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Transcript of Michael Allen Jensen, Ph.D.

Date: March 20, 2023

Case: Samsung Electronics Co., Ltd., et al. -v- Smart Mobile Technologies, LLC
(PTAB)

Planet Depos

Phone: 888.433.3767

Email: transcripts@planetdepos.com

www.planetdepos.com

1 UNITED STATES PATENT AND TRADEMARK OFFICE

2 -----
3 BEFORE THE PATENT TRIAL AND APPEAL BOARD
4 -----

5 SAMSUNG ELECTRONICS CO., LTD.

6 Petitioner,

7 v.

8 SMART MOBILE TECHNOLOGIES, LLC

9 Patent Owner.

10 -----
11 Case: IPR2022-01004

12 U.S. Patent No. 9,614,943
13 -----

14
15 Deposition of MICHAEL ALLEN JENSEN, Ph.D.

16 Conducted Virtually

17 Monday, March 20, 2023

18 9:32 a.m. MT
19

20 Job No.: 483544

21 Pages: 1 - 110

22 Reported by: Stephanie A. Battaglia, CSR, RMR, CRR

1 PRESENT:

2 SKIERMONT DERBY, LLP
3 BY: MR. STEVE UDICK
4 1601 Elm Street, Suite 4400
5 Dallas, Texas 75201
6 (214) 978-6600
7 e-mail: sudick@skiermontderby.com

8 - and -

9 SKIERMONT DERBY, LLP
10 BY: MR. REX HWANG
11 633 West Fifth Street, Suite 5800
12 Los Angeles, California 90071
13 (213) 788-4500
14 e-mail: rhwang@skiermontderby.com

15 - and -

16 GRAVES & SHAW, LLP
17 BY: MR. PHILIP GRAVES
18 355 South Grand Avenue, Suite 2450
19 Los Angeles, California 90071
20 (213) 204-5101
21 e-mail: pgraves@gravesshaw.com

22 appeared on behalf of the
Patent Owner Smart Mobile
Technologies;

1 (Cont'd.):

2 FISH & RICHARDSON
3 BY: MR. AAMIR A. KAZI
4 1180 Peachtree NE, 21st Floor
5 Atlanta, Georgia 30309
6 (404) 724-2811
7 e-mail: kazi@fr.com

8 - and -

9 FISH & RICHARDSON
10 BY: MR. SANGKI PARK
11 60 South 6th Street, Suite 3200
12 Minneapolis, Minnesota 55402
13 (612) 638-5763
14 e-mail: spark@fr.com

15 appeared on behalf of the
16 Petitioner Samsung.

17 ALSO PRESENT:

18 Mr. Ky Shanklin, Technician
19 Planet Depos

20 Ms. Stephanie A. Battaglia, CSR, RMR, CRR
21 Planet Depos
22

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I N D E X

WITNESS: PAGE:

Michael Allen Jensen, Ph.D.

EXAMINATION BY:

Mr. Udick 6

E X H I B I T S

(Not Attached)

Exhibit 1001	U.S. Patent No. 9,614,943	87
Exhibit 1003	Declaration for Dr. Michael Allen Jensen	9
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1 MS. REPORTER: Here begins the
2 videoconference deposition of Dr. Michael Jensen
3 in the matter of Samsung Electronics versus Smart
4 Mobile Technologies.

5 Today's date is March 20, 2023 and the
6 time is 9:32 a.m., Mountain Time.

7 My name is Stephanie Battaglia of
8 Planet Depos.

9 Beginning with the noticing party, will
10 counsel please introduce themselves, state whom
11 they represent, and stipulate to the swearing in
12 of the witness remotely.

13 We will start with Mr. Udick.

14 MR. UDICK: This is Steve Udick with the
15 firm Skiermont Derby representing Smart Mobile
16 Technologies.

17 Alongside me is Rex Hwang also of the same
18 firm and Philip Graves with Graves Shaw, LLP, and
19 we so stipulate.

20 MR. KAZI: This is Aamir Kazi with the law
21 firm of Fish & Richardson here on behalf of the
22 Petitioner Samsung. And also on behalf of the

1 witness and along with me at this deposition is
2 Mr. Sangki Park also of the same law firm, and we
3 also stipulate.

4 MICHAEL ALLEN JENSEN, Ph.D.,
5 called as a witness herein, having been first duly
6 sworn was examined and testified via Zoom
7 conference as follows:

8 EXAMINATION

9 BY MR. UDICK:

10 Q Good morning, Dr. Jensen.

11 A Good morning.

12 Q How are you?

13 A I am doing well.

14 Q Great.

15 A Thank you.

16 Q We previously had a deposition several
17 months ago, correct?

18 A That's correct.

19 Q And we ran through kind of your background
20 and history of how many depositions you have had and the
21 ground rules as well.

22 A Yes, sir.

1 Q I will just restate some of them.

2 Let's continue to make sure, as we did I
3 think particularly well in the last deposition,
4 that we try not to speak over each other,
5 especially in this Zoom world where signals can
6 cut when two people speak and the reporter may not
7 be able to hear it and, likewise, head nods and
8 head gestures for answers, the court reporter
9 won't be able to capture that. Does that all make
10 sense?

11 A Yes.

12 Q I will do my best to speak slowly so we
13 are not rushing the transcript, and if you will do
14 the same in your answers, I think the court
15 reporter and the record will greatly appreciate
16 that. Is that okay?

17 A Yes.

18 Q And then as you noticed from last time
19 occasionally I will ask questions that make no
20 sense to you or you need some further
21 understanding. Will you do me that favor if you
22 don't understand the question ask me for

1 clarification or to repeat it?

2 A I will.

3 Q And if you do answer the question is it
4 okay that I assume that you have understood the
5 question that I have asked you?

6 A Yes.

7 Q Just a couple questions for the record
8 that some lawyer made up some time ago and we
9 continue to use it now, is there any reason today
10 that you are unable to give full and complete and
11 honest testimony?

12 A No.

13 Q Any medications that would impair your
14 ability to do so?

15 A No.

16 Q Great.

17 This is the petition for
18 U.S. Patent 9,614,943, is that correct?

19 A That's my understanding as well, yes.

20 Q And with that petition you provided a
21 supporting declaration, correct?

22 A That's correct.

1 MR. UDICK: And just so we have the record
2 clear, Mr. Shanklin, if you could please put Doc 4
3 into the record.

4 (Document identified as Exhibit 1003 for
5 identification.)

6 BY MR. UDICK:

7 Q Dr. Jensen, last time you had clean copies
8 of the exhibits and the declaration you filed in
9 this case. Is that true today as well?

10 A Yes.

11 Q As we did last time if it's okay with you
12 I will mark -- make sure we have on the record
13 that the exhibit is what we are both talking about
14 the same exhibit, but then feel free to use what
15 you have in front of you on your computer soft
16 copy as well, is that okay?

17 A Yes, that's great.

18 Q What we have is the Exhibit 1003 of the
19 IPR, which is the declaration of
20 Dr. Michael Allen Jensen.

21 If the tech can give the witness control
22 and then, Dr. Jensen, if you can quickly scroll to

1 make sure that what you are looking at here is
2 consistent with what you understand to be your
3 declaration in the IPR.

4 A Based on my quick scroll through that
5 appears to be my declaration that I submitted.

6 Q Great.

7 We can take that down and we can use the
8 one that you have a soft copy.

9 Dr. Jensen, I will refer to the paragraph
10 numbers, if that's easier for you or if you like I
11 can give you a page number as well as the
12 paragraph as needed.

13 First I would like to turn to Paragraph 14
14 -- I am sorry, Paragraph 19.

15 A Okay.

16 Q Here you begin an overview of your
17 conclusions formed, is that correct?

18 A Yes, sir.

19 Q In 21 you list specific references that
20 you have reviewed in forming the conclusions and
21 the opinions that you have in your declaration, is
22 that correct?

1 A Yes, that's right.

2 Q That goes through I guess Page 18?

3 A Correct. I mean, on my copy here Page 16,
4 you mean the list of references, Page 16?

5 Q Yes, 16, I am sorry. I was looking at
6 different bullet points that looked like 18,
7 sorry.

8 A No problem.

9 Q And then in 22, it is almost a catchall,
10 it is anything else supported in your declaration,
11 is that correct?

12 A Yes.

13 Q Are any of these references references
14 that you identified yourself?

15 A I mean, yes, as I went through definitely
16 several of these references are things that I
17 identified myself.

18 Q When you say identified yourself, just to
19 make sure we are on the same page, they are
20 references that you researched and found on your
21 own without them previously being provided by
22 counsel, is that correct?

1 A That's what I meant, yes, sir.

2 Q Great.

3 Do you know if -- let me -- if we go to
4 Page 18, 17 and 18, in Paragraph 26 it is a
5 summary of your conclusions, the opinions you
6 formed and your conclusions in this declaration,
7 is that correct?

8 A That's correct.

9 Q And there is certain references in those
10 in each of those bullet points, right?

11 A That's correct.

12 Q Are any of those references ones that you
13 independently found on your own?

14 A Those references while I was aware of one
15 of them all of those were identified by counsel
16 and pointed out to me by counsel.

17 Q Which one were you aware of?

18 A The Raleigh reference.

19 Q And how were you aware of Raleigh?

20 MR. KAZI: Objection to the form.

21 Sorry, go ahead, Dr. Jensen, objection to
22 form.

1 THE WITNESS: That's primely in my
2 research area, especially around the time of its
3 disclosure, and so I was aware of what was
4 happening in the industry in these multi antenna
5 space-time encoding kind of systems including the
6 work from Mr. -- Dr. now Raleigh.

7 BY MR. UDICK:

8 Q In Paragraph 27 you state your
9 understanding of what the person of ordinary skill
10 in the art is at the time of the invention?

11 A Yes.

12 Q And that is they would have a Bachelor's
13 degree in electrical engineering, computer
14 engineering, computer science or related field,
15 and at least two years of experience related to
16 the design or development of wireless
17 communication systems or the equivalent.

18 You go on, additional graduate education
19 could substitute for professional experience or
20 significant experience in the field could
21 substitute for formal education, correct?

22 A That's correct.

1 Q And that is -- in our previous deposition
2 it was on another patent in the same family, the
3 '434 patent, is that correct?

4 A That's my recollection, the last time you
5 deposed me it was '434.

6 Q And that was the same definition of a
7 POSITA that you had given in that case, correct?

8 A That's my recollection, it was the same
9 definition.

10 Q Nothing would change about how that person
11 of skill in the art, your understanding of what
12 they would be aware of and what their capabilities
13 were at the time, is that correct?

14 A No, I haven't changed my perspectives on
15 that.

16 Q If you would turn to -- one of the first
17 references that your opinions relate to is Byrne,
18 is that correct --

19 A Yes, sir.

20 Q -- as we march through your declaration?

21 A That's correct.

22 Q And if we would, please turn to Page 39,

1 Paragraph 69.

2 A Okay, I am there.

3 Q Does that begin your analysis of Byrne in
4 relation to the claims of the '943 patent?

5 A Yes.

6 Q Byrne is another reference we discussed in
7 the '434 deposition, is that correct?

8 A At this stage I honestly don't recall.

9 Q If it is you wouldn't -- the record is
10 what it is as to whether that was Byrne, correct?

11 A Absolutely, yes.

12 Q I would make the representation that it
13 is, but I understand that you have had I think at
14 least one other deposition in this collective
15 matter so by now there may be some different
16 references in different places and you'd like to
17 be correct with your memory, I assume.

