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Transcript of Matthew C. Valenti, Ph.D.

Date: March 7, 2025

Case: Samsung Electronics Co. LTD, et al. -v- Empire Technology Development
LLC (PTAB)

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WORLDWIDE COURT REPORTING & LITIGATION TECHNOLOGY

1 UNITED STATES PATENT AND TRADEMARK OFFICE

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

5 SAMSUNG ELECTRONICS CO., LTD.;
6 SAMSUNG ELECTRONICS AMERICA, INC.,
7 Petitioners,
8 v.
9 EMPIRE TECHNOLOGY DEVELOPMENT LLC,
10 Patent Owner.
11 -----

12 Case No. IPR2024-00896

13 U.S. Patent No. 8,798,120
14

15 DEPOSITION OF MATTHEW C. VALENTI, Ph.D.

16 APPEARING REMOTELY FROM MORGANTOWN, WV

17 FRIDAY, MARCH 7, 2025

18 10:06 A.M.
19

20 Job No.: 573314

21 Pages 1 - 158

22 Reported by: Adrienne M. Mignano, RPR

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

2

1 Deposition of MATTHEW C. VALENTI, PH.D.,
2 held via Zoom videoconferencing, pursuant to Notice,
3 before Adrienne M. Mignano, a Registered Professional
4 Stenographic Reporter and Notary Public in and for the
5 States of New York, North Carolina and Washington D.C.

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Empire 2013 - P 3
Samsung v. Empire
IPR2024-00896

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C O N T E N T S

EXAMINATION OF MATTHEW C. VALENTI, Ph.D. PAGE

By Mr. Browand 8

E X H I B I T S

(Attached to the transcript)

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Transcript of Matthew C. Valenti, Ph.D.
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1 REMOTE TECH: Thank you to everyone
2 for attending this proceeding remotely, which we
3 anticipate will run smoothly. Please remember
4 to speak slowly and do your best not to talk
5 over one another.

6 Please be aware that we are recording
7 this proceeding for backup purposes. Any
8 off-the-record discussions should be had away
9 from the computer. Please remember to mute your
10 microphones for those conversations.

11 Please have your video enabled to
12 help the reporter identify who is speaking. And
13 if you are unable to connect with video and are
14 connecting via phone, please identify yourself
15 each time before speaking.

16 I apologize in advance for any
17 technical-related interruptions. Thank you.

18 THE VIDEOGRAPHER: Here begins Media	10:05:33
19 Number 1 in the videotaped deposition of	10:05:33
20 Dr. Matthew C. Valenti in the matter of Samsung	10:05:36
21 Electronics Co., Ltd.; Samsung Electronics	10:05:39
22 America, Inc. v. Empire Technology Development	10:05:43

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

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1	LLC, in the United States Patent and Trademark	10:05:48
2	Office before the Patent Trial and Appeal Board,	10:05:50
3	Case Number IPR2024-00896.	10:05:52
4	Today's date is March 7th, 2025. The	10:06:02
5	time on the video monitor is 10:06. The remote	10:06:07
6	videographer today is Maddie Reif, representing	10:06:10
7	Planet Depos. All parties of this video	10:06:13
8	deposition are attending remotely.	10:06:14
9	Would counsel please voice identify	10:06:17
10	themselves and state whom they represent.	10:06:20
11	MR. BROWAND: Nathaniel Browand, from	10:06:24
12	Milbank LLP, on behalf of Patent Owner Empire	10:06:27
13	Technology Development LLC. And with me today	10:06:30
14	is Allison Kempf, also from Milbank.	10:06:33
15	DR. COOK: Good morning. This is	10:06:37
16	Brian Cook, with O'Melveny & Myers, appearing on	10:06:39
17	behalf of the petitioner Samsung. And with me	10:06:43
18	is my colleague Caitlin Hogan, also with	10:06:47
19	O'Melveny.	10:06:51
20	THE VIDEOGRAPHER: All right. Thank	10:06:59
21	you very much. The court reporter today is	10:06:59
22	Adrienne Mignano, representing Planet Depos.	10:07:01

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

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1	The witness will now be sworn.	10:07:03
2	Whereupon,	10:07:05
3	MATTHEW C. VALENTI, Ph.D.,	10:07:05
4	being first duly sworn or affirmed to testify to	10:07:05
5	the truth, the whole truth, and nothing but the	10:07:05
6	truth, was examined and testified as follows:	10:07:05
7	EXAMINATION BY COUNSEL FOR THE PATENT OWNER	10:07:05
8	BY MR. BROWAND:	10:07:21
9	Q Good morning, Dr. Valenti.	10:07:21
10	A Good morning.	10:07:23
11	Q Will you please state your full name	10:07:24
12	for the record.	10:07:26
13	A Yes. It is Matthew Charles Valenti.	10:07:27
14	Q And where do you currently reside?	10:07:30
15	A I live in Morgantown, West Virginia.	10:07:34
16	Q And where are you located today for	10:07:37
17	this deposition?	10:07:39
18	A I'm located in my residence, down in	10:07:41
19	the basement.	10:07:43
20	Q And what is the address there?	10:07:44
21	A The address is 929 Riverview Drive.	10:07:47
22	And that is Morgantown.	10:07:50

1	Q	Let's look at Exhibit 1, which I	10:07:58
2		think you have access to.	10:08:01
3		(Valenti Exhibit 1 marked for	10:08:03
4		identification and attached to the transcript.)	10:08:03
5	Q	It was in the browser. Let me know	10:08:08
6		when you can see it.	10:08:12
7	A	Exhibit 1, yes, I have it. It is	10:08:15
8		Patent Owner's Notice of Deposition.	10:08:17
9	Q	Okay. And towards the top of the	10:08:20
10		page, you'll see that Empire Technology	10:08:22
11		Development LLC is the patent owner. If I refer	10:08:23
12		to Empire Technology Development LLC as "Empire"	10:08:27
13		or "patent owner," will you understand that	10:08:32
14		shorthand?	10:08:35
15	A	Yes.	10:08:35
16	Q	And also at the top you can see that	10:08:36
17		it says Samsung Electronics Co., Limited and	10:08:39
18		Samsung Electronics America, Inc. are the	10:08:43
19		petitioners?	10:08:47
20	A	Yes.	10:08:48
21	Q	So if I refer to Samsung Electronics	10:08:48
22		Co., Limited and Samsung Electronics America,	10:08:50

1	Inc. collectively as "Samsung" or "petitioners,"	10:08:53
2	will you understand that?	10:08:59
3	A Yes.	10:09:00
4	Q You understand that you are providing	10:09:03
5	testimony today pursuant to this Deposition	10:09:04
6	Notice, fair?	10:09:06
7	A Yes, I do.	10:09:09
8	Q I'd like to go over some ground rules	10:09:13
9	for this deposition. My questions and your	10:09:15
10	answers are transcribed by the court reporter	10:09:17
11	here today, and this deposition is also being	10:09:21
12	videotaped. Do you understand that?	10:09:23
13	A Yes.	10:09:26
14	Q It is important that we try to make	10:09:28
15	as clear a record as possible today. So please	10:09:31
16	answer verbally because the court reporter	10:09:34
17	cannot transcribe head nodding or other	10:09:36
18	non-verbal cues. Is that fair?	10:09:39
19	A Yes.	10:09:42
20	Q And I'll ask you to please answer	10:09:44
21	audibly. Sometimes the court reporter can't	10:09:45
22	hear you if you speak softly.	10:09:48

1	A	Okay.	10:09:51
2	Q	And it is also important that we try	10:09:53
3		not to speak over each other. Please try to let	10:09:55
4		me finish asking a question before you begin	10:09:57
5		answering my question and I'll do the same in	10:10:00
6		return. Fair?	10:10:02
7	A	Yes.	10:10:05
8	Q	If you don't understand any question,	10:10:06
9		please let me know. Otherwise, if you answer a	10:10:10
10		question, I will assume that you understood it;	10:10:13
11		is that fair?	10:10:15
12	A	Yes.	10:10:17
13	Q	You are under oath to tell the truth,	10:10:19
14		which means that your testimony here today will	10:10:21
15		have the same force and effect and be subject to	10:10:25
16		the same penalties as if you were testifying in	10:10:29
17		a courtroom. Do you understand that?	10:10:31
18	A	Yes.	10:10:33
19	Q	Your counsel may object to my	10:10:35
20		questions, but unless your counsel instructs you	10:10:37
21		not to answer, I will expect an answer to my	10:10:40
22		question. Is that understood?	10:10:43

1	A	Yes.	10:10:45
2	Q	We can take breaks throughout the day	10:10:48
3		today. If you need a break for any reason,	10:10:50
4		please let me know and I will find an	10:10:52
5		opportunity to accommodate you. But if the	10:10:54
6		question is pending, I will ask you to answer	10:10:56
7		the question before we have a break; is that	10:10:59
8		fair?	10:11:00
9	A	Yes.	10:11:01
10	Q	And do you understand that during	10:11:04
11		breaks you cannot talk with counsel or anyone	10:11:06
12		else about the substance of your testimony that	10:11:08
13		has already been given or is anticipated to be	10:11:10
14		given?	10:11:13
15	A	Yes.	10:11:14
16	Q	Is there any reason you cannot	10:11:17
17		provide complete and truthful answers today,	10:11:19
18		Dr. Valenti?	10:11:22
19	A	No, there is not.	10:11:22
20	Q	And I have to ask this question, but	10:11:25
21		are you taking any medications that would	10:11:27
22		inhibit your ability to testify fully and	10:11:29

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

13

1	accurately today?	10:11:32
2	A No, I am not.	10:11:34
3	Q And is there any other reason that	10:11:36
4	you can think of that would affect your ability	10:11:38
5	to participate in the deposition today and to	10:11:40
6	give complete and honest testimony?	10:11:42
7	A No.	10:11:44
8	Q What did you do to prepare for your	10:11:48
9	deposition today?	10:11:50
10	DR. COOK: And I'll just caution the	10:11:50
11	witness, do not reveal any attorney-client	10:11:54
12	communications, but go ahead and answer.	10:11:56
13	A I met with the attorneys that are	10:12:00
14	present here and reviewed materials.	10:12:03
15	Q Did you meet with anyone else besides	10:12:08
16	counsel?	10:12:10
17	A No, I did not.	10:12:10
18	Q And when did you meet with counsel?	10:12:13
19	A It was over the past week for this	10:12:17
20	deposition, maybe two or three times, over Zoom.	10:12:20
21	Q And in these two or three Zoom	10:12:27
22	meetings, how much time did you spend with the	10:12:29

1	attorneys?	10:12:32
2	A The sum total of those three meetings	10:12:35
3	was I think approximately seven hours.	10:12:39
4	Q And did you spend any time reviewing	10:12:44
5	on your own?	10:12:46
6	A Yes.	10:12:47
7	Q And how long did you spend reviewing	10:12:48
8	on your own for this deposition?	10:12:51
9	A Probably another seven or eight	10:12:53
10	hours.	10:12:54
11	Q And in both of these, even on your	10:12:57
12	own and with counsel, I assume you reviewed some	10:13:03
13	documents; is that fair?	10:13:06
14	A Yes.	10:13:08
15	Q What documents did you review?	10:13:08
16	A The documents I reviewed included the	10:13:12
17	patent, my declaration, the preliminary patent	10:13:15
18	owner's response, and there was a couple of	10:13:22
19	replies after that filed by both parties. There	10:13:25
20	were the key anticipatory references that I	10:13:29
21	reviewed. I think there were four of them.	10:13:34
22	There was another related reference, I think by	10:13:37

1	Walton, that I reviewed.	10:13:40
2	Those would be the documents or	10:13:43
3	record that I recall reviewing. There may have	10:13:47
4	been a few others, but those were the ones I	10:13:49
5	spent most of my time on.	10:13:52
6	Q Before we get going, do you have any	10:13:55
7	programs up on a computer that you're referring	10:13:57
8	to, like messaging or e-mail or PDFs other than	10:14:02
9	the Zoom and the exhibit?	10:14:07
10	A No, I don't. I have Acrobat open	10:14:08
11	with the one document in it. I have two web	10:14:12
12	browsers in -- just for the document share --	10:14:17
13	Q Okay.	10:14:20
14	A -- and the Zoom, and that's the only	10:14:21
15	thing that is open.	10:14:23
16	Q Dr. Valenti, I will ask you to	10:14:24
17	refrain from viewing any other such programs	10:14:26
18	while we are on the record. Will you do that?	10:14:30
19	A Yes.	10:14:33
20	Q And do you have a phone or other	10:14:33
21	electronic device beside your computer that is	10:14:35
22	within viewing distance?	10:14:38

1	A	No, I don't. I have a phone sort of	10:14:39
2		on the other side of the room, but it's not --	10:14:42
3	Q	Okay. Thank you. I will ask you to	10:14:44
4		refrain from viewing your phone while we're on	10:14:46
5		the record as well. Will you do that?	10:14:49
6	A	Yes.	10:14:51
7	Q	And do you have any hard copy	10:14:52
8		documents in front of you?	10:14:54
9	A	Yes, I do.	10:14:56
10	Q	What are those?	10:14:57
11	A	I have a binder.	10:15:00
12	Q	Okay. What's in it?	10:15:02
13	A	And in the binder it has more or less	10:15:04
14		the same documents that I had reviewed. There	10:15:07
15		are 11 documents. I can go through them if you	10:15:11
16		wish.	10:15:14
17	Q	Sure. Why don't you just identify	10:15:15
18		them for the purposes of completeness.	10:15:17
19	A	Sure. The first one is the patent	10:15:19
20		itself, the '120 patent. The second one is my	10:15:21
21		declaration. The third one is the patent owner	10:15:26
22		preliminary response. The fourth one is the	10:15:29

1 Samsung preliminary reply. The fifth one is the
2 patent owner preliminary surreply. The sixth
3 one is the Institution Decision. And I will add
4 that is among the documents that I reviewed
5 beforehand, if I did not mention that earlier.

