

Transcript of Todor Cooklev, Ph.D.

Date: February 9, 2024
Case: Certain Electronic Devices and Semiconductor Devices (337-TA-1367)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

UNITED STATES INTERNATIONAL TRADE COMMISSION

WASHINGTON, D.C.

In the Matter of :

CERTAIN ELECTRONIC DEVICES :

AND SEMICONDUCTOR DEVICES : Inv. No. 337-TA-1367

HAVING WIRELESS :

COMMUNICATION CAPABILITIES :

AND COMPONENTS THEREOF :

[redacted]

Videotaped Deposition of

TODOR COOKLEV, Ph.D.

Chicago, Illinois

Friday, February 9, 2024

10:33 a.m.

Job No.: 525258

Pages: 1 - 141

Reported by: THERESA A. VORKAPIC, CSR, RMR, CRR, RPR

Videotaped deposition of Todor Cooklev, Ph.D., held at the location of:

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Pursuant to notice before Theresa A. Vorkapic, a Certified Shorthand Reporter, Registered Merit Reporter, Certified Realtime Reporter, Registered Professional Reporter and a Notary Public in and for the State of Illinois.

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A P P E A R A N C E S (Continued)

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Jeremy Hatfield, Audiovisual Technician, Planet Depos

Brianna Bramlet, Videographer, Planet Depos

C O N T E N T S

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E X H I B I T S

(Attached to transcript.)

COOKLEV DEPOSITION EXHIBITS PAGE

Exhibit 1 Opening Expert Report 11

Exhibit 2 US Patent 8,416,862 80

P R O C E E D I N G S

THE VIDEOGRAPHER: Here begins Media No. 1 in the videotaped deposition of Todor Cooklev, sorry, Dr. Todor Cooklev in the matter of Certain Electronic Devices and Semiconductor Devices in the United States International Trade Commission Washington DC, Case No. 337-TA-1367. 09:03:57 09:04:02 09:04:07 09:04:09 09:04:12 09:04:14

Today's date is February 9th, 2024. The time on the video monitor is 9:04 a.m. The videographer today is Brianna Bramlet representing Planet Depos. This video deposition is taking place at Hilton Chicago O'Hare Airport. 09:04:20 09:04:25 09:04:28 09:04:31 09:04:34

Would counsel please voice-identify themselves and state whom they represent. 09:04:37 09:04:39

MR. JACOBSON: Good morning. This is Lowell Jacobson from Devlin Law Firm representing complainant Bell Northern Research LLC. With me on the Zoom is my colleague Srikant Cheruvu. 09:04:41 09:04:43 09:04:47 09:04:49

MR. TAMBURO: Sal Tamburo with DLA Piper on behalf of the NXP respondents and with me also from DLA Piper is Brian Erickson and Zachary Taylor -- Zachary Loney on the Zoom, and also on 09:04:55 09:04:57 09:05:01 09:05:05

behalf of NXP respondents is Jing Hu, Dr. Jing Hu on Zoom. 09:05:07 09:05:13

MR. BELL: Cory Bell for the MediaTech respondents from Finnegan law firm. With me today is Yinan Liu and Luke MacDonald on Zoom. 09:05:18 09:05:23 09:05:26

MR. TAYLOR: This is Todd Taylor representing the Office of Unfair Import Investigations. 09:05:30 09:05:32 09:05:34

MR. SCHMIDT: And this is Chris Schmidt from Erise IP for the Asus respondents. 09:05:36 09:05:39

THE VIDEOGRAPHER: The court reporter today is Theresa Vorkapic representing Planet Depos. The witness will now be sworn. 09:05:43 09:05:45 09:05:47

THE REPORTER: Would you raise your right hand, please.

(The witness was duly sworn.) 09:05:54

TODOR COOKLEV, Ph.D.,

called as a witness herein, having been first duly sworn, was examined and testified as follows:

EXAMINATION 09:06:03

BY MR. TAMBURO: 09:06:03

Q Good morning, Dr. Cooklev. 09:06:04

A Good morning, Counsel. 09:06:05

Q I have to say this is the most people I've ever had involved in a deposition in my career so this must be an important day. 09:06:06 09:06:09 09:06:11

A It is. It is important. 09:06:13

Q Can you just state your full name for the record so we have it? 09:06:14 09:06:16

A Todor Cooklev. 09:06:18

Q Thank you. 09:06:19

MR. TAMBURO: I'd like to mark the first exhibit which will be Cooklev Exhibit 1 which would be -- Jeremy, can we put up the -- Dr. Cooklev's opening expert report. 09:06:19 09:06:21 09:06:25 09:06:30

AV TECH HARTFIELD: Stand by. 09:06:36

BY MR. TAMBURO: 09:06:37

Q It should show up on your screen I think. 09:06:39

MR. JACOBSON: Sal, do you have physical copies or do I need to go into Zoom? 09:06:42 09:06:44

MR. TAMBURO: Yeah. I don't have any paper. 09:06:46 09:06:47

THE WITNESS: And if I may, with your permission I brought -- it's a clean unmarked copy 09:06:48 09:06:50

of my report. This is a hard copy that -- I mean, I'm used to electronic paper. It almost doesn't matter, but I brought this. 09:06:52 09:06:55 09:06:58

MR. TAMBURO: Sure, whatever you prefer. 09:07:00

THE WITNESS: It might be convenient to have. 09:07:02 09:07:04

MR. TAMBURO: Whatever you prefer. I appreciate that, thank you. 09:07:04 09:07:05

(A certain document was marked Cooklev Deposition Exhibit 1 for identification, as of 02/09/2024.) 09:07:17 09:07:17

BY MR. TAMBURO: 09:07:34

Q Up on the screen you should see what's been marked as Cooklev Exhibit 1. 09:07:35 09:07:37

Do you recognize that? 09:07:39

A I do. It is my infringement report, and it's the same report that as I said that I have a hard copy here in front of me. 09:07:49 09:07:56 09:07:59

Q Okay. Can I ask you to turn to Paragraph 24, please. 09:08:13 09:08:15

A Yes, I'm looking at Paragraph 24. 09:08:25

Q Can you go down to the '629 bullet, you 09:08:27

say for the '629 patent. 09:08:32

Do you see that? 09:08:33

A Yes. 09:08:34

Q Okay. This is your list of NXP accused 09:08:34

products for the '629 patent, correct? 09:08:46

A Yes. 09:08:48

[redacted] 09:08:48

[redacted] 09:08:51

[redacted] 09:08:58

[redacted] 09:09:08

[redacted] 09:09:11

[redacted] 09:09:14

[redacted] 09:09:20

[redacted] 09:09:22

[redacted] 09:09:24

[redacted] 09:09:25

[redacted] 09:09:27

[redacted] 09:09:35

[redacted] 09:09:38

[redacted] 09:09:46

[redacted] 09:09:48

[redacted] 09:09:49

[redacted]

Q Okay. You created the table, correct? 09:10:55

A It is, of course, my reports and contains 09:11:14

my opinions. 09:11:16

As far as formatting the report, I can say 09:11:17

that it was a -- the process was I think I could 09:11:27

say collaborative with counsel. 09:11:34

Q Okay. And you agree, though, that the 09:11:36

table is accurate in your report on Paragraph 24? 09:11:41

A Well, I -- well, first I'm not aware 09:11:52

sitting here right now I'm not aware of things 09:11:56

that I need to correct. 09:11:59

Q Okay. 09:12:00

A But as far as some -- as far as parts 09:12:01

numbers, I don't have them memorized obviously. 09:12:04

Q I understand. Appreciate that. 09:12:08

Can I ask you to turn to Paragraph 249 in 09:12:11

your report Exhibit 1? 09:12:14

A Paragraph 249? 09:12:19

Q Yes. 09:12:21

A Yes, I'm there. 09:12:33

Q You say in Paragraph 249: "It is my 09:12:39

understanding that each of the NXP accused 09:12:43

products -- I'm sorry, let me back up. Strike 09:12:45

that. 09:12:47

Paragraph 249, this is your opinion regarding the NXP '629 accused products, correct? 09:12:47 09:12:50

A Yes. 09:12:55

Q Okay. And you say in Paragraph 249 that: It is my understanding that each of the NXP accused products functions in the same way for the purposes of the claim limitations." 09:12:56 09:13:03 09:13:06 09:13:08

Do you see that? 09:13:12

A Yes. 09:13:13

[redacted] 09:13:14 09:13:16 09:13:23 09:13:26 09:13:27 09:13:27 09:13:29 09:13:34 09:13:45

Q Okay. Can you show me in your report where you've analyzed a part number other than NXP 88W8997 for the '629 patent? 09:13:46 09:13:48 09:13:53

A Yes. And I -- I can answer. 09:14:03

My report pertains to all of the accused products because for several reasons. All of the accused products of -- and here I mean NXP '629 accused products. [redacted]

[redacted]

so that's another reason that my report pertains to all of the NXP '629 accused products.

[redacted]

So for all these reasons, my analysis relates to all of the accused products. 09:16:35 09:16:41

MR. TAMBURO: I object to the response and move to strike that answer as nonresponsive. 09:16:42 09:16:44

BY MR. TAMBURO: 09:16:47

Q Dr. Cooklev, my question was: Can you show me in your report where -- let me strike that. 09:16:49 09:16:51 09:16:52

Paragraph 249 you say that: I have selected the NXP 88W8997 chip as an exemplary product for the purpose of my analysis, correct? 09:16:52 09:16:55 09:17:01

A That's what -- that's exactly what it says, this sentence is there. 09:17:06 09:17:08

Q Your report does not say you've analyzed any other NXP chip for purposes of your report, correct? 09:17:09 09:17:12 09:17:14

A Well, I disagree with this. Although first I think you started the question just one sentence and the sentence says exactly what you said it says. But this is just one sentence. And I'm -- and I'm explaining -- and your question was about the entire report, and I think the entire 09:17:20 09:17:27 09:17:30 09:17:32 09:17:37 09:17:40

report relates to all of the accused products. 09:17:42
BY MR. TAMBURO: 09:17:48
Q Isn't it correct that your report does not 09:17:49
mention any other NXP chip aside from the NXP 09:17:51
88W8997 anywhere except in the table in 09:17:55
Paragraph 24? 09:18:00
MR. JACOBSON: Object to form. 09:18:00
BY THE WITNESS: 09:18:12
A And I haven't memorized my report. 09:18:12
BY MR. TAMBURO: 09:18:14
Q Well, you have it in front of you 09:18:15
electronic and paper. If you'd like to search for 09:18:17
other part numbers, we can do that right now and 09:18:20
you can show me where you've identified another 09:18:22
NXP chip accused of the '629 patent other than the 09:18:24
one identified in Paragraph 249. 09:18:28
MR. JACOBSON: Objection. Argumentative. 09:18:34
BY THE WITNESS: 09:18:39
A Even if I don't, even if I don't, I think 09:18:40
I gave a complete and accurate answer that my 09:18:45
report for -- I think I mentioned three reasons, 09:18:51
and for these reasons it relates to all of the 09:18:57

accused products. 09:18:59

MR. TAMBURO: Okay. And move to strike as nonresponsive. 09:19:01 09:19:03

BY MR. TAMBURO: 09:19:00

Q You say "even if I don't." Does that -- is that an acknowledgment that you don't mention any other NXP chip in your report other than the 88W8997? 09:19:04 09:19:05 09:19:08 09:19:13

MR. JACOBSON: Object to form. Argumentative. 09:19:16 09:19:17

BY THE WITNESS: 09:19:22

A Well, I wouldn't quite agree with this because first I listed the accused products in that table that we saw in Paragraph 24. [redacted] 09:19:28 09:19:32 09:19:33

[redacted] 09:19:39 09:19:45 09:19:49 09:19:58 09:20:02 09:20:04 09:20:11 09:20:17

[redacted]

MR. TAMBURO: Okay. Again, move to strike. Object as nonresponsive. 09:20:19 09:20:21 09:20:22

BY MR. TAMBURO: 09:20:24

Q Dr. Cooklev, I'll give you one more opportunity to review your report and to point me to anywhere in your report where you identify any other product other than 88W8997 as part of your analysis of infringing the '629 patent. I'll wait. You can look. 09:20:26 09:20:28 09:20:30 09:20:33 09:20:39 09:20:41

MR. JACOBSON: Object to form. 09:20:42

BY THE WITNESS: 09:21:03

A Well, I guess I can go through my report in more detail, but I disagree that I'm not -- that there is -- that my report doesn't contain evidence about the other products, [redacted] 09:21:04 09:21:09 09:21:21 09:21:24

[redacted] 09:21:27

[redacted] 09:21:30

[redacted] 09:21:32

[redacted] 09:21:40

[redacted] 09:21:47

[redacted] 09:21:50

MR. TAMBURO: Again, move to strike as nonresponsive. Let the record show Dr. Cooklev pointed me to no other part numbers in his report other than 88W8997 as being accused of infringing -- as being analyzed for infringement of the '629 patent. 09:21:52 09:21:57 09:21:59 09:22:03 09:22:08 09:22:10

BY MR. TAMBURO: 09:22:11

Q Dr. Cooklev, I'm going to move on. 09:22:11

[redacted] 09:22:13

[redacted] 09:22:16

[redacted] 09:22:44

Q Going back to Paragraph 249, Dr. Cooklev, you say: "It is my understanding that each of the NXP accused products functions in the same way for purposes of the claim limitations." 09:22:50 09:23:05 09:23:07 09:23:11

Do you see that? 09:23:14

A Yes. 09:23:15

Q Your report does not include any basis for that understanding, correct? 09:23:20 09:23:24

A No, it does include. 09:23:29

Q Okay. You're going to show me where you have a basis for your understanding that all -- 09:23:32 09:23:35

each of the NXP accused products for the '629 patent function in the same way for purposes of the claim limitations, correct? Are you going to show me that? 09:23:40 09:23:44 09:23:46 09:23:49

MR. JACOBSON: Object to form. Argumentative. 09:23:50 09:23:51

BY THE WITNESS: 09:24:01

A Maybe I don't say the basis for that in Paragraph 249, but the basis is that all of the accused NXP products, accused NXP '629 products to be more accurate, all of them are compliant with the same standard, and this is the basis for my opinion that each one of them functions or operates in the same way for the purposes of the claim limitations. 09:24:02 09:24:05 09:24:08 09:24:14 09:24:21 09:24:27 09:24:34 09:24:36

Q Is that your only basis, that they all in your view comply with the standard? 09:24:40 09:24:43

MR. JACOBSON: Object to form. 09:24:58

MR. TAMBURO: Let me rephrase. 09:24:59

BY MR. TAMBURO: 09:25:01

Q Is that the only basis in your report that all of the NXP accused '629 patent products 09:25:02 09:25:03

operate the same way for purposes of the claim limitation, the fact that they are compliant with the standard? 09:25:10 09:25:12 09:25:14

MR. JACOBSON: Object to form. 09:25:15

BY THE WITNESS: 09:25:20

A That's not the entire basis, although, first I think that this is independently sufficient basis to reach this conclusion, but my opinion in this paragraph is also based on my review of the source code of the accused products. 09:25:21 09:25:31 09:25:32 09:25:34 09:25:39

BY MR. TAMBURO: 09:25:46

Q Okay. And going back to Paragraph 24 of your report? 09:25:48 09:25:53

A Yes. 09:26:09

[redacted] 09:26:09 09:26:12 09:26:15 09:26:18 09:26:22 09:26:25 09:26:30 09:26:32

BY THE WITNESS: 09:26:43

A I certainly focused on -- in the report, I 09:26:44

mean, I focused on source code for one accused 09:26:46

product, but I -- I -- I reviewed source code for 09:26:50

all of the accused products. 09:26:59

Now, we were -- first, we were limited 09:27:04

to -- the protective order limited us to producing 09:27:06

only a certain number of pages and, I -- as I 09:27:17

explained, that all of the accused products are 09:27:27

compliant with the same standard and so for the 09:27:31

purpose of the report, yes, I focus on source code 09:27:35

for only one of them, but I did review source code 09:27:37

for all of them. 09:27:43

MR. TAMBURO: Object and move to strike 09:27:45

that answer as nonresponsive. Everything after "I 09:27:46

focused -- I certainly focused on -- in the 09:27:52

report, I mean, I focused on source code for one 09:27:54

accused product," everything after that is 09:27:57

nonresponsive. 09:28:01

BY MR. TAMBURO: 09:28:01

Q That source code for the one project for 09:28:06

the NXP '629 accused products was [redacted] 09:28:08

code, correct? 09:28:17

A It's -- I mean, just the sound of it, I was familiar with what you said. I just don't at the moment recall where I discuss that, but just you said [redacted], which, again, sounds something familiar to me. 09:29:05 09:29:13 09:29:18 09:29:25 09:29:33

Q Maybe I can help you out. Can you turn to Paragraph 256, please. 09:29:34 09:29:37

A Yes, and thank you very much for that. My memory -- my memory has become worse I think with all of this. 09:29:38 09:29:48 09:29:50

Q I understand. My isn't getting any better, either. 09:29:51 09:29:54

So on Paragraph 256, Dr. Cooklev, do you see your citation to NXP source code? 09:29:56 09:29:59

A Yes. 09:30:03

Q And that's NXP source code for the [redacted] project, correct? 09:30:04 09:30:07

A Yes. 09:30:20

Q Okay. And, you know, we can wait for you if you'd like to look to see if you've cited any other source code with any other project but I 09:30:20 09:30:21 09:30:24

[redacted]

source code in the report.