18 A This is actually my fourth deposition in
19 this family of depositions so, yes, it gets a
20 little jumbled.

21 Q Totally understand.

22 MR. UDICK: If you would, Mr. Shanklin, if

1 we can pull up Doc 8, which is Samsung
2 Exhibit 1008 in the IPR.

3 (Document identified as Exhibit 1008 for
4 identification.)

5 BY MR. UDICK:

6 Q And, Dr. Jensen, like before, take a look
7 and make sure this aligns with your understanding
8 of what the exhibit Byrne is as well as Samsung
9 1008.

10 A This is Byrne 1008.

11 Q Great.

12 And this is the first -- and we can take
13 that down.

14 Dr. Jensen, if you would like to look at
15 the soft copy you have on your computer, however
16 you would like to as well. Is that also -- and
17 also, your declaration aside, because I think in
18 some cases you have created some annotated images
19 from Figure 1 that I might ask about.

20 A Okay, I have them both up.

21 Q Great.

22 In addition to the documents -- since you

1 have submitted your declaration have you reviewed
2 any other documents in preparation for your
3 deposition?

4 A You mean documents other than what I have
5 talked about in my declaration?

6 Q Yes.

7 A No, I don't recall reviewing any other
8 documents. Well -- no, that's not true, I have
9 since filing this declaration I have seen,
10 although not reviewed extensively, the PTAB's
11 institution document as well as I believe in this
12 case also some patent owner preliminary response
13 documents.

14 Q Yes, and for the record that's correct, we
15 -- Smart Mobile submitted patent owner preliminary
16 response and there was a reply and a surreply and
17 then the institution decision.

18 A Those are additional documents I did not
19 have at the time of my declaration.

20 Q Correct.

21 If we look to Paragraph 87.

22 A Okay, I am at 87.

1 Q Just above that is Figure 1 of
2 Exhibit 1008 annotated, correct?

3 A It's Figure 2.

4 Q I am sorry?

5 A Of 1008.

6 Q Yes.

7 A Yes.

8 Q My apologies, correct.

9 In Figure 2 you have identified -- first,
10 did you create the annotations on this image?

11 A No. Counsel prepared these annotations.

12 Q Did you give instruction as to how to make
13 the annotations?

14 A I gave instruction as to sort of what we
15 were trying to accomplish and we went back and
16 forth on those annotations.

17 Q Understood.

18 And here you identify, you have got two --
19 so there is two -- three colors, a yellow, a blue,
20 and a green, correct?

21 A That's correct.

22 Q What is it that you are attempting to show

1 with yellow?

2 A The parts or some of the parts of Byrne's
3 disclosure that relate to cordless telephone
4 transceiver and antenna and its communication with
5 the microprocessor.

6 Q And is it your -- does this annotation
7 indicate that whatever is -- Item 228 is the first
8 thing that's marked in yellow, correct?

9 A Yes, it's one of the things marked in
10 yellow.

11 Q And that is an antenna, correct?

12 A That's correct.

13 Q And is it your understanding that
14 information is received or transmitted through
15 that antenna?

16 A Yes. Precisely, a radio signal that
17 contains information, yes.

18 Q And is it your -- is this annotation
19 indicating that the information or the radio
20 signal -- strike that.

21 Is this annotation indicating that the
22 information received by that antenna is passed to

1 the microprocessor?

2 A Yes. I mean, through other components,
3 but if it's on reception, for example, in that
4 environment where we are receiving through the
5 antenna that information would be passed through
6 the microprocessor.

7 Q So it is -- one of the stops would be the
8 cordless receiver 221, is that correct?

9 A That's right.

10 Q And then this annotation is indicating
11 that information received by the antenna in
12 receive mode goes through the cordless receiver
13 and then that data or that information is passed
14 to the microprocessor, is that correct?

15 A That is, yes, my opinion.

16 Q If we look at Paragraph 87, you have a
17 couple citations. Can you tell me I guess 87 and
18 88, perhaps 88 has the references, but where is it
19 that you are citing the disclosure that indicates
20 that the information received from the antenna is
21 passed to the microprocessor?

22 A I don't see the reference that -- in those

1 paragraphs I don't see quickly the references
2 unless it might be in Paragraph 88, I think that
3 first reference there, I need to look, but I think
4 that first reference is a paragraph in Byrne that
5 talks about what you are referring to of the
6 microprocessor's role in the data.

7 Q You are talking about in Paragraph 88?

8 A Yes, in Paragraph 88 it is EX-1008, column
9 8, Line 16 through 23, but I need to go to clarify
10 that's the right reference that I am thinking of.

11 Q Sure, that's why I introduced Byrne
12 already.

13 If you would take a look at Byrne and let
14 me know if that's what you are referring to.

15 A That's the reference that I was thinking
16 of.

17 Q So this is 8, 16 to 23, it is part of the
18 paragraph that finishes up at 28, correct?

19 A Yes.

20 Q And so the paragraph says when operating
21 as a cordless telephone control signals from the
22 microprocessor 210 enable cordless receiver and

1 cordless transmitter 222 is enabling -- I am
2 sorry -- is controlling signals from the
3 microprocessor -- strike that.

4 So there is in this first sentence there
5 are control signals that are coming from the
6 microprocessor, correct?

7 A Yes. The first sentence talks about
8 control signals for enabling the cordless
9 transceiver, that's correct.

10 Q And then the next sentence is the
11 microprocessor also monitors signals from the
12 cordless receiver indicating received signal
13 strength and for detecting received data and from
14 the cordless transmitter 222 for sending transmit
15 data, correct?

16 A That's the next sentence, yes, sir.

17 Q And so that means that the microprocessor
18 receives signals from the cordless receiver that
19 indicates the received signal strength, that's one
20 item, correct?

21 A That's one item, yes, sir.

22 Q And then it receives signals for detecting

1 received data, correct?

2 A Yes, sir.

3 Q And then from the cordless transmitter for
4 sending transmit data, correct?

5 A That's -- yes, those are the three
6 elements of that sentence, yes.

7 Q Anywhere in there does it refer to
8 processing the received data?

9 A It doesn't expressly use the words
10 processing the received data, but detecting is a
11 form of processing.

12 Q Is it of the data received?

13 A I am sorry, I don't quite understand.

14 Q Detecting that the cordless receiver is
15 receiving data, does that mean that the
16 microprocessor is also receiving that data?

17 A Well -- so Byrne here -- you know, this is
18 the only sentence we have, so Byrne here is not
19 highly clear on everything that he means by this
20 sentence, but it certainly leaves a POSITA to
21 understand that data is being passed from that
22 receiver to the microprocessor.

1 Q Is it the same data that is being received
2 by the antenna?

3 A Presumably, right. Again, he is not
4 highly explicit here, this is kind of the only
5 sentence we have of exactly what that data is and
6 what is happening, but data would be coming
7 through the antenna that would end up at the
8 microprocessor through this channel, it is just
9 not highly explicit or not explicit at all about
10 what form that takes.

11 Q Why is it your opinion that it would be --
12 that it would -- data would necessarily end up at
13 the microprocessor through this channel?

14 A Well, again, it says here for detecting
15 received data, so what's doing that detecting,
16 what's doing that processing, the processor he
17 discloses is the microprocessor 210.

18 Q For detecting that the cordless receiver
19 is receiving data, correct?

20 A Well, I think when you add those words for
21 detecting that the cordless receiver is receiving
22 data, that's not what he says, he says for

1 detecting received data.

2 Q But the microprocessor is monitoring
3 signals from the cordless receiver indicating -- I
4 am sorry -- monitoring signals from the cordless
5 receiver for detecting received data, correct?

6 A That is what the language says, yes.

7 Q And it wouldn't need to monitor signals
8 from the cordless receiver for the microprocessor
9 to receive data, it would know already that it is
10 receiving that data, correct?

11 MR. KAZI: Objection to the form.

12 THE WITNESS: But that's not how it would
13 work, right? I mean, if it's monitoring an input
14 line to say, oh, data is coming in that I need to
15 process, that would also be consistent with this
16 language.

17 BY MR. UDICK:

18 Q Why would it need to input -- why would it
19 need to monitor an input line if it would be
20 receiving the data?

21 A Every microprocessor is monitoring its
22 input lines, right, you have input lines that will

1 say, okay, I have got data here, I need you to do
2 something.

3 Q But it's not --

4 A That's not how microprocessors work.

5 Q Apologies.

6 But the disclosure in Byrne isn't that it
7 is monitoring its own line, it says the
8 microprocessor is monitoring signals from the
9 receiver indicating or detecting received data,
10 correct?

11 A When you say its own line, so -- I mean,
12 that would be coming -- anything that's coming
13 from the cordless receiver, in this case 221,
14 would be coming in to the microprocessor on a line
15 of the microprocessor, so I am not sure I
16 understand your question.

17 Q What would the microprocessor then do with
18 that data?

19 A Again, Byrne has not expressed as to what
20 that processing might look like, but there is a
21 lot of processing that might happen to that data
22 stream, right? I mean, it is coming in -- it uses

1 digital standards so there is all kinds of
2 processing that needs to happen to get that in a
3 form, say, where a speaker could actually play
4 that.

5 Q In Figure 2 that you reference what you
6 don't highlight is a line from the cordless
7 receiver to the cordless audio, correct?

8 A I don't highlight it, but it's there, yes.

9 Q What is your understanding of what that is
10 passing?

11 A Well, once again, Byrne is not highly
12 explicit about what signals go where. At a
13 minimum that is something that the cordless audio
14 could do some maybe filtering or amplification of
15 or something like that to send it out through the
16 audio switch to the speaker in this particular
17 case because we are receiving.

18 Q Is there anything -- is there any
19 disclosure in Byrne that the information is sent
20 to the speakers from the microprocessor?

21 A I am not aware of any disclosure, I don't
22 recall any disclosure in Byrne that says that the

1 microprocessor 210 sends audio data to the
2 speaker.

3 Q Byrne is explicit -- Byrne does indicate
4 that -- if you look at Byrne in Paragraph 7,
5 beginning at Line 56, the microprocessor 210, and
6 that's the microprocessor that you highlight,
7 correct?

8 A I am sorry, you said paragraph -- you
9 meant column 7?

10 Q Yes, I am sorry.

11 A Yes, I am there.

12 Q It said the microprocessor 210 illustrated
13 in Figure 2, which is the microprocessor you
14 identify in the annotations, correct?

15 A Yes.

16 Q It says it's adapted to operate in
17 accordance with the flowcharts illustrated in
18 Figures 3 through 4 for controlling the CCT 200 is
19 a cordless telephone, a cellular telephone, or a
20 cellular cordless telephone, correct?