6 And then the remaining ones are some
7 prior art documents. So the seventh one is the
8 one referred to as Li. The eighth one is the
9 document referred to as Siam. The ninth one is
10 the one referred to as Cui 2003. Cui is spelled
11 C-U-I. The tenth one is the document referred
12 to as Tirola, spelled T-I-I-R-O-L-A. And then
13 the last one is the document referred to as Wu,
14 W-U.

15 Q Do you have any annotations on those
16 documents in that binder?

17 A No, I don't. The only thing is there
18 are section dividers so I can find the
19 documents. But there is nothing annotated on
20 any of the documents.

21 Q And besides the binder, do you have
22 any other handwritten notes or other documents

1	in front of you?	10:16:50
2	A No, I do not.	10:16:51
3	MR. BROWAND: So I'd like to mark	10:16:57
4	Tab 2 as Exhibit 2.	10:16:59
5	(Valenti Exhibit 2 marked for	10:17:02
6	identification and attached to the transcript.)	10:17:02
7	MR. BROWAND: And can the tech let us	10:17:06
8	know when that is ready.	10:17:07
9	REMOTE TECH: It's uploading now,	10:17:17
10	Counsel. It should just take a moment.	10:17:18
11	It should be there if everyone	10:17:20
12	refreshes their page.	10:17:43
13	Q Dr. Valenti, please let us know when	10:17:47
14	you can see Exhibit 2.	10:17:49
15	A Yes, I see the document and I	10:18:09
16	downloaded it and I have opened it up in my	10:18:10
17	Acrobat.	10:18:13
18	Q Great. Is this the expert	10:18:13
19	declaration that you submitted on behalf of	10:18:15
20	Samsung in this IPR proceeding?	10:18:17
21	A Yes, it is.	10:18:36
22	DR. COOK: I'll just note that the	10:18:51

1 last page of that is upside down for some 10:18:52

2 reason, but I think the rest of it looks okay. 10:18:55

3 A Yes, I do note the last page was 10:18:58

4 upside down. So my slight pause was I scrolled 10:19:00

5 through the whole document, and it looks to 10:19:02

6 be -- at first glance to be identical to the one 10:19:03

7 that was submitted except for the last page 10:19:06

8 being upside down. 10:19:09

9 Q So if I refer to "the declaration" or 10:19:11

10 "your declaration" or "your report" without any 10:19:13

11 additional context, will you understand that I'm 10:19:15

12 referring to this Exhibit 2, the declaration 10:19:18

13 that you submitted on behalf of Samsung in 10:19:21

14 connection with this IPR proceeding? 10:19:23

15 A Yes. 10:19:25

16 Q Now, I understand you're billing 10:19:28

17 Samsung for your work on this matter, correct? 10:19:30

18 A Yes. 10:19:32

19 Q And you're billing Samsung at a rate 10:19:37

20 of \$550 per hour; is that right? 10:19:39

21 A Yes. 10:19:42

22 Q And have you been paid for some of 10:19:42

1 your work in connection with this IPR 10:19:44

2 proceeding? 10:19:47

3 A Yes, I have. 10:19:47

4 Q And about approximately how much have 10:19:48

5 you been paid so far for your work in this 10:19:51

6 matter? 10:19:54

7 A Well, there were two IPRs filed. Are 10:19:55

8 you asking me to provide an estimate just for 10:20:00

9 the part that would be related to this 10:20:05

10 particular patent and its IPR? 10:20:08

11 Q If you know that amount, that would 10:20:11

12 be fine. If you only know the total amount, 10:20:12

13 that would be fine as well. 10:20:14

14 A Okay. So I would estimate the amount 10:20:16

15 of time spent on this particular patent and its 10:20:20

16 IPR, prior to the preparations over the past 10:20:25

17 week, was probably about 50 to 60 hours. If you 10:20:33

18 want to pull up a calculator, you can multiply 10:20:38

19 that by 550 to determine the amount. 10:20:41

20 Q And is that similar to the amount 10:20:45

21 that you spent on the other IPR proceeding? 10:20:47

22 A Yes. I think the other one was a 10:20:52

1 little lower, and also, the amount that I gave 10:20:54
2 you also accounted for some overlap between the 10:20:56
3 two. So there is some -- some time that maybe 10:21:00
4 was directed towards both. So, for instance, 10:21:02
5 drafting some of the introductory material, my 10:21:05
6 background, things like that. So maybe another 10:21:09
7 40 hours or so for the other IPR. 10:21:13

8 Q And then the work that you have spent 10:21:20
9 over the last week or two you haven't, 10:21:22
10 obviously, probably billed or been paid for that 10:21:24
11 work yet, correct? 10:21:26

12 A Right. I haven't -- I certainly 10:21:27
13 haven't been paid. I mean, I billed for 10:21:32
14 February at the end of the month. So the extra, 10:21:34
15 you know, 15, 16 hours that we discussed would 10:21:37
16 be on top of that, as would today. 10:21:39

17 Q Going back in time, when did you 10:21:47
18 begin working on your declaration, that is, 10:21:48
19 Exhibit 2? 10:21:50

20 A Oh. So looking at the signature, it 10:21:53
21 was in June of 2024. So certainly it was before 10:22:14
22 that. My best recollection was about a year ago 10:22:17

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

22

1	I was working on it. I think I was contacted	10:22:22
2	and started working on this maybe early 2024,	10:22:28
3	give or take a few months. I don't remember the	10:22:31
4	exact date.	10:22:34
5	Q You said you were contacted. Who	10:22:36
6	were you contacted by?	10:22:38
7	A The attorney was Tim Fink from	10:22:41
8	O'Melveny.	10:22:46
9	Q And he just reached out to see if you	10:22:49
10	might be interested in serving as an expert in	10:22:52
11	this proceeding?	10:22:54
12	A Yes, that is correct.	10:22:55
13	Q Have you worked with Mr. Fink before?	10:22:58
14	A Yeah. Actually, I did work with him	10:23:02
15	many years ago back when he was with Kirkland &	10:23:04
16	Ellis. So this would be approximately 2012.	10:23:08
17	Q Did you personally prepare the first	10:23:19
18	draft of your declaration that is Exhibit 2?	10:23:21
19	A Yes, I did.	10:23:25
20	Q And did you write every word or it,	10:23:29
21	or was it a collaboration with counsel?	10:23:32
22	A I think it would be fair to	10:23:35

1	characterize it as a collaboration with counsel.	10:23:38
2	We worked together, but the opinions in the	10:23:42
3	declaration are my own.	10:23:45
4	Q And out of those 50 or 60 hours that	10:23:48
5	you talked about earlier, how many of those	10:23:51
6	hours were spent working on this declaration?	10:23:55
7	A It was probably a little more than	10:24:02
8	half. So, you know, maybe something on the	10:24:04
9	order of 30 hours, you know, give or take a few.	10:24:09
10	Q And let's go to the last page of the	10:24:20
11	exhibit, I guess the one that's upside down.	10:24:23
12	A Okay.	10:24:27
13	Q And do you see on that page it says	10:24:29
14	that you "declare under the penalty of perjury	10:24:31
15	under the laws of the United States of America	10:24:35
16	that the foregoing is true and correct"?	10:24:37
17	A Yes, I see that. And just for the	10:24:49
18	record, I have flipped the page to its right	10:24:50
19	side so I can read that. But, yeah, I see what	10:24:54
20	I wrote there and signed.	10:24:57
21	Q And that is your signature below that	10:24:59
22	paragraph, right?	10:25:01

1	A	Correct.	10:25:02
2	Q	And sitting here today, are you aware	10:25:05
3		of any statements in your declaration that are	10:25:07
4		either false or incorrect?	10:25:10
5	A	No, I'm not aware of anything that	10:25:11
6		would be false or incorrect.	10:25:17
7	Q	And are you aware of any mistakes in	10:25:20
8		your declaration?	10:25:23
9	A	No, I'm not aware of any mistakes.	10:25:26
10	Q	So sitting here today, you believe	10:25:28
11		that all of the statements in your declaration	10:25:29
12		are true and correct?	10:25:32
13	A	Yes, I do.	10:25:33
14	MR. BROWAND:	If the tech could	10:25:40
15		please mark Tab 3 as Exhibit 3 and then let us	10:25:41
16		know when that is ready.	10:25:47
17		(Valenti Exhibit 3 marked for	10:25:49
18		identification and attached to the transcript.)	10:25:49
19	REMOTE TECH:	It is uploading now,	10:26:05
20		Counsel, and it should be in there.	10:26:06
21	Q	Dr. Valenti, can you let us know when	10:26:08
22		you can see Exhibit 3.	10:26:12

1	A	Yes, I have it and I have downloaded	10:26:30
2		it.	10:26:32
3	Q	Do you recognize Exhibit 3?	10:26:32
4	A	Yes. Exhibit 3 is the patent at	10:26:35
5		issue, which I think we can call the '120	10:26:40
6		patent.	10:26:45
7	Q	Perfect. So if I refer to Exhibit 3	10:26:46
8		as the '120 patent, you'll understand that,	10:26:48
9		right?	10:26:50
10	A	Yes.	10:26:50
11	Q	And now, you also understand that at	10:26:52
12		the time of filing your declaration, Samsung	10:26:54
13		also filed an IPR petition, correct?	10:26:59
14	A	Yes. I believe my declaration was to	10:27:03
15		support the IPR petition.	10:27:06
16	Q	And have you read Samsung's IPR	10:27:08
17		petition?	10:27:12
18	A	No, I have not, to the best of my	10:27:14
19		recollection. I think I may have -- I may have	10:27:18
20		read it at the time it was filed, but I did	10:27:23
21		not -- it is not among the documents I reviewed	10:27:24
22		for today.	10:27:27

1	MR. BROWAND: Okay. Dylan, if you	10:27:34
2	could add Tab 4 and mark it as Exhibit 4 and let	10:27:35
3	us know when that's ready.	10:27:41
4	(Valenti Exhibit 4 marked for	10:27:43
5	identification and attached to the transcript.)	10:27:43
6	Q Dr. Valenti, let us know when you can	10:28:24
7	see Exhibit 4, which is now in the browser	10:28:27
8	window.	10:28:30
9	A Okay. I have Exhibit 4 and I have	10:28:51
10	downloaded it and opened it in Acrobat.	10:28:53
11	Q Okay. And do you recognize that this	10:28:56
12	is Samsung's IPR petition with respect to the	10:28:58
13	'120 patent?	10:29:01
14	A Yes. Looking at it, it does appear	10:29:03
15	to be the IPR petition.	10:29:05
16	Q But this is not a document that you	10:29:08
17	looked at in preparing for your deposition over	10:29:09
18	the last couple of weeks, right?	10:29:11
19	A No, it is not.	10:29:13
20	Q Now, you also said that you read the	10:29:17
21	preliminary response and the PTAB's Institution	10:29:20
22	Decision, right?	10:29:24

