixed my name and official seal 25 this _____ day of _____, 20____. 26 _____ 27 Notary Public 28 _____ 29 Commission Expiration Date	Page 140 1 ERRATA SHEET 2 VERITEXT LEGAL SOLUTIONS MIDWEST 3 ASSIGNMENT NO: 7019578 4 PAGE/LINE(S) / CHANGE /REASON 5 _____ 6 _____ 7 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____ 21 Date James Bertonis 22 SUBSCRIBED AND SWORN TO BEFORE ME THIS _____ 23 DAY OF _____, 20____ . 24 _____ 25 Notary Public 26 _____ 27 Commission Expiration Date
Page 139 1 DEPOSITION REVIEW 2 CERTIFICATION OF WITNESS 3 ASSIGNMENT REFERENCE NO: 7019578 4 CASE NAME: Comcast Cable Communications, LLC v. Entropic 5 Communications, LLC 6 DATE OF DEPOSITION: 11/13/2024 7 WITNESS' NAME: James Bertonis 8 In accordance with the Rules of Civil 9 Procedure, I have read the entire transcript of 10 my testimony or it has been read to me. 11 I have listed my changes on the attached 12 Errata Sheet, listing page and line numbers as 13 well as the reason(s) for the change(s). 14 I request that these changes be entered 15 as part of the record of my testimony. 16 I have executed the Errata Sheet, as well 17 as this Certificate, and request and authorize 18 that both be appended to the transcript of my 19 testimony and be incorporated therein. 20 _____ 21 Date James Bertonis 22 Sworn to and subscribed before me, a 23 Notary Public in and for the State and County, 24 the referenced witness did personally appear 25 and acknowledge that: 26 They have read the transcript; 27 They have listed all of their corrections 28 in the appended Errata Sheet; 29 They signed the foregoing Sworn 30 Statement; and 31 Their execution of this Statement is of 32 their free act and deed. 33 I have affixed my name and official seal 34 this _____ day of _____, 20____. 35 _____ 36 Notary Public 37 _____ 38 Commission Expiration Date	

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

DISCLAIMER: THE FOREGOING FEDERAL PROCEDURE RULES ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS

COMPANY CERTIFICATE AND DISCLOSURE STATEMENT

Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

Veritext Legal Solutions is committed to maintaining the confidentiality of client and witness information, in accordance with the regulations promulgated under the Health Insurance Portability and Accountability Act (HIPAA), as amended with respect to protected health information and the Gramm-Leach-Bliley Act, as amended, with respect to Personally Identifiable Information (PII). Physical transcripts and exhibits are managed under strict facility and personnel access controls. Electronic files of documents are stored in encrypted form and are transmitted in an encrypted

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