21 A That's correct, that's what it says.

22 Q As relates to Byrne it does tell you what

1 the microprocessor in Figures 3 to 4 does,
2 correct?

3 A Just to be precise, it discloses that
4 functionality of -- that's something that the
5 microprocessor does.

6 Q And if you look at Figures 3 or 4 do
7 either of those figures indicate that -- indicate
8 processing data received by the antenna?

9 A In this case these flowcharts they are
10 talking -- they talk about what's being monitored
11 and then how to control the phone, how to maybe
12 hand over or switch over from one modality to
13 another, so that's their main objective.

14 Now, to answer more specifically your
15 question about whether or not data coming in from
16 the antenna is ending up in the microprocessor, I
17 think it's a little more nuanced whether that's
18 happening or not. It is certainly not expressed
19 in these figures.

20 Q And the flowcharts that they talk about
21 what's being monitored and then how to control the
22 phone, that's also consistent with columns 7 and 8

1 in their discussion of the microprocessor that it
2 relates to how the microprocessor controls or
3 monitors the device, correct?

4 A Well, there is certainly consistency
5 there, yes, there is, I know in particular in the
6 last sentence of the paragraph we were talking
7 about in column 8, it is the sentence that starts
8 I think on line 23 where it talks about
9 additionally the microprocessor monitors control
10 signals from the cordless transceiver 220 for
11 detecting incoming calls (ringing), security codes
12 and broadcast information relevant to the cordless
13 system and for sending dialing information.

14 So certainly we have got some control work
15 going there, control work going in in the first
16 sentence.

17 This middle sentence that we have been
18 focusing on talks more expressly about received
19 data in this case.

20 Q So what does -- what does the received
21 data -- what does the microprocessor do with what
22 you have identified as the received data?

1 A Well, as I have already testified he is
2 not expressive about what that signal processing
3 or data processing might look like. So now we are
4 left to sort of speculate or a POSITA would look
5 at all the processing that needs to be done and
6 figure out what's happening, how is it going to do
7 that, so there is a lot of answers that we can
8 talk about for what that microprocessor might be
9 doing with that data.

10 Q Would it be fair to say that the cordless
11 receiver processes incoming data?

12 A Well, once again because Byrne is an
13 express there is something happening in the
14 cordless receiver, right, to that incoming stream,
15 and what it might be doing versus what the
16 microprocessor might be doing is just
17 unfortunately not expressly given in this
18 description.

19 Q Doesn't Figure 2 make it fairly explicit
20 when it shows the input to the cordless receiver
21 and then an output to the cordless audio?

22 A Well, it certainly shows that data comes

1 in through the cordless receiver, there is
2 connection to the microprocessor and information
3 goes out of the cordless receiver through the
4 cordless audio. That is certainly shown.

5 Q You don't say that the information
6 received by the cordless receiver is passed to the
7 microprocessor then passed to the cordless
8 receiver to the cordless audio, correct?

9 A That is one possible path for that kind of
10 information.

11 Q But Byrne identified the connections
12 between the cordless receiver and the cordless
13 audio in a graphically different way than the
14 connection between the transceiver and the
15 microprocessor, correct?

16 A That's correct.

17 Q There is no direct disclosure that says
18 the microprocessor sends information to the
19 cordless receiver to go to the cordless audio,
20 correct?

21 A Yes.

22 I am not aware of any disclosure that

1 would disclose exactly what you just said.

2 Q And no express disclosure that said that
3 the cordless receiver takes the information
4 received from the antenna and passes that
5 information to the microprocessor? And, being
6 clear, I said no express disclosure, is that
7 correct?

8 A Can you repeat it? I am sorry, I want to
9 make sure I understood it. It wasn't that you
10 weren't clear, I just want to make sure.

11 Q Sure.

12 And there is no express disclosure that
13 said that the cordless receiver takes the
14 information from the antenna and passes that
15 information to the processor, is that correct?

16 A Well, express, I mean, I think that
17 paragraph and that sentence we talked about in
18 column 8 about detecting received data does
19 indicate a passing of received data from the
20 cordless receiver to the microprocessor.

21 Q But it never says the microprocessor
22 receives that data, it says that -- only that it

1 detects signal from the cordless receiver for
2 detecting received data, correct?

3 A That is the language -- I will agree, that
4 is the language from Byrne, yes.

5 Q And it is possible the cordless receiver
6 could process the signal itself, correct?

7 A So now -- let's be precise. When we talk
8 about a signal I think a better way, if I may pose
9 your question, is it possible that sort of the
10 audio signal, the audio information that's being
11 received is received by the receiver and passed to
12 the cordless audio block without that data being
13 passed to the microprocessor, I believe that is an
14 embodiment that could be implemented through this
15 architecture.

16 Q For cordless audio it then goes to the
17 audio switch, correct?

18 A That's correct.

19 Q And then outputted through the different
20 speaker means, so either a microphone or maybe a
21 loud speaker or a hands-free speaker, correct?

22 A In this case it would be output through a

1 speaker of some form, yes.

2 Q Here and then in Paragraph 8 in 39,
3 Line 39, again, you have the audio switch is
4 controlled by the microprocessor to link the
5 cordless audio channel or the cellular audio
6 channel to the microphone and loud speaker as
7 appropriate, correct?

8 A Yes, that's correct.

9 Q And so, again, that's the microprocessor
10 acting as a control mechanism for the other
11 components, right?

12 A Yes.

13 In this case on the audio switch, just to
14 be clear, the audio switch, the microprocessor
15 210, controls that audio switch to route audio
16 signals from the microphone or to the speaker,
17 depending on which of the devices is active.

18 Q Which comes from the cordless audio module
19 240, right?

20 A I am sorry -- yes.

21 So, for example, cordless audio
22 information is passed through the block 240 and

1 put into a form to drive a speaker in this case.

2 Q Through it looks like A2 is a connection
3 to the audio switch in a cordless audio that's
4 likely related to the receive function or giving
5 the user the received information in one form and
6 then B2 appears to be kind of the opposite pathway
7 that it provides the information to cordless
8 audio, correct?

9 A From the microphone 261 if now the user is
10 speaking Item B or 261 connected to Part B on the
11 audio switch is a microphone and that would be
12 routed by the audio switch into the -- out the
13 port B2 into the cordless audio block into the
14 transmitter.

15 Q Do you have an understanding of what the
16 cordless audio block 240 does?

17 A Again, I am not aware of -- I am aware of
18 the kinds of things that a cordless -- that an
19 audio block like that might do. I don't believe
20 that Byrne is explicit or express about the actual
21 things that are done in that box.

22 Q I am just looking through this paragraph

1 to make sure I have everything I needed.

2 In looking at 87, Paragraph 87, here is
3 your opinion that the data streams are processed
4 in parallel, is that correct, or at the same time?

5 A Yes.

6 Q What is the data that you are saying is
7 being processed at the same time?

8 A This is consistent with the conversation
9 we have been having.

10 Depending on how a POSITA would use this
11 architecture would kind of control what that data
12 is.

13 I mean, we already talked about at one
14 level that could represent the audio data and some
15 digital signal processing being performed by the
16 microprocessor.

17 It could mean other kinds of data, header
18 information that's on every packet of the received
19 signal, for example, or that needs to go on to the
20 transmitted signal.

21 So, again, it is not express. I think a
22 POSITA would have some liberty in how to use the

1 microprocessor and transceiver together to
2 accomplish the goal.

3 Q Is the data streams that you talk about in
4 87 that are being processed simultaneously the
5 same data streams you refer to in 88 regarding --

6 A Yes.

7 Q -- the microprocessor processing them?

8 A I apologize for jumping in.

9 Yes, yes, the data streams would be
10 consistent between 87 and 88 in my declaration.

11 Q In both those cases that is the data
12 stream that comes from the antenna 228 or 238 for
13 the corresponding cellular system, correct?

14 A That's correct.

15 Q Is there any disclosure that shows that
16 both audio -- that the audio from both cordless
17 and cellular can be sent to the audio switch at
18 the same time?

19 A In this architecture in this discussion of
20 this architecture Byrne doesn't disclose sending
21 that at the same time. Byrne just discloses that
22 both the cellular and the cordless can be

1 operational at the same time, which then presumes
2 a way in order to do that through the audio
3 speaker and microphones.

4 Q We talked about in your last deposition
5 this simultaneous operation passage a bit. Do you
6 recall that?

7 A Vaguely, yes.

8 Q Specifically, if you recall, we talked
9 about how one interpretation of the language of it
10 being in simultaneous operation is that it's --
11 the device is able to be operated as a cellular
12 cordless device simultaneously, correct, do you
13 remember that?

14 A I mean, to be clear, it seems to me we
15 were talking about an earlier reference to a
16 cordless -- cellular telephone in the '434, not
17 this one, but maybe something like Gillig, which
18 are similar references, but this one cites that
19 one, am I misremembering?

20 Q I think we had a specific discussion about
21 Byrne in that regard, but I am sure the transcript
22 is what it is.

1 A Sure, I -- so obviously I don't recall the
2 details of that conversation.

3 Q Sure, and that's fine. I am not going to
4 have you dig into an old transcript or anything,
5 but if you had remembered I would follow up on it.

6 Following your discussion of Byrne then on
7 page 62 you have your first obviousness
8 combination, that's Byrne and W0748. Do you see
9 that?

10 A Yes, sir, I do.

11 MR. UDICK: If we would pull up -- and if
12 we could, Mr. Shanklin, pull up Doc 7.

13 (Document identified as Exhibit 1007 for
14 identification.)

15 BY MR. UDICK:

16 Q Dr. Jensen, this will be another exercise
17 of ensuring that we are both looking at the same
18 reference and referencing the same. So Doc 7, as
19 I understand it, is Exhibit 1007 from the
20 petition. And it is also what, Doctor, you refer
21 to as W0748 in your declaration, if you would let
22 me know if that's your understanding as well.

1 A Yes, I believe this is the document that I
2 used.

3 Q We can take down 1007.

4 Dr. Jensen, what is your understanding of
5 what WO748 is?

6 A When you say what it is, what it teaches?

7 Q What technology does it cover, yes.

8 A It is particularly talking about the
9 challenges of getting cellular and other similar
10 kinds of wireless signals that are transmitted
11 from outside a building to inside a building and
12 therefore creating a capability to bring those
13 signals in inside the building in a way that it
14 provides good coverage within the building.

15 Q For WO748, that's embodiment to work in
16 the outside world, is it a modification just to a
17 device or is it a modification greater than that?

18 A To a device like -- can we be more
19 explicit about what we mean by a device?

20 Q Sure.

21 So if you -- you combined Byrne and WO748,
22 correct?

1 A Yes.

2 Q Do you combine just changes to the device
3 in Byrne to be the Byrne WO748 combination?

4 A I understand your question, yes, thanks
5 for the clarification.

6 So in this case it's really not as much
7 about a modification of, say, the device, say a
8 handheld or portable device that we might -- that
9 Byrne teaches, right, a cellular cordless phone.
10 It's modification to the infrastructure that would
11 support that device.