1	A	Yes, I did.	10:29:26
2	Q	I'd like to take a step back and talk	10:29:30
3		about your personal background, Dr. Valenti.	10:29:33
4		You have a bachelor's of science	10:29:37
5		degree in electrical engineering from Virginia	10:29:39
6		Tech; is that right?	10:29:42
7	A	Yes, that is correct.	10:29:44
8	Q	And you have a master's of science	10:29:45
9		degree in electrical engineering from Johns	10:29:47
10		Hopkins, right?	10:29:51
11	A	Yes, that is correct.	10:29:52
12	Q	And you have a Ph.D. in electrical	10:29:53
13		engineering from Virginia Tech, right?	10:29:57
14	A	Yes.	10:30:00
15	Q	When was that degree conferred?	10:30:01
16	A	Well, the Ph.D., if that's what	10:30:03
17		you're referring to, was conferred in 1999.	10:30:06
18	Q	And you're currently a professor at	10:30:08
19		West Virginia University, right?	10:30:11
20	A	Yes.	10:30:13
21	Q	And you are currently director of the	10:30:14
22		West Virginia University site of the Center for	10:30:18

1	Identification Technology Research; is that	10:30:21
2	right?	10:30:25
3	A Yes.	10:30:26
4	Q What is the Center for Identification	10:30:27
5	Technology Research?	10:30:28
6	A This is an NSF, or National Science	10:30:33
7	Foundation, funded Industry/University	10:30:38
8	Collaborative Research Center. And so that is a	10:30:40
9	research center that has some funding from	10:30:45
10	industry and also from some government agencies	10:30:48
11	to perform research on a central theme, and the	10:30:53
12	theme of the research center is identification	10:30:56
13	technology, which is things like biometric	10:31:00
14	identification. It gets into aspects of	10:31:02
15	accessing computer systems and identifying	10:31:07
16	people and various types of technologies.	10:31:11
17	Q And what do you do as director of	10:31:17
18	this center?	10:31:19
19	A Well, director is largely a research	10:31:22
20	management role, so it would be interacting with	10:31:26
21	the sponsors, getting funding, working with the	10:31:30
22	sponsors to identify which research projects are	10:31:34

1 funded. So there are a lot of faculty who are 10:31:37
2 supported by projects in the center, and so a 10:31:40
3 lot of it is just managing those projects, 10:31:44
4 not -- the role doesn't really involve 10:31:46
5 conducting the research itself so much as 10:31:53
6 managing the research. 10:31:55

7 Q You, as director, do you also perform 10:31:57
8 any of the research at the center or do you just 10:32:00
9 perform the management role? 10:32:03

10 A Yes, I do. I have executed maybe 10:32:05
11 four or five projects over the year -- over the 10:32:10
12 years that was funded by the center. 10:32:13

13 Q And who were the sponsors for the 10:32:17
14 four or five projects that were funded by the 10:32:21
15 center that you performed? 10:32:24

16 A Well, sponsorship is kind of in a 10:32:26
17 pool, and so money is kind of placed into a pool 10:32:31
18 by the sponsors and then drawn from it. So it 10:32:35
19 is a little hard to attribute it to any one 10:32:38
20 sponsor. The sponsors that pay to the pool are 10:32:41
21 mostly government sponsors. So the FBI, the DoD 10:32:44
22 are among our biggest sponsors. 10:32:52

1	There are some small companies.	10:32:54
2	There is a small business called Athena	10:32:56
3	Sciences, and then there is another company	10:32:59
4	called IDEMIA that has contributed.	10:33:02
5	Q Is Samsung one of the sponsors for	10:33:09
6	the center?	10:33:12
7	A No, they are not.	10:33:12
8	Q You have been a professor or	10:33:15
9	assistant professor of electrical engineering	10:33:18
10	since 1999; is that correct?	10:33:21
11	A Yes, I started as an assistant	10:33:23
12	professor in 1999 and then progressed from	10:33:25
13	there.	10:33:28
14	Q And while you were still at Virginia	10:33:31
15	Tech, you were a graduate research assistant	10:33:36
16	instructor in the electrical and computer	10:33:40
17	engineering department there, right?	10:33:43
18	A Yes, I was.	10:33:44
19	Q And then prior to that, you also	10:33:51
20	worked as an electronics engineer at the U.S.	10:33:53
21	Naval Research Laboratory; is that right?	10:33:57
22	A Yes.	10:34:01

1	Q	What was your role there?	10:34:02
2	A	At the Naval Research Lab, I was an	10:34:05
3		electronics engineer. I was tasked with	10:34:09
4		developing certain systems. Most of them dealt	10:34:12
5		with using antenna arrays for acquisition of	10:34:16
6		signals. Some of them flew on satellites. And	10:34:20
7		some other aspects involved tracking of maritime	10:34:26
8		vessels as they went around the earth by	10:34:30
9		fingerprinting their radar signatures.	10:34:35
10	Q	Now, I understand you have testified	10:34:42
11		in depositions before today, correct?	10:34:44
12	A	Yes, I have.	10:34:46
13	Q	And about how many?	10:34:48
14	A	I believe, prior to today, I have	10:34:51
15		been deposed 16 times, give or take a few.	10:34:54
16	Q	And how many of those were patent	10:34:59
17		cases, if you recall?	10:35:02
18	A	All 16 of those would be related to	10:35:05
19		patents or intellectual property.	10:35:08
20	Q	And how many of them were IPR	10:35:13
21		proceedings, if you recall?	10:35:15
22	A	I don't know exactly. I haven't	10:35:23

1 broken it down. But there has been, you know, 10:35:26
2 at least three, maybe as many as eight, but 10:35:27
3 there have been -- I have been deposed a few 10:35:33
4 times for IPRs. In some cases I had maybe 10:35:36
5 multiple IPRs with back-to-back depositions. So 10:35:41
6 it depends on how you count, you know, if I have 10:35:48
7 two IPRs, back-to-back days, whether that would 10:35:50
8 count as one or two. 10:35:54

9 Q Have you always been deposed as an 10:35:57
10 expert or have you ever been deposed as a fact 10:35:58
11 witness? 10:36:01

12 A It's always been as an expert. 10:36:04

13 Q And have you ever provided expert 10:36:06
14 testimony at a trial in court? 10:36:10

15 A Yes, I have. Well, depending on what 10:36:14
16 you mean by a trial, so I have not testified 10:36:18
17 before a jury in a jury trial. I have testified 10:36:21
18 at bench trials. So, in particular, I have 10:36:24
19 testified at two ITC hearings, and I also 10:36:29
20 testified in a bench trial that was in the UK. 10:36:33

21 Q And those were all either IP or 10:36:39
22 patent cases; is that fair? 10:36:43

1	A	Yes, they were.	10:36:45
2	Q	Now, in the 16 cases where you have	10:36:52
3		provided deposition testimony, has it always	10:36:55
4		been on behalf of defendants or IPR petitioners?	10:36:59
5	A	No. Well, we already talked about	10:37:04
6		not all of those were IPRs, but among the ones	10:37:08
7		that were IPRs, I have represented both sides,	10:37:11
8		so including the patent owner.	10:37:15
9	Q	And what's the breakdown between	10:37:19
10		representing patent owner or representing the	10:37:21
11		accused infringer?	10:37:26
12	A	Well, if you want to open my resumé,	10:37:29
13		we could walk through it. There was one patent	10:37:31
14		owner I represented. The name of it was	10:37:37
15		Rideshare Technologies. That one was multiple	10:37:41
16		patents so I don't recall whether it would count	10:37:44
17		as one deposition or multiple. But then aside	10:37:46
18		from that one, of the ones that I have been	10:37:49
19		deposed on, I believe all of the others were for	10:37:53
20		the petitioner. And so there, it was however	10:37:56
21		many, maybe three -- four or five, something	10:38:01
22		like that. But you would have to look at my	10:38:05

1 resumé to get the exact number, which we could 10:38:07

2 do if you wanted to. 10:38:09

3 Q The CV that you submitted is correct 10:38:12

4 and accurate, right? 10:38:15

5 A Yes, it was accurate at least as of 10:38:16

6 the time it was filed. 10:38:19

7 Q Do you know if your testimony has 10:38:24

8 ever been excluded either from a district court 10:38:26

9 case or from a -- in an IPR proceeding? 10:38:30

10 A No, I'm not aware that my testimony 10:38:36

11 has ever been excluded. 10:38:38

12 Q Let's turn to Exhibit 2, which is 10:38:41

13 your declaration, and I'd like to look at 10:38:47

14 paragraph 33 first. Let me know when you're 10:38:51

15 there. 10:38:57

16 And if you would rather look at the 10:39:05

17 hard copy or online, it's totally up to you, 10:39:07

18 whatever is more comfortable. 10:39:11

19 A Okay. I am there. And just for your 10:39:19

20 reference, I have it both on the electronic and 10:39:22

21 hard copy in case we need to flip around. 10:39:25

22 Q In this paragraph you set forth your 10:39:29

1	understanding of the qualifications of a person	10:39:31
2	of ordinary skill in the art as of October 1st,	10:39:33
3	2007 for purposes of the '120 patent, right?	10:39:38
4	A Yes.	10:39:43
5	Q And you provide two categories, and	10:39:46
6	one is sort of academic and one professional; is	10:39:48
7	that fair?	10:39:51
8	A Yes.	10:39:54
9	Q And you understand that a person of	10:40:00
10	ordinary skill in the art would have had a	10:40:01
11	bachelor's degree in electrical engineering,	10:40:04
12	computer science, computer engineering or a	10:40:07
13	related field and two to three years of	10:40:10
14	experience in the research, design, development	10:40:13
15	or testing of wireless data communications	10:40:15
16	systems at the physical and media access control	10:40:18
17	layer, right?	10:40:22
18	A Yes.	10:40:24
19	Q How did you come up with that	10:40:25
20	definition?	10:40:26
21	A Well, I looked at certain factors,	10:40:27
22	such as the types of problems encountered in the	10:40:42

1 art, prior art solution to those problems, the 10:40:46
2 rapidity with which innovations are made, the 10:40:50
3 sophistication of the technology and the 10:40:53
4 educational level of the active workers in the 10:40:55
5 field kind of to establish, you know, the POSITA 10:40:58
6 and the, you know, common knowledge at the time. 10:41:03

7 Q Now, as of 2007, Dr. Valenti, you 10:41:07
8 qualified as a person of ordinary skill in the 10:41:12
9 art applying this definition, correct? 10:41:15

10 A Yes, I did. 10:41:17

11 Q Now, let's turn ahead to paragraph 39 10:41:31
12 in your declaration, and in this paragraph you 10:41:35
13 begin discussing the '120 patent, right? 10:41:39

14 A Yes. 10:41:42

15 Q And you describe it as "a system that 10:41:43
16 selects a multiple-input multiple-output (MIMO) 10:41:48
17 or single-input multiple-output (SIMO) 10:41:53
18 transmission mode for communicating data between 10:42:00
19 a mobile station and a base station in a 10:42:04
20 communications system based on certain 10:42:06
21 parameters," right? 10:42:09

22 A Yes. 10:42:10

1	Q	So when we talk about "MIMO" today,	10:42:14
2		you'll understand that that means multiple-input	10:42:17
3		multiple-output, correct?	10:42:19
4	A	Yes.	10:42:22
5	Q	And when we talk about "SIMO," you'll	10:42:23
6		understand that means single-input	10:42:27
7		multiple-output, correct?	10:42:27
8	A	Yes.	10:42:30
9	Q	You also say that "The MIMO mode	10:42:35
10		communicates data using multiple transmit	10:42:39
11		antennas and multiple receive antennas, and the	10:42:43
12		SIMO communicates data using a single transmit	10:42:47
13		antenna and multiple receive antennas," right?	10:42:51
14	A	Yes.	10:42:54
15	Q	So turning ahead in your declaration,	10:43:11
16		you have an annotated version of Figure 4 of the	10:43:13
17		'120 patent. Do you see that?	10:43:18
18	A	Could you orient me to page or	10:43:22
19		paragraph.	10:43:24
20	Q	Sure. It is, I guess, paragraph 41	10:43:25
21		on page 18.	10:43:27
22	A	Okay, yes. I see that.	10:43:31