Q Okay. Thank you.

So your report for the '629 patent as to NXP does not cite source code for [redacted] listed in the table in Paragraph 24, [redacted] correct?

A Well, as I just testified, I reviewed all of the source code that was produced, but for the purpose of writing the report I focused on only one.

Q Your report does not include -- let me strike that.

Your report for the '629 patent as to NXP does not include any comparison of source code associated with [redacted] in Paragraph 24, correct?

09:30:26
09:30:28
09:30:38
09:30:40
09:30:43
09:30:45
09:30:50
09:30:56
09:30:57
09:31:01
09:31:04
09:31:10
09:31:14
09:31:18
09:31:27
09:31:30
09:31:30
09:31:33
09:31:33
09:31:36
09:31:40
09:31:42

A I looked at that source code. There's also evidence that all of them comply with the same standard. I did not include a detailed comparison of the source code. 09:32:00 09:32:07 09:32:09 09:32:11

MR. TAMBURO: Move to strike. 09:32:12

BY MR. TAMBURO: 09:32:16

Q My question, Dr. Cooklev, respectfully is: Your report for the '629 patent as to NXP does not include any comparison of source code associated with [redacted] in Paragraph 24, correct? I'm focusing on your report. 09:32:17 09:32:18 09:32:21 09:32:24 09:32:27 09:32:30

MR. JACOBSON: Object to form. 09:32:32

BY THE WITNESS: 09:32:35

A But I'm just -- I think I've given a complete answer that I reviewed the source codes and there is also evidence that all of the products comply with the same standard, and I did not include a comparison, a formal comparison between and detailed comparison between the source code for the other products because I didn't think it was necessary. 09:32:36 09:32:39 09:32:42 09:32:47 09:32:49 09:32:53 09:33:00 09:33:02

BY MR. TAMBURO: 09:33:04

Q You say you didn't do a detailed 09:33:04

comparison between the source code [redacted] 09:33:06

[redacted]. 09:33:08

Did you do any comparison in your report 09:33:10

of the source code for [redacted] different NXP 09:33:12

accused products for the '629 patent? 09:33:15

A I mean, I thought that to include it in 09:33:23

the report it has to be, if you will, a more 09:33:26

detailed comparison, so -- but I can testify that, 09:33:28

again, I looked at the source code, there's 09:33:34

evidence that all of them comply with the same 09:33:41

standard and I didn't think that was necessary. 09:33:43

So that's my... 09:33:47

Q So there is no comparison in your report, 09:33:48

you agree? 09:33:50

A For the reasons that I just provided. 09:33:51

Q Okay. And so your report for the '629 09:33:52

patent as to NXP does not include an analysis to 09:34:00

confirm that [redacted] source code 09:34:06

operate the same way for purposes of the claim 09:34:11

limitations, correct? 09:34:13

A Well, I think it does because all of them are compliant with the same standard, and I'm showing that the claims of this patent, they are infringed when the standard is practiced. 09:34:17 09:34:20 09:34:23 09:34:34

Q So your testimony is you did no comparison between [redacted] of source code, but your report does include an analysis to confirm that [redacted] of source code operate the same way; is that your testimony? 09:34:37 09:34:39 09:34:41 09:34:45 09:34:47

MR. JACOBSON: Object to form. Mischaracterizes prior testimony. 09:34:49 09:34:50

BY THE WITNESS: 09:35:03

A I mean, I think this was also a compound question. The first part that I did not -- I didn't say that I didn't do any comparison -- I reviewed -- I reviewed the source code for the other -- for all of the accused products. And now, I'm sorry I forgot the second part of the question. 09:35:03 09:35:05 09:35:08 09:35:25 09:35:27 09:35:32 09:35:34

MR. TAMBURO: That's okay. Move to strike as nonresponsive. 09:35:34 09:35:36

BY MR. TAMBURO: 09:35:36

Q Dr. Cooklev, my -- my question is: Can you show me where in your report you include an analysis to confirm that [redacted] of source code for NXP accused products for the '629 patent operate the same way for purposes of the claim limitations? 09:35:37 09:35:38 09:35:41 09:35:45 09:35:48 09:35:50

A But my report is -- the entirety of my report accomplishes this by showing that first, the claims of the patent are infringed when the standard is practiced, and all of these accused products are compliant with the standard. This is evidence for all of the accused products. 09:36:00 09:36:11 09:36:24 09:36:25 09:36:29 09:36:33

MR. TAMBURO: Again, object, move to strike. 09:36:37 09:36:38

BY MR. TAMBURO: 09:36:39

Q Dr. Cooklev, I'm talking about source code analysis in your report. Source code analysis in your report. 09:36:40 09:36:43 09:36:47

You agree that there is no analysis in your report of [redacted] of NXP source code for the '629 accused products to confirm that your statement that they all operate the same way 09:36:47 09:36:50 09:36:54 09:37:00

for purposes of the claims? 09:37:02

MR. JACOBSON: Object to form, 09:37:06

argumentative. 09:37:07

BY THE WITNESS: 09:37:09

A Well, my opinion that all of them, all of 09:37:11

the accused '629 products operate the same way for 09:37:14

the purposes of the claims, the asserted claims is 09:37:19

based on multiple sources of evidence. 09:37:27

It's -- it's based on the standard 09:37:32

compliance and it's also based on my review of all 09:37:35

of the produced documents and my review of the 09:37:41

produced source code. 09:37:44

So that's what my opinion that my analysis 09:37:50

applies to all of the accused products, that is on 09:37:58

what my opinion is based. 09:38:00

MR. TAMBURO: Again, move to strike. 09:38:02

Nonresponsive. 09:38:06

BY MR. TAMBURO:

Q I'll give you one more opportunity, 09:38:06

Dr. Cooklev. If you can point me to an analysis 09:38:09

in your report that compares the source code for 09:38:11

[redacted] NXP accused projects for the '629 09:38:14

patent to confirm your understanding that they all operate the same way for purposes of the claim limitations. You have your report in front of you in electronic and paper, if you can point us to an analysis, we will wait. 09:38:18 09:38:20 09:38:23 09:38:31 09:38:34

MR. JACOBSON: Object to form. 09:38:35

BY THE WITNESS: 09:38:52

A The way I -- at least the way I understand the question, it's the entirety of my report that pertains to all of the accused products for at least the reasons that I gave, that all of them are compliant with the standard and based on my analysis, so we can -- we can go on claim limitation by claim limitation in which where I show that the claim is infringed when the standard is practiced, and so as I testified earlier that I've reviewed all of the source code so this is why my report pertains to all of the accused products. 09:38:53 09:38:55 09:38:58 09:39:03 09:39:06 09:39:11 09:39:13 09:39:21 09:39:24 09:39:29 09:39:34 09:39:40

MR. TAMBURO: Okay. Move to strike as nonresponsive. Let the record show Dr. Cooklev pointed me to no analysis and instead referred me 09:39:40 09:39:41 09:39:43

to his 500-page report as a response. 09:39:46

BY MR. TAMBURO: 09:39:51

Q Dr. Cooklev, could we look at Paragraph 24 again in your report. 09:39:54 09:40:00

A Yes, I'm there. 09:40:09

Q This is the '629 patent table of accused products for NXP, right? 09:40:16 09:40:19

A Yes, it's on Page 6. 09:40:21

[redacted] 09:40:26

[redacted] 09:40:29

[redacted] 09:40:38

[redacted] 09:40:39

Q Now, you also agree that your report does not cite to any source code from [redacted], correct? 09:40:40 09:40:42 09:40:46

A In this paragraph it identifies that [redacted]. Again, maybe specifically it doesn't -- I haven't done a search. [redacted] 09:41:00 09:41:02 09:41:07 09:41:19

[redacted] 09:41:24

[redacted] 09:41:27

[redacted] 09:41:35

Q Okay, but you cannot point me to any citation to any specific source code for the [redacted] in your report for the '629 patent accused products, correct? 09:41:37 09:41:41 09:41:43 09:41:46

A Well, I think I selected the representative product. And to make the report as you -- to make it more tractable, as you said, it's 500 pages already so I focused on only one, but I -- I -- not only to make it more tractable, I have -- as I said, there are two reasons why, the first is standards compliance, which -- and based on the standard compliance it is my understanding that then it is the respondents and in this case NXP's task to show that given that the products are compliant and one of them has been thoroughly analyzed to show that the others are not compliant with the standard or somehow operate differently. So I think this is the complete answer to the question. 09:41:54 09:41:55 09:41:59 09:42:03 09:42:09 09:42:16 09:42:21 09:42:25 09:42:28 09:42:31 09:42:44 09:42:47 09:42:50 09:42:53 09:43:05

MR. TAMBURO: Okay. Move to strike as nonresponsive. 09:43:06 09:43:07

BY MR. TAMBURO: 09:43:07

Q Dr. Cooklev, can you point me right now in your report where you cite to any [redacted] source code aside from mentioning it in the table in Paragraph 24? 09:43:07 09:43:11 09:43:14 09:43:18

A But the -- I mean, Counsel, if I -- Counsel, if I may say that, it would be misleading to say that my report by not citing specifically, even if it doesn't cite [redacted] it would be inaccurate to say that it doesn't pertain to [redacted]. It does pertain to [redacted] 09:43:22 09:43:46 09:43:54 09:43:59 09:44:03 09:44:06

Q Dr. Cooklev, was that response an acknowledgment that your report does not cite to [redacted] source code? 09:44:13 09:44:15 09:44:18

A It's a complete explanation that the report does relate to the [redacted]. 09:44:28 09:44:30

MR. TAMBURO: Again, move to strike as nonresponsive. Dr. Cooklev did not point me to any [redacted] citations in his report. 09:44:37 09:44:39 09:44:42

BY MR. TAMBURO: 09:44:51

Q Dr. Cooklev, the source code, the NXP source code you cited in your report was the [redacted] source code. I think we 09:44:51 09:44:53 09:44:56

established that earlier, correct? 09:45:00

A It's -- I think we did and we looked at 09:45:06

one paragraph where specifically it said that. 09:45:08

Q And you agree that that source code that 09:45:11

you do cite, [redacted] 09:45:13

[redacted], 09:45:18

correct? 09:45:24

A I mean, this -- this table in Paragraph 24 09:45:41

says that [redacted] 09:45:44

[redacted]. Obviously I don't remember the chipsets 09:45:50

off the top of my head, but that's what the table 09:45:53

says. 09:45:54

Q You anticipated my next question. Thank 09:45:57

you. 09:46:00

So the source code, the NXP source code 09:46:00

you do cite for the [redacted] project, that 09:46:02

is the source code for the [redacted], correct? 09:46:09

A Yes, it is the one that I selected as 09:46:19

representative. 09:46:21

Q Well, let's -- let's go back to 09:46:22

Table 24 -- I'm sorry, let's go back to 09:46:28

Paragraph 249 where you selected the [redacted] 09:46:30

as representative, isn't that correct? 09:46:40

A I think you're correct. I think that this 09:47:21

confirms, this is -- also supports my opinion that 09:47:24

my report is about all of the accused products. 09:47:28

Q Okay. 09:47:32

MR. TAMBURO: So move to strike everything 09:47:36

after "I think you're correct" as nonresponsive. 09:47:38

BY MR. TAMBURO: 09:47:42

Q I want to just confirm that the source 09:47:43

code for the [redacted] 09:47:46

[redacted], correct? 09:47:52

A That's what the table in Paragraph 24 09:48:03

says. 09:48:09

Q And your report did not include an 09:48:09

analysis of the [redacted], correct? 09:48:14

A No. My report is about all of the accused 09:48:35

products and including the [redacted]. 09:48:38

Q Okay. But in Paragraph 249 you say you 09:48:45

have selected the [redacted] as an exemplary 09:48:48

product for purposes of my analysis. 09:48:53

Do you see where you say that? 09:48:55

A I do. 09:48:56

Q But you also agree that your report does not cite to the source code for the [redacted] [redacted] correct? 09:48:57 09:49:01 09:49:07

A As I said, this provides additional support for my opinion that my report is about all of the accused products. 09:49:14 09:49:16 09:49:20

MR. TAMBURO: Okay. But, again, move to strike as nonresponsive. 09:49:22 09:49:25

BY MR. TAMBURO:

Q Let me ask my question again. 09:49:26

You also agree that your report does not cite to the source code for the [redacted] [redacted], correct? 09:49:28 09:49:29 09:49:33 09:49:38

A And, I mean, even if there is no specific citation to [redacted] I did review the source code for [redacted] platform or project name. 09:49:53 09:49:55 09:50:00 09:50:03

MR. TAMBURO: Move to strike everything after "there is no specific citation to the [redacted]" as nonresponsive. 09:50:08 09:50:12 09:50:14

BY MR. TAMBURO: 09:50:15

Q Dr. Cooklev, isn't it correct that the code you did review, the [redacted] -- let me rephrase that. 09:50:17 09:50:18 09:50:22

Isn't it correct that the source code for NXP's '629 accused products that you did cite in your report, the [redacted] for a part number that is different than the one you identified in Paragraph 249 as being representative? 09:50:23 09:50:26 09:50:29 09:50:35 09:50:38 09:50:48

A Based on this table, yes, it appears to be different which, as I said, it's additional support for my opinion that for the purposes of the assert claims all of the accused products function the same way. 09:51:01 09:51:04 09:51:06 09:51:13 09:51:15

Q Okay. Can you point me to a comparison in your report between [redacted] to support that those two projects operate the same? 09:51:16 09:51:19 09:51:22 09:51:30

A But my opinion that they -- these two platforms or project names function in the same way for the purpose of the asserted claims is not based only on the source code. It's based also on 09:51:44 09:51:46 09:51:50 09:51:54

the standards compliance, and I didn't think a formal comparison of source code is necessary, so I did not include that in the report. 09:52:03 09:52:05 09:52:08

Q Okay. Can we move to Paragraph 252, please. 09:52:10 09:52:21

A Yes. 09:52:25

Q And this is part of your infringement opinion regarding the NXP '629 patent accused products, correct? 09:52:30 09:52:32 09:52:38

A Paragraph 252? 09:52:40

Q Yes. 09:52:41

A Yes. 09:52:42

Q Okay. Thank you. 09:52:42

Can you show me -- actually, let me rephrase that. Strike that. 09:52:49 09:52:52

This Paragraph 252 is directed to the limitation in the '629 patent, a signal generator that generates an extended long training sequence, end, close quote. 09:52:53 09:52:58 09:53:03 09:53:07

Do you see that? 09:53:09

A Yes. 09:53:10

Q Okay. Can you show me in your report, in 09:53:14

this section of your report for the '629 patent where you cite to a signal generator in the 802.11 N standard? 09:53:19 09:53:32 09:53:35

MR. JACOBSON: Object to form. 09:53:43

BY THE WITNESS: 09:55:02

A Yes, I can answer. 09:55:02

That -- well, starting with Paragraph 253, I state that as part of the 802.11 N standard there is a Section 20.3.9.4.6 defines a high throughput long training field. I think I then -- I cite to that section, and then at the end of the citation is the HT-LTF sequence shown in equation 20.23. So this is what I cite from the standard. 09:55:04 09:55:08 09:55:14 09:55:20 09:55:28 09:55:31 09:55:39