12 Q Understood.

13 And would there need to be any
14 modification to Byrne to support that
15 infrastructure?

16 A I mean, there are different ways you can
17 implement that, but you could implement that
18 combination in a way without needing to modify
19 Byrne's device.

20 Q But how would you do that?

21 A Well, what WO748 teaches is a way with
22 this combination of remote units, these sort of

1 almost micro cells within the building to be able
2 to pick up a wireless signal from a device like
3 Byrne's using those remote units or these almost
4 sort of micro cellular base stations, although
5 they don't have the full functionality of a base
6 station, and then routing that through a fiber
7 optic network routed in the building out to a base
8 unit then for connection to the outside world in
9 one form or another, at that point the handheld
10 device doesn't need to be modified.

11 Q You used this combination with reference
12 to claims 3 and 4, correct?

13 A That's correct.

14 Q And that begins on Page 65 of your
15 deposition -- I am sorry, of your declaration,
16 correct?

17 A I am sorry, yes, I -- let me just double
18 check.

19 Yes, that's right, that analysis starts on
20 Page 65, yes.

21 Q It says that the device is further in
22 communication with a network switch box configured

1 with a plurality of ports and configured to
2 connect to a plurality of networks to forward
3 packets between different networks and join a
4 virtual network, do you see that?

5 A That is the claim language, right, yes.

6 Q Is it your understanding that is it the
7 network switch box that is configured with the
8 plurality of ports and configured to connect to a
9 plurality of networks to forward packets between
10 different networks and join a virtual network?

11 A Yes, that is the reading that I have of
12 this claim.

13 Q And the distinction I am drawing, just to
14 be clear, is when it says that the -- when it uses
15 configured or connect or join it's referencing
16 what the network switch box is configured or
17 connected or joining, is that correct?

18 A My understanding is that the network
19 switch box is what is configured with plurality
20 ports to connect to a plurality of networks and to
21 forward packets between different networks and
22 join a virtual network, that that describes the

1 network switch box.

2 Q Where in W0748 does it show joining a
3 virtual network? Let me strike that.

4 Where in W0748 does it describe a network
5 switch box that joins a virtual network?

6 A My recollection -- we need to go through
7 carefully, my recollection is W0748 does not
8 disclose a virtual network or the remote unit or
9 the base unit joining a virtual network.

10 Q This relates to your Paragraph 120?

11 A Bear with me.

12 Yes, this is where I discuss virtual
13 network, yes.

14 Q Here identified -- in virtual network you
15 also say that an example is a VPN, correct?

16 A Yes, a VPN or virtual private network is
17 an example of a virtual network, yes, that is what
18 I say.

19 Q Would you agree that virtual network
20 provides kind of a logical but not a physical
21 separation between network communications?

22 A Yes, I think that's a good description of

1 virtual network. I mean, there is a physical
2 connection, but it is a more public or external
3 physical connection that you make it more private
4 or kind of internal network logically, so, yes, I
5 think your description is fair.

6 Q Things like MPLS that would tag frames in
7 advance, that would create a logical segregation
8 of the network traffic as an example, correct?

9 A Yes, I am not familiar with all the
10 standards, but that is the kind of functionality
11 of a virtual network.

12 Q In Exhibit 1007 in W0748 the network that
13 it is referring to it is already physically
14 separated, is it not?

15 A I think we are going to have to delve into
16 that a little more, I am sorry, I am not sure I am
17 following your question.

18 Q Sure.

19 From Exhibit 1007 in W0748 the only
20 traffic occurring through the network box is
21 traffic from the remote unit, correct, or remote
22 units?

1 A If the network box, for example, is the
2 remote unit then, yes, there is traffic flowing
3 through those, yes. That's the traffic being
4 discussed in W0748.

5 Q And what would you logically -- what would
6 you logically separate from the network box, you
7 know, what would be the logical separation that
8 would exist for a VPN or a V link?

9 A So, again, I am not sure I am following
10 the question because -- you are going to have to
11 help me, I am sorry, I am not sure I am following
12 the question.

13 Q Sure.

14 So you discussed some benefits of using a
15 VPN in 120 here, correct?

16 A Yes.

17 Q Such as securing the network by stopping
18 third-party access to the network, e.g.,
19 preventing a third-party application or website
20 from tracking activities in the network, correct?

21 A For example, yes.

22 Q And in that example in the network box

1 that we have in W0748 where would the third-party
2 access come from?

3 A I just need to make sure I understand.

4 So the third-party access, meaning you are
5 talking about the remote unit joining the virtual
6 network, that's what we are specifically talking
7 about.

8 Q So for whatever you have identified as
9 joining the virtual network, yes, if that is what
10 you were pointing to that is what I am referring
11 to.

12 A In my declaration I treated this as the
13 device joining a virtual network, the challenge
14 here is whether -- you know, if the remote unit,
15 which we are calling the network switch box, at
16 least in my declaration that's what I call the
17 network switch box, can join a virtual network.

18 It certainly could because it is connected
19 to networks, but there is no disclosure about that
20 remote -- that remote box connecting to a virtual
21 network. So it would have to be some sort of a
22 remote box with that capability, a remote unit to

1 use the W0748 language to be able to join. It
2 would have to have a capability to join a virtual
3 network.

4 Q And then you also point to virtual
5 networks can prove network scalability by running
6 applications in a cloud environment providing
7 remote employees access through secure VPN
8 tunnels, correct?

9 A Yes, that's correct.

10 Q And would that also require a network --
11 where would that VPN tunnel begin?

12 A Well, again, it depends on the device we
13 are talking about connecting to it. That could be
14 done on the device, right, the device, but if it
15 is the remote unit that's actually doing that then
16 that would have to happen at that remote unit.

17 Q That would grant access to everyone
18 connected to that remote unit into that secure
19 network, correct?

20 A Presumably. Presumably if that remote
21 unit is a part of the VPN then everything
22 communicating with it would be part of the VPN.

1 Q Which could or could not, depending on
2 where that remote unit is, could be granting
3 access to people that aren't employees if it is a
4 public box, for example, correct?

5 A Yes. In that case you would have to
6 implement it in a way that they have to
7 authenticate to that remote unit somehow.

8 When I say they I mean the subscribers of
9 the mobile devices.

10 Q We then move to -- actually, we have gone
11 about an hour, sorry, about that if we want to
12 take a five or ten-minute bio break?

13 A Sure, that would be great. Let me know
14 when we are coming back.

15 MR. UDICK: Let's go off the record.

16 MS. REPORTER: We are off the record at
17 10:39 Mountain.

18 (Recess taken.)

19 MS. REPORTER: Back on the record at 10:50
20 mountain.

21 BY MR. UDICK:

22 Q Welcome back, Dr. Jensen.

1 We just talked about Byrne and a
2 combination of W0748, but I would like to move on,
3 if you go to paragraph -- sorry, Page 70.

4 A Okay, yes.

5 Q And that's your combination of Byrne,
6 Johnston, and Pillekamp?

7 A Yes, I am there.

8 Q Is Pillekamp -- sort of speaking the same
9 language, is that how you would pronounce that?

10 A Depending on the day, yes.

11 Q Fair.

12 And Paragraph 124 has a -- it says Byrne
13 is not explicit as to using multiple antennas for
14 its cellular cordless system and then Johnston
15 teaches using multiple antennas in a cellular and
16 then Pillekamp describes using multiple antennas
17 in a cordless, right?

18 A That's right.

19 Q And is that the sort of reliance that you
20 place on each of Byrne, Johnson and Pillekamp, you
21 refer to Johnson and Pillekamp for the multiple
22 antenna disclosures?

1 A Yes, that's correct.

2 Q Turning to Johnston in 126, one of the
3 motivations that you identify is the benefits of
4 long-established antenna diversity, is that
5 correct?

6 A That's correct, that's what I reference.

7 Q What is antenna diversity?

8 A Antenna diversity is a strategy where you
9 use multiple antennas on a wireless device to
10 essentially overcome or at least improve what we
11 call fading due to multipath propagation.

12 Q If you have multiple antennas on the
13 cordless do you transmit the same information
14 across all -- each of the antennas?

15 A So, for example, on transmit antenna
16 diversity that's one strategy.

17 For either transmit or receive diversity
18 there is different strategies that you can use to
19 exploit your multiple antennas with varying levels
20 of sophistication.

21 One option is you could transmit both, the
22 same from both antennas. That's typically not

1 going to be your best way to use transmit antenna
2 diversity, maybe even a problematic way to do it.

3 Q What manner did you anticipate a POSITA
4 using when they combined Byrne with Johnston?

5 A So, again, there is a -- it is very well
6 known in the art, right.

7 I think receive diversity is more commonly
8 implemented and so there is a lot of different
9 ways it could be implemented. It could be as
10 simple as just selecting the antenna that has the
11 best sort of connection to the other radio. It
12 could be a carefully -- especially on receive a
13 carefully scripted algorithm in order to use both
14 of the signals off the antennas but make sure that
15 they don't interfere with one another, there is
16 maximal ratio combining, equal gain combining.

17 There is different ways that are known in
18 the art of how to use antenna diversity to reduce
19 states.

20 Q I understand that there is different ones,
21 do you know -- in your declaration do you take a
22 position as to which one or how the POSITA would

1 combine those two references and implement?

2 A I don't believe with Johnston on the
3 cellular that I opined on which one might be used.
4 I need to look through it, I am looking through.
5 I don't believe that I talked about which kind of
6 a combining or transmission algorithm you might
7 use in order to do that.

8 Q Do you identify whether the diversity
9 would be used for reception or transmission or
10 both?

11 A That one I am less certain about what I
12 disclosed.

13 Antenna diversity can be used for both,
14 but I don't remember exactly what I wrote here in
15 this. I just don't remember what I wrote here
16 related to transmit and receive.

17 Q If you see it as we go through or you
18 remember will you let me know?

19 A Yes, of course.

20 Q In 127 you point out a benefit in
21 shielding the operator's head from electrical and
22 magnetic fields and reduce health and legal

1 concerns, do you see that?

2 A Yes, I do.

3 Q This is something that was talked about in
4 the past, but there has never been any scientific
5 information that indicates that there is an actual
6 cause or effect associated with antenna signals
7 near the head, is that correct?

8 A My understanding, and this was a field of
9 research for me early in my career, my
10 understanding, and there has been no medical link
11 between radiofrequencies and cancer, but there
12 certainly has been concern raised, but, yes, I am
13 not aware of any medical studies that have
14 confirmed that link.

15 MR. UDICK: Mr. Shanklin, if you could
16 introduce Document 6, this would be Exhibit 1006
17 from the IPR which I understand to be Johnston.

18 (Document identified as Exhibit 1006 for
19 identification.)

20 BY MR. UDICK:

21 Q Obviously, Dr. Jensen, if you could take a
22 look as well and confirm that's consistent with

1 your understanding.

2 A Of course.

3 Yes, this is the Johnston reference or
4 1006 in the numbering.

5 Q Is there a point in Johnston where it
6 indicates that -- we can take that Johnston down.

7 Where is it in Johnston that it indicates
8 that this is adaptable for the cellular telephone
9 operator functionality?