1	Q	And Figure 4 shows a communications	10:43:37
2		system that includes a mobile station and a base	10:43:42
3		station. Do you see that?	10:43:47
4	A	Yes, I do.	10:43:50
5	Q	And, in fact, there is what looks	10:43:51
6		like three mobile stations; is that fair?	10:43:53
7	A	Yes, the figure appears to show three	10:43:57
8		mobile stations.	10:44:00
9	Q	And the mobile stations are the ones	10:44:01
10		you sort of have annotated; is that right?	10:44:04
11	A	Yes. The mobile stations have a blue	10:44:08
12		box around them.	10:44:10
13	Q	Now, the base station is configured	10:44:18
14		to communicate with the mobile stations over a	10:44:22
15		communications channel, right?	10:44:25
16	A	Yes.	10:44:28
17	Q	And that's sort of depicted by that	10:44:29
18		cloud in the middle; is that fair?	10:44:32
19	A	Yes, the cloud, which is given	10:44:38
20		component 422 represented by the matrix H would	10:44:43
21		represent the channel.	10:44:48
22	Q	And the controller in the mobile	10:44:50

1	station, which you have identified in a red box,	10:44:57
2	receives a control signal; is that fair?	10:45:00
3	A Yes.	10:45:08
4	Q Well, let's actually turn to	10:45:09
5	Exhibit 3, which is the '120 patent. Let me	10:45:16
6	know when you have it up.	10:45:19
7	A Okay. It's up.	10:45:21
8	Q Now, the '120 patent talks about idle	10:45:24
9	power and idle time, right?	10:45:28
10	A Yes.	10:45:31
11	Q And idle power is the power during an	10:45:33
12	idle time, right?	10:45:37
13	A Yes. I think it uses phrases like	10:45:46
14	"idle power consumption" or sometimes "idle	10:45:49
15	power," but that would be understood to be idle	10:45:55
16	power consumed during the idle time.	10:45:58
17	Q And idle time is when the mobile	10:46:01
18	station is idling, right?	10:46:04
19	A Yes. I think, more specifically, it	10:46:10
20	is referring to the communication parts of the	10:46:13
21	mobile station as being idling. You may have	10:46:17
22	other things that are active, like your screen	10:46:20

1 or the processor so you could run apps. 10:46:24

2 Q Now, the '120 patent states that "The 10:46:29

3 idle time is a time during which the transceiver 10:46:31

4 may be waiting to send data over the 10:46:36

5 communications channel," right? 10:46:38

6 A Yes. That is in -- towards the 10:46:54

7 bottom of column 2, it makes that statement. 10:46:57

8 Q And in the sentence after that, it 10:47:03

9 states, "The idle time is a time during which 10:47:09

10 the transceiver" -- 10:47:12

11 MR. BROWAND: I'm sorry, strike that. 10:47:17

12 Q In the sentence after that sentence, 10:47:19

13 it says, "The transceiver may, for example, be 10:47:20

14 waiting for a scheduled start time for the 10:47:24

15 transceiver to use the communications channel." 10:47:26

16 Do you see that? 10:47:29

17 A Yes. 10:47:31

18 Q And so we can think of that sentence 10:47:32

19 as an example of this idle time, correct? 10:47:34

20 A Yes, I think that's fair enough. 10:47:40

21 Q Now, the '120 patent does not mention 10:47:47

22 a sleep mode for a mobile device, right? 10:47:50

1	A	It doesn't talk about or use the term	10:47:56
2		"sleep mode." It just talks about "idle time,"	10:47:58
3		"idle power consumption." For that matter, it	10:48:02
4		doesn't use the term "idle mode" either.	10:48:05
5	Q	Now, if you go on to the top of	10:48:14
6		column 3, the '120 patent states that "If the	10:48:18
7		transmission rate is too slow, a greater number	10:48:24
8		of transceivers may become idle, waiting to send	10:48:28
9		transmissions over the communications channel."	10:48:31
10		Do you see that?	10:48:34
11	A	Yes.	10:48:36
12	Q	And then in the next sentence it	10:48:38
13		states, "Even if the idling transceivers turn	10:48:40
14		off their transmission chains, some idle power	10:48:44
15		may be consumed due to leakage current or other	10:48:49
16		effects."	10:48:53
17		Do you see that?	10:48:54
18	A	Yes.	10:48:55
19	Q	And so while the transmission chains	10:48:57
20		are turned off, some idle power may still be	10:49:00
21		consumed by the transceivers, right?	10:49:04
22	A	Yes, I think that's what that	10:49:08

1	sentence says.	10:49:09
2	Q And this is because the transceivers	10:49:10
3	are still idling, right?	10:49:12
4	A Yes, to the extent that idling	10:49:16
5	transceivers consume power -- and here it is	10:49:19
6	saying that there still is some power, or idle	10:49:23
7	power being used through leakage current -- then	10:49:26
8	I would agree with that.	10:49:30
9	Q When the transceivers are idling the	10:49:34
10	mobile station is powered on, right?	10:49:37
11	A Yeah. The mobile station as a whole	10:49:42
12	would be powered on.	10:49:44
13	Q And when the transceivers are idling,	10:49:46
14	the transceiver circuitry is powered on, right?	10:49:47
15	A It may or may not be powered on. I	10:49:54
16	think here all that really matters is whether or	10:49:56
17	not it is using power. So you could have a	10:50:00
18	situation where it is maybe shut down, maybe not	10:50:07
19	completely off, but it is still using some	10:50:11
20	power.	10:50:14
21	Q When the transceivers are idling, at	10:50:22
22	least some of the circuitry of the mobile	10:50:25

1	station is powered on, right?	10:50:28
2	A Yeah, I think I would characterize it	10:50:30
3	as to at least some of the circuitry is	10:50:32
4	consuming power. You know, it is probably not	10:50:34
5	fully powered on, probably not fully powered	10:50:37
6	off, but it is intended to be some kind of	10:50:41
7	intermediate state. I think the patent is	10:50:43
8	pretty clear here about when it is idling, it is	10:50:46
9	still using power, but it is not using the full	10:50:49
10	amount of power that would be used while it is	10:50:52
11	actively transmitting.	10:50:55
12	Q You can have transmission chains	10:50:56
13	turned off but circuits and the mobile station	10:51:00
14	would still be powered, right?	10:51:03
15	A Yes, certainly. And there could be	10:51:05
16	other circuits that are on, for instance.	10:51:07
17	Q So, let's turn to claim 25 of the	10:51:16
18	'120 patent. Let me know when you're at the	10:51:23
19	claims.	10:51:26
20	A Okay. I'm on the last page of the	10:51:34
21	patent, which has claim 25.	10:51:36
22	Q So after the preamble, the first	10:51:39

1	limitation is "a first antenna and a second	10:51:45
2	antenna," right?	10:51:50
3	A Yes.	10:51:51
4	Q And the second limitation is "first	10:51:52
5	circuitry coupled to the first antenna and	10:51:57
6	configured to process signals for transmission	10:52:00
7	by the first antenna," right?	10:52:03
8	A Yes.	10:52:05
9	Q And the third limitation is "second	10:52:08
10	circuitry coupled to the second antenna and	10:52:10
11	configured to process signals for transmission	10:52:13
12	by the second antenna," correct?	10:52:17
13	A Yes. That is the third indent. I	10:52:25
14	think we may have not -- I may have used a	10:52:29
15	different numbering in my declaration with	10:52:34
16	respect to the exact numbering of first and	10:52:37
17	second and third here.	10:52:39
18	Q And then the next limitation starts	10:52:46
19	with "a controller coupled to the first and	10:52:48
20	second circuitry, wherein the controller is	10:52:51
21	configured to receive a control signal."	10:52:54
22	Do you see that?	10:52:57

1	A	Yes.	10:52:59
2	Q	And then it says, "in accordance with	10:53:08
3		the control signal, to select between a MIMO	10:53:09
4		mode and a SIMO mode," right?	10:53:14
5	A	Yes.	10:53:17
6	Q	And then the last two limitations of	10:53:23
7		claim 25 are wherein clauses?	10:53:26
8	A	Yes.	10:53:30
9	Q	And the first wherein clause is	10:53:32
10		"wherein the control signal is based, at least	10:53:34
11		in part, on a power consumption of the first and	10:53:37
12		second circuitry," right?	10:53:39
13	A	Yes.	10:53:41
14	Q	And then the second wherein clause is	10:53:42
15		"wherein the control signal is based, at least	10:53:44
16		in part, on an idle power consumption of the	10:53:47
17		mobile station," right?	10:53:51
18	A	Yes.	10:53:53
19	Q	And then claim 27 and claim 28 depend	10:53:56
20		from claim 25, right?	10:54:03
21	A	Yes, they do.	10:54:06
22	Q	And then claim 29 is another	10:54:12

1 independent claim, right? 10:54:17

2 A Yes, it is. 10:54:20

3 Q And claim 29 is actually identical to 10:54:22

4 claim 25 except for that second wherein clause; 10:54:29

5 is that right? 10:54:33

6 A Yes. It is identical all the way to 10:54:36

7 the very last wherein clause. 10:54:39

8 Q And that last wherein clause in 10:54:43

9 claim 29 is "wherein the control signal is 10:54:46

10 based, at least in part, on a number of users of 10:54:50

11 the communications system," right? 10:54:54

12 A Yes, that is correct. 10:54:58

13 Q So after you submitted your 10:55:16

14 declaration, you understand the PTAB issued an 10:55:17

15 Institution Decision in this proceeding, right? 10:55:21

16 A Yes, I understand that's what 10:55:24

17 happened. 10:55:26

18 MR. BROWAND: So let's have marked 10:55:29

19 Tab 5 as Exhibit 5, and let us know when -- 10:55:31

20 Dylan, when that document is ready. 10:55:33

21 REMOTE TECH: It should be uploaded 10:55:51

22 now. 10:55:53

1	(Valenti Exhibit 5 marked for	10:55:53
2	identification and attached to the transcript.)	10:55:53
3	Q Dr. Valenti, let us know when you can	10:56:02
4	see Exhibit 5.	10:56:06
5	A Okay. I have downloaded it and it is	10:56:14
6	open.	10:56:17
7	Q And you recognize this document,	10:56:17
8	Exhibit 5, as the Institution Decision in this	10:56:19
9	IPR proceeding, correct?	10:56:22
10	A Yes, I do.	10:56:24
11	Q So if I refer to Exhibit 5 as the	10:56:24
12	"Institution Decision," you will understand	10:56:26
13	that, right?	10:56:29
14	A Yes.	10:56:29
15	Q So there's five grounds that are	10:56:32
16	discussed in the Institution Decision just like	10:56:33
17	in the petition, and you understand that the	10:56:36
18	Institution Decision ordered an IPR on those	10:56:38
19	five grounds, right?	10:56:42
20	A Yes. It granted institution of the	10:56:44
21	IPR.	10:56:47
22	Q So in addition to all of the elements	10:57:04

1 of the challenged claims that must be disclosed 10:57:05
2 by the combinations set forth in the grounds, 10:57:09
3 you also understand that to show unpatentability 10:57:11
4 in view of any of these combinations, there must 10:57:14
5 be a demonstrated motivation to combine the 10:57:18
6 prior art references, correct? 10:57:21

7 A Yes, I do. 10:57:23

8 Q Do you have any additional opinions 10:57:27
9 that are not set forth in your declaration as a 10:57:28
10 result of the Institution Decision? 10:57:31

11 A No, I don't think do. 10:57:36

12 Q So let's go back to your declaration, 10:57:45
13 and I'd like to have you turn to paragraph 83. 10:57:47
14 Let me know when you're there. 10:57:54

15 A Okay, I'm here. 10:58:10

16 Q And 83 is the beginning of a section 10:58:12
17 called "Claim Construction." Do you see that? 10:58:14

18 A Yes. 10:58:16

19 Q And in the first sentence you state 10:58:17
20 you "do not believe that any claim term requires 10:58:20
21 explicit construction to resolve the issues 10:58:23
22 presented in the petition," correct? 10:58:27

1	A	Correct.	10:58:28
2	Q	And you also state that you "apply	10:58:30
3		the plain and ordinary meaning to each claim	10:58:35
4		term, as that plain and ordinary meaning would	10:58:39
5		have been understood by a POSITA," correct?	10:58:41
6	A	Yes.	10:58:44
7	Q	And do you stand by your opinion that	10:58:48
8		idle power consumption should be construed in	10:58:55
9		accordance with its plain and ordinary meaning?	10:59:00
10	A	Yes, I do.	10:59:03
11	Q	So turning to paragraph 86, and in	10:59:05
12		this paragraph you have a footnote 5. Let me	10:59:17
13		know when you're there.	10:59:20
14	A	Okay, I'm at the footnote.	10:59:32
15	Q	And in the footnote you state that	10:59:36
16		"Idle power consumption means that the circuits	10:59:38
17		are powered but have nothing to transmit or	10:59:41
18		receive," right?	10:59:45
19	A	Yes.	10:59:47
20	Q	When you say "the circuits are	10:59:48
21		powered," you mean that the circuits are powered	10:59:50
22		on, right?	10:59:52