BY MR. TAMBURO: 09:55:51

Q Okay. So you just -- thank you for that answer. You pointed me to the HT-LTF signal, correct? 09:55:52 09:55:53 09:55:58

A I mean, you can -- it says sequence, but with -- I think engineers sometimes call it a signal, but... 09:56:08 09:56:15 09:56:18

Q So you pointed me to the it LTF, HT-LTF sequence. 09:56:19 09:56:25

A Yes. 09:56:26

Q Is that in your view a signal generator, 09:56:26

the sequence? 09:56:32

A The sequence itself being defined is 09:56:33

evidence that a product that produces this 09:56:44

sequence has a signal generator. 09:56:49

Q Can you point me to anywhere in your 09:56:52

report where you cite to the 802.11 N standard 09:56:54

where there is a signal generator as opposed to 09:57:04

the HT-LTF sequence? 09:57:06

A I don't think a generator is -- a signal 09:57:16

generator can be opposed to a sequence. I mean, 09:57:23

the signal generator generates or produces a 09:57:28

sequence, and so because the sequence is defined 09:57:31

in the standard, so equipment -- and I think the 09:57:40

claim is an apparatus claim, so equipment that is 09:57:47

compliant with the standard will have a signal 09:57:55

generator that generates the sequence that is 09:58:00

described in the standard. 09:58:03

Q So it's your opinion that because the 09:58:04

802.11 N standard discloses the presence of an 09:58:08

HT-LTF sequence there must also be a signal 09:58:13

generator that generates that sequence? 09:58:19
A Yes. 09:58:24
Q Now, assuming for purposes of my question, 09:58:30
Dr. Cooklev, that there is a signal generator 09:58:36
present to generate that HT-LTF sequence, can we 09:58:40
do that? Can we assume there is a signal 09:58:46
generator present? 09:58:48
A Okay. 09:58:49
Q Do you agree that the location of that 09:58:49
signal generator is not described in the 802.11 N 09:58:54
standard? 09:58:59
A The location? I -- first, I'm not sure 09:59:11
what do you mean the location? I mean, your 09:59:22
question raises a number of questions beginning I 09:59:26
guess with this one. 09:59:29
Q Well, let me clarify if I can. 09:59:30
I think it's your opinion that there must 09:59:32
be a signal generator that generates the sequence, 09:59:36
correct? 09:59:39
A The sequence, yes. 09:59:39
Q Okay. Can you also identify where the 09:59:43
signal generator is in the system, in the 09:59:47

transmitter? 09:59:54

MR. JACOBSON: Object to form. 09:59:58

BY MR. TAMBURO: 10:00:04

Q And we'll start with your report. Let me rephrase. 10:00:05

Does your report include any identification of where there is a signal generator assuming there must be a signal generator? 10:00:09

MR. JACOBSON: Object to form. 10:00:22

BY THE WITNESS: 10:00:42

A Yes. My report does -- does I think include the answer to your question, that the signal generator is operatively coupled to an inverse Fourier transformer. 10:00:42

BY MR. TAMBURO: 10:01:05

Q Okay. I'm talking specifically now about the 802.11 standard. 10:01:06

Do you cite to any portion of the 802.11 N standard that would tell us where the signal generator is located? 10:01:11

A Yes. If by where is it located, from 10:01:54

1	the -- for the purpose of the claim, if that's the	10:02:06
2	analysis, yes, my report does -- does include a	10:02:10
3	citation from the standard which answers your	10:02:15
4	question. If we look at Paragraph 262 of my	10:02:21
5	report where I cite equation 19-25, and in this	10:02:23
6	equation, we see -- it's -- it -- we see the	10:02:36
7	HT-LTF sequence, there is an index K there, and we	10:02:48
8	see the inverse Fourier transform basis function	10:02:58
9	right next to it, so -- so my report I think	10:03:06
10	answers your question.	10:03:14
11	Q But you pointed us, again, to the sequence	10:03:16
12	and I'm asking you about the signal generator that	10:03:18
13	generated that sequence.	10:03:23
14	Where is that in equation 19-25?	10:03:24
15	A But equation 19-25 is evidence that -- and	10:03:37
16	now we're talking about, I think, two claim	10:03:44
17	limitations, these are the claim limitations B and	10:03:46
18	C of my report, and it is evidence -- the	10:03:49
19	equation, of course, includes the sequence, so at	10:03:56
20	least the generator that generates this sequence	10:04:01
21	is right here. It is operatively coupled to an	10:04:08
22	inverse Fourier transformer.	10:04:13

MR. JACOBSON: Sal, we've been going about an hour. I don't want to interrupt you right if you're in the middle of something. We should probably get to a good stopping point. 10:04:18 10:04:20 10:04:22 10:04:24

MR. TAMBURO: Yeah, very, very shortly. 10:04:26

THE WITNESS: Yeah, thank you. 10:04:27

MR. TAMBURO: Do you need a break now, Dr. Cooklev? 10:04:28 10:04:30

THE WITNESS: I mean, either -- either now or in the next five minutes. 10:04:31 10:04:32

MR. TAMBURO: Yeah, okay. We won't go longer than that. Thank you. 10:04:36 10:04:38

BY MR. TAMBURO: 10:04:39

Q So your opinion is that equation 19-25 discloses the location of a signal generator? 10:04:50 10:04:53

A Maybe slightly more accurately would be to say that equation 19-25 is evidence that claim limitation C is met. 10:05:09 10:05:16 10:05:21

MR. TAMBURO: Okay. Why don't we take a break. 10:05:28 10:05:29

THE VIDEOGRAPHER: Okay. One moment. We are going off record. The time is 10:05 a.m. 10:05:30 10:05:31

(A recess was had.) 10:05:36

THE VIDEOGRAPHER: We are back on record. 10:14:02

The time is 10:14 a.m. 10:14:14

BY MR. TAMBURO: 10:14:17

Q Dr. Cooklev, can I ask you to look at 10:14:23

Paragraph 280 of your report. 10:14:26

A I'm there. 10:14:38

Q Okay. And if you go back a couple of 10:14:39

pages, this is for the limitation D of the '629 10:14:41

patent, correct? 10:14:45

A Yes. 10:14:47

Q And in Paragraph 280, you state: "The 10:14:53

extended long training sequence taught by the 10:15:00

802.11 N-2009 and 802.11-2016 standards meet the 10:15:03

limitation of the claim. This peak-to-average 10:15:12

ratio corresponds to the 'minimal' peak-to-average 10:15:19

power ratio of 3.6 dB as taught by the 10:15:24

specification of the '629 patent," and then you 10:15:28

cite a portion of the '629 patent. 10:15:31

Do you see that? 10:15:34

A Yes. 10:15:35

Q So is it your opinion that because the 10:15:41

extended long training sequence for 56 subcarriers is the same in the 11 -- I'm sorry -- is the same in the 802.11 N standard as it is in the '629 patent, then its peak-to-average ratio is also the same as in the '629 patent, correct? 10:15:43 10:15:49 10:15:50 10:15:54 10:15:59

MR. JACOBSON: Object to form. 10:16:05

BY THE WITNESS: 10:16:10

A Just let me restate how I understand the question. 10:16:11 10:16:13

So your question is because -- if two sequences are the same do they have the same peak average power ratio. 10:16:13 10:16:19 10:16:25

BY MR. TAMBURO: 10:16:29

Q Yes. 10:16:29

A I think they do I mean, just because if they are the same, if two sequences are the same and there is a mathematical formula for the peak average power ratio so the result will be the same. 10:16:30 10:16:31 10:16:34 10:16:38 10:16:40

Q Okay. And for the same reasons you just stated, are -- is the sequence in the 802.11 N standard, does that also have a minimal PAPR, the 10:16:41 10:16:45 10:16:51

same as the '629 patent sequence? 10:16:58

MR. JACOBSON: Object to form. 10:17:03

BY THE WITNESS: 10:17:19

A Well, if I may say that it's a little bit -- at least a little bit confusing is the question because the term minimal "peak-to-average ratio" appears in the claim element. 10:17:20 10:17:28 10:17:31 10:17:35

Q Yes. Let me rephrase. 10:17:49

A The standard doesn't -- doesn't even calculate the peak-to-average ratio. Obviously that was a factor in coming up with that sequence. That sequence is there in the standard because -- because it has certain properties. 10:17:51 10:17:53 10:18:02 10:18:06 10:18:10

Q But it's your opinion that the standard meets this limitation of the claim, correct? 10:18:12 10:18:15

A Yes. 10:18:17

Q And it's your opinion that a standard meets this limitation of the claim because the sequence in the standard is the same as in the claim, correct? 10:18:18 10:18:21 10:18:23 10:18:26

A Yes. 10:18:28

Q So the sequence in the standard is the 10:18:29

same as the patent claim meaning the sequence has a minimal PAPR in both the standard and the patent, correct? 10:18:31 10:18:37 10:18:41

A Well, the minimal PAPR or the claim says minimal peak-to-average ratio which is the same thing, this is -- this is in the claim. 10:18:51 10:18:54 10:18:57

Q Right. 10:19:00

A So I'm just not sure -- what is -- what is it that you mean when you say it's minimal PAPR in the standard? 10:19:04 10:19:07 10:19:11

Q Well, is it your opinion that the standard -- the standard discloses a long training sequence with a minimal PAPR or not? 10:19:13 10:19:15 10:19:21

A I mean, in the context of the claim, yes. 10:19:30

Q It does? 10:19:32

A Yes. 10:19:33

Q Okay. So is that because the sequence is the same in the standard as it is in the claim? 10:19:35 10:19:39

A Yes. 10:19:41

Q Okay. And is it also your opinion that the standard discloses an optimal extended long training sequence for the same reason because the 10:19:55 10:19:57 10:20:00

sequence is the same in the standard as it is in the claim? 10:20:03 10:20:05

MR. JACOBSON: Object to form. 10:20:13

BY THE WITNESS: 10:20:23

A Well, the -- the sequence is optimal because this is how the inventors characterize it. They said that this sequence is optimal, and because the sequence in the standard is identical to the one in the '629 patent, therefore, it meets the limitation of the claim. 10:20:24 10:20:26 10:20:31 10:20:33 10:20:37 10:20:40

BY MR. TAMBURO: 10:20:42

Q Including an optimal extended long training sequence? 10:20:44 10:20:46

A I mean, that's how the inventors characterize it. 10:20:47 10:20:50

Q Yes. So if the sequence is the same as what is disclosed in the '629 patent, it's going to be an optimal extended long training sequence for the same reason you just explained? 10:20:51 10:20:53 10:20:55 10:20:59

A In the context of the claim, yes. 10:21:00

Q Yes, okay. Can I ask you to turn to Paragraph 275 in your report, please. 10:21:02 10:21:15

A 275. Yes, I'm there. 10:21:19

Q Okay. And this is the same limitation D in the '629 patent, right? 10:21:22 10:21:24

A Yes. 10:21:26

Q Can I ask you to look at Page 92 of your report. 10:21:40 10:21:43

A Yes. 10:21:46

Q Okay. You see Figure 20-9 and Figure 20-10 from the 802.11 N standard? 10:21:46 10:21:51

A Yes. 10:22:02

Q Do you see the IFFT on the right side? 10:22:03

A I do. 10:22:08

Q That's an inverse fast Fourier transformer? 10:22:08 10:22:12

A Yes. 10:22:13

Q You agree that the input to the IFFT comes from the output of the Q steering matrix in Figure 20-9? 10:22:16 10:22:21 10:22:26

A Not quite. We can certainly look at Figure 20-9 and 20-10 and we can analyze them in particular with also equation 19-25 which appears below on the same page, and so the input to the 10:22:38 10:22:50 10:22:54 10:22:59

IFFT includes includes several factors, and the equation makes that clear. 10:23:05 10:23:10

Yes, there is a Q matrix there in those elements, there is a P matrix. There is a factor which is -- there is another factor there and then the HT long training sequence. 10:23:11 10:23:18 10:23:27 10:23:32

Q I appreciate it, Dr. Cooklev. I'm going to take each of these steps one at a time if that's okay. 10:23:36 10:23:38 10:23:41

A I mean, that's -- I will try to answer truthfully your questions. 10:23:42 10:23:45

Q I have no doubt about that, sir. Thank you. 10:23:46 10:23:48

So starting on the right side of Figure 20-9, for purposes of my questions I think Figure 20-9 and 20-10 are equivalent. 10:23:49 10:23:58 10:24:04

So looking at 20-9, for example, isn't it correct that the direct input to the IFT is coming from the Q steering matrix? 10:24:11 10:24:15 10:24:20

A Well, as I said, it will be incorrect to say that, so I don't -- 10:24:29 10:24:37

(Reporter clarification.)

BY THE WITNESS:

A It would be incorrect -- it would be incorrect to say that. For -- and for maybe two -- at least two or maybe even three reasons. So the first reason is -- the first reason is that certainly one would analyze these figures together with the equation and will see that what goes into the IFFT are several factors there in the equation, and one of these factors is the extended long training sequence. 10:24:40 10:24:40 10:25:03 10:25:09 10:25:19 10:25:22 10:25:27 10:25:31 10:25:40

So -- and Claim Element D does not preclude from -- doesn't preclude the inverse Fourier transformer from processing other factors. So this is one reason for which it would not be correct to say that the input to the IFFT is -- is -- it would be incorrect to say basically that the IFFT does not process the extended long training sequence. It does. 10:25:42 10:25:45 10:25:49 10:25:54 10:26:05 10:26:21 10:26:23 10:26:25

But there's another reason. The Figure 20-9 shows a multiple antenna system, and it is a conceptual -- it is a conceptual illustration, if you will, of the connections, but 10:26:27 10:26:31 10:26:38 10:26:42

when we have a single antenna system, so when the multiple antennas are -- then when you don't have multiple antennas you have just one, then the matrix Q becomes just the number one. Essentially which means there is no matrix Q because it's the number one. 10:26:44 10:26:49 10:26:55 10:26:57 10:27:05 10:27:08

The matrix P becomes the number one. There is -- effectively there is no matrix P, and so in this case we see that the only thing is the extended long training sequence that goes into the IFFT. That is another reason. And so for these reasons, these figures that come from the standard in the equation they are evidence that this claim element is met. 10:27:08 10:27:13 10:27:22 10:27:28 10:27:31 10:27:42 10:27:52 10:27:55

MR. TAMBURO: I'm going to move to strike as nonresponsive. 10:27:56 10:27:59

BY MR. TAMBURO: 10:28:00

Q I'm just asking you, Dr. Cooklev, in Figure 20-9, where does the -- let me strike that. 10:28:00 10:28:06

You said there are several factors that are the input of the IFFT, correct? 10:28:12 10:28:14

A Yes. 10:28:17

Q What does the Q matrix do? What is the function of the Q matrix in Figure 20-9 of the 802.11 N standard? 10:28:17 10:28:20 10:28:30

A It provides a mapping to the spacial streams. 10:28:33 10:28:38

Q And what does that mean? Can you explain what that means, a mapping to the spacial streams? 10:28:43 10:28:45

MR. JACOBSON: Object to form. 10:28:49

BY MR. TAMBURO: 10:28:53

Q What's at the input of -- let me rephrase that. 10:28:54 10:28:55

What's at the input of the Q matrix and what's at the output of the Q matrix? 10:28:56 10:28:58

MR. JACOBSON: Object to form. 10:29:00

BY THE WITNESS: 10:29:05

A Well, the output is what is transmitted on each antenna, so we can call that a spacial stream, and so effectively it maps what is at the input to the -- the two or more spacial streams that are transmitted. 10:29:05 10:29:07 10:29:11 10:29:17 10:29:27

BY MR. TAMBURO: 10:29:31

Q What is at the input of the Q matrix? 10:29:31

A Well, at the input, we have -- there are a couple of sequences. 10:29:45 10:29:47

Q What are those couple of sequences? 10:29:52

A I mean, they are obtained -- they are obtained by if we have multiple antenna systems. So -- so there are -- there are a series of steps starting from the extended long training sequence. There is a multiplication with what is the -- the P matrix. There is a circular shift delay, or CSD, that's applied, so I think that's what Figure 20-9 shows. 10:29:58 10:30:02 10:30:06 10:30:16 10:30:21 10:30:26 10:30:30 10:30:41

Q Okay. So what is the function of the P matrix in Figure 20-9? Let me rephrase. 10:30:43 10:30:45