10 A Boy, I don't recall.

11 Q So if we look at I think the first
12 instance of where it may come up is in paragraph
13 142 -- it looks like Exhibit 1006 you have a few
14 citations here, column 11, 9 to 22. It describes
15 a mobile radio transceiver, is that correct?

16 A It does talk about that there in that
17 reference, yes.

18 Q I guess the bottom it says transceivers
19 308 or 309 are conventional mobile transceivers
20 for cellular phones. Is that at least one
21 instance where you look at it for the cellular
22 aspect?

1 A Yes, for example, it is -- I mean, even
2 earlier than that when he is talking about the
3 prior art he is talking about a lot of disclosures
4 that were for mobile telephones, so he has got
5 that whole context when he is -- of course he is
6 talking about the prior art and included the
7 background, he is talking a lot about handheld
8 radios and mobile phones.

9 Q Are you reading mobile phones as the same
10 as cellular phones in this context?

11 A Well, it was certainly at the time the
12 predominant kind of application for this diversity
13 in the research at the time. That doesn't mean it
14 is limited to that, but it certainly would have
15 been the predominant thing at the time.

16 Q To incorporate Johnston would you just
17 need to add an antenna to Byrne?

18 A An antenna and then some sort of combining
19 circuitry.

20 Q What do you mean by combining circuitry?

21 A Johnston discloses this. It is also well
22 known in the art.

1 Different ways that you might use the
2 multiple antennas in some sort of -- in an
3 advantageous way to achieve the diversity.

4 Q So that's left up to the POSITA to decide?

5 A Yes. And, again, it is sort of a
6 performance complexity trade-off. For example,
7 Johnston in Figure 29A on Page 13 of the Johnston
8 disclosure talks about a switched selection
9 combiner, so in addition to adding the antenna you
10 would need this capability to decide which antenna
11 you are going to select and create that ability to
12 control that. That's one example.

13 But then he goes in Figure 29B and says,
14 well, we will do a different kind of a combiner
15 and that, again, could be something more
16 complicated.

17 Q In the switch selection combiner, 29A, how
18 is that using the antennas?

19 A So in a switch selection combiner you are
20 using one antenna at a time and selecting them,
21 selecting the one that has the best signal to the
22 other radio or the best channel quality to the

1 other radio.

2 Q Is that for reception and transmission?

3 A Yes.

4 And you can see in that figure he
5 expressly shows, and it's known in the art, there
6 is an RX for the receiver line and a TX for the
7 transmitter line through the switch selection
8 combiner and then whichever of the antennas is
9 selected for that communication.

10 Q Would the existing transceiver in Byrne be
11 able to do the combining of Johnston with that
12 modification?

13 A No. There would have to be modification
14 in order to implement this.

15 Q Do you know -- is that the modification
16 that would be the combining circumstance that you
17 talked about?

18 A Well, if I can say what I think is, that
19 the additions would be in addition to adding an
20 antenna or one or more additional antennas, yes,
21 there would have to be the capability to determine
22 which in this particular implementation which

1 antenna would be selected at any given instant.
2 So the switch as well as the monitoring of which
3 antenna is the best one under current conditions.

4 Q And that's in the case with a 29A switch
5 selection combiner application, correct?

6 A That's correct.

7 Q And do you identify which method that is
8 being combined?

9 A Are you asking me, please --

10 Q Maybe we covered this before, in your
11 declaration did you identify in combining Johnston
12 to Byrne the specific implementation that the
13 combination would use for antenna diversity, so
14 would it use switch selection, for example, or a
15 different type?

16 A As I said, I don't believe anywhere in my
17 declaration I expressly suggest one of the types.

18 Q And then in Pillekamp that's the reference
19 -- why don't we go to the number here,
20 Mr. Shanklin, if you can open up Doc 9, which I
21 understand to be Samsung Exhibit 1009 in the IPR
22 also the Pillekamp reference?

1 (Document identified as Exhibit 1009 for
2 identification.)

3 BY MR. UDICK:

4 Q Dr. Jensen, if you can confirm that's your
5 understanding as well.

6 A Yes, sir, I agree this is the Pillekamp or
7 Samsung 1009.

8 Q If you turn to 132 in your declaration.

9 A Okay, I am there.

10 Q You point to antenna diversity again as
11 another motivation to combine, is that correct?

12 A Yes, the benefits of antenna diversity,
13 yes.

14 Q In 132 it says that the two antennas are
15 controlled by changeover switch diversity
16 switch/DS. Is that describing a specific type of
17 implementation that you are identifying for the
18 Pillekamp combination?

19 A The Pillekamp disclosure, I believe, only
20 talks about that sort of switched diversity
21 strategy.

22 Q In 133 it indicates that Pillekamp's

1 cordless system is designed to achieve the "lowest
2 possible use of energy," do you see that?

3 A I do.

4 Q Then you go on with -- the Pillekamp
5 teaching would operate such that whenever the
6 devices are supplied stationarily, for example,
7 via a battery, through the rest of that paragraph
8 to not belabor reading the entire portion, can you
9 describe a little bit about what that Pillekamp
10 teaching that you reference at column 1, lines 52
11 to 63 is talking about?

12 A Right.

13 So this is additional disclosure in
14 Pillekamp, right, not so much related to the
15 diversity, but it is just sort of a way to make
16 sure that you are using a lower power mode unless
17 you are actively sending a transmission burst or
18 receiving a burst, so it is just sort of an energy
19 savings technique that they disclose by sort of
20 turning things on and off only as they are needed.

21 Q What did you understand when it said
22 whenever the devices are supplied stationarily,

1 for example, via a battery, what is that? That
2 one didn't make sense to me so I am just wondering
3 what that means.

4 A Well, I share your confusion about what
5 stationarily means. I think when it is operating
6 on the battery I think we all understand what that
7 means, so I think we are just talking about it is
8 detached from the base station which doesn't seem
9 like stationarily to me, detached from its
10 charging station and being used as a mobile device
11 when it is on battery, which is when you would
12 want to save energy.

13 Q What is the time lead in burst
14 transmission that it is talking about, is that --
15 how does that occur?

16 A Well, I didn't go through all the details
17 of this so I am not prepared to testify and give
18 opinions on exactly how that works.

19 Just generally what I understand it to
20 mean is anticipating that something is going to
21 come, and yet I know that they divide it into two
22 parts, just sort of activating the circuit in

1 advance so that when that burst comes that the
2 circuitry is ready and so some sort of a mechanism
3 for knowing that that communication burst is going
4 to come.

5 Q Is that something that DECT as a standard
6 already did?

7 A To be honest, I don't know exactly how
8 that is implemented in a DECT standard. So if
9 that is precisely what it is or not, I am not -- I
10 have not formed an opinion on that, I did not
11 research it.

12 Q To have the benefit, this specific benefit
13 of the many that you list, for this particular one
14 that would have to either already exist or be
15 developed into the combination to obtain that
16 benefit, correct?

17 A If you were to want to incorporate that
18 benefit if it's not already there then you would
19 need to do something to create it, yes.

20 Q Got it.

21 You would have to then combine, so we have
22 got the Byrne-Johnston combination and we are

1 further combining it with Pillekamp now, correct?

2 A Yes, that's correct.

3 Q And so we have added at least one other
4 antenna for the cellular system and now for this
5 Pillekamp we will add at least one other antenna
6 for the cordless side as well, correct?

7 A That's correct.

8 Q And then will the cordless receiver
9 transmitter, will that be already able to handle
10 the additional antenna or will further
11 modification need to be made?

12 A Similar to my testimony about the cellular
13 side the cordless would have to have some
14 modifications in order to be able to use that one
15 or more additional antennas that would be added
16 due to Pillekamp's teachings.

17 Q Would any other component of the
18 Byrne-Johnston combination need to be modified?

19 A Well, when you say additional, again, just
20 to be precise, much like I said in the cellular
21 case you would have to have some sort of combining
22 circuitry or in this case he only discloses a

1 switching circuitry and then a way to determine
2 which antenna you should be using at any given
3 time under the current conditions.

4 Q Would you have to -- for the total
5 combination would you have to do anything in
6 regards to power consumption? I will strike that
7 and be a little bit better with my question.

8 Would you have to modify the combined
9 device -- I will start over.

10 If you add these two combinations to the
11 existing and the original Byrne would it -- would
12 the two combinations modify the power consumption
13 requirements on the battery of Byrne?

14 A Modestly but, yes, it would consume
15 additional power.

16 Q How would it be -- how do you know that it
17 would be a modest change?

18 A Well, for example, something like switch
19 diversity is not particularly computationally
20 intensive, in fact, it is very, very simple to
21 implement. So compared to usually the power
22 amplifier of a transmitter and the kind of power

1 that it consumes, the sort of monitoring and
2 occasionally switching is a fairly modest power
3 consumption activity compared to what the radio is
4 already doing most of the time.

5 Q Would you have to modify anything that
6 Byrne's microprocessor is doing?

7 A Yes, most certainly, or have some other
8 means of monitoring, right, the relative strength
9 of what's coming in and making a decision whether
10 to switch. So whether it is there or some other
11 dedicated processor there would have to be a
12 control mechanism.

13 Q You then for claims 13 and 14, this is on
14 Page 80, you combine -- you use that
15 Byrne-Johnston-Pillekamp combination and then add
16 Billstrom, is that correct?

17 A That's correct.

18 (Document identified as Exhibit 1010 for
19 identification.)

20 BY MR. UDICK:

21 Q And if we can pull up Document 10, which
22 is Exhibit 1010 of the IPR typical exercise, can

1 you confirm this is the Billstrom you looked at as
2 well as Exhibit 1010 from the IPR?

3 A Yes, this appears to be the Billstrom
4 reference which is Samsung 1010.

5 Q Great.

6 MR. UDICK: And if we can pull that down,
7 Mr. Shanklin.

8 BY MR. UDICK:

9 Q In Paragraphs 151 through 155 you
10 generally identify reasons that a POSITA would
11 have modified that combination to add Billstrom,
12 is that correct?

13 A That's correct.

14 Q And in each of these -- for the benefits
15 identified in each of these would the
16 infrastructure be required to have adopted the
17 manner in which Billstrom identifies its
18 communication system?

19 A Yes. So -- yes, Billstrom teaches
20 additions to the infrastructure in order to
21 accommodate internet protocol IP communications, I
22 think that was your question, that is correct, you

1 need additional -- you need changes to the
2 infrastructure.

3 Q Correct.

4 And to modify a mobile device to -- let me
5 think of a better way to ask that, that's a
6 convoluted question.

7 In order to make -- in order to modify the
8 device to use IP over cellular the POSITA
9 modifying device would need to know what the
10 infrastructure has adopted, correct?

11 A Yes, that's correct, they have to be
12 compatible or they can't communicate.

13 Q And at the time of the critical date of
14 the patent is there any infrastructure that
15 settled on what type of structure to use or
16 infrastructure to use for IP communication?

17 A Let's see, so first of all, so many cases
18 I want to make sure I understand the critical date
19 on this, I think this is like others I think it is
20 June, 1999, do we agree on that that that's the
21 critical date?