1	A	What I mean here is that they are not	10:59:54
2		powered off. So "powered" was kind of	10:59:56
3		intentionally vague here. They are certainly	11:00:01
4		not powered off, but -- in the sense that they	11:00:04
5		are not drawing any power at all, but the intent	11:00:08
6		is for this to mean that there is some power	11:00:11
7		that is being drawn by the circuits.	11:00:13
8	Q	So under the plain and ordinary	11:00:17
9		meaning of "idle power consumption," the	11:00:19
10		circuits are powered on, right?	11:00:22
11	A	No. I would say they are not powered	11:00:26
12		off, which may sound strange, but powering is a	11:00:29
13		continuum. So fully -- they are certainly not	11:00:33
14		fully powered on. They are not consuming their	11:00:36
15		maximum power, but they are also not fully	11:00:40
16		powered off in the sense that they are not	11:00:43
17		consuming zero power. So it is something in	11:00:46
18		between.	11:00:48
19	Q	So your interpretation of idle power	11:00:55
20		consumption in footnote 5 is what you believe is	11:00:58
21		the plain and ordinary meaning that would have	11:01:02
22		been understood by a POSITA, right?	11:01:05

1	A	Yes, I think this would be consistent	11:01:09
2		with what a POSITA would recognize. I mean, the	11:01:11
3		meaning is kind of implied by the phrase. It	11:01:15
4		would be power consumed when it is idle.	11:01:20
5	Q	Are you familiar with the preliminary	11:01:35
6		claim construction of "idle power consumption"	11:01:38
7		as determined by the district court in the	
8		related proceeding?	
9	A	Yes, I believe I reviewed that at one	11:01:56
10		point.	11:02:00
11	MR. BROWAND:	Okay. Let's have Tab 6	11:02:03
12		marked as Exhibit 6, and let us know when that	11:02:07
13		is ready.	11:02:12
14		(Valenti Exhibit 6 marked for	11:02:12
15		identification and attached to the transcript.)	11:02:12
16	REMOTE TECH:	It should be in there	11:02:33
17		now, Counsel.	11:02:34
18	Q	Dr. Valenti, let us know when you	11:02:36
19		have Exhibit 6 up.	11:02:38
20	A	I have Exhibit 6 up.	11:02:55
21	Q	So in row C you see that there is the	11:02:59
22		district court's preliminary construction for	11:03:02

1	"idle power consumption of the mobile station,"	11:03:05
2	right?	11:03:08
3	A Right.	11:03:09
4	Q And the preliminary construction	11:03:12
5	offered by the court is "power consumed by the	11:03:14
6	first and second circuitry when the mobile	11:03:17
7	station is powered on, enabled for transmitting,	11:03:20
8	but waiting to send," right?	11:03:23
9	A Yes.	11:03:27
10	Q Do you agree with the district	11:03:29
11	court's preliminary construction?	11:03:32
12	A I really haven't fully considered it,	11:03:37
13	so I don't think I would say that I either agree	11:03:39
14	nor disagree. I mean, at first glance, it seems	11:03:42
15	reasonable, but I think I would want more time	11:03:45
16	to fully consider it.	11:03:47
17	Q Is the district court's preliminary	11:03:49
18	construction consistent with your understanding	11:03:52
19	of the plain and ordinary meaning of the term?	11:03:54
20	A Yes, I think it is consistent with	11:03:57
21	the plain and ordinary meaning, based on my look	11:04:00
22	at it right now.	11:04:05

1	Q	And is the district court's	11:04:08
2		preliminary construction consistent with your	11:04:10
3		interpretation of idle power consumption being	11:04:14
4		the circuits are powered but have nothing to	11:04:17
5		transmit or receive?	11:04:21
6		DR. COOK: Objection to form.	11:04:22
7	A	Well, I think it is consistent.	11:04:26
8		Certainly, the definition that I offered in my	11:04:28
9		footnote 5 would be -- fall within the scope of	11:04:32
10		what was offered by the district court.	11:04:38
11	Q	And that's because in both cases the	11:04:40
12		mobile station is powered, right?	11:04:42
13	A	No. Because there is actually a	11:04:46
14		distinction there. The district court says the	11:04:49
15		mobile station is powered on. It actually	11:04:52
16		doesn't say the circuits are powered on. In	11:04:54
17		fact, the -- this district court interpretation	11:04:57
18		is silent regarding circuits being on or not.	11:04:59
19		It just says the mobile station is powered on.	11:05:03
20		Whereas my definition, as we just discussed, it	11:05:08
21		maybe adds to it and just the additional feature	11:05:11
22		that the circuits are powered, so meaning that	11:05:14

1	the circuits are not powered off.	11:05:19
2	Q And the district court's preliminary	11:05:26
3	construction describes the mobile station as	11:05:30
4	"waiting to send." Do you see that?	11:05:32
5	A Yes.	11:05:35
6	Q And under your interpretation "having	11:05:38
7	nothing to transmit or receive," does that	11:05:43
8	convey the same concept?	11:05:47
9	A Yes, I think it would convey the same	11:05:52
10	concept, especially when you consider modern	11:05:53
11	transceivers are sending and receiving all the	11:05:57
12	time. So it would be understood if you're	11:06:00
13	waiting to send, you would also be waiting to	11:06:04
14	receive.	11:06:06
15	Q Did you also consider the district	11:06:23
16	court's Markman hearing transcript?	11:06:25
17	A No, I didn't. I think the extent of	11:06:27
18	what I reviewed was just what we're seeing on	11:06:30
19	this document.	11:06:33
20	Q Is there any reason why the district	11:06:36
21	court's preliminary construction should not be	11:06:38
22	adopted by the PTAB?	11:06:41

1	A	I have no opinion one way or the	11:06:44
2		other on that.	11:06:46
3	Q	If the PTAB adopted the district	11:06:50
4		court's construction, would that change any of	11:06:55
5		your opinions?	11:06:56
6	A	No, it would not change my opinion.	11:06:57
7	Q	So let's turn now to the Institution	11:07:10
8		Decision, which I think is Exhibit 5. Let me	11:07:11
9		know when you have that up.	11:07:18
10	A	Okay. I have it up on the first	11:07:23
11		page.	11:07:26
12	Q	So you understand that the	11:07:38
13		Institution Decision offered a preliminary	11:07:39
14		construction of the term "idle power	11:07:41
15		consumption," right?	11:07:44
16	A	Yes, I believe it did.	11:07:45
17	Q	And it is on page 25 if you wanted to	11:07:47
18		reference it. And it says that "We	11:07:53
19		preliminarily interpret 'idle power consumption'	11:08:04
20		as including power consumption during which the	11:08:08
21		transceiver may be waiting to send data, whether	11:08:11
22		the transceiver is on or off."	11:08:14

1	Do you see that?	11:08:15
2	A Yes, I do.	11:08:21
3	Q So under the Institution Decision	11:08:24
4	construction, the transceiver can be powered off	11:08:32
5	and still be within the scope of idle power	11:08:35
6	consumption, correct?	11:08:38
7	A Yeah, I think that would be fair. I	11:08:45
8	would point out it just says that the	11:08:46
9	transceiver is off. It doesn't specifically say	11:08:48
10	the transceiver is powered off. So it is	11:08:52
11	understood, and I think some of the prior art	11:08:54
12	documents show that when the transceiver is off,	11:08:57
13	it could still be consuming some power through	11:09:00
14	leakage current.	11:09:03
15	Q So you're drawing a distinction	11:09:12
16	between "off" and "powered off"; is that fair?	11:09:14
17	A Yes. I think you have to look at the	11:09:17
18	context. But powered off may involve less power	11:09:18
19	than something simply being disabled or shut off	11:09:24
20	or saying that a transceiver is off. Sometimes,	11:09:28
21	within the context, it might mean that it is	11:09:32
22	disabled but still has some leakage current.	11:09:34

1	Q	Though the construction actually says	11:10:00
2		that the transceiver is off.	11:10:02
3	A	Right.	11:10:03
4	Q	Right?	11:10:06
5	A	Right.	11:10:06
6	Q	And so under that circumstance, there	11:10:06
7		is no leakage current, right?	11:10:09
8	A	Well, not necessarily. It depends on	11:10:11
9		how it is turned off. Off just might mean not	11:10:13
10		transmitting. But off might also mean fully	11:10:16
11		powered down or fully powered off. So I	11:10:20
12		think -- I think all of that would be within the	11:10:23
13		scope. I mean, it also says it could be powered	11:10:25
14		on. So I think basically the construction here	11:10:27
15		basically allows any amount of power to be used	11:10:31
16		by the transceiver. But, yeah, I mean, I would	11:10:35
17		agree that it -- that could include the power	11:10:38
18		being completely off as well and not --	11:10:41
19	Q	If the power is completely off, is	11:10:46
20		there any leakage current?	11:10:48
21	A	Well, it depends on how it is off,	11:10:50
22		right? So you could have, like, each current --	11:10:52

1	even if the power supply is cut off, there could	11:10:55
2	still be some leakage current. You may have to	11:10:59
3	take additional steps to stop the leakage	11:11:02
4	current.	11:11:05
5	Q Let's say the mobile station is	11:11:06
6	powered off in a way that it is --	11:11:09
7	THE COURT REPORTER: I'm sorry. Can	11:11:13
8	we go off the record for a second?	11:11:13
9	MR. BROWAND: Sure.	11:11:13
10	DR. COOK: Sure.	11:11:13
11	THE VIDEOGRAPHER: We are going off	11:11:22
12	the record at 11:11 a.m.	11:11:23
13	(A recess was taken.)	11:11:24
14	THE VIDEOGRAPHER: We are back on the	11:22:35
15	record at 11:22.	11:22:38
16	BY MR. BROWAND:	11:22:41
17	Q Dr. Valenti, let's say that the	11:22:46
18	mobile station is powered off and also in a way	11:22:49
19	that the battery is completely drained with	11:22:56
20	respect to the mobile station. In that	11:23:00
21	circumstance, is there still any leakage	11:23:04
22	current?	11:23:07

1 A No, there should not be. 11:23:07

2 Q And if the mobile station is powered 11:23:11

3 off and the battery is completely drained, could 11:23:15

4 there still be idle power consumption within the 11:23:32

5 scope of the Institution Decision construction? 11:23:36

6 A No. I don't think that there would 11:23:43

7 be because at that point it would not be waiting 11:23:44

8 to send or receive data, for instance. 11:23:49

9 Q Do you agree that the Institution 11:23:51

10 Decision construction of "idle power 11:24:15

11 consumption" is broader than your interpretation 11:24:20

12 because it covers a circumstance where the 11:24:25

13 transceiver is off? 11:24:27

14 A I think it's pretty consistent with 11:24:37

15 my definition. Perhaps the only edge case where 11:24:40

16 it would be broader is the specific case where 11:24:45

17 the transceiver is completely off. But even 11:24:48

18 then, it would have to be drawing some amount of 11:24:51

19 power for it to make sense. Otherwise, there 11:24:55

20 would be no idle power consumption. 11:24:59

21 Q Is there a circumstance where the 11:25:12

22 transceiver is waiting to send and off? 11:25:14

1	A	Waiting to send and off? Well, here	11:25:40
2		I think it would depend on what you mean by	11:25:43
3		"off." So you mean the transceiver is off?	11:25:45
4	Q	Right.	11:25:49
5	A	Yeah, so -- yeah, the transceiver	11:25:49
6		could be off even though it is waiting to send	11:25:52
7		data. And this is certainly true if you have	11:25:54
8		multiple transceivers, for instance, so some of	11:25:57
9		the transceiver chains may be off. Off does not	11:25:59
10		necessarily mean that it is not drawing any	11:26:06
11		power. It just means that it is off.	11:26:08
12	Q	But is there a circumstance where the	11:26:10
13		transceiver is waiting to send and fully powered	11:26:12
14		off?	11:26:14
15	A	Fully powered off? I don't know. I	11:26:16
16		don't know if I really have an opinion there. I	11:26:21
17		don't know, unless you want to rephrase the	11:26:26
18		question.	11:26:28
19	Q	So if it is fully powered off, it is	11:26:29
20		not -- the transceiver is not waiting to send,	11:26:32
21		right?	11:26:35
22	A	If it is fully powered off, I think	11:26:37

1 that would be fair that you would fully power it 11:26:39
2 off at the point that it is no longer wanting to 11:26:44
3 send data, right? So in an idle mode, you would 11:26:46
4 typically have it at least have some power so 11:26:50
5 that it is ready to quickly turn on, right? 11:26:53