The P matrix receivers the long training sequence, correct? 10:31:02 10:31:07

A It multiplies the long -- the extended long training sequence, yes. 10:31:08 10:31:09

Q The P matrix is processing the long training sequence? 10:31:11 10:31:14

A Well, it multiplies. So the IFFT will process the extended long training sequence together with these factors, so all of them go 10:31:18 10:31:21 10:31:25

into the IFFT. 10:31:32

Q So why don't we take it step by step. 10:31:35

What happens to the long training sequence before it reaches the IFFT? Can you -- can you tell us what happens to the long training sequence at the P matrix? 10:31:38 10:31:45 10:31:48 10:31:52

A Well, this is -- certainly the figure shows what happens and shows that the IFFT process -- processes -- processes the extended long training sequence, multiplied by the P matrix by this circular shift delay and the Q matrix if in the case when we have multiple antenna systems -- a multiple antenna system. If we have a single antenna system, then we don't need a P matrix, we don't need a Q matrix, we don't need a circular shift delay and what goes in the IFFT is the extended long training sequence. 10:31:59 10:32:01 10:32:09 10:32:14 10:32:17 10:32:22 10:32:28 10:32:31 10:32:36 10:32:41 10:32:44

Q Okay. Your opinion is that the signal generator is probably somewhere on the left side of this diagram, Figure 20-9 because that's where the sequence is located? 10:32:47 10:32:50 10:32:52 10:32:55

MR. JACOBSON: Object to form. 10:32:58

Mischaracterizes prior testimony. 10:32:59
BY THE WITNESS: 10:33:08
A You said the signal generator is -- the signal generator generates the extended long training sequence, so in this figure it's -- it is where the extended long training sequence is. 10:33:08 10:33:13 10:33:18 10:33:19
BY MR. TAMBURO: 10:33:22
Q Okay. And the first step in Figure 20-9 after the signal generator is the P matrix, correct? 10:33:23 10:33:35 10:33:37
A In the special case when the system operates as a multiple antenna system, there is a P matrix, yes. 10:33:39 10:33:45 10:33:52
Q Okay. And the second step in Figure 20-9 of the 802.11 N standard is a CSD, correct? 10:33:53 10:33:59
A There is a CSD, yes. 10:34:03
Q And so the CSD is then processing the output of the P matrix, correct? 10:34:06 10:34:09
A Well, you're using the term "processing" which is a claim term. 10:34:14 10:34:17
Q You want to use a different term? 10:34:22
A Well, all of these factors, they -- they 10:34:26

go into the IFFT, so the IFFT is applied on the result of these multiplications and which I've shown in formula 19-25. So you have several factors that are multiplied and all of them go into the IFFT. 10:34:32 10:34:41 10:34:47 10:34:51 10:34:57

Q And these multiplications that you described, is that also happening in CSD or is that not a multiplication? 10:35:00 10:35:09 10:35:15

MR. JACOBSON: Object to form. 10:35:16

BY MR. TAMBURO: 10:35:55

Q Let me withdraw that and I'll ask it again a different way. 10:35:56 10:35:58

A Okay. 10:35:59

Q Isn't it correct that these multiplications you described are occurring before the input to the IFFT? 10:35:59 10:36:00 10:36:03

MR. JACOBSON: Object to form. 10:36:15

BY THE WITNESS: 10:36:27

A They start with the extended long training sequence and they are performed before the IFFT is applied. 10:36:28 10:36:31 10:36:38

BY MR. TAMBURO: 10:36:47
Q And the CSD block, is that a 10:36:47
multiplication function or is that something 10:36:49
different? 10:36:53
MR. JACOBSON: Object to form. 10:36:53
BY MR. TAMBURO: 10:36:54
Q In Figure 20-9? 10:36:54
MR. JACOBSON: Same objection. 10:36:56
BY THE WITNESS: 10:37:15
A The circular shift delay delays each 10:37:16
stream by a certain amount. I think it's 200 10:37:27
nanoseconds. So that's what it does. I haven't 10:37:32
mathematically represented what that circular 10:37:57
shift delay does. 10:38:04
BY MR. TAMBURO: 10:38:05
Q So -- and, again, this circular shift 10:38:06
delay, is that what it's called? 10:38:08
A Yes. 10:38:10
Q That's happening, again, before the input 10:38:10
to the IFFT, correct? 10:38:12
MR. JACOBSON: Object to form. 10:38:14
BY THE WITNESS: 10:38:21

A Well, the IFFT processes a result that starts with the extended long training sequence that undergoes these operations. 10:38:22 10:38:25 10:38:29

BY MR. TAMBURO: 10:38:36

Q Okay. Thank you. 10:38:36

Can I ask you to turn to Paragraph 269, please, in your report? 10:38:59 10:39:06

A Yes, I'm looking at it. 10:39:12

[redacted] 10:39:21

[redacted] 10:39:26

[redacted] 10:39:28

[redacted] 10:39:32

[redacted] 10:39:35

[redacted] 10:39:38

Do you see that? 10:39:38

A Yes. 10:39:44

[redacted] 10:39:45

[redacted] 10:39:47

[redacted] 10:39:54

[redacted] 10:39:58

[redacted] 10:40:03

MR. TAMBURO: Let me just put on the 10:40:06

record this line of questioning is directed to Dr. Cooklev's analysis of NXP's source code and this is all subject to a motion to strike so I just want to mark this in the exhibit separately as such. 10:40:07 10:40:13 10:40:17 10:40:24 10:40:27

So this section of the deposition I would withdraw the questions to the extent the motion is granted. 10:40:29 10:40:32 10:40:34

MR. JACOBSON: I understand you're making your record, Counsel. We disagree with that. If you want to proceed with these questions, you do so on the risk that you're opening the door regardless of whether the motion is granted or not. 10:40:36 10:40:37 10:40:40 10:40:43 10:40:45 10:40:49

MR. TAMBURO: I disagree. 10:40:49

MR. ERICKSON: To the extent the motion to strike is denied, are you willing to bring Dr. Cooklev back for a supplemental deposition? 10:41:15 10:41:18 10:41:21

MR. JACOBSON: We are certainly willing to discuss reasonable accommodations that are workable for everybody. My understanding and usual practice is that supplemental depositions 10:41:23 10:41:25 10:41:26 10:41:31

while not ideal are compromises in which both parties are a little bit unhappy and are often ways to solve solutions -- 10:41:33 10:41:37 10:41:44

(Reporter clarification.)

MR. JACOBSON: And are often ways to solve -- to provide solutions. 10:41:46

MR. TAMBURO: Could we go off the record for a moment. 10:41:48 10:41:49

MR. JACOBSON: Sure. 10:41:49

THE VIDEOGRAPHER: Okay. We are going off record. The time is 10:41 a.m. 10:41:50 10:41:51

(A recess was had.) 10:41:54

THE VIDEOGRAPHER: We are back on record. The time is 10:47 a.m. 10:47:09 10:47:14

MR. TAMBURO: So, Lowell, subject to your -- because of your objection we're going to forego the line of questioning now regarding the source code portions of Dr. Cooklev's opinion, but we're going to if the motion is denied, the motion to strike is denied we're going to seek to bring Dr. Cooklev back for these portions of the report. 10:47:16 10:47:19 10:47:21 10:47:23 10:47:27 10:47:30 10:47:33

MR. JACOBSON: Okay. Just for the record, 10:47:37

Dr. Cooklev is again being made available next Friday so rather than a third day of deposition with Dr. Cooklev, it seems like it would be -- make the most sense and least inconvenient if we could try to do that next Friday, and alternatively if you guys reconsider your position and want to include a brief segment of that line of questioning next Friday while Dr. Cooklev is already here, I'm sure we can discuss making an exception to our division between invalidity and infringement. 10:47:39 10:47:41 10:47:44 10:47:47 10:47:50 10:47:55 10:47:57 10:48:00 10:48:04 10:48:06 10:48:09

MR. TAMBURO: I understand and appreciate that. You know, we're -- this is all subject to what the ALJ is going to do with the motion so we may not hear by next Friday. So if we do, then we can revisit this. 10:48:09 10:48:10 10:48:13 10:48:17 10:48:20

MR. JACOBSON: Understood. 10:48:21

MR. TAMBURO: Fair enough? Thanks. 10:48:24

BY MR. TAMBURO: 10:48:25

Q Okay. So I'm going to move on, then. 10:48:26

Can I ask you to turn to Paragraph 319 of your report? 10:48:48 10:48:51

A 319, yes. Yes, I'm looking at 319. 10:48:59

Q Thank you. This is your opinion regarding Claim 20 of the '629 patent and NXP's alleged infringement, correct? 10:49:03 10:49:05 10:49:08

A Yes. 10:49:11

Q Can you please -- strike that. 10:49:27

This claim recites a symbol mapper that generates symbols from each of 64 subcarriers of an OFDM sequence, right? 10:49:28 10:49:31 10:49:35

A Yes. 10:49:38

Q Can you show me in your report where you cite to the 802.11 N standard as including a symbol mapper that generates symbols for 64 subcarriers? 10:49:38 10:49:40 10:49:49 10:49:54

A So the question is where do I cite this evidence that this claim limitation is met, where do I cite portions of the standard, and I guess what portions do I cite if any? 10:51:03 10:51:06 10:51:11 10:51:14

Q Let me rephrase, if I may. 10:51:16

Where do you cite to portions of the standard that show 64 subcarriers being met? 10:51:20 10:51:24

A Clearly what I -- it is clear what 10:51:56

evidence I am showing that this claim limitation is met. I think my -- so this is the report starting with Paragraph 321. And there I cite Figure 20-3, and so this citation from the standard continues on to the next page and I think it's -- it describes -- it describes basically this figure or at least -- at least a relevant portion of this figure. 10:51:58 10:52:00 10:52:09 10:52:17 10:52:28 10:52:38 10:52:43 10:52:52

So in this figure I identify a constellation mapper. That's the -- the term that the standard is using. And this constellation mapper is evidence that this claim, Claim 20 is met, because it receives coded bits and generates symbols for each of 64 subcarriers. 10:52:53 10:52:55 10:53:00 10:53:14 10:53:20 10:53:27

Q Where do you see evidence in this portion of the standard that you cite to of 64 subcarriers? Let me rephrase that. 10:53:32 10:53:37 10:53:48

Where do you see evidence in this portion of the standard you cite to of generating symbols for each of 64 subcarriers? 10:53:49 10:53:52 10:53:57

A You know, you are right in the sense that I don't specifically cite that right here that the 10:54:26 10:54:29

number of subcarriers is 64 because it is a -- it is a well-known fact that the number of subcarriers is 64. And the standard makes this clear a number of -- many times, a number of times at least, and it is a very well-known fact. 10:54:35 10:54:40 10:54:42 10:54:49 10:54:54

Maybe I could have -- I could have been here a little more careful I guess. I could have included that -- that evidence, but I just thought that this is a very well-known fact and I did not. 10:55:02 10:55:08 10:55:13 10:55:18

Q Is your testimony, then, that if you had the entire standard you might be able to point to something different that shows a constellation mapper that generates symbols for each of 64 subcarriers? 10:55:26 10:55:29 10:55:32 10:55:35 10:55:41

A Yes. I could have -- since you seem to focus on the 64 number, I could have -- if I have the standard I could identify. 10:55:42 10:55:45 10:55:53

Q But it's not in your report currently? 10:55:55

A It's -- at least for this claim, I mean, obviously the No. 64 is not on these two pages, and, again, I mean, I acknowledge the sense that my report could have been maybe a little more 10:55:57 10:56:08 10:56:13 10:56:21

complete, but I think that it is a widely known fact that the number of subcarriers is 64. 10:56:22 10:56:30

Q Claim 20 is a dependent claim, right? 10:56:33

A Yes. It is a dependent claim. It depends on Claim 1. 10:56:41 10:56:45

Q Right. And Claim 1 recites exactly 56 subcarriers, right? 10:56:46 10:56:49

A We can -- there is something like that, yes. And I'm sorry I haven't memorized all the claims, but, yes, Claim 1-F says: The optimum extended long training sequence is carried by exactly 56 active subcarriers." 10:56:58 10:57:00 10:57:05 10:57:09 10:57:11

That's -- that's -- we need to be accurate here for the claim language. 10:57:17 10:57:18

Q Okay. So is it your opinion, then, that the constellation mapper could generate symbols for inactive subcarriers? Referring back to Claim 20. 10:57:25 10:57:29 10:57:48 10:57:56

A Well, Claim 20 says a simple mapper and goes on: Wherein the simple mapper receives coded bits, generates symbols for each of 64 subcarriers. 10:57:56 10:58:00 10:58:04 10:58:07

So it doesn't say active subcarriers. So I think this is a distinction between the 56 number in Claim 1 and the 64 number in Claim 20. 10:58:07 10:58:14 10:58:17

Q What do you mean by a "distinction"? 10:58:22

A That the Claim 1-F says 56 active subcarriers and Claim 20 says 64 subcarriers. 10:58:28 10:58:32

Q If there's 56 subcarriers transmitting an LTF -- strike that. 10:58:48 10:58:51

Yeah. If there's 56 subcarriers in Claim 1 transmitting an LTF, does that mean that there's 56 subcarriers transmitting data as well? 10:58:55 10:58:59 10:59:02

MR. JACOBSON: Object to form, incomplete hypothetical. 10:59:11 10:59:12

BY THE WITNESS: 10:59:17

A Well, first Claim 1-F says 56 active subcarriers, and for Claim Element 1-F my report shows that it is met. 10:59:17 10:59:21 10:59:27

Now, when we get to -- as is in the entire Claim 1, and when we get to Claim 20, yes, the claimed symbol mapper, so the claim symbol mapper generates symbols for each of 64 subcarriers, yes. 10:59:29 10:59:32 10:59:41 10:59:49

Q Are symbols generated for an inactive 10:59:53

1	subcarrier?	10:59:58
2	A For the purpose of the claim, yes.	11:00:08
3	Q I'm asking about for the purposes of real	11:00:09
4	life. Are symbols generated for inactive	11:00:12
5	subcarriers?	11:00:19
6	A Yeah, but I'm -- I mean, my analysis is	11:00:27
7	for the purpose of the claim and for the purpose	11:00:28
8	of the claim, yes, symbols are generated for each	11:00:30
9	of 64 subcarriers.	11:00:37
10	Q Even though there's 56 active subcarriers?	11:00:45
11	A Yes.	11:00:54
12	Q So symbols are generated for 8 inactive	11:00:55
13	subcarriers in your opinion?	11:01:00
14	A For the purpose of the claim, yes.	11:01:00
15	Q Okay. And that's a possibility in your	11:01:02
16	view?	11:01:04
17	A For the purpose of the claim, yes.	11:01:04
18	Q Okay. Is it a well-known fact in your	11:01:43
19	view that symbols are generated for inactive	11:01:44
20	subcarriers?	11:01:47
21	A Well, I said that my analysis is in the	11:02:09
22	context of the claim, so I'm not sure how to	11:02:11

understand the question is it a well-known fact that something is happening in the context of a claim. I'm afraid I don't understand the question just to give you an answer. 11:02:16 11:02:22 11:02:25 11:02:41

I mean, obviously we need to look at every -- at the -- at a claim to say if it's met or not met. Generally claims -- and since your questions seem to be more general, but I assume generally the claims of an issued patent are presumed to be not known prior to the patent. 11:02:42 11:02:43 11:02:45 11:02:54 11:02:59 11:03:03

Q Is it your opinion that in Claim 20 that there are 56 active subcarriers and 8 inactive subcarriers for a total of 64? 11:03:23 11:03:25 11:03:29

MR. JACOBSON: Object to form. 11:03:34

BY THE WITNESS: 11:03:44

A My opinion is that the symbol mapper generates symbols for each of 64 subcarriers. 11:03:45 11:03:47

BY MR. TAMBURO: 11:04:18

Q And are 8 of those 64 subcarriers inactive? 11:04:19 11:04:23

A I think we can say that, yes. 11:05:24

Q Okay. So your opinion is that symbols are 11:05:26

mapped or strike that. 11:05:30

Symbols are generated for inactive 11:05:32

subcarriers, is that your testimony? 11:05:35

A In the context of the claim, yes. 11:05:39

[redacted] 11:05:41

[redacted] 11:05:42

[redacted] 11:05:49

[redacted] 11:05:52

Q I'm going to move on. 11:06:08

How many hours did you spend reviewing 11:06:13

NXP's source code? 11:06:17

A I don't remember number of -- the number 11:06:29

of hours that I spent. I spent a little bit of 11:06:30

time at the facility where source code was 11:06:38

produced. 11:06:41

Q Let's start there. That was in Austin, 11:06:41

Texas? 11:06:44

A Yes. 11:06:44

Q Okay. Do you recall how many days you 11:06:45

went to Austin to review NXP's source code? 11:06:47

A Probably I -- I traveled on two or three 11:06:59

occasions and sometimes I can -- I think I 11:07:05

spent maybe I spent one day or did I spend more than a day? I just don't -- one or two days. 11:07:09 11:07:21

Q Okay. Physically in Austin looking at the source code computer? 11:07:24 11:07:26

A Yes. 11:07:27

Q Okay. And then there were hard copies that were printed out of NXP's source code? 11:07:27 11:07:33

A Yes. 11:07:36

Q About how much time did you spend reviewing the hard copies of source code? Do you recall? 11:07:36 11:07:42 11:08:03

A I mean, that night was -- I mean, I was periodically reviewing them in connection with producing the report. So in total probably a few days. 11:08:03 11:08:03 11:08:06 11:08:18

Q Okay. So would that be 20 hours or more? 11:08:22

A I would say a little bit more than that. 11:08:28

Q 40 hours? 11:08:31

A I mean, I think we are getting to a number that probably reflects what I did, the amount of time that I spent. 11:08:33 11:08:37 11:08:46

Q Okay.