22 Q That is my understanding.

1 A So assuming that answer, while there was a
2 lot of work being done on this there was not
3 significant or really any rollout yet other than
4 experimental rollouts of IP-based cellular
5 systems.

6 Q So would the -- if a POSITA had used the
7 -- built a device to use IP communications in
8 accordance with the way Billstrom does it would
9 that individual have been guaranteed a network
10 infrastructure supporting it would be rolled out?

11 A No. That would have required that the
12 POSITA would have had to do that in coordination
13 with what might be being rolled out in order to
14 make that effective.

15 Q If we will turn to Page 85.

16 A Okay, I am there.

17 Q And here we move into your grounds 2A
18 through the others, correct?

19 A Yes.

20 Q I believe, yes. And so if we -- so this
21 is Byrne in combination with Raleigh, correct?

22 A That's correct, Raleigh in combination.

1 MR. UDICK: Mr. Shanklin, if you can pull
2 up Exhibit 1005, which is Doc 5.

3 (Document identified as Exhibit 1005 for
4 identification.)

5 BY MR. UDICK:

6 Q And we will go through the same approach
7 to make sure this is the same Raleigh that we are
8 talking about.

9 A Yes, sir, this seems to be the reference
10 you referred to, Raleigh, Samsung 1005.

11 Q Great.

12 If we can take that down. Of course, if
13 you want to look at your soft copy obviously then
14 please do.

15 And this is the reference that you said
16 you had prior knowledge about kind of even before
17 this case, is that correct?

18 A That's correct.

19 Q And it deals with a field that you were --
20 it was one that you were actively researching and
21 knowledgeable of in general, is that right?

22 A Yes, I was actively researching these

1 kinds of techniques at that time.

2 Q I think space-time signal processing is
3 something that you were involved in research on?

4 A Yes. More particularly for me the kinds
5 of things that would be needed to support
6 effective space-time processing, but, yes, I also
7 at least very well understood the single
8 processing that was being done.

9 Q Sure.

10 So just for the record, what is kind of
11 space-time signal processing?

12 A Well, prior to this with the exception of
13 not just this reference but a few others that
14 occurred earlier in the late '90s we were using
15 multiple antennas in more simplistic ways like the
16 diversity that we have already discussed here, but
17 with these kinds of disclosures like Raleigh and
18 others we were starting to use multiple antennas
19 in a more sophisticated way.

20 So spatial processing refers specifically
21 to how we might send information out multiple
22 antennas to have higher data rates and higher

1 reliability through very unpredictable wireless
2 channels. So the time part is that we have always
3 done processing related to the temporal or time
4 nature of our signals, so now we are adding the
5 spatial part. And whether we are doing it
6 space-time processing or space frequency
7 processing, which is really kind of Raleigh's
8 approach, it is really the same, a traditional
9 kind of processing team or frequency and then a
10 new kind of processing space or antennas.

11 Q Digging down a little bit -- let me make
12 sure I get the -- spatial processing, what does
13 that kind of refer to, what is the space you are
14 referring to, I guess?

15 A The fact that instead of transmitting it
16 or receiving it from sort of one point in space
17 you have a set of points in space from which you
18 are transmitting or from which you are receiving
19 and now you are going to do signal processing to
20 exploit that capability as well as what is going
21 on in the radio wave propagation between all of
22 those antennas. So it is the signal processing

1 specifically to take advantage of this antenna and
2 propagation system that we have.

3 Q So would MIMO or multiple in/multiple out
4 would that be an example of spatial processing?

5 A Well, precisely, no.

6 Precisely MIMO means I have multiple
7 transmit and multiple receive antennas. The
8 spatial processing would be what signal processing
9 am I going to do to exploit that MIMO capability.
10 So a distinction, to the lay person probably not a
11 big one, but to an engineer a fairly significant
12 one.

13 Q Can you give me an example of spatial
14 processing scheme?

15 A So in the very simplest one, and maybe one
16 of the first that was disclosed and got a lot of
17 attention, was that I would just take a data
18 stream that's coming in, if I had four antennas
19 maybe I would take the first four sets of bits,
20 and there is a reason I say a set of bits, I say
21 take four bits and then I take the next four bits
22 and I break it into four chunks of four bits and

1 then I am going to send in parallel each one of
2 those four sets of bits out a unique antenna at
3 the same time at the same frequency. So that
4 would be the very most simple example of a
5 transmit spatial processing, and then at the
6 receiver I have a lot of processing to do in order
7 to determine which bits were which because they
8 are all coming in at the same time at the same
9 frequency, and so there is a lot of signal
10 processing at the receiver in that case.

11 Q Understood.

12 So the spatial in that easiest sense is
13 essentially increasing the amount of data you can
14 transmit over a time variable?

15 A Yes, time and bandwidth. So that
16 particular spatial multiplexing example I just
17 gave you, its goal is to try to maximize the
18 amount of data I send given time and frequency
19 resource.

20 Q Got it.

21 What is the -- is there a spatial time --
22 space-time signal scheme -- signal processing

1 scheme that Raleigh specifically discloses?

2 A Well, he gives examples of different
3 things that you might do to jointly process in
4 time and frequency. One example is using kind of
5 a discrete OFPM for the frequency or time
6 processing and then how to take all those symbols
7 and send them out the antennas for the spatial
8 processing part of it.

9 Q Does it disclose on the receiving side how
10 to kind of handle the signal -- the space-time
11 signal processing on the receiver side?

12 A So he does have some example embodiments
13 in the mathematics that would go with it, it is
14 fairly complicated but, yes, he has examples of
15 ways to receive that.

16 Q It certainly brought back memories of my
17 abstract algebra days.

18 A You are talking to a professor, don't tell
19 me nightmares, tell me it was a great preparation
20 for you.

21 Q I enjoyed that much more than topology, at
22 least I could look at what I was thinking of in

1 abstract linear.

2 If we turn to some of the disclosures that
3 you have in Raleigh, in 164 you identify it
4 appears to be some benefits associated with signal
5 fidelity, for lack of a better word, several
6 variables of signal benefit.

7 A Yes. I do highlight some of, yes, signal
8 fidelity or other communications advantages.

9 Q Yes.

10 This is another aspect that would require
11 that the -- whatever the opposite end of the
12 communication channel is also aware of what is --
13 of how this processing or transmitting is
14 occurring, correct?

15 A That is correct.

16 Q And so in one case it's the mobile device,
17 the other side of it is the wireless base station
18 of whatever system is associated, correct?

19 A Yes. So the base station and the mobile
20 device would have to agree on how -- they would
21 both have to have the capability and would have to
22 agree in how they are implementing this kind of

1 technology.

2 Q Are there any -- in this mode in terms of
3 in 1999 were there any physical limitations on
4 antenna spacing in order to accomplish the
5 diversity?

6 A Well, I am not sure -- no offense, I am
7 not sure that question is well posed. Do you mean
8 like in a mobile device are there limitations to
9 the spacing that you can have between antennas?

10 Q So -- thank you. My question is
11 different, which clearly meant that it was not
12 well posed. And obviously no offense taken.

13 The question is at the time, so in 1999,
14 were there essentially limitations in to how close
15 you could put antennas to accomplish spatial
16 processing?

17 A Okay, so I think I now understand your
18 question.

19 So, first of all, the limitations on
20 antennas and their configuration and your ability
21 to do spatial processing really has nothing to do
22 with the time like the critical date, it has to do

1 with the physics. So that's the first
2 clarification there.

3 And, therefore, yes, you have to properly
4 design your antennas considering your device in
5 order to get that. So, for example, if it is
6 completely just separation of the antennas you do
7 need a minimum separation in order to have
8 effective kind of diversity or kind of
9 multiplexing gains.

10 There are other ways to do it,
11 polarization, the patterns, there are other ways
12 to do it that allow you to be more compact, but it
13 is completely separation, there needs to be at
14 least about a quarter of a wave link separation
15 between the devices -- between the antennas,
16 pardon me.

17 Q And that accounts for how they might --
18 the difference in the way they will move through
19 the channel to the other side of the device here I
20 am using channel to mean the kind of classic
21 physics definition of the medium through which a
22 signal moves.

1 A Yes. I think we are talking about in this
2 case the wireless channel, the propagation, the
3 radiofrequency electromagnetic wave propagation
4 through the channel I believe is what you are
5 referring to there. Yes, so the antennas and that
6 propagation, that's an interaction that is
7 critical to the processing that we are talking
8 about space-time coding kinds of processing.

9 Q Understood.

10 And in Raleigh is part of the
11 identification of how -- which as you said for
12 which almost which sequence those bits are
13 reconstructed in come from identifying which
14 antenna it was transmitted from in the first
15 place?

16 A Yes.

17 Ultimately MIMO techniques depend on being
18 able to separate, maybe not uniquely identifying
19 each individual antenna, but being able to
20 separate out the signals based upon which antenna
21 they were transmitted from.

22 Q And that's where the half a wavelength

1 separation comes in to play, correct?

2 A Yes. And, to be clear, I testified
3 quarter wavelength --

4 Q Quarter wavelength?

5 A -- sort of minimum, but half would be
6 preferable if you can get it.

7 Q And from a quarter wavelength does that
8 relate in any way to physically how they are
9 placed in the device?

10 A Yes, it relates precisely. I mean, there
11 is a one-to-one relationship depending on the
12 frequency.

13 Q Right.

14 A That separation, a quarter wavelength, is
15 a distance once you specify the frequency.

16 Q Right.

17 Each wavelength has a particular pattern
18 and the distance associated with that plus the
19 frequency would dictate the physical distance
20 between the two once you do that radio math.

21 A Yes, well said.

22 Q If we would turn to -- if we turn to

1 Page 92 of your declaration.

2 A I am on Page 92.

3 Q This begins your analysis of the
4 Raleigh-Byrne combination limitation by
5 limitation, correct?

6 A That's correct.

7 Q Over to Page 94, Paragraph 174, you have
8 figure -- Exhibit 1005, Figure 1, annotated, do
9 you see that?

10 A Yes, I do.

11 Q And so this is on a transmission side,
12 correct?

13 A Yes, this is a transmitter side, yes.

14 Q So you have got -- it begins at input
15 data, right?

16 A Yes.

17 Q What is the input data?

18 A Raleigh is not explicit as to what it
19 might be, but a POSITA would understand that is
20 whatever the device is trying to communicate
21 elsewhere, it could come from a software
22 application, it could be voice, any kind of data.

1 Q What is the intercoder and interleaving
2 10, briefly in general what does that do?

3 A An encoder and interleaving -- encoding is
4 some sort of -- it could be for security purposes,
5 it could be for other purposes, and interleaving
6 is a way of sort of rearranging digital sequences
7 to make them less susceptible to short duration
8 kind of loss of the communication.

9 Q And then a training symbol injection
10 briefly can you just describe what that is?

11 A Yes.

12 For the receiver to do its work it needs
13 to understand the channel over which the
14 information is transmitted and, therefore, it
15 needs to put some known symbols into the stream
16 from which the receiver can then estimate that
17 channel what happened to the data as it
18 propagated.