6 So, again, you know, I would look at 11:26:55
7 this as when it is in idle mode, it is just not 11:26:58
8 fully powered off, but it could be in any of a 11:27:02
9 continuum amount of power usage states. 11:27:05

10 MR. BROWAND: I'd like to have marked 11:27:17
11 Tabs 7 and 8 as Exhibits 7 and 8. 11:27:19

12 (Valenti Exhibit 7 marked for 11:27:23
13 identification and attached to the transcript.) 11:27:23

14 (Valenti Exhibit 8 marked for 11:27:23
15 identification and attached to the transcript.) 11:27:23

16 Q Dr. Valenti, please let us know when 11:27:47
17 you can see Exhibits 7 and 8. 11:27:49

18 A Okay. I have both exhibits, and they 11:28:13
19 are open. 11:28:15

20 Q So Exhibit 7 is U.S. Patent 11:28:15
21 Application Publication Number 2006/0067263, and 11:28:17
22 we've been calling it the Li reference; is that 11:28:28

1	fair?	11:28:33
2	A Yes, that's correct, Li spelled L-I.	11:28:35
3	Q And this is one of the patent	11:28:40
4	application publications for which you offer	11:28:41
5	opinions in your report, correct?	11:28:44
6	A Yes, it is.	11:28:46
7	Q Exhibit 8 is an article entitled	11:28:56
8	"Adaptive Multi-antenna Power Control in	11:28:58
9	Wireless Networks," correct?	11:29:03
10	A Yes, it is.	11:29:04
11	Q And the first listed author of the	11:29:06
12	article is Mohammad Siam?	11:29:08
13	A Yes, it is.	11:29:13
14	Q And this is another one of the prior	11:29:20
15	art references for which you're offering	11:29:21
16	opinions in your declaration, correct?	11:29:23
17	A Yes, it is.	11:29:25
18	Q Now, you're not relying on Siam for	11:29:26
19	the idle power consumption limitation in the	11:29:33
20	claims, correct?	11:29:36
21	A Well, in part. I mean, if you look	11:29:36
22	at, for instance, Ground 1, it is the	11:29:40

1	combination of Siam with Li, and so you have to	11:29:43
2	kind of look at them together.	11:29:47
3	Q So let's turn to your declaration,	11:30:00
4	which is Exhibit 2. And paragraphs 119 through	11:30:01
5	124 discuss element 25(f), which is the "wherein	11:30:28
6	the control signal is based, at least in part,	11:30:35
7	on an idle power consumption of the mobile	11:30:41
8	station," right?	11:30:46
9	A Correct.	11:30:47
10	Q And in these paragraphs, the only	11:31:30
11	citation to Siam is that -- in paragraph 123,	11:31:36
12	where it says, "Siam teaches an algorithm that	11:31:40
13	expressly takes circuit power into account when	11:31:44
14	selecting between a MIMO and SIMO mode,"	11:31:46
15	correct?	11:31:51
16	A Yes, that's correct. That would be	11:32:26
17	where I relate Siam to the teachings of Li.	11:32:28
18	Q And you agree that taking into	11:32:34
19	account circuit power is the limitation -- the	11:32:40
20	first wherein clause limitation and taking into	11:32:44
21	account idle power is the second wherein clause	11:32:49
22	limitation, right?	11:32:55

1	DR. COOK: Object to the form.	11:32:58
2	A Yeah, I mean, that's the way that the	11:32:59
3	claims are drafted. I think a POSITA would look	11:33:02
4	at this and interpret both claims to relate to	11:33:06
5	circuit power. It is just that the last claim	11:33:10
6	element deals with the circuit power related to	11:33:14
7	idle power consumption. I mean, the idle power	11:33:19
8	consumption is clearly consumption of a circuit.	11:33:23
9	So, necessarily, both relate to circuit power.	11:33:26
10	It is just different kinds of circuit powers.	11:33:29
11	Q Siam doesn't say anything about idle	11:33:37
12	power, right?	11:33:42
13	A Yeah, Siam alone doesn't talk about	11:33:43
14	idle power or idle states. So one would have to	11:33:45
15	look to Li for its teachings on idle power and	11:33:49
16	then look to Siam for its teachings on circuit	11:33:53
17	power generally to appreciate that the circuit	11:33:58
18	power contemplated in Siam could, in fact,	11:34:02
19	include the idle power that is taught in Li.	11:34:06
20	Q So let's actually look at Li. And on	11:34:10
21	page 77, paragraph 119, of your declaration, you	11:34:21
22	say, "Li teaches that 'a station in idle mode	11:34:25

1	waiting for incoming signals may consume	11:34:31
2	approximately 60 percent of its battery	11:34:34
3	energy," Right?	11:34:37
4	A Yes. I'm sorry, could you give me	11:34:39
5	the citation in my report again?	11:34:41
6	Q Paragraph 119.	11:34:43
7	A Yes.	11:35:00
8	Q So in paragraph 119 you say, "Li	11:35:00
9	teaches that 'a station in idle mode waiting for	11:35:04
10	incoming signals may consume approximately	11:35:07
11	60 percent of its battery energy," right?	11:35:10
12	A Right, that is what Li says.	11:35:13
13	Q Do you agree with Li's statement that	11:35:16
14	"a station in idle mode waiting for incoming	11:35:18
15	signals may consume approximately 60 percent of	11:35:21
16	its battery energy"?	11:35:24
17	A I think it is reasonable if you	11:35:27
18	consider what I believe Li is referencing, which	11:35:30
19	would be a reduction in circuit power, which	11:35:36
20	would account for some of that, but there may be	11:35:38
21	some other factors contributing to that battery	11:35:41
22	energy because it does say it is "a station in	11:35:44

1 idle mode waiting for incoming signals." So it
2 would imply that that would be the energy in the
3 entire station, so it may include perhaps some
4 controllers and things like that that might not
5 necessarily be considered circuit power.

6 Q And the reason why it may consume
7 60 percent of its battery energy in idle mode is
8 because circuitry and controllers are powered
9 during idle mode, right?

10 A Yes. I think it is fair enough that
11 something is powered because it is consuming
12 60 percent of the battery energy.

13 I think the main takeaway from this
14 statement is that when the station is in idle
15 mode, because it is not transmitting, it is
16 consuming its full amount of power. So it is
17 something less than that, and that something
18 less than that would be due, at least in part,
19 to idling circuits.

20 Q Now, there is only one reference to
21 an idle mode in Li and that is this sentence
22 we've been talking about, right?

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11:36:39

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11:36:47

11:36:48

11:36:51

11:36:58

11:37:00

11:37:04

1 A Yes, I believe there is only one 11:37:17
2 reference to idle mode in Li. 11:37:19

3 Q So Li teaches that a station may send 11:37:25
4 a request to switch from a SISO or MISO 11:37:30
5 operating mode to a SIMO or MIMO operating mode, 11:37:35
6 right? 11:37:41

7 A Yes, that's what it contemplates in 11:37:52
8 its example. 11:37:55

9 Q So, for example, Li describes how a 11:37:59
10 media access control processor can be arranged 11:38:02
11 to receive a physical layer convergence 11:38:06
12 procedure protocol data unit, right? 11:38:11

13 A Yes. 11:38:19

14 Q And Li describes how, in response to 11:38:20
15 the received physical layer convergence 11:38:23
16 procedure protocol data unit, the media access 11:38:28
17 control processor outputs a receiver control 11:38:33
18 signal instructing the mobile station to switch 11:38:37
19 its mode, right? 11:38:40

20 A Yes, that is what is described in an 11:38:43
21 embodiment of the patent. 11:38:46

22 Q Now, nowhere does Li provide any 11:38:51

1	criteria for determining when to -- mode	11:38:53
2	switching should occur, correct?	11:38:56
3	A Yeah, I think it is fair enough to	11:38:59
4	say that it doesn't explicitly recite criteria	11:39:01
5	for doing the mode switching, but it does	11:39:07
6	suggest reasons for doing that, as is	11:39:10
7	articulated in, for instance, paragraph 18 that	11:39:14
8	would include idle mode power that we discussed	11:39:17
9	before and also taking into account the	11:39:21
10	differing powers used when multiple antennas are	11:39:25
11	active. So it at least suggests that, but, you	11:39:30
12	know, I would agree that it doesn't explicitly	11:39:32
13	recite it.	11:39:36
14	Q Now, it doesn't identify any inputs	11:39:37
15	used in determining mode switching, right?	11:39:40
16	A Right. I mean the mode switching is	11:39:46
17	embodied by that PLCP data unit, but it doesn't	11:39:49
18	explicitly recite how the command and the PLCP	11:39:57
19	data unit is determined.	11:40:03
20	Q And it doesn't identify any variables	11:40:04
21	that are used in determining mode switching,	11:40:06
22	right?	11:40:09

1	A	Right. It does not explicitly recite	11:40:11
2		the variables. Again, it does suggest variables	11:40:13
3		that could be used, as we discussed earlier.	11:40:17
4	Q	And it doesn't say anything about	11:40:21
5		using power consumption to determine mode	11:40:23
6		switching, right?	11:40:25
7	A	Right, it does not explicitly recite	11:40:31
8		power consumption. It just does suggest it back	11:40:33
9		in the background, like around paragraphs 18 or	11:40:40
10		19.	11:40:43
11	Q	And Li doesn't say anything about	11:40:44
12		using the power consumption in an idle mode in	11:40:45
13		any way, right?	11:40:49
14	A	Well, there is just a suggestion. So	11:40:54
15		in paragraph 18 it is talking about idle mode,	11:40:57
16		and in paragraph 19 it says that the embodiments	11:41:03
17		solve this problem, "this problem" being the	11:41:07
18		consumption in idle mode. But that would be the	11:41:11
19		extent of Li's consideration of idle mode.	11:41:14
20	Q	You agree that Li does not disclose	11:41:33
21		the claim limitation "wherein the control signal	11:41:36
22		is based, at least in part, on a power	11:41:40

1 consumption of the first and second circuitry"?

11:41:43

2 A So I think my testimony is that Li
3 and Siam together consider the control signal
4 being based on the power consumption of the
5 first and second circuitry. I think your
6 question is about Li alone, and I think I would
7 agree that Li does not disclose it. As we
8 discussed earlier, it may suggest it, but it
9 doesn't disclose it alone.

11:42:29

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10 Q So you're relying on Siam for the
11 claim limitation "wherein the control signal is
12 based, at least in part, on a power consumption
13 of the first and second circuitry," right?

11:42:51

11:42:56

11:42:59

11:43:02

14 A Well, I'm not relying on Siam alone.
15 I mean, it is a combination of Li and Siam. But
16 the important feature of that claim element is,
17 of course, in Siam.