A I also got some assistance with the source code review process, so... 11:08:48 11:08:51

Q And who was that? 11:08:53

A Who? Well, I don't -- I don't remember the names. I'm sure counsel has records as far as who has signed the protective order. I don't. I said that my memory isn't that good, so I don't exactly remember the -- recall the names. 11:08:54 11:09:10 11:09:21 11:09:30 11:09:33

Q That's fine. 11:09:35

Did they provide you with any information regarding the source code, any notes or were these just conversations or did they prove you with anything? 11:09:37 11:09:39 11:09:45 11:09:47

MR. JACOBSON: Object to form. 11:09:47

BY THE WITNESS: 11:09:48

A I think it's both. There were some -- they did provide some notes and we did have conversations. We had several conversations regarding the source code. 11:09:49 11:09:56 11:10:03 11:10:10

BY MR. TAMBURO: 11:10:12

Q Did you produce those notes as part of your disclosure in your report? 11:10:13 11:10:15

A Did I produce those notes? 11:10:23
Q Yes. 11:10:25
A I don't I've produced anything other than my report. 11:10:25
MR. TAMBURO: Counsel, to the extent Dr. Cooklev relied on notes given to him, we would ask that those be produced for purposes of his report. 11:10:30
MR. JACOBSON: Okay. We can certainly discuss that. 11:10:38
BY MR. TAMBURO: 11:10:40
Q Who decided to print out the source code in hard copies from the source code computer at NXP's source code computer? 11:10:43
MR. JACOBSON: I'm going to object to the extent that that would reveal work product. 11:10:47
Your opinions that you're making about the litigation or would encompass attorney-client communications, to the extent reveal any of those types of information, I would instruct you not to answer. If you can answer without revealing that sort of information, you may do so. 11:10:47
11:10:49
11:10:50
11:10:59
11:11:01
11:11:07
11:11:28
11:11:29
11:11:36
11:11:38
11:11:44
11:11:46
11:11:48
11:11:51

BY THE WITNESS: 11:12:08

A Well, I was doing that work, the work on 11:12:09

reviewing the source code with keeping in mind the 11:12:11

task that I had, and I think it would be correct 11:12:22

to say that I made that decision. I think that 11:12:36

would be correct to say. 11:12:48

Certainly we had -- we had discussions. I 11:12:50

mean, it's quite a bit of source code. I mean, 11:12:56

thousand -- I don't have the exact number, but 11:13:04

it's not just thousands of pages, it's probably 11:13:07

tens of thousands if not even more, and so I'm 11:13:11

just giving you an idea of our process to work on 11:13:17

the source code. 11:13:22

BY MR. TAMBURO: 11:13:23

Q You say you were there physically in 11:13:23

Austin reviewing NXP's source code for one or two 11:13:25

days, right? 11:13:28

MR. JACOBSON: Objection. 11:13:29

Mischaracterizes prior testimony. 11:13:29

BY THE WITNESS: 11:13:36

A I think one or two days is just my 11:13:36

recollection, yes. 11:13:38

BY MR. TAMBURO: 11:13:39
Q Now, in those one or two days did you 11:13:39
direct that any code be printed out in hard copy? 11:13:42
A I think, yes. 11:13:53
Q And who -- was it someone other than you 11:13:57
who was directing that code be printed out when 11:14:01
you were not -- when somebody else was reviewing 11:14:03
the code and not you physically there? Was 11:14:06
somebody else making those decisions besides you? 11:14:10
A Well, I think we are talking about to some 11:14:16
extent two separate things. I think the decision 11:14:22
on which -- what portion to print, I think that's 11:14:32
one thing, and who actually makes the request and 11:14:37
carries out, if you will, that decision, I think 11:14:43
it's a separate -- I think it's a separate thing. 11:14:46
Q I'm asking about -- and I appreciate that. 11:14:50
I'm asking about the first part. 11:14:52
Who made the decision of which pages to 11:14:53
print out on the days you were not physically 11:14:57
reviewing the code, someone else was physically 11:15:01
reviewing the code? 11:15:04
A But even if someone else was reviewing the 11:15:06

code, they were working based on directions that I have given and that we've discussed. 11:15:10 11:15:29

[redacted] 11:15:33

[redacted] 11:15:38

[redacted] 11:15:41

[redacted] 11:15:47

[redacted] 11:15:51

[redacted] 11:15:52

[redacted] 11:15:55

[redacted] 11:15:57

[redacted] 11:15:59

[redacted] 11:16:04

[redacted] 11:16:07

[redacted] 11:16:11

[redacted] 11:16:14

[redacted] 11:16:19

Q Okay. 11:16:29

MR. JACOBSON: Sal, we've been going about an another hour since the last real break. 11:16:29 11:16:32

MR. TAMBURO: Okay. Yeah, why don't we go off the record and take a break and see if lunch is here. 11:16:34 11:16:35 11:16:38

THE VIDEOGRAPHER: Okay, one moment. We are going off record. The time is 11:16 a.m. 11:16:39 11:16:40

(A recess was had.) 11:16:44

THE VIDEOGRAPHER: We are going back on record. The time is 11:31 a.m. 11:31:17 11:31:26

EXAMINATION 11:31:30

BY MR. ERICKSON: 11:31:32

Q Good morning, Dr. Cooklev. My name is Brian Erickson. I'll be asking you some questions about your opinions regarding the '862 patent and the NXP products, okay? 11:31:32 11:31:34 11:31:37 11:31:39

A Okay. 11:31:41

Q We've marked as Cooklev Exhibit 2 a copy of the '862 patent which should be made available to you electronically. Let me know when you have access to that. 11:31:42 11:31:49 11:31:51 11:31:54

(A certain document was marked Cooklev Deposition Exhibit 2 for identification, as of 02/09/2024.) 11:31:54 11:32:13

BY THE WITNESS: 11:32:13

A I see only Exhibit 1. 11:32:13

Oh, now I do see Exhibit 2. Should I save 11:32:15

it or -- should I save it to the computer? 11:32:31

BY MR. TAMBURO:

Q If you can open it and scroll through it 11:32:32

it's not that big, it probably doesn't matter if 11:32:34

it's saved locally or not. 11:32:37

A Yes. I see on the first page it says 11:33:06

Exhibit 3, but I think it's Exhibit 2 to the 11:33:09

deposition maybe. 11:33:12

Q Yes. We like to stamp things multiple 11:33:14

times with inconsistent numbers. We'll soon add 11:33:16

in RX or a CX or a JX to that as well. If you 11:33:22

scroll down I think there's the certificate page 11:33:32

and the '862 patent will start maybe on Page 3. 11:33:35

A Yes, yes.

Q Okay. 11:33:43

THE VIDEOGRAPHER: Counsel Erickson, do 11:33:43

you have your mic on? 11:33:44

MR. ERICKSON: Yes. 11:33:46

THE VIDEOGRAPHER: There's a little 11:33:49

interference. Thank you. 11:33:51

BY MR. ERICKSON: 11:33:59

Q So, Dr. Cooklev, I'll refer to what's been 11:34:01

marked as Exhibit 2 as the '862 patent; is that okay? 11:34:04 11:34:08

A Yes. 11:34:08

Q This is the '862 patent on which you've opined regarding the NXP products, correct? 11:34:08 11:34:11

A Yes. 11:34:14

Q Can you turn to Claim 1 of the '862 patent, please? 11:34:14 11:34:18

A Yes. 11:34:40

Q Do you see at approximately Line 12 at the very end of that line it recites: "A preamble sequence"? 11:34:41 11:34:45 11:34:50

Do you see that? 11:34:50

A I do. 11:34:57

Q Okay. If you'll turn back to Column 13 of the patent and scroll down to Line 36 of Column 13 and let me know when you're there, please. 11:34:58 11:35:00 11:35:13

A Line 36, I'm there. 11:35:28

Q Okay. Beginning at Line 36 of Column 13, the specification states: "The method 700 commences with the receiving wireless communication device receiving a preamble sequence 11:35:34 11:35:38 11:35:42 11:35:45

from the transmitting wireless device and estimating a channel response from the preamble sequence (Step 702)." 11:35:50 11:35:54 11:35:58

The second sentence reads: "Estimating the channel response includes comparing received training symbols of the preamble to corresponding expected training symbols using any of a number of techniques that are known in the art." 11:36:03 11:36:06 11:36:09 11:36:11 11:36:15

Do you see those passages? 11:36:17

A I do. 11:36:19

Q Is it fair to say that the '862 patent discloses that a preamble sequence includes training symbols? 11:36:21 11:36:24 11:36:33

A I think the specification mentions that. 11:36:58

Q Does the '862 patent describe any other aspect of the preamble sequence other than the fact that it includes training symbols? 11:37:09 11:37:14 11:37:17

MR. JACOBSON: Objection. The patent speaks for itself. 11:37:25 11:37:26

BY THE WITNESS: 11:37:34

A And if I may, what exactly is the -- I just was thinking about the exact language of the 11:37:50 11:37:53

question. If I may have it repeated. 11:37:57
(Discussion off the video record.) 11:38:25
BY MR. ERICKSON: 11:38:25
Q Does the '862 patent describe any other aspect of the preamble sequence other than the fact that it includes training symbols? 11:38:26 11:38:29 11:38:31
MR. JACOBSON: Same objection, patent speaks for itself. 11:38:33 11:38:34
BY THE WITNESS: 11:38:57
A That's what is relevant in this technique here. I -- I mean, just from in the passage that we are right now looking at, I mean clearly that's what it says. It says that there are -- the preamble sequence contains training symbols, the training symbols of the preamble. So this is what's relevant at least for this passage, so that's what it describes. 11:38:58 11:39:01 11:39:13 11:39:22 11:39:27 11:39:36 11:39:40 11:39:42
BY MR. ERICKSON: 11:39:43
Q Are you aware of the '862 patent describing the preamble sequence as including anything other than training symbols? 11:39:44 11:39:50 11:39:52
A Well, I... If this is related to an 11:40:22

opinion that I have given in my report, please if you could direct me to roughly the part of my report where I provide an opinion about that, that would be helpful because I don't have in my memory right now -- I have neither the report memorized nor the patent. 11:40:23 11:40:28 11:40:33 11:40:38 11:40:45 11:40:50

[redacted] 11:40:59

[redacted] 11:41:02

[redacted] 11:41:09

[redacted] 11:41:13

To speed things up if you want to turn to Paragraph 550, that would be one example. 11:41:29 11:41:32

A Okay. Well, thank you. 11:41:33

Yes, I'm looking at Paragraph 550. 11:41:56

Q In the last sentence you state: "The long training field is a preamble sequence as defined by the claim." 11:41:58 11:42:01 11:42:03

Do you see that? 11:42:04

A Yes, to the question that I do see this, yes. 11:42:14 11:42:16

Q Okay. There's been no formal claim construction of the term "a preamble sequence," 11:42:23 11:42:25

correct? 11:42:29

A I don't think -- I don't think there has been. 11:43:09 11:43:15

Q No, I can represent to you that there hasn't been any claim constructions for the '862 patent as well. 11:43:15 11:43:16 11:43:19

A And -- and thank you. Thank you for that and I -- and I accept that and take your representation. 11:43:22 11:43:24 11:43:27

Q So in forming your opinion about whether NXP's products practice the -- a preamble sequence limitation, you applied the ordinary meaning of a preamble sequence, correct? 11:43:29 11:43:31 11:43:36 11:43:41

MR. JACOBSON: Objection. Calls for a legal conclusion. 11:43:46 11:43:47

BY THE WITNESS: 11:43:48

A Yes. For any claim term that was not construed, I applied the meaning of that term as understood by a person of ordinary skill in the art. 11:43:51 11:43:54 11:44:02 11:44:08

And so this is my understanding of a preamble sequence. It's from the perspective of a 11:44:09 11:44:13

person of ordinary skill in the art and, yes, the long training field is a preamble sequence in the context of the claim. 11:44:15 11:44:23 11:44:25

BY MR. ERICKSON: 11:44:27

Q So turning back to the patent, the '862 patent itself in Column 13. 11:44:27 11:44:31

A Okay. Yes, I am there. 11:44:44

Q The example we discussed in Column 13 at Lines 36 to 44 describes a preamble sequence that includes training symbols, correct? 11:44:45 11:44:52 11:44:59

MR. JACOBSON: Objection. The patent speaks for itself. 11:45:05 11:45:07

BY THE WITNESS: 11:45:11

A Yeah, it says training symbols of the preamble. That's what the specification says. 11:45:12 11:45:14

BY MR. ERICKSON: 11:45:28

Q Do you agree that the training symbols of the preamble are a preamble sequence? 11:45:29 11:45:31

A But I'm -- now what is the exercise that we are doing? So you directed me to Paragraph 550 which is part of my analysis regarding claim limitation. I have marked this "I" which I think 11:45:56 11:46:04 11:46:12 11:46:16

is from Claim 1 so I'm analyzing one claim limitation. The claim limitation says: "The receiving wireless communication device receiving a preamble sequence from the transmitting wireless device," so this is the limitation that I'm analyzing and so I think my analysis is correct. 11:46:26 11:46:32 11:46:36 11:46:39 11:46:43 11:46:48

Now, at the same time you were directing me to a portion of the specification of the patent, and so now I'm not sure what is the exercise that we are doing. 11:46:53 11:46:55 11:47:04 11:47:08

BY MR. ERICKSON: 11:47:09

Q [redacted] 11:47:09

[redacted] 11:47:10

[redacted] 11:47:17

[redacted] What I'm trying to explore is what meaning you attributed to the term "a preamble sequence" in forming your conclusion. 11:47:22 11:47:25 11:47:29

So with that let me ask directly: What in your opinion is the ordinary meaning of a preamble sequence that you used in forming your opinion? 11:47:32 11:47:41 11:47:42

MR. JACOBSON: Object to form. 11:47:52

BY THE WITNESS: 11:49:26

A Not as a definition, but just as a general understanding what this term means, a preamble sequence is a sequence that includes training symbols, again, not as a definition, if you will, but as an understanding what this preamble sequence -- on the claim preamble sequence includes. 11:49:27 11:49:32 11:49:49 11:49:52 11:50:05 11:50:13 11:50:16

BY MR. ERICKSON: 11:50:20

Q Does the claim a preamble sequence require anything other than training symbols? 11:50:22 11:50:25

MR. JACOBSON: Object to form, calls for a legal conclusion. 11:50:31 11:50:33

BY THE WITNESS: 11:51:13

A So in the question does it require anything or can it include anything? I mean, it seems to me the question is is the scope broader than -- I don't think I -- that was something that I was thinking when I was here working on the report. 11:51:14 11:51:19 11:51:22 11:51:28 11:51:42 11:51:47

When I was making this analysis, I concluded that the long training field is a preamble sequence, so I concluded that the scope 11:51:52 11:51:59 11:52:03

of the claim preamble sequence includes at least the long training field. 11:52:10 11:52:14