19 Q Essentially some markers so that the
20 receiver can estimate what the information just
21 went through.

22 A That is fair, yes.

1 Q And then the transmit space frequency
2 preprocessor, what is that doing there?

3 A Now we are getting into what we have
4 discussed previously, this space-time coding and,
5 as I mentioned, some of it does in the frequency
6 domain instead of the time domain, so
7 space-frequency processing, and that's where all
8 of that is going to happen.

9 Q It's breaking up or partitioning out
10 pieces to send across that antenna array, correct?

11 A Yes.

12 Again, that's a very simple thing, that's
13 not mostly what Raleigh is talking about, but that
14 would be a simple example.

15 Q And then moving over to Page 95 you have
16 got Figure 3 annotated that's kind of the
17 receiving side of it, do you see that?

18 A I do.

19 Q For a large part it looks fairly similar
20 to some extent. What is the difference -- the
21 difference I see is what is the channel ID 130?

22 A We talked about the injection of training

1 symbols, the function of that block is to use
2 those training symbols to estimate, as you have
3 said, what just happened to the data and then use
4 that knowledge in the receiver space frequency
5 processor to recover the original data as well as
6 in a decoder and interleaving, just to recover
7 that original data.

8 Q And then what does the receiver space
9 frequency processor, what is its role?

10 A These space-time coding algorithms almost
11 always have a part you have to do at the
12 transmitter and a part you have to do at the
13 receiver, so that's in coordination with the space
14 frequency transmit preprocessor that we just
15 talked about, those two have to coordinate in
16 order for this communication to happen to extract
17 the original data in the output data.

18 Q Got it.

19 MR. UDICK: Let's go off the record
20 quickly.

21 MS. REPORTER: We are off at 11:52 a.m.

22 (Lunch recess taken.)

1 A F T E R N O O N S E S S I O N

2 MS. REPORTER: We are on the record at
3 12:47.

4 BY MR. UDICK:

5 Q Welcome back, Dr. Jensen.

6 A Thank you.

7 Q When we were -- when we just left we had
8 finished kind of generally discussing Raleigh and
9 the technology it describes and moving on to your
10 analysis with respect to the claim limitations. I
11 think we were looking at -- if not let's go ahead
12 and move to Page 92 of your declaration.

13 A Okay, I am there.

14 Q Which begins with claim 1.

15 A Yes, sir.

16 Q Actually, if we would go to Page 100,
17 Paragraph 184. Just above Paragraph 184 is the 1D
18 limitation that says wherein one or more subtasks
19 are assigned to one or more channels, and this
20 language comes from the '943 patent, right?

21 A That's correct.

22 Q Why don't we do this since it will be

1 easier, let's introduce Document 2, which is
2 Exhibit 1001, the '943 patent, Mr. Shanklin, if
3 you can pull that document up.

4 (Document identified as Exhibit 1001 for
5 identification.)

6 BY MR. UDICK:

7 Q Dr. Jensen, when you have access and
8 ability to scroll, this is the '943 patent that
9 you analyzed, correct?

10 A Yes, this is the '943 patent I analyzed,
11 yes, sir.

12 Q And if we look at claim 1, we can take
13 this down, claim 1 of the '943 patent, that's
14 where this limitation is that has subtasks, one or
15 more subtasks are assigned to one or more
16 channels, correct?

17 A That's correct.

18 Q Just so I understand it, when you read and
19 analyzed this limitation how did you understand or
20 how did you apply your understanding of the word
21 subtask in conducting your analysis?

22 A The '943 patent talks about subtasks. I

1 wouldn't consider it highly explicit to what they
2 mean, but the reading in the specification
3 suggests that subtasks are just some sort of a
4 block of communication, it might be a task of an
5 application that is broken down, but sort of
6 independent pieces of communication that would
7 need to be sent over the system, so that's sort of
8 my best explanation of subtasks based on the
9 specification.

10 Q And then just so we are on the same page,
11 what is your -- when you read the term channel or
12 channels in the claim limitation what
13 understanding did you apply in your analysis
14 that's in your declaration to the word channels?

15 A So here it channels sort of two parts
16 because of the way this and the next limitation
17 their language is, channel being a path, a
18 communication path through which information is
19 transmitted or received coupled with the
20 processing of that information. So the channel
21 seems to encompass both of those in this language.

22 Q If we look at Page 104, Paragraph 188,

1 just above it is the 1E limitation that has that
2 same first data stream and second data stream that
3 we kind of looked at with respect to Byrne,
4 correct?

5 A That's correct.

6 Q And so my understanding is in this
7 combination in Paragraph 188 you rely on your
8 disclosure from Byrne for this limitation,
9 correct?

10 A Yes.

11 So one of the things I discussed with
12 regard to this limitation is the same discussion
13 we already had with regard to Byrne earlier in my
14 declaration.

15 Q And then you then referred to Raleigh as
16 disclosing this limitation as well, correct?

17 A That's correct.

18 Q And are those independent of each other?

19 A It is sort of an alternative way because
20 Raleigh brings some things in. When we say
21 independent obviously we still have them in the
22 combination but Raleigh discloses in an

1 alternative view this limitation.

2 Q And I guess maybe that's what I am getting
3 at, your opinion is that either Byrne or Raleigh
4 disclosed this limitation in this overall
5 combination, is that correct?

6 A Yes, I think that's a fair way to
7 articulate it, yes.

8 Q And is it your opinion that you must have
9 both Raleigh and Byrne to disclose -- combined to
10 disclose this limitation?

11 A I am not quite sure how to answer that, I
12 will tell you why. It is because in this
13 combination now Raleigh is handling the cellular
14 communication, and so in the first sort of
15 alternative, which is consistent with what we had
16 when we had Byrne in other combinations or Byrne
17 by itself, you need that Raleigh piece for the
18 cellular communication and then of course combined
19 in the way that Byrne teaches.

20 I mean, yes, Byrne disclose it is like we
21 talked about previously and I don't want to be
22 inconsistent with that, but Raleigh is playing a

1 role in this combination that Byrne alone didn't
2 have.

3 Q So when you combined Byrne with Raleigh
4 now Raleigh is kind of taking the place of what
5 you had in Byrne?

6 A The cellular side of what we had in Byrne.

7 Q And so to that extent they are not
8 independent, but just in terms of exclusively this
9 limitation you are not saying you must use this
10 part of Byrne and this part of Raleigh to disclose
11 1E, correct?

12 A Right, right.

13 In the one description it's really that
14 the Byrne that brings in the cellular and the
15 cordless, and that's adequate disclosure.

16 Q Got it.

17 What is the first data stream in Raleigh?

18 A In Raleigh?

19 Q Yes.

20 A So just looking at the Raleigh disclosure
21 the fact that his space-time processing creates
22 parallel data, parallel I think he calls them

1 symbol streams or sequences I think is the word
2 that Raleigh uses, so one mapping could be the
3 first one of those plurality of symbol streams due
4 to the space-time coding could represent a first
5 data stream.

6 Q And that's what you have on Page 105 in an
7 annotated version just above Paragraph 190, is
8 that correct?

9 A Yes.

10 Q And you identify in your declaration it
11 points to the first and second data stream as
12 coming out of that transmit antenna array,
13 correct?

14 A That is what I show in the annotated
15 figure and I believe discuss in the ensuing
16 paragraphs.

17 Q For clarity the first and second data
18 stream that you identify comes from just one input
19 data going into the encoder, correct?

20 A Yes. In this particular case that is
21 correct, it is an original input data stream that
22 is broke into multiple substreams.

1 Q If you only captured what you identify as
2 a first data stream in this Exhibit -- in this
3 figure that you have annotated can you -- do you
4 know the entire input data?

5 A If you only capture one of those streams
6 but you have spread it across multiple but you
7 only capture one then you do not have a complete
8 set of the input data.

9 I need to back up. It depends, if you do
10 multiplexing like the simplest example I gave you
11 you don't. There are -- because space-time coding
12 isn't always about multiplexing, it is possible
13 that you could extract all the data from that
14 stream, it really depends on how you did the
15 coding.

16 Q In that way you get to do a coding that
17 would either -- each substream would transmit all
18 the data or it would be recreate be with some N
19 minus 1 number of substreams, correct, or N --
20 some number minus whatever you could rebuild
21 without the remainder?

22 A Yes. Yes.

1 To be precise, space-time coding can be
2 just that coding, which is for error control, and
3 so getting one stream through still possesses all
4 of the data, having all of the streams allows you
5 to reconstruct the data more reliably.

6 Q But that wouldn't increase any bandwidth
7 or provide any of those other benefits, correct?

8 A No, that's correct, and you are not really
9 -- you are throwing away spatial coding entirely
10 in that circumstance.

11 I just want to be precise you could have a
12 single stream, but, yes, you would not enjoy the
13 benefits of the antenna array.

14 Q Understood.

15 If you combine Raleigh and Byrne to
16 utilize this on the cellular channel what
17 modifications would you have to make to Byrne?

18 A For Byrne certainly the hardware for the
19 cellular side of Byrne's disclosure, we looked I
20 think it was Figure 2 earlier, so -- there would
21 be a fairly significant change to that whole side.
22 The hardware and the software would all have to

1 support this new protocol in order to accomplish
2 that.

3 Q And would the -- would you have to -- this
4 transmit space frequency preprocessor, would that
5 have to be built into the microprocessor of Byrne?

6 A So that is one option is to have that and
7 other signal processing built into the
8 microprocessor. Another is to have some dedicated
9 processing for some of that signal processing
10 functions. Those would be the two alternatives a
11 POSITA would be facing.

12 Q Which one would your POSITA choose?

13 A I think there are always arguments for
14 both.

15 I think you have to look at the capability
16 of processors, always fewer processors tends to be
17 better because of the overhead associated with
18 many, many processors on a single system, but then
19 you have to look if the processors that were
20 available at the time, of course we are looking at
21 the critical date here, could handle it or if
22 there would have to be an additional processor

1 brought into the system. So I haven't done that
2 analysis, but I would be seeking to minimize the
3 number of discrete integrated circuits in order to
4 accomplish my purposes.

5 Q Does Raleigh describe the physical
6 requirements to implement its disclosures?

7 A I can't say for certain, but I don't
8 recall any disclosures. When you say physical I
9 am interpreting that to mean hardware, electronic
10 hardware specifically, and I do not recall any
11 disclosures of what it would take other than what
12 a POSITA would understand from the teachings.

13 Q If you turn to Page 119, this is Raleigh,
14 Byrne, and WO748.

15 A I am sorry, you said 119, is that right?

16 Q Yes, Page 119 Paragraph 220.

17 A Yes, I am there now.

18 Q It appears that you are using Raleigh and
19 Byrne for the independent limitation that is of
20 which 3 and 4 depend and then WO748 with respect
21 to claims 3 and 4, correct?

22 A That's correct.

1 Q If you had Raleigh added to Byrne would
2 there need to be further modifications to WO748 to
3 communicate with Raleigh?