11:43:06

11:43:08

11:43:13

11:43:17

18 Q Siam doesn't disclose a mobile
19 station, right?

11:43:22

11:43:26

20 A I believe Siam is disclosing a mobile
21 station. I mean, it is about wireless
22 communications. So certainly the transmitter

11:44:01

11:44:03

11:44:05

1 and/or receiver could be a mobile station. 11:44:08

2 Q Well, Siam is just a paper about a 11:44:11

3 protocol or a wireless network, correct? 11:44:22

4 A Siam is an academic paper. So to the 11:44:31

5 extent that your question is asking about 11:44:36

6 whether Siam, you know, recites all the parts of 11:44:39

7 a mobile station, then yes, I would agree with 11:44:42

8 that. But it does, of course, inherently 11:44:46

9 include a mobile station because it is talking 11:44:50

10 about communications that would require a 11:44:53

11 station that would include a transmitter or 11:44:56

12 receiver, which would be a mobile station. 11:44:58

13 Q But none of those features are 11:45:06

14 actually set forth in Siam. They are just -- it 11:45:08

15 is really just talking about the protocol 11:45:11

16 itself, correct? 11:45:13

17 DR. COOK: Object to the form. 11:45:16

18 A Well, the protocol, of course, has to 11:45:17

19 run on devices. So in order for there to be a 11:45:20

20 protocol, there has to be mobile devices. So I 11:45:23

21 think it is inherent in Siam that there is a 11:45:26

22 mobile station, and, of course, those that would 11:45:29

1 be skilled in the art at the time would 11:45:33
2 understand and appreciate what that mobile 11:45:37
3 station would be and the components that it 11:45:39
4 would contain therein. 11:45:42

5 Q I mean, the protocol could just be 11:45:44
6 running on a computer, correct? 11:45:46

7 A I don't know if that would make 11:45:52
8 sense. I mean, this is a protocol that's 11:45:53
9 intended to be run over a wireless channel. It 11:45:56
10 includes factors that relate to wireless 11:45:59
11 channels, such as path loss and transmitter 11:46:03
12 power and things like that. So to be realized 11:46:06
13 in its intended form, it would have to be run 11:46:10
14 over a wireless channel using mobile stations. 11:46:13

15 Q Is there any evidence in Siam that 11:46:26
16 that was actually done, or was this all just 11:46:28
17 done on a computer? 11:46:31

18 A Well, I think Siam's numerical 11:46:32
19 results were all done on a computer as a 11:46:35
20 simulation. I don't think there is any 11:46:39
21 requirement for it to have an over-the-air test, 11:46:42
22 if you will, just as like the '120 patent spec 11:46:45

1	itself doesn't make reference to any testing or	11:46:50
2	proof-of-concept, over-the-air transmissions.	11:46:53
3	Q Let's go back to your declaration,	11:47:13
4	Dr. Valenti. And Ground 1 starts on page 52.	11:47:14
5	Do you see that?	11:47:29
6	A (Witness reviewing document.)	11:47:30
7	Q Let me know when you're there.	11:48:11
8	A Oh, yeah, sorry. I'm there.	11:48:13
9	Q Okay. And you see the heading there.	11:48:15
10	It says that "A POSITA would have been motivated	11:48:16
11	to combine Li's teaching with Siam's teachings."	11:48:21
12	A Yes.	11:48:24
13	Q Are all of your motivations to	11:48:25
14	combine Li and Siam set forth in this section of	11:48:29
15	your declaration?	11:48:36
16	A These would express my opinions	11:48:51
17	related to motivation to combine. There may be	11:48:53
18	more motivations to combine than what I have	11:48:57
19	written here. But I think what I have written	11:49:00
20	is sufficient to show a motivation to combine.	11:49:02
21	Q You did not withhold from your	11:49:05
22	declaration any of the reasons why you believe a	11:49:07

1 POSITA would have been motivated to combine Li 11:49:10
2 and Siam, right? 11:49:13

3 A I am not aware of withholding any 11:49:18
4 opinions that I had at the time. 11:49:19

5 Q And are you aware of any further 11:49:21
6 opinions that aren't set forth in this section 11:49:23
7 with respect to the motivations to combine these 11:49:27
8 two references? 11:49:29

9 A No, I'm not aware of any further 11:49:31
10 opinions. Perhaps in the course of our 11:49:33
11 discussion you may ask me to offer opinions that 11:49:36
12 I haven't offered before, but I believe what I 11:49:39
13 have here is complete. 11:49:42

14 Q So we talked about Siam being -- 11:50:22
15 describing a protocol that consumes less energy 11:50:25
16 compared to other known access protocols, this 11:50:30
17 E-BASIC protocol it describes, correct? 11:50:34

18 DR. COOK: Object to the form. 11:50:39

19 A I believe that's what Li discusses. 11:50:41
20 I'm not sure if you and I have discussed that 11:50:43
21 aspect about it yet. 11:50:46

22 Q So let me back up. Li describes -- 11:50:49

1	sorry, Siam describes a protocol that consumes	11:50:53
2	less energy compared to other known access	11:50:56
3	protocols, right?	11:50:58
4	A I believe that's how it characterizes	11:51:18
5	its contribution.	11:51:21
6	Q And Siam is an article that describes	11:51:25
7	some simulations that were performed by the	11:51:33
8	study's authors, correct?	11:51:35
9	A Yes. It includes simulation results	11:51:39
10	as part of the paper.	11:51:42
11	Q And Siam is not disclosing any	11:51:48
12	physical apparatus, correct?	11:51:53
13	A Well, as we discussed, the physical	11:51:57
14	apparatus would be inherent to systems that it	11:52:01
15	is describing. And I think a person of ordinary	11:52:04
16	skill would understand what those apparatuses	11:52:08
17	would be, but it doesn't go into any detail	11:52:11
18	about the nature and contents of those	11:52:14
19	apparatuses.	11:52:17
20	Q So let me just try to unpack that.	11:52:19
21	There is no physical apparatus disclosed in	11:52:24
22	Siam, correct?	11:52:31

1	A	Well, there is a disclosure in a	11:52:44
2		model. This would be in Section 3 in, for	11:52:45
3		instance, Section 3.1. It is talking about a	11:52:49
4		system that has multiple antennas. It has	11:52:53
5		multiple transmit antennas and multiple receive	11:52:56
6		antennas. It has a power amplifier because	11:53:00
7		there is a drain efficiency parameter that would	11:53:04
8		relate to a power amplifier. There is a	11:53:07
9		modulator because it is talking about a	11:53:08
10		modulation scheme. There is noise, so that	11:53:10
11		would imply there is a receiver. There is a	11:53:14
12		distance between transmitter and receiver, so	11:53:16
13		there is some sort of a link there.	11:53:19
14		So it is disclosing the components of	11:53:20
15		what you would expect from a wireless link	11:53:23
16		between two physical devices.	11:53:26
17	Q	And you understand these are all, you	11:53:39
18		know, sort of hypothetical constructs that a	11:53:40
19		person of ordinary skill in the art would	11:53:49
20		understand but weren't actually the things that	11:53:51
21		the authors created or used, correct?	11:53:53
22	A	Well, I don't really know one way or	11:53:56

1 the other what the authors may have done as 11:53:59
2 regards to implementation. The paper provides a 11:54:04
3 simulation result, so they at least implemented 11:54:10
4 it in simulation. They may or may not have 11:54:13
5 built a physical realization of the protocols 11:54:16
6 that are described. 11:54:19

7 Q So you could run these simulations as 11:54:22
8 they did, create the results that they did 11:54:26
9 without actually building a physical 11:54:30
10 realization, correct? 11:54:35

11 A Yes, I think it is fair enough to say 11:54:39
12 that the simulation results that are shown in 11:54:41
13 the paper could be done without, for instance, 11:54:44
14 needing an actual radio or transceiver and could 11:54:48
15 be done on a computer. 11:54:52

16 Q And is that your understanding of how 11:54:56
17 they actually generated the results that they 11:54:58
18 obtained? 11:55:03

19 A Yes. My understanding, based on the 11:55:41
20 paper, is they used a simulation platform called 11:55:44
21 CSIM, C-S-I-M, to run their simulations. And 11:55:50
22 I'm not aware of anything beyond a simulation, 11:55:54

1	but they certainly could have done that and	11:55:58
2	maybe not included it in their paper.	11:56:03
3	MR. BROWAND: I'd like to have Tab 9	11:56:06
4	marked as Exhibit 9.	11:56:09
5	(Valenti Exhibit 9 marked for	11:56:10
6	identification and attached to the transcript.)	11:56:10
7	Q Dr. Valenti, let us know when you can	11:56:32
8	view Exhibit 9.	11:56:36
9	A Okay. I have it up.	11:56:41
10	Q Great. And Exhibit 9 is an article	11:56:47
11	entitled "Modulation Optimization under Energy	11:56:51
12	Constraints," and the first author's last name	11:56:56
13	is Cui, and it is spelled C-U-I.	11:57:02
14	Do you see that?	11:57:09
15	A Yes.	11:57:09
16	Q And you recognize this document,	11:57:10
17	correct?	11:57:15
18	A Yes, this is a prior art document	11:57:20
19	that was used, I believe, in Ground 2.	11:57:25
20	Q And you refer to this article as Cui	11:57:29
21	2003, correct?	11:57:36
22	A Yes.	11:57:38

1	Q	Now, in the abstract Cui 2003 states	11:57:46
2		that it teaches methods for selecting "the best	11:57:52
3		modulation strategy to minimize the total energy	11:57:55
4		consumption required to send a given number of	11:57:59
5		bits," right?	11:58:03
6	A	Yes.	11:58:05
7	Q	And the total energy consumption	11:58:15
8		includes the transmission energy and the circuit	11:58:18
9		energy consumption, right?	11:58:21
10	A	Yes, that is correct.	11:58:23
11	Q	And on the second page, the reference	11:58:26
12		describes transceiver circuitry that works on a	11:58:36
13		multi-mode basis, right?	11:58:41
14	A	Yes.	11:58:43
15	Q	The modes that are in Cui are sleep	11:58:45
16		mode, active mode and transient mode, correct?	11:58:50
17	A	Correct. That's what Cui calls these	11:58:53
18		modes.	11:58:59
19	Q	And Cui 2003 does not mention an idle	11:59:00
20		mode, correct?	11:59:04
21	A	It doesn't use the term "idle mode."	11:59:05
22	Q	Cui states that "when there is a	11:59:23

1	signal to transmit, all circuits work in active	11:59:25
2	mode," right?	11:59:29
3	A Yes, it says that.	11:59:39
4	Q And in active mode the transceiver	11:59:42
5	may be transmitting bits, correct?	11:59:47
6	A Yes.	11:59:49
7	Q But it doesn't need to be actively	11:59:54
8	transmitting bits, right?	11:59:58
9	A I'm not sure if I follow your	12:00:06
10	question.	12:00:10
11	Q Well, it says the circuits are in	12:00:10
12	active mode when there is a signal to transmit	12:00:13
13	even if they are not transmitting at a	12:00:16
14	particular moment, correct?	12:00:19
15	A I don't know if I can find that. Can	12:00:36
16	you help orient me?	12:00:37
17	Q So right below Figure 2.	12:00:52
18	A Right.	12:00:54
19	Q "When there is a signal to transmit,	12:00:58
20	all circuits work in active mode."	12:01:00
21	A Right.	12:01:03
22	Q That would cover the circumstance	12:01:04

1 where there is a signal to transmit but it is 12:01:07
2 not transmitting at a particular moment, 12:01:12
3 correct? 12:01:14

4 DR. COOK: Object to the form. 12:01:19

5 A I would just read it as "when there 12:01:20
6 is a signal to transmit." So I believe they 12:01:22
7 mean that the signal is being transmitted, and 12:01:27
8 that's the way I understood it. I don't really 12:01:30
9 have an opinion as to whether it could still be 12:01:36
10 in active mode even if it is not transmitting, 12:01:40
11 but that seems a bit inconsistent with their 12:01:43
12 description of active mode. 12:01:47

13 Q So when there is a signal to transmit 12:01:56
14 but it is not transmitting, is it in active mode 12:02:01
15 or sleep mode? 12:02:06

16 A I will ask you to repeat that, but I 12:02:13
17 also would like to add a little bit more to my 12:02:15
18 previous answer. And to answer your earlier 12:02:18
19 question, I believe, in this paper, when it is 12:02:23
20 in active mode, it would always be transmitting. 12:02:27
21 And this comes from Equation 1 because in 12:02:32
22 Equation 1 it recites a variable P_{on} , and it 12:02:36

1 says that that is the active mode power, which 12:02:43
2 is transmission signal power P_t and circuit 12:02:46
3 power. And so the only reason why it would be 12:02:49
4 using transmission signal power P_t is if it was 12:02:52
5 transmitting. 12:02:57

6 So I think Equation 1 clarifies your 12:02:57
7 earlier question, and my apologies if I didn't 12:03:01
8 fully answer it then. But I would interpret Cui 12:03:04
9 here as stating that when it is in active mode, 12:03:10
10 it is transmitting. 12:03:15

11 Q Well, P_t could be zero, and that part 12:03:23
12 of the equation could still be non-zero, 12:03:27
13 correct? 12:03:31

14 A Well, it defines it as the 12:03:31
15 transmission signal power, P_t . I think if it 12:03:34
16 was zero, then it just wouldn't be in the 12:03:38
17 equation. 12:03:40

18 Q Well, no, but there is also the P_{c0} , 12:03:42
19 correct? 12:03:49

20 A Yeah, there is a circuit power there. 12:03:52

21 Q So there could be a circuit power but 12:03:57
22 not a transmission signal power, correct? 12:04:01

1	A	Well, the other thing is there is a	12:04:15
2		variable T_0 that we're ignoring -- or, I'm	12:04:19
3		sorry, T_{on} in Equation 1.	12:04:23
4		And then so if you look at the	12:04:25
5		previous power -- previous column, there is a	12:04:28
6		definition of T_{on} -- this is the last full	12:04:33
7		paragraph in the left column of this page, and	12:04:37
8		it reads, "We assume a node has L bits to	12:04:41
9		transmit with a deadline T . The transceiver	12:04:46
10		spends time T_{on} less than or equal to T to	12:04:50
11		communicate these bits." So here I think it is	12:04:53
12		clearly contemplating transmitting bits during	12:04:58
13		T_{on} .	12:05:03
14	Q	So T_{on} represents the time that it is	12:05:04
15		in the active mode, correct?	12:05:07
16	A	Yes.	12:05:09
17	Q	So it could be in the active mode and	12:05:12
18		not transmitting and still consuming circuit	12:05:17
19		power, correct?	12:05:27
20	A	Well, that contradicts Cui's	12:05:28
21		definition here of "active mode." So it is in	12:05:35
22		active mode. It is transmitting over this time	12:05:39