And I also concluded, if we look at the first sentence of paragraph of 550, that the null data packet is a preamble sequence. 11:53:08 11:53:10 11:53:17

BY MR. ERICKSON: 11:53:55

Q Dr. Cooklev, I think my question got lost there somewhere a while ago. 11:53:55 11:53:57

My question to you is: Does the claim term "a preamble sequence" require anything other than training symbols? 11:53:58 11:54:01 11:54:05

MR. JACOBSON: Again, object to form, calls for a legal conclusion. 11:54:09 11:54:11

BY THE WITNESS: 11:54:47

A Does the claim term "preamble sequence" require -- if the question is does it require anything more than -- than a null data packet. 11:54:48 11:54:51 11:54:58

BY MR. ERICKSON: 11:55:13

Q No. That's not the question. 11:55:14

The question is: Does the claim term "a preamble sequence" require anything more than training symbols? 11:55:16 11:55:20 11:55:22

A Well, first to the extent that answering this question requires -- to the extent that it requires claim construction, claim construction is a serious undertaking that I can't I can't do claim construction on the stand. 11:56:21 11:56:24 11:56:32 11:56:42 11:56:50

What I can testify is why do I think this claim element is met, and what is the evidence that I have identified for the claimed preamble sequence, and I mean that is my Paragraph 550, and that's the evidence that I have identified that this claim element is met, and I think this is the -- this does correspond to the understanding of the claim preamble sequence by a person of skill in the art because the purpose here of this -- of the receiving wireless device receiving a preamble sequence, the purpose is channel estimation. 11:57:05 11:57:10 11:57:17 11:57:24 11:57:39 11:57:42 11:57:49 11:57:51 11:57:57 11:58:08 11:58:12 11:58:17

So the receiving device will perform -- on the basis of this preamble sequence will perform channel estimation, and for that it needs training symbols. And this is why in Paragraph 550 as I point to the null data packet and I point to the 11:58:18 11:58:22 11:58:25 11:58:37 11:58:44

long training field as being the claim preamble sequence. 11:58:50 11:58:57

Q The long training field is a training symbol, correct? 11:58:57 11:59:08

MR. JACOBSON: Object to form. 11:59:12

BY THE WITNESS: 11:59:13

A Yes. 11:59:14

BY MR. ERICKSON: 11:59:17

Q And the long training field is used for channel estimation, correct? 11:59:18 11:59:20

A Yes. 11:59:22

Q Other than the fact that the long training field is a training symbol and is used for channel estimation, is there any other aspect of the long training field that was relevant to your opinion that it constitutes a preamble sequence? 11:59:23 11:59:26 11:59:29 11:59:37 11:59:41

MR. JACOBSON: Object to form. 11:59:49

BY THE WITNESS: 12:00:18

A Well, the way I understand the question may be the fact that the long training field that is part of the null data packet, that is the specific long training field that we are talking 12:00:18 12:00:20 12:00:23 12:00:27

about. 12:00:29

BY MR. ERICKSON: 12:00:33

Q Why is it relevant the long training field is part of the null data packet? 12:00:34 12:00:37

A It is relevant when we analyze the entire claim. 12:00:47 12:01:46

Q With respect to just the limitation a preamble sequence, is there any relevance to the fact that the long training field is part of the null data packet? 12:01:55 12:01:57 12:02:06 12:02:09

A It is my understanding that when we analyze the terms used in a claim element, that these terms should not be analyzed, removed from the claim in a vacuum so to speak. 12:02:24 12:02:28 12:02:44 12:02:59

So when we analyze the entire claim, for that it is -- it is relevant that the long training field is part of the null data packet. 12:03:18 12:03:25 12:03:32

Q Why? 12:03:34

A Because we can essentially go claim element by claim element. So Claim 1 of the '862 patent recites a method for feeding back transmitter beamforming information, and the first 12:03:35 12:03:56 12:04:07 12:04:12

step of this method is the receiving device receiving a preamble sequence, and now when I analyze the standard whether or not this claim element is met, I analyzed what happens when the receiving device receives the null data packet and then what the other steps that follow after that and I concluded that this element is met because the receiving device receives a null data packet which includes a long training field. 12:04:21 12:04:28 12:04:41 12:04:43 12:04:53 12:05:00 12:05:07 12:05:10 12:05:14

Q Based on that analysis, you concluded that the device uses the long training field for channel estimation, correct? 12:05:27 12:05:30 12:05:33

A Yes. 12:05:36

Q So other than the fact that the long training field is a training symbol and is used for channel estimation, what else was relevant to your determination that it constitutes the claimed a preamble sequence? 12:05:38 12:05:42 12:05:44 12:05:51 12:05:55

MR. JACOBSON: Object to form. 12:05:58

BY THE WITNESS: 12:06:02

A Well, the fact that it is part of the null data packet. 12:06:03 12:06:08

BY MR. ERICKSON: 12:06:08

Q And why is that relevant? Who cares 12:06:09

whether it's part of the null data packet or not? 12:06:11

MR. JACOBSON: Object to form, asked and 12:06:14

answered. 12:06:15

BY THE WITNESS: 12:06:17

A Well, I care because my analysis is in the 12:06:42

context of the complete claim. 12:06:51

BY MR. ERICKSON: 12:06:54

Q Is there any aspect of the null data 12:06:55

packet that was relevant to your determination 12:07:01

that the long training field constituted the 12:07:06

claimed a preamble sequence? 12:07:12

A Well, the null data packet is relevant 12:07:33

here. It is evidence that this claim element is 12:07:38

met because we established that it contains 12:07:41

training symbols based on which channel estimation 12:07:50

can be performed, and then the null data -- the 12:07:55

fact that a null data packet is received is 12:08:04

relevant because we can -- when we analyze all of 12:08:08

the limitations of Claim 1, we will see that all 12:08:18

of them are also met. When -- and they are met 12:08:25

when for this claim element the receiving device receives a null data packet. 12:08:33 12:08:38

Q You have your report open, if you turn to Paragraph 549, please. 12:08:44 12:08:48

A Yes, I'm there. 12:08:49

Q And you can see Figure 21-28 VHT NDP format. 12:08:50 12:08:58

Do you see that? 12:08:59

A Yes. 12:09:04

Q Is that the null data packet you've been referring to? 12:09:04 12:09:07

A Yes. 12:09:08

Q Which portion or portions of that null data packet are used for the accused 802.11 AC channel estimation? 12:09:09 12:09:15 12:09:23

A So the contents of the null data packet is -- so there's this text below the Figure 21-28 on Page 191 of my report, and then there are fields of the VHT PPDU which is just this is a description of what these fields, what is their name, what do they mean. So what we see that after the legacy portion -- we see that there is a 12:12:23 12:12:41 12:12:44 12:12:47 12:13:02 12:13:13 12:13:48

VHT long training field, and now the entire null data packet is -- I mean, we can say that the entire null data packet is used for channel estimation which that is its -- that is its purpose, but in particular we can -- in particular there is the VHT-LTF field for that. 12:13:58 12:14:24 12:14:34 12:14:36 12:14:52 12:15:02

[redacted] 12:15:11

[redacted] 12:15:15

[redacted] 12:15:45

[redacted] 12:16:02

[redacted] 12:16:05

[redacted] 12:16:08

[redacted] 12:16:12

[redacted] 12:16:16

[redacted] 12:16:28

[redacted] 12:16:49

[redacted] 12:16:50

[redacted] 12:16:53

[redacted] 12:16:59

[redacted] 12:17:02

[redacted] 12:17:06

BY MR. ERICKSON: 12:17:09

Q Can you flip back to Claim 1? I guess to make it easier staying in your report, turn to Page 197 of your report, you'll see the next limitation which states: "The receiving wireless device estimating a channel response based upon the preamble sequence." 12:17:10 12:17:13 12:17:18 12:17:22 12:17:28 12:17:31

Do you see that? 12:17:33

A Yes. 12:17:34

[redacted] 12:17:41

[redacted] 12:17:45

[redacted] 12:17:48

[redacted] 12:17:51

[redacted] 12:17:59

[redacted]

[redacted] 12:19:39

[redacted] 12:19:41

[redacted] 12:19:54

[redacted] 12:20:10

[redacted] 12:20:21

[redacted] 12:20:35

BY MR. ERICKSON: 12:20:49

Q Is there anything in the NDP packet that 12:20:51

is not a training symbol? 12:20:55

A First, I know that training symbol is not a claim term. I mean, from the context of the NDP packet, I don't think the L-SIG field, for example, is used for channel estimation. But I don't think this is relevant for the purpose of analyzing these claim elements. 12:21:41 12:21:47 12:22:30 12:22:46 12:22:58 12:23:02

Q So in your opinion the relevant fields in the NDP are the training symbols that are used for channel estimation, correct? 12:23:20 12:23:23 12:23:30

MR. JACOBSON: Object to form, vague. 12:23:42

BY THE WITNESS: 12:23:48

A The NDP as a whole is relevant. So I think that's my -- the NDP as a whole is relevant even if it might contain something that's not specifically used for channel estimation. 12:23:49 12:24:08 12:24:12 12:24:19

BY MR. ERICKSON: 12:24:24

Q So I understand from your testimony today that two relevant criteria to determining whether something satisfies the claimed a preamble sequence limitation is whether it includes training symbols that are used for channel 12:24:34 12:24:35 12:24:41 12:24:47 12:24:55

estimation; is that correct? 12:24:58
MR. JACOBSON: Object to form, 12:25:04
mischaracterizes prior testimony. 12:25:05
BY THE WITNESS: 12:25:27
A So the claim preamble sequence, yes, it 12:25:27
has to include training symbols. 12:25:29
BY MR. ERICKSON: 12:25:33
Q And they have to be used for channel 12:25:33
estimation, correct? 12:25:36
A That is correct. 12:25:37
Q Does it have to include anything else? 12:25:37
MR. JACOBSON: Object to form, vague. 12:25:42
MR. ERICKSON: I'll rephrase. 12:25:44
BY MR. ERICKSON: 12:25:45
Q Does it have to include anything else to 12:25:46
constitute the claimed a preamble sequence? 12:25:48
MR. JACOBSON: Same objections. 12:25:51
BY THE WITNESS: 12:27:51
A I think a standalone transmission of a 12:27:51
preamble sequence is within the scope of this 12:27:59
claim element. 12:28:09
BY MR. ERICKSON: 12:28:14

Q So a standalone transmission of training symbols that are used for channel estimation would be within the scope of the limitation a preamble sequence; is that right? 12:28:15 12:28:18 12:28:23 12:28:31

A Again, not as -- I'm not giving a formal definition here, but as a general idea, I think I would agree with that. 12:28:42 12:28:46 12:28:51

Q Turning back to Paragraph 550 of your report, that last sentence: "The long training field is a preamble sequence as defined by the claim," which field are you referring to there in that sentence? 12:28:57 12:28:59 12:29:07 12:29:09 12:29:15

A Yeah, and thank you for the -- for that question. I think here I should have clarified that. I mean, the VHT-LTF field. 12:29:19 12:29:22 12:29:38

MR. ERICKSON: Do you want to break for lunch? 12:29:49 12:29:51

THE VIDEOGRAPHER: One moment. We are going off record. The time is 12:29 p.m. 12:29:51 12:29:53

(A lunch recess was had from 12:29 p.m. to 1:03 p.m.) 12:29:57

A F T E R N O O N S E S S I O N 13:03:02

THE VIDEOGRAPHER: We are back on record. 13:03:04

The time is 1:03 p.m. 13:03:21

TODOR COOKLEV, PhD,

called as a witness herein, having been previously duly sworn and having testified, was examined and testified further as follows:

EXAMINATION (Resumed) 13:03:34

BY MR. ERICKSON: 13:03:34

Q Dr. Cooklev, could you turn to 13:03:34

Paragraph 64 of your report, please. 13:03:36

A Yes, I'm there. 13:03:38

Q Paragraph 64 begins with the phrase 13:03:43

"beamforming requires at least the beam former to 13:03:48

have multiple antennas." 13:03:51

Do you see that phrase? 13:03:53

A Yes. 13:03:55

Q Why does beamforming require at least the 13:03:55

beam former to have multiple antennas? 13:03:58

A Well, I certainly can explain this. 13:04:20

It's -- I think the answer is -- at a high level 13:04:50

the answer is in Paragraph 61 and 62 of my report. 13:04:56

So in Paragraph 61 I say that a beam is the main lobe of the radiation patent of an antenna array, and an antenna array is -- is essentially what I say in Paragraph 64 multiple antennas. 13:05:05 13:05:11 13:05:16 13:05:28

Sometimes it's an antenna array, they are referred to as antenna elements or as I state in Paragraph 64, multiple antennas, that's the same thing, so -- so you need an antenna array to get this beam. 13:05:36 13:05:39 13:05:42 13:05:44 13:05:55

Otherwise, as I state in Paragraph 62 without -- without beamforming, essentially if you have just one antenna and not multiple antennas, but one antenna power is still submitted in many directions according to the properties of the antenna. So that's what -- that's what you have if you have just a single antenna and the transmitter. 13:06:00 13:06:07 13:06:10 13:06:14 13:06:21 13:06:23 13:06:25 13:06:29

Now, the receiver can have one antenna. 13:06:30

Q How are the signals from the antennas adjusted in order to focus the radio signal in a given direction? 13:06:54 13:06:57 13:07:00

A So, for example, in Paragraph 62, the last 13:07:39

sentence I state: Beamforming involves multiple antennas as we are discussing and the ability to adjust the amplitudes and phases of the signals transmitted -- I'll stop here. 13:08:07 13:08:14 13:08:17 13:08:21

So the answer to your question how is by adjusting the amplitudes and phases of the signals transmitted, and so to do that it's multiplying -- we have to multiply every transmitted signal -- the transmitted signal by every antenna with a complex number. And this complex number comes from -- in particular it comes from the columns of the V matrix. 13:08:27 13:08:34 13:08:39 13:08:45 13:08:51 13:08:56 13:09:10 13:09:16

Q If you could turn to the '862 patent, please, and we're going to look at a passage that begins at the bottom of Column 2 at Line 67 and extends on to the top of Column 3. Let me know when you're there. 13:09:29 13:09:32 13:09:38 13:09:42 13:09:54

A Column 2 and 3. I just have to move the Zoom icon. I'm there. 13:09:54 13:10:21

Q There's a sentence that states: "In general beamforming is a processing technique" -- 13:10:23 13:10:26

A You said column excuse me oh, yes. 13:10:32

Yes, I see that. 13:10:35

Q For the record starting at the bottom of Column 2, Line 67 there is a sentence that picks up halfway through that line that states: In general, beamforming is a processing technique to create a focused antenna beam by shifting a signal in time or in phase to provide gain of the signal in a desired direction and to attenuate the signal in other directions." 13:10:36 13:10:38 13:10:41 13:10:44 13:10:48 13:10:54 13:10:59 13:11:03

Do you see that sentence? 13:11:05

A I do. 13:11:06

Q Do you agree with that high-level description of well, do you agree with that description of beamforming? 13:11:14 13:11:15 13:11:16

A I do. 13:11:20

Q Do you agree that the '862 patent defines beamforming to require shifting a signal in time or in phase? 13:11:24 13:11:31 13:11:36

MR. JACOBSON: Objection. The patent speaks itself. 13:11:46 13:11:48

BY THE WITNESS: 13:12:03

A Well, as far as shifting signals in phase, 13:12:04

that's what I state in my Paragraph 62. I state that adjust the amplitudes and phases which I think is essentially the same thing as far as the shift what as far as what the specification here says. 13:12:06 13:12:12 13:12:18 13:12:22 13:12:23

It's -- the patent is -- the '862 patent in this sentence, the sentence begins with "in general," so, yeah, and I clearly agree but the specification says what it says. So in general, beamforming can be implemented by shifting a signal in time, but that'll be a different type of beamforming. 13:12:36 13:12:45 13:12:52 13:13:04 13:13:13 13:13:18 13:13:25

BY MR. ERICKSON: 13:13:33

Q In forming your opinions related to the '862 patent, did any portions of the prosecution history of the '862 patent inform your understanding of the meaning of beamforming? 13:13:34 13:13:36 13:13:39 13:13:41