4 A Yes. For example, if the remote unit were
5 to communicate now with this new combination of
6 Raleigh-Byrne then the remote unit -- you say
7 modification, I mean, WO748 teaches that it could
8 be a variety of different standards. So it is not
9 necessarily a modification of 748, but the remote
10 unit if it is in communication with the device,
11 the Raleigh-Byrne device, then it would have to be
12 configured in order to do that.

13 Q If it was communicating with the OFDM as
14 an example that Raleigh uses then the device, you
15 know, the micro cell if it was communicating on
16 the Raleigh side would also have to support OFDM,
17 correct?

18 A For example, yes.

19 Q Following up into Page 120 Paragraph 223,
20 you use Raleigh, Byrne, and Pillekamp, correct?

21 A That's correct.

22 Q And here what isn't there previously used

1 Johnston on the cellular cite, correct?

2 A Yes. Byrne, Johnston, and Pillekamp and
3 here I have Raleigh, Byrne, and Pillekamp, yes.

4 Q And it's because Raleigh discloses using
5 multiple antennas already, is that right?

6 A Yes. And I think Raleigh and Johnston
7 would not be a combination that makes any sense
8 given Raleigh's disclosure.

9 Q It looks like the reasons for combining
10 the Raleigh-Byrne device with Pillekamp are the
11 same as those combining essentially the
12 Byrne-Johnston device, does that appear correct to
13 you as well?

14 A That's my recollection, that the arguments
15 were the same or at least very similar. I don't
16 recall all those details, but yes.

17 Q In each of these -- so then 134, you have
18 Raleigh, Byrne, Pillekamp, and Billstrom for IP
19 disclosure, is that correct?

20 A Raleigh, Byrne, Pillekamp, and Billstrom,
21 yes, sir, that's correct.

22 Q Is there any additional complexity when

1 combining Billstrom with Raleigh-Byrne-Pillekamp
2 device as it relates to IP, for example, is there
3 any complexity associated with using spatial time
4 processing with the IP-based communication?

5 A Well, I think not beyond what we have
6 already talked about.

7 The additional complication here is of
8 course for Raleigh the base station or whatever
9 that Raleigh device is talking to has to know how
10 to do Raleigh.

11 Adding IP on top of that is similar to
12 adding IP on top of the prior combination that we
13 had with Byrne and the other references without
14 Raleigh.

15 Q In Raleigh what is your understanding of
16 what a transmitter SOP is?

17 A Substantial orthogonalizing procedure, I
18 think procedure, let me verify it that word.
19 Substantially orthogonalizing I know is right.
20 The whole idea, and he uses that mainly to talk
21 about the frequency processing that he does, and
22 it's a way of sending multiple data across the

1 channel, and the orthogonalization is designed so
2 that you are sending it simultaneously so that
3 each of those pieces do not interfere with each
4 other or minimize the interference they have with
5 each other.

6 Q Does that procedure occur on a single
7 processor or multiple processors?

8 A So to answer that question properly we
9 have to recognize that a computer engineer or most
10 people when they see a processor they think of one
11 chip. When a signal processing person like
12 Raleigh talks about a processor he's not
13 necessarily, he or she, is not necessarily mapping
14 it to a piece of silicon but rather a block that
15 does a function.

16 So the answer to your question is Raleigh
17 doesn't answer that question of, again, we talked
18 about he doesn't actually show the hardware
19 implementation of this. He is more interested in
20 the algorithmic blocks that need to happen. He
21 would have multiple processors, but recognize that
22 processor does not mean necessarily one piece, one

1 integrated circuit.

2 Q And he talks about the output of those
3 being from the transmitter SOP processor being
4 symbol streams, correct?

5 A Yes, I think he calls them symbol
6 sequences. Parallel symbol sequences I think is
7 what he calls those.

8 Q What is -- if you look at -- I am trying
9 to find an easy one here.

10 Is there a difference -- in Raleigh do you
11 understand there to be a difference between -- do
12 you understand there to be a difference between
13 the input or output data that ultimately
14 transmitted and the symbol stream?

15 A Well, the precise answer is the symbol
16 streams are a representation of the data, say, on
17 the transmitter that's input, but put in a form,
18 to extract the benefits of the multiple antennas
19 and the algorithms, and then the receiver the
20 same.

21 You have got these things come in but then
22 you have to process them to get the original data

1 back as the output data.

2 MR. UDICK: Maybe we can break a little
3 bit early, I think I am actually pretty close, let
4 me review my notes and see if I have anything
5 else. I definitely would not have stopped for
6 lunch knowing I had this much left. But if --
7 just a couple minutes and then see if we can wrap
8 up and possibly end a little bit earlier today.

9 MS. REPORTER: We are off the record at
10 1:19 mountain.

11 (Recess taken.)

12 MS. REPORTER: We are going back on at
13 1:31 mountain.

14 BY MR. UDICK:

15 Q Dr. Jensen, I just want to touch back on
16 something we had talked about this morning. If
17 you go back to your declaration, Paragraph 87,
18 Page 52?

19 A Okay, I am there.

20 Q And this is the paragraph where it says,
21 therefore, because -- and this is -- it will be
22 four lines down in that paragraph, because Byrne's

1 telephone is, quote, so arranged such that both
2 cellular and cordless operations are in progress
3 at the same time, end paren, a POSITA would have
4 understood or found obvious that referring to
5 Figure 2 above the microprocessor 211 is
6 configured to process cordless data stream and the
7 cellular data stream in parallel to ensure that
8 both operations are in progress at the same time,
9 is that essentially what you just said?

10 A Yes, sir.

11 Q Are there other ways that Byrne could
12 process the cellular and cordless operations other
13 than having a microprocessor do so in parallel?

14 A There are other ways, yes, there are other
15 ways that Byrne can do that.

16 Q And assuming you are correct that this is
17 the way that it does it, what are the other ways
18 that it could have done it?

19 A First of all, all of the signal
20 processing, again, he is not clear what the data
21 is, but all the signal processing could be done in
22 the other components still in parallel but by

1 discrete components it could be that there is a
2 nonparallel approach in the microprocessor to
3 process the data, meaning kind of a timed
4 multiplexed approach.

5 Q Anything else?

6 A Those are the two main ones I can think
7 of.

8 Q When you looked at Byrne, as you recall we
9 reviewed Byrne in the context of the '434 patent,
10 correct?

11 A I believe that's correct, yes.

12 Q Is there any instance where Byrne meant
13 one thing to you or you interpreted Byrne one way
14 in the '434 patent while in the '943 patent you
15 interpreted it in a different manner?

16 MR. KAZI: Objection to the form.

17 THE WITNESS: It's a fair question that I
18 don't -- I just don't recall enough to be able to
19 opine on that or talk about that, I just don't
20 remember, I am sorry.

21 BY MR. UDICK:

22 Q In general without getting into any

1 privileged conversations did you do anything to
2 prepare for today's deposition?

3 A Yes, I did.

4 Q And what did you do?

5 A Reviewed particularly my declaration,
6 reviewed '943 patent, and then reviewed the
7 primary references certainly that we have been
8 talking about today and then spent some time with
9 counsel.

10 Q And about how much time did you spend with
11 counsel?

12 A With counsel, probably five hours I guess,
13 I am guessing.

14 Q And when did that occur?

15 A Over the course of the week -- of the past
16 week.

17 Q Do you recall how many number of days it
18 was?

19 A Well, I do recall that our first meeting
20 on it was precisely a week ago last Monday.

21 Q Do you know for about how long that
22 meeting went?

1 A A few hours, recognizing I was preparing
2 for two depositions at the same time, so tweaking
3 out what sections and hours were spent on each is
4 probably -- that's the challenge for me.

5 Q Fair.

6 And your other deposition occurred Friday,
7 just three days ago, is that correct?

8 A That's correct.

9 Q And I will stop you, I am sure you were
10 asked this essential line of questioning in that
11 deposition, did you do any -- did you meet with
12 counsel at all from the end of that deposition
13 until today?

14 A Yes. We had one short meeting yesterday,
15 Sunday.

16 Q For about how long did that go?

17 A About 90 minutes.

18 Q And whom was present at that meeting
19 besides yourself, obviously?

20 A Mr. Kazi and Mr. Park.

21 Q Just a couple of wrap-up questions again
22 from the previous deposition we had they are just

1 formalities, during your deposition today did you
2 have any communication means up by which you could
3 communicate with anyone during the deposition and
4 you did in fact do so?

5 A No, sir.

6 Q And during breaks did you communicate with
7 counsel at all regarding substance of your
8 deposition?

9 A No, sir.

10 MR. UDICK: Subject to any redirect by
11 Mr. Kazi I have no questions.

12 MR. KAZI: I don't think we are going to
13 have any redirect. In fact, I can confirm we are
14 not. We will review the witness's ability to
15 review and sign the transcript, other than that I
16 think we are done.

17 MS. REPORTER: We are off the record at
18 1:37.

19 Transcript has been ordered for delivery
20 for tomorrow. Mr. Kazi, do you want the same
21 delivery?

22 MR. KAZI: Patent owner has requested it

1 delivered tomorrow on an expedited basis?

2 MR. UDICK: I will say it is us.

3 MR. KAZI: Yes, I don't think we need it
4 on an expedited basis. I think if we have a
5 standing order, I will take whatever the standing
6 order is, but otherwise we will take regular
7 delivery unless Mr. Park tells me that we need it
8 faster.

9 MS. REPORTER: Mr. Kazi, do you need a
10 rough draft?

11 MR. KAZI: I will take a rough.

12 (WHICH WERE ALL OF THE PROCEEDINGS HAD OR
13 TAKEN PLACE IN THE ABOVE-ENTITLED MATTER.)

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1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC
2 I, STEPHANIE BATTAGLIA, Certified Reporter
3 and Notary Public within and for the State of
4 Illinois do hereby certify:

5 That DR. MICHAEL JENSEN, the witness whose
6 deposition is hereinbefore set forth, was duly
7 sworn by me before the commencement of such
8 deposition and that such deposition was taken
9 before me and is a true record of the testimony
10 given by such witness.

11 I further certify that the adverse party,
12 Samsung Electronics Co., Ltd., was represented by
13 counsel at the deposition.

14 I further certify that the deposition of
15 DR. MICHAEL JENSEN, occurred via Zoom conference,
16 on Monday, March 20, 2023, commencing at 9:32 a.m.
17 to 1:37 p.m., Central Time.

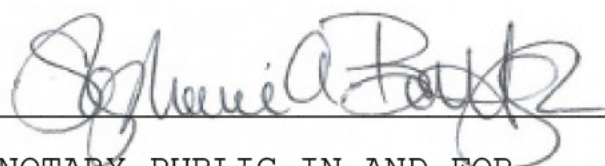
18 I further certify that I am not related to
19 any of the parties to this action by blood or
20 marriage, I am not employed by or an attorney to
21 any of the parties to this action, and that I am
22 in no way interested, financially or otherwise, in

1 the outcome of this matter.

2 IN WITNESS WHEREOF, I have hereunto set my
3 hand this 21st day of March, 2023.

4 My commission expires:

5 March 13, 2027

6 
7 _____

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9 THE STATE OF ILLINOIS

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