A I do not recall at the moment. 13:14:00

And if I may real quick, may we take a very short break? 13:14:03 13:14:06

MR. ERICKSON: Sure. 13:14:09

THE VIDEOGRAPHER: Okay. One moment. We 13:14:10

are going off record. The time is 1:13 p.m. 13:14:11

(A recess was had.) 13:15:12

THE VIDEOGRAPHER: We are back on record. 13:15:13

The time is 1:15 p.m. 13:15:23

BY MR. ERICKSON: 13:15:26

Q Dr. Cooklev, I understand your opinion 13:15:31

that the relevant type of beamforming for the '862 13:15:35

patent would involve adjusting the amplitudes and 13:15:39

phases of signals; is that correct? 13:15:46

A Yes. 13:15:50

Q Back in the '862 patent can you turn to 13:16:00

Figure 3? 13:16:03

A One second, Figure 1, Figure 2, Figure 3. 13:16:33

I am looking at Figure 3. I need to --- it's a 13:16:40

big figure. 13:16:43

Q We're going to have rotation issues, 13:16:48

aren't we? 13:16:50

A Yes, it's a big figure. Oh, thank you. 13:16:51

Q Do you have Figure 3? 13:17:28

A I do. I am looking at Figure 3. 13:17:29

Q Great. You see the baseband processing 13:17:32

module 100 in Figure 3? 13:17:36

A Yes. 13:17:40
Q And on the lower left side there is an 13:17:41
input called outbound data 94. 13:17:44
Do you see that? 13:17:51
A Yes. 13:17:52
Q And that's the data that is going to be 13:17:52
transmitted eventually, correct? 13:17:59
MR. JACOBSON: Object to form. The patent 13:18:06
speaks for itself. 13:18:07
BY THE WITNESS: 13:18:20
A I think yes. 13:18:21
BY MR. ERICKSON: 13:18:22
Q Okay. And then the baseband processing 13:18:22
module will process that outbound data and output 13:18:24
what's labeled outbound symbol streams 104; is 13:18:29
that right? 13:18:37
MR. JACOBSON: Same objections. 13:18:37
BY THE WITNESS: 13:18:39
A Yes. 13:18:56
BY MR. ERICKSON: 13:18:56
Q Okay. Now, if you will turn to Figure 4, 13:18:59
which I believe zooms in on what we just discussed 13:19:02

there just getting oriented here, if you'll turn to Figure 4 and let me know when you're there. 13:19:06 13:19:11

A Yeah, I will. Yes, I'm looking at Figure 4. 13:19:14 13:19:21

Q Okay. You'll see on the far left of Figure 4 we see that outbound data 94 and then there are a series of processing blocks and then on the right you see you have the outbound symbol streams 104, do you see that? 13:19:21 13:19:26 13:19:32 13:19:35 13:19:38

MR. JACOBSON: Object to form. The patent speaks for itself. 13:19:40 13:19:42

BY THE WITNESS: 13:19:44

A Yes. 13:19:45

BY MR. ERICKSON: 13:19:45

Q Okay. In Figure 4 the processing blocks here that are labeled 100-TX represent processing of signals for transmission by the baseband processing module, correct? 13:19:52 13:19:56 13:20:03 13:20:07

A Yes. 13:20:16

Q Now, there's a processing block beamforming module 132. 13:20:18 13:20:28

Do you see that? 13:20:31

A I do. 13:20:32
Q I want to turn to the portion of the 13:20:37
specification that discusses that module, which I 13:20:39
believe is at Column 9, Line 66. 13:20:42
A Okay. I will get there. Now I -- maybe I 13:21:11
can do it or you need to rotate it back. 13:21:13
THE VIDEOGRAPHER: Mr. Hatfield, he's the 13:21:15
remote tech, he's rotating for you. 13:21:18
THE WITNESS: Oh, okay. Whoever it is, 13:21:21
thank you. And I appreciate the help. 13:21:23
BY MR. ERICKSON: 13:21:33
Q It's a cloud rotation. 13:21:34
A Yeah, everything is in the cloud, so... 13:21:37
You said Column...? 13:21:38
Q 9. 13:21:41
A 9. 13:21:42
Q Line 66. 13:21:43
A And I am there, so that's at the bottom of 13:21:48
Column 9. 13:21:51
Q Yes. And of course the sentence will 13:21:52
continue on to the top of Column 10. 13:21:55
A Yes. 13:21:57

Q The beamforming module 132 multiplies the baseband signals by a beamforming unitary matrix V, correct? 13:22:02 13:22:13 13:22:19

A Yes. 13:22:34

Q The beamforming module 132 shifts the signals in time or phase by multiplying them with the beamforming unitary matrix V, correct? 13:22:34 13:22:37 13:22:40

A The matrix V is composed of complex numbers, and because of that we can say that -- I use the term "adjust the amplitude in the phase," there would be a multiplication of the amplitudes in phases. 13:23:00 13:23:06 13:23:15 13:23:19 13:23:23

Q Okay. So the beamforming module 132 adjusts the amplitude and phase of the signals by multiplying them with the beamforming unitary matrix V, correct? 13:23:34 13:23:36 13:23:40 13:23:43

A Yes. 13:24:02

Q I want to talk about the received side so that will unfortunately go back to Figure 3 again and get a rotation. 13:24:02 13:24:05 13:24:07

A That's okay. 13:24:14

Q It's so much easier than a hard copy, 13:24:14

right? 13:24:17

A It's fine. I've gotten used to even looking at figures that have been rotated. 13:24:19 13:24:24

Yes, I'm looking at Figure 3. 13:24:31

Q On the receive side, Figure 3 shows: Inbound symbol streams 124 that are input into the baseband processing module which in turn outputs inbound data 92, right? 13:24:36 13:24:44 13:24:50 13:24:55

A Yes, in Figure 3, you said the inbound symbol streams 124? 13:25:18 13:25:24

Q Yes. 13:25:27

A They go into the baseband processing module 100 and the result is inbound data 92. 13:25:28 13:25:30

Q Okay. If you'll turn to Figure 5, please. 13:25:37

A Yes, I'm looking at Figure 5. 13:25:49

Q Figure 5 shows the inbound symbol streams 124, a series of processing blocks and then the inbound data 92 on the right. 13:25:51 13:25:56 13:26:02

Do you see that? 13:26:05

A I do. 13:26:06

Q So Figure 5 labels -- I'm sorry, I think I may have said Figure 4. No. Okay. Scratch that. 13:26:07 13:26:16

1	The processing steps in Figure 5 labeled	13:26:22
2	100 RX represent the processing of the received	13:26:25
3	signals by the baseband processing module,	13:26:31
4	correct?	13:26:33
5	A Yes.	13:26:38
6	Q One of the processing steps is the	13:26:42
7	beamforming (U) module 144, correct?	13:26:45
8	A Yes.	13:26:53
9	Q All right. So I want to turn to the	13:26:53
10	portion of the specification that discusses that.	13:26:55
11	If we can get it rotated and go to Column 12,	13:26:59
12	Line 34?	13:27:05
13	A I'm looking at that.	13:27:22
14	Q The beamforming module 144 multiplies the	13:27:23
15	received baseband signals by a beamforming unitary	13:27:27
16	matrix U, correct?	13:27:30
17	A Yes.	13:27:40
18	Q The beamforming module 144 adjusts the	13:27:40
19	amplitude and phase of the received signals by	13:27:43
20	multiplying them with the beamforming unitary	13:27:49
21	matrix U, correct?	13:27:53
22	A Yes.	13:27:55

Q If we turn to your report, Paragraph 581, please. 13:28:02 13:28:06

A 581. 13:28:15

Q Yes, please. 13:28:16

A Yes. 13:28:21

Q What is single stream beamforming? 13:28:25

A When a single stream is transmitted using beamforming. 13:28:38 13:28:44

Q Does single stream refer to a single set of underlying data -- scratch that. 13:28:56 13:29:00

What's the difference between single stream and multi-stream that you're referring to here in Paragraph 581? 13:29:09 13:29:12 13:29:15

A I think the -- I've given a good answer to this question in Paragraph 582. So in Paragraph 582, I state that: In single stream beamforming the beamforming weights, so the beamforming weights are these complex numbers, they are found in the first column of V so to perform single stream beamforming, we need only one column of V, and that's enough. That's all we need for single stream beamforming. 13:29:20 13:29:23 13:29:28 13:29:36 13:29:43 13:29:48 13:29:55 13:30:04 13:30:10

If two spacial streams are beam formed, that's the next sentence, the beamforming weights in the transmitter are found in the first two columns of V. 13:30:19 13:30:21 13:30:23 13:30:25

So -- and if the number of spacial streams is equal to the number of antennas, then we need the entire matrix V, which -- which if it helps, I mean, this follows the rules of matrix algebra. 13:30:32 13:30:34 13:30:39 13:30:49

Q Why would a system -- what are the advantages or disadvantages of single stream beamforming versus multi-stream beamforming? 13:31:10 13:31:16 13:31:18

MR. JACOBSON: Object to form. 13:31:30

BY THE WITNESS: 13:31:31

A If we are beamforming two spacial streams that means we are communicating at the higher data rate compared to single stream beamforming. 13:31:31 13:31:37 13:31:40

BY MR. ERICKSON: 13:32:08

Q Does single stream beamforming refer to using multiple transmission antennas and a single receiving antenna? 13:32:09 13:32:12 13:32:19

A Yes. 13:32:30

Q And multi-stream beamforming here refers 13:32:31

to multiple transmitting antennas and multiple receiving antennas; is that correct? 13:32:33 13:32:37

A Yeah, we can -- we can say that, we can say even a single stream beamforming can be done if we have a receiver with more than one antenna. It can be done. But the other way, multi-stream beamforming cannot be done if the receiver has only one antenna. 13:32:39 13:32:45 13:32:50 13:32:59 13:33:07 13:33:10

Q Okay. As you state here in the first sentence of Paragraph 582, in your opinion, beamforming requires processing at the transmitter and at the receiver, right? 13:33:25 13:33:27 13:33:30 13:33:33

A Yes. 13:33:37

Q In Paragraph 582, you describe processing at the transmitter which you say can be referred to as precoding at the bottom of 583; is that right? 13:33:45 13:33:49 13:33:54 13:34:00

A Yes. 13:34:00

Q The example that we discussed in the '862 specification where we had the beamforming module 132, that's an example of processing at the transmitter you're referring to here in 13:34:03 13:34:10 13:34:13 13:34:24

Paragraph 582, correct? 13:34:26

A Yeah, I don't exactly remember the number, 13:34:35

but I think there are five -- you said 132, the 13:34:37

beamforming module? 13:34:41

Q Sure. And I can get rid of that number, 13:34:42

so I'm not meaning to test you on the numbers. 13:34:44

But you recall the example on the '862 13:34:46

patent where on the transmit side there was a 13:34:49

module that multiplied the transmit signals by V? 13:34:51

A Yes. 13:34:54

Q And that's an example of the processing at 13:34:55

the transmitter you're referring to here in 13:34:58

Paragraph 582, correct? 13:35:00

A I describe it I think accurately, yes. 13:35:01

Q And then the other example we discussed on 13:35:13

the reception side in the patent where they 13:35:15

describe multiplying the receive signals by the 13:35:20

matrix U, that's an example of the post processing 13:35:22

you're discussing here in Paragraph 583, correct? 13:35:26

A Yes. 13:35:49

Q In the first sentence of 583 you state: 13:35:49

The optimal weights at the receiver are in the 13:35:52

columns of U. 13:35:55

Now, by weights at the receiver, are you, again, referring to the complex numbers? 13:35:56 13:35:59

A Yes. 13:36:08

Q I noticed you used the word "optimal" here in 583 but not in 582. Is there any meaning to that or is that just not intended to mean anything? 13:36:09 13:36:13 13:36:17 13:36:21

A Well, what it means is that this is how beamforming is done and that the columns of U, the corresponding columns of U are used in the receiver, and that the number of rows of V doesn't have to be equal to the number of columns, precisely as I explain here in Paragraph 582 and the same is true for the case -- the matrix U. 13:36:41 13:36:44 13:36:52 13:36:55 13:37:02 13:37:06 13:37:09

Q All right. So the receiver beamforming matrix U contains the weights that the receiver uses to multiply the received baseband signals; is that correct? 13:37:39 13:37:41 13:37:46 13:38:02

A Yes, yes, I understand. So I say that in the second sentence of Paragraph 582 through 583, after multiplying on the left by U, this conjugate 13:38:02 13:38:07 13:38:11

transpose at the receiver a separate channel for every spatial stream is obtained. 13:38:19 13:38:27

Q Do you agree that the ordinary meaning of a receiver beamforming unitary matrix U is a unitary matrix used to perform beamforming at the receiver? 13:38:32 13:38:48 13:38:56 13:39:01

MR. JACOBSON: Objection. Calls for a legal conclusion. 13:39:02 13:39:09

BY THE WITNESS: 13:39:09

A I'm sorry, if I may, I'd like the -- maybe it got a little bit too long for me. 13:39:09 13:39:12

BY MR. ERICKSON: 13:39:19

Q Sure. 13:39:20

Do you agree that the ordinary meaning of a receiver beamforming unitary matrix U is a unitary matrix used to perform beamforming at the receiver? 13:39:20 13:39:22 13:39:26 13:39:29

MR. JACOBSON: Same objection. 13:39:38

BY THE WITNESS: 13:39:51

A I mean, if you -- I think what you said, it doesn't clarify. I mean, you're just -- it seemed to me the answer -- it seemed to me your 13:39:51 13:39:58 13:40:05

question is whether the meaning of X is X, right? So it doesn't define what X is. 13:40:09 13:40:13

BY MR. ERICKSON: 13:40:17

Q Okay. How about this: Do you agree that a receiver beamforming unitary matrix U is a matrix used at the receiver to adjust the amplitude and phase of the signals? 13:40:18 13:40:22 13:40:28 13:40:31

A Well, that's a general -- it's a general statement that I think it's fine, that the receiver is using -- is using a matrix. In a special case this matrix, it can be a vector meaning it can have -- as I say, the optimal weights are in the columns of U so we can use just one column of U or we can use two columns of U. 13:40:45 13:40:49 13:40:53 13:41:02 13:41:11 13:41:18 13:41:23

In -- I mean, you know, in a certain sense here the beamforming weights of the transmitter which are in the columns of V, I think we can say that they -- it's like that works together with applying the matrix U at the receiver like locking and unlocking something, if it's locked in a certain way you have to unlock it in a certain way, and that's how these two things work 13:41:39 13:41:40 13:41:43 13:41:53 13:41:56 13:42:02 13:42:09 13:42:11

together. 13:42:14

Q All right. So the receiver beamforming 13:42:26

matrix U is the matrix used by the receiver to 13:42:28

adjust the amplitude and phase of the receive 13:42:30

signal; is that right? 13:42:33

A Yes. 13:42:37

Q Now, what is a unitary matrix? 13:42:48

A I answer this question in Paragraph 576 in 13:43:03

my report. So in the context of the -- and I will 13:43:05

provide additional context to Paragraph 576 to 13:43:17

explain my opinion, but in the context of the 13:43:20

claim, a unitary matrix is a matrix that has 13:43:25

orthonormal columns. That's a matrix that is 13:43:35

unitary in the context of this claim, and it does 13:43:38

not have to have equal number of rows and columns. 13:43:41

So matrices that are -- if I can use an 13:43:50

example, if the transmitter has four antennas and 13:43:55

the receiver has one, it will be -- V would be 13:44:01

four by one. That is within the scope of the 13:44:08

claim. And if the receiver has two antennas and 13:44:11

the transmitter of the beam former has four, it 13:44:16

will be four by two. And that is also within the 13:44:19

scope of the claim. 13:44:23

Q What does it mean for a matrix to have orthonormal columns? 13:44:28 13:44:31

A So it means that the columns are orthogonal and normalized and they become orthonormal. 13:44:53 13:44:55 13:44:58

Q In your opinion a unitary matrix could have only a single column? 13:45:06 13:45:08

A In the context of the claim, yes. 13:45:15

Q As long as that single column is orthonormal? 13:45:17 13:45:19

A In an orthonormal in a singular value to composition, yes. 13:45:25 13:45:31

Q Do you agree that a unitary matrix is a matrix whose inverse is equal to its conjugate? 13:45:32 13:45:39

A The claim has a slightly more general -- attaches a slightly more general meaning of the term "unitary" and that's the meaning that I state here. 13:46:09 13:46:12 13:46:15 13:46:17

Q So you -- okay. In your opinion the term "unitary matrix" in the claim does not require a matrix whose inverse is equal to its conjugate; is 13:46:22 13:46:25 13:46:28

that correct? 13:46:33

A That is correct. 13:46:33

Q Okay.

A I mean, if I may add here, I very recently 13:47:00

published a textbook in which I explain what we 13:47:07

are talking about. 13:47:15

Q Some of the NXP products that you opine 13:47:34

infringe the '862 patent have only a single 13:47:38

receive antenna, correct? 13:47:42

A I believe that's correct. 13:47:50

Q And as we discussed before, to have 13:47:51

beamforming, the transmitter must have at least 13:47:55

two antennas, correct? 13:47:58

A Yes. 13:48:01

Q So for those NXP products that have only a 13:48:02

single receive antenna, to the extent they 13:48:08

determine a V matrix, that V matrix will never be 13:48:12

a square matrix, correct? 13:48:17

A [redacted] 13:48:22

[redacted] 13:48:32

[redacted] 13:48:35

[redacted] 13:48:38

But the second part of the question, the V matrix is not going to be a square, but it doesn't need to be a square as I -- as I testified. Just the V matrix it could be just a vector and that's all that's necessary to beamform to those devices that have a single antenna. 13:48:44 13:48:49 13:48:54 13:49:03 13:49:09 13:49:16

Q Okay. If we turn to your report at Paragraph 570, please. 13:50:08 13:50:10

A Yes, I'm looking at it. 13:50:24

[redacted] 13:50:26 13:50:29 13:50:34 13:50:43 13:50:48 13:50:48 13:50:51 13:51:00 13:51:11 13:51:22 13:51:26 13:51:32 13:51:39

13:51:41
13:51:47
13:51:53
13:52:02
13:52:05
13:52:10
13:52:18
13:52:21
13:52:27
13:52:36
13:52:45
13:52:50
13:52:56
13:52:58
13:53:02
13:53:10
Q 13:53:13
13:53:17
13:53:21
13:53:36
13:53:38
13:53:48

Q Turning to your report at Paragraph 573? 13:54:35

A Yes. 13:54:42

Q Now, here you cite an excerpt from another 13:54:43

document that you cite for the proposition that in 13:54:50

part that a matrix V is determined, correct? 13:54:56

A Yes. 13:55:04

Q Now, backing up -- backing up, sorry, to 13:55:10

Paragraph 571, you discuss preprocessing. 13:55:20

Do you see that? 13:55:26

A Yes. 13:55:30

[redacted] 13:55:38

[redacted] 13:55:42

[redacted] 13:55:49

[redacted] 13:55:56

[redacted] 13:56:04

[redacted] 13:56:04

[redacted] 13:56:08

[redacted] 13:56:13

[redacted] 13:56:18

MR. JACOBSON: Object to form. 13:56:21

BY THE WITNESS: 13:56:24

[redacted] 13:56:24

[redacted] 13:56:27

[redacted] 13:56:33

BY MR. ERICKSON: 13:56:37

[redacted] 13:56:38

[redacted] 13:56:40

[redacted] 13:56:45

[redacted] 13:56:50

[redacted] 13:56:56

[redacted] 13:57:10

[redacted] 13:57:13

[redacted] 13:57:16

[redacted] 13:57:22

MR. JACOBSON: Object to form. 13:57:25

BY THE WITNESS: 13:57:39

[redacted] 13:57:40

[redacted] 13:57:44

[redacted] 13:57:45

[redacted] 13:57:46

[redacted] 13:58:08

Q Okay. Now, we've been discussing some 13:58:18

select paragraphs of your report. If you back up 13:58:20

to Paragraph 567, this is where this section of 13:58:31

your report begins addressing limitation Claim 1 iii I believe? 13:58:36 13:58:45

A Yes. 13:58:53

[redacted] 13:58:54

[redacted] 13:58:55

[redacted] 13:58:57

[redacted] 13:59:00

[redacted] 13:59:11

MR. JACOBSON: Object to form. 13:59:12

BY THE WITNESS: 13:59:14

[redacted] 13:59:14

[redacted] 13:59:16

MR. ERICKSON: Why don't we take a quick break. 13:59:25 13:59:27

THE VIDEOGRAPHER: Okay. One moment. We are going off record. The time is 1:59 p.m. 13:59:27 13:59:29

(A recess was had.) 13:59:35

THE VIDEOGRAPHER: We are back on record. The time is 2:07 p.m. 14:07:12 14:07:18

MR. TAYLOR: Mr. Erickson, do you want to finish your -- 14:07:25 14:07:32

MR. ERICKSON: I'll pass the witness 14:07:33

examination. 14:07:36

EXAMINATION 14:07:41

BY MR. TAYLOR:

Q Dr. Cooklev, I have a few questions 14:07:43

regarding NXP's counsel's questions this morning. 14:07:45

A Okay. 14:07:47

Q Please look at Paragraph 24 of your 14:07:47

opening report which is Exhibit 1. 14:07:58

A Yes, I'm looking at it. 14:08:00

Q And with respect to the '629 patent list 14:08:01

of accused products, there were a number of 14:08:04

questions this morning, correct? 14:08:06

A Yes. 14:08:08

Q In these part numbers, part numbers 14:08:18

identify chipsets, correct? 14:08:22

A Yes. 14:08:23

Q And do you know what products, end 14:08:27

products that these chipsets end up in? 14:08:29

A Unless I somewhere state in my report, I 14:09:09

would not be able to answer right now. 14:09:11

Q And I believe you've testified that you 14:09:13

analyzed one of these part numbers and found that 14:09:18

it infringed the asserted claims of the '629 patent, correct? 14:09:31 14:09:34

A From a certain perspective, I think that's correct, [redacted] yes, my intention was to analyze one that is representative. 14:09:47 14:09:51 14:09:59 14:10:02 14:10:10 14:10:14 14:10:23 14:10:29 14:10:33

Q And I believe you testified that because the other part numbers also practice the 802.11 standard that they, therefore, also infringe Claim 1 of the '629 patent; is that correct? 14:10:34 14:10:36 14:10:45 14:10:51

A Yes, that is one of the things that I also said, that they practice the same standard and behave in the same way with respect to the accused functionality here. 14:10:57 14:10:59 14:11:04 14:11:09

Q Is it possible for NXP to design a chipset or part number that complies with 802.11 standard that does not infringe Claim 1 of the '629 patent? 14:11:13 14:11:19 14:11:25

A No. 14:11:29

Q How many people assisted you in reviewing NXP source code? 14:11:42

A In addition to counsel, I think a couple of other people. 14:11:47

Q You don't know how many? 14:12:13

A It's -- it's a little difficult for me right now to give you an answer with that level of precision, is it two or three, but it's I think in that -- in that range. 14:12:16

MR. TAYLOR: I have no additional questions. Thank you. 14:12:43

MR. TAMBURO: I have no redirect. 14:12:46

MR. TAYLOR: Do you want to go off the record quickly? 14:12:52

MR. ERICKSON: Yeah, let's go off record for a minute. 14:12:57

THE VIDEOGRAPHER: Okay. We are going off record. The time is 2:13 p.m. 14:13:00

(A recess was had.) 14:13:01

THE VIDEOGRAPHER: We are back on record. The time is 2:14 p.m. 14:13:08

EXAMINATION

BY MR. BELL:

Q Good afternoon, Dr. Cooklev. 14:15:00

A Good afternoon. 14:15:01

Q In preparing your report marked as Exhibit 1 to this deposition, about how long did you spend analyzing the MediaTech source code? 14:15:01 14:15:03 14:15:05

A I mean, I followed a similar process or procedure. I -- the MediaTech source code was made available for review in D.C., and I went -- I mean, it seems like I've been to D.C. a few times, I think for the purpose of reviewing MediaTech source code it might have been only once. But then I -- again, I was reviewing -- I kept reviewing the code all the way through the -- until the report was finalized. 14:15:27 14:15:30 14:15:39 14:15:50 14:15:54 14:15:58 14:16:01 14:16:15 14:16:19

And I apologize, if some of the details I don't specifically remember, was it MediaTech source code or NXP's code, I may sometimes -- may not exactly remember. 14:16:23 14:16:25 14:16:27 14:16:33

Q Thank you. 14:16:36

So you said you kept on reviewing the code 14:16:40

all the way through until the report was finalized. 14:16:43 14:16:46

Are you referring to the source code that was printed? 14:16:47 14:16:47

A Yes. 14:16:48

Q So is it safe to say that for chips where no code was printed you didn't review source code after your one-day review in DC? 14:16:58 14:17:01 14:17:03

A Well, since -- if it wasn't produced, obviously I could not have -- didn't have access to it, so in this sense clearly I did not look at that source code, but we tried to -- and we did look at all of the -- all of the code that was produced when we decided on what portion of that code to print and to focus in the analysis. 14:17:09 14:17:17 14:17:20 14:17:34 14:17:40 14:17:44 14:17:51

Q When you said "we," who are you referring to? 14:17:56 14:17:59

A Well, I understand that the -- the analysis is under my direction and so what I felt was necessary, but I have discussed this with counsel. So I had discussions with counsel during the -- during the source code review process and 14:18:06 14:18:11 14:18:13 14:18:17 14:18:25

during the preparation of the report. 14:18:29

Q Did you have discussions with anyone other than counsel about the source code? 14:18:34 14:18:35

A I think I did. As I said, I received some assistance with the review of the source code and we certainly had discussions about that. 14:18:38 14:18:45 14:18:51

Q I believe you previously said that you may have gotten notes relating to NXP's source code. 14:18:56 14:18:58

Did you receive similar notes for MediaTech? 14:19:02 14:19:04

A That's -- perhaps. As I said, there was just a lot of things happening and I don't specifically recall at the moment, but perhaps yes. 14:19:17 14:19:22 14:19:25 14:19:34

MR. BELL: Counsel, same request as NXP if there are notes. 14:19:40 14:19:43

BY MR. BELL: 14:19:45

Q Can you turn to Paragraph 24 of your report? 14:19:46 14:19:48

A Yes, I'm there. 14:19:49

Q And you see the first bullet discussing MediaTech products? 14:19:50 14:19:51

A Yes. 14:19:58
Q And then in the first sentence it says: 14:19:58
MediaTech products that practice the 802.11 N 14:20:01
standard for the '629 patent only. 14:20:06
Do you see that? 14:20:07
A Yes. 14:20:09
Q In the list of identifiers, which chips 14:20:12
are you accusing of practicing 802.11 N for the 14:20:15
'629 patent? 14:20:21
A Excuse me. What is the question? I'm not 14:20:26
sure. 14:20:28
Q Sure. 14:20:29
So your statement seems to suggest that 14:20:30
certain chips are only accused for the '629 patent 14:20:33
only and I'm trying to determine which chips in 14:20:36
that list are accused for the '629 patent only and 14:20:39
which are accused for the '862 and the '629 14:20:42
patent. 14:21:25
A I think all of the products mentioned in 14:21:25
this first bullet point of Paragraph 24, all of 14:21:30
them practice 802.11 N and they also practice 14:21:36
802.11 AC and/or 802.11 AX. 14:21:52

Q So sitting here today you know that each of the identifiers in that list refers to a chip that refers to 802.11 -- sorry. Strike that. 14:22:08 14:22:10 14:22:12

So sitting here today, you're testifying that you know that each of the identifiers in this list refers to a chip that practices 802.11 N, 802.11 AC and 802.11 AX? 14:22:16 14:22:19 14:22:21 14:22:27

A I think I said 802.11 AC and/or 802.11 AX. 14:22:37

Q So do you know which of the identifiers in the list in Paragraph 24 you're asserting practice 802.11 AX? 14:22:51 14:22:53 14:22:59

A AC? 14:23:00

Q AX. 14:23:01

A Oh, AX. Do I know which of these products practices 802.11 AX. Unless somewhere in my report I identify this, no, I don't know. 14:23:03 14:23:09 14:23:41

Q Again referring to the list for MediaTech in Paragraph 24, do you know which of these identifiers you are asserting refer to chips that practice 802.11 AC? 14:23:55 14:23:58 14:24:02 14:24:05

MR. JACOBSON: Object to form. 14:24:09

BY THE WITNESS: 14:24:10

A Unless I -- I mean, very similar answer, unless I identify that somewhere else in my report, no, but if regarding 802.11 AC if I have to -- if I have to guess, I would say all of them. 14:24:28 14:24:33 14:24:39 14:24:49

BY MR. BELL: 14:25:00

Q But you don't know? 14:25:00

A I mean, it's the same answer I think that I just said I -- unless I somewhere specifically identify it, not for sure but I think it's reasonable to assume that all of them -- all of them are compliant with 802.11 AC. 14:25:07 14:25:09 14:25:20 14:25:24 14:25:28

Q Would it surprise you if some of them are not compliant with 802.11 AC? 14:25:34 14:25:37

A If some of them are not compliant with 802.11 AC, would I be surprised? A little bit. And I would -- I mean, but then that question may be -- just invites if I may say the question -- well, what do you mean under compliant with 802.11 AC? 14:25:41 14:26:07 14:26:22 14:26:31 14:26:37 14:26:42

Q Sure. I'll rephrase. 14:26:43

So the first sentence under the bullet in Paragraph 24 for MediaTech says: The MediaTech 14:26:46 14:26:48

products have practiced the 802.11 N. 14:26:50

A Yes. 14:26:54

Q And then it also has after that 802.11 AC and/or 802.11 AX? 14:26:55 14:26:59

A Yes. 14:27:02

Q Would it surprise you if some of the items identified in the next sentence do not practice 802.11 AC? 14:27:03 14:27:10 14:27:16

A So the commercial implementation of 802.11 AC began with I think it was 802.11 AC Wave 1 if I recall correctly. There were products that 802.11 AC Wave 1, and those were products that were fielded relatively early as vendors wanted to -- basically wanted to field products even before -- even before formally the standup was done, and so those were I think the term is Wave 1, and this was followed by Wave 2. 14:27:21 14:27:25 14:27:37 14:27:40 14:27:46 14:27:53 14:28:00 14:28:07 14:28:11

Now, the response would it surprise me? Maybe a little bit. 14:28:21 14:28:26

Q Does whether or not something practices 802.11 AC Wave 1 versus 802.11 AC Wave 2 change your analysis in your report? 14:28:32 14:28:34 14:28:42

A No. And when you said not compliant with 802.11 AC, I meant not compliant with any one of them. 14:28:45 14:28:55 14:28:59

Q Any one of them being 802.11 AC Wave 1 and 802.11 AC Wave 2? 14:29:03 14:29:08

A Yes. 14:29:10

Q In that same bullet in Paragraph 24 of your report, in the second sentence you see the list of I'll call them identifiers, it starts with: [redacted] 14:29:18 14:29:21 14:29:23 14:29:28

A Yes. 14:29:41

Q Did you prepare that list? 14:29:41

A I think counsel helped with this list. 14:29:51

Q Again referring back to that same list, do you know which of those identifiers refer to a chip with a single antenna? 14:30:05 14:30:08 14:30:11

A No, just on these as you called them identifiers, I don't know which one is for a product with a single antenna. 14:30:32 14:30:35 14:30:39

MR. BELL: I have no further questions. 14:30:57

MR. TAYLOR: I have no questions. 14:31:06

MR. JACOBSON: No redirect from me. 14:31:09

MR. SCHMIDT: No questions for Asus. 14:31:19

THE VIDEOGRAPHER: Okay. One moment. We 14:31:26

are going off record. The time is 2:31 p.m. 14:31:28

(Deposition concluded at 2:31 p.m. CST.)

CERTIFICATE OF COURT REPORTER - NOTARY PUBLIC

I, Theresa A. Vorkapic, Certified Shorthand Reporter No. 084-2589, CSR, RMR, CRR, RPR, and a Notary Public in and for the County of Kane, State of Illinois, the officer before whom the foregoing deposition was taken, do hereby certify that the foregoing transcript is a true and correct record of the testimony given; that said testimony was taken by me and thereafter reduced to typewriting under my direction; that reading and signing was not requested; and that I am neither counsel for, related to, nor employed by any of the parties to this case and have no interest, financial or otherwise, in its outcome.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my notarial seal this 16th day of February, 2024.

My commission expires November 6, 2027.

Theresa A Vorkapic

THERESA A. VORKAPIC

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