1	period Ton. And --	12:05:43
2	Q So your interpretation requires	12:05:47
3	reading the words "when there is a signal to	12:05:52
4	transmit" to mean transmitting, correct?	12:05:55
5	DR. COOK: Object to the form.	12:06:04
6	A Well, no. The basis of my answer to	12:06:05
7	this line of questioning is more that last	12:06:06
8	paragraph on the left column of page 2806, where	12:06:09
9	it is saying that it spends time T0 to	12:06:15
10	communicate these bits. So the basis is, okay,	12:06:19
11	Ton is the time that it is in active mode, and	12:06:22
12	if that's the time that it is communicating	12:06:27
13	these bits, then that is what it is doing. It	12:06:29
14	is communicating bits.	12:06:33
15	Q Well, Ton is not equal to the time to	12:06:37
16	communicate the bits. It says less than or	12:06:43
17	equal to the time to communicate the bits,	12:06:45
18	doesn't it?	12:06:49
19	A No, it doesn't. The capital T that I	12:06:50
20	believe you are referring to is a deadline, so	12:06:52
21	that's just --	12:06:55
22	Q So let's -- we're not looking at the	12:06:57

1	right sentence together.	12:06:59
2	A Oh, okay.	12:07:01
3	Q On the left-hand side of page 2806,	12:07:03
4	the last paragraph, the second sentence, says,	12:07:06
5	"The transceiver spends time T_{on} less than or	12:07:12
6	equal to T to communicate these bits," correct?	12:07:18
7	A Right. Yeah, we're looking at the	12:07:25
8	same place. You're not looking at what the	12:07:29
9	definition of T is. So T is not the time spent	12:07:30
10	transmitting. T is a deadline. That's in the	12:07:36
11	previous sentence. "We assume a node has L bits	12:07:38
12	to transmit with a deadline T ."	12:07:42
13	So, really, what's going on here is	12:07:44
14	within a period T , some of that time is spent	12:07:49
15	transmitting bits, and that is T_{on} . And then	12:07:53
16	other parts of the time period T will be used	12:07:55
17	for other purposes, for being in its sleep state	12:08:00
18	or being in its transition state.	12:08:06
19	And this is further clarified in the	12:08:08
20	same paragraph. If you look three lines from	12:08:12
21	the bottom, there is an equation, T equals T_{tr}	12:08:16
22	plus T_{on} plus T_{sp} . So it kind of shows how this	12:08:24

1 deadline T can be occupied by those three 12:08:32

2 different modes completely. 12:08:36

3 Q So all of the time spent in active 12:08:40

4 mode is covered by Ton, correct? 12:08:43

5 A Yes. That would be my interpretation 12:08:46

6 of Ton. I believe it has numerous references, 12:08:51

7 that Ton would be the time that it is in active 12:08:56

8 mode. 12:08:59

9 Q So whenever the system is not in 12:09:00

10 transient mode or sleep mode, the time would be 12:09:04

11 covered by Ton, right? 12:09:09

12 A Well, within this period T. That's 12:09:14

13 what the equation three lines from the bottom of 12:09:17

14 the left column is saying. So, yes, if you look 12:09:21

15 at a transition period, capital T within that, 12:09:24

16 if it is not on or in active mode, then it is in 12:09:27

17 one of the other modes, the transition mode or 12:09:32

18 the sleep mode. 12:09:34

19 Q So Cui 2003 also provides that in 12:09:43

20 sleep mode all circuits in the signal path are 12:09:49

21 shut down for energy saving, right? 12:09:55

22 A Yes. And I think that's in the same 12:10:18

1	paragraph we were looking at. It uses the term	12:10:20
2	"the circuits in the signal path are shut down."	12:10:22
3	Q And it describes the multi-mode	12:10:43
4	operation as providing a significant saving of	12:10:46
5	energy when the sleep mode is deployed, right?	12:10:52
6	A Yes.	12:11:04
7	Q So the objective with deploying the	12:11:06
8	sleep mode is to consume very little energy,	12:11:19
9	correct?	12:11:23
10	A Yes. I think the intent is to reduce	12:11:26
11	the energy consumption by putting the	12:11:28
12	transceiver into a sleep mode.	12:11:32
13	Q So in the sleep mode, the wireless	12:11:37
14	device in Cui 2003 may shut down as many circuit	12:11:39
15	blocks as possible to conserve power, right?	12:11:45
16	A Yeah. I mean, Cui is talking about	12:12:24
17	shutting down circuits for energy savings. I	12:12:26
18	think you used a phrase "as many as possible."	12:12:30
19	Is that a direct quote, and if so, do you want	12:12:34
20	to lead me to it?	12:12:37
21	Q I'll come back to that.	12:13:06
22	A Sure.	12:13:07

1 Q In sleep mode all circuits in the 12:13:07
2 signal path are shut down for energy saving, 12:13:09
3 right? 12:13:13

4 A Yes, that's what he says. And it is 12:13:14
5 saying that it's -- the circuit is in the signal 12:13:15
6 path, and it is saying that it is shut down. 12:13:18

7 Q So that would mean that the 12:13:21
8 transceivers are powered off in sleep mode, 12:13:25
9 right? 12:13:28

10 A Not necessarily. So there may still 12:13:33
11 be some power draw, and there are several 12:13:35
12 reasons for that possible power draw. So one 12:13:38
13 may be -- there could be circuits that are off 12:13:42
14 of the signal path but are still related to 12:13:46
15 communications. So it could be something like a 12:13:49
16 frequency synthesizer or a local oscillator that 12:13:51
17 is still on. 12:13:55

18 And even the ones that are along the 12:13:55
19 sleep -- oh, sorry, along the signal path could, 12:13:57
20 in fact, still have some power applied because 12:14:00
21 it is using the phrase -- using the phrase "shut 12:14:04
22 down," but it doesn't use the phrase "turned 12:14:10

1	off." And I think someone would appreciate --	12:14:12
2	and this is consistent with our earlier	12:14:15
3	discussion that you could have a circuit that is	12:14:20
4	shut down yet still drawing some current and,	12:14:22
5	hence, not be completely off.	12:14:26
6	Q So shut down is like off but not	12:14:27
7	powered off, necessarily?	12:14:29
8	A Yeah, I think it is fair enough that	12:14:32
9	it is in a low power mode. So it would still	12:14:34
10	potentially be drawing some power, but it should	12:14:39
11	be a minimal amount or at least less than the	12:14:42
12	amount that would be used when it is in the	12:14:46
13	active mode.	12:14:47
14	Q Well, I mean, is it fair to think of	12:14:49
15	it like shut down like your computer is shut	12:14:52
16	down, or is it different than that?	12:14:56
17	A Well, "shut down" referring to a	12:14:58
18	computer is more of a process. You shut a	12:15:00
19	computer down, and it goes through a process	12:15:05
20	that eventually leads it to being off. And so	12:15:08
21	here -- and, of course, even when you're	12:15:11
22	shutting your computer down, it is going to kind	12:15:13

1 of reduce its power until it is completely off. 12:15:17

2 So here the shutdown I would 12:15:21

3 interpret -- and I think it's consistent with 12:15:24

4 this paper -- that it is some kind of 12:15:25

5 intermediate power usage state that is not 12:15:28

6 completely off and drawing no power but, of 12:15:31

7 course, not completely on and using full power. 12:15:35

8 Q Do you think that's how a POSITA 12:15:43

9 would interpret the word "shut down" in this 12:15:45

10 article? 12:15:48

11 A Yes, I think so. And I think there's 12:15:50

12 further statements in the paper that would lead 12:15:52

13 them to that conclusion, including, you know, in 12:15:57

14 the paragraph right below Figure 2 that we were 12:16:03

15 looking at. When it is talking about the 12:16:07

16 different modes, the third line says, "When 12:16:12

17 there is no signal to transmit, they work in 12:16:16

18 sleep mode." You know, "work" implies usage of 12:16:19

19 energy. In fact, power is a unit of work. So I 12:16:24

20 think if you work in sleep mode, that that sort 12:16:28

21 of implies that there is still some energy being 12:16:31

22 used. It is not something where it is 12:16:34

1 completely off. 12:16:36

2 And then the other evidence would be 12:16:37

3 in the equations themselves. So there is an 12:16:40

4 equation for the sleep power, P_{sp} , in 12:16:46

5 Equation 1. And yes, I mean, the paper does 12:16:52

6 later contemplate a case where the signal power 12:16:57

7 is zero, but it also allows for having sleep 12:17:01

8 power to be non-zero. 12:17:04

9 Q And that's what Cui -- Cui teaches 12:17:29

10 that in sleep mode the power consumption is 12:17:33

11 dominated by the leaking current of the 12:17:37

12 switching transistors if the circuitry is 12:17:40

13 properly designed, right? 12:17:43

14 A Correct. Yeah, he makes that 12:17:45

15 statement two paragraphs above Equation 3. 12:17:47

16 Q And then he also sets the power in 12:17:59

17 sleep mode at zero, right? 12:18:05

18 A Yes. Beginning in that paragraph, he 12:18:12

19 sets it to zero, and the rationale being that 12:18:15

20 the leaking current is approximately zero but 12:18:19

21 not exactly equal to zero. So I think he is 12:18:22

22 doing this as kind of an approximation to kind 12:18:26

1 of simplify the remainder of the paper. 12:18:29

2 Q And zero is a lot different than 12:18:33

3 60 percent, right? 12:18:36

4 A Oh, yeah, I would agree with that. 12:18:40

5 But recall the 60 percent in the other reference 12:18:42

6 could, in fact, include power usage beyond just 12:18:45

7 that of the communication circuits. So I think 12:18:49

8 there is still some consistency between these 12:18:53

9 references in that -- in both cases when the -- 12:18:57

10 when the transceivers are in a low power mode, 12:19:00

11 whether that be idle mode or sleep mode, it is 12:19:06

12 consuming a small amount of current but not a 12:19:10

13 zero amount of current. So you still have some 12:19:14

14 minimal power usage. 12:19:17

15 Q Dr. Valenti, I'm going to have to 12:19:19

16 strike that as non-responsive. You know, my 12:19:22

17 question was, zero is a lot different than 12:19:24

18 60 percent, and I would like a yes or no answer 12:19:26

19 to that. 12:19:28

20 A Okay. 12:19:29

21 DR. COOK: Objection. 12:19:29

22 THE WITNESS: Sorry. 12:19:30

1	A	If you just want a straight answer to	12:19:30
2		zero versus .6, I mean, they are different by	12:19:36
3		.6.	12:19:41
4	Q	So in Cui 2003, the power consumed in	12:19:46
5		sleep mode is limited to the leaking current,	12:19:51
6		correct?	12:19:55
7	A	Well, it says it "is dominated by the	12:19:57
8		leaking current." I don't think it says it is	12:19:59
9		exclusively leaking current. And it also says,	12:20:01
10		"if the circuitry is properly designed."	12:20:04
11		So, for instance, you know, if the	12:20:06
12		circuitry is not properly designed, there could	12:20:08
13		be other sources of power consumption.	12:20:11
14	Q	You would agree with Cui's 2003's	12:20:51
15		setting the sleep mode power to zero?	12:20:56
16	A	I'm not sure what you mean by	12:21:01
17		"agree."	12:21:02
18	Q	Well, I think Cui says that the	12:21:06
19		leaking current is about zero compared with the	12:21:10
20		active mode, and so we set the sleep mode power	12:21:13
21		to zero. Is that a reasonable interpretation of	12:21:17
22		what a POSITA would do?	12:21:20

1	DR. COOK: Object to the form.	12:21:25
2	A Well, I think what he is doing is he	12:21:26
3	is making a simplification and setting it to	12:21:28
4	zero. I think, given the conditions that he is	12:21:31
5	reciting, with small leaking current, that, you	12:21:35
6	know, it is reasonable to in certain situations	12:21:39
7	set it to zero. But, you know, taking a step	12:21:42
8	back, Cui does allow for it to be non-zero. So,	12:21:45
9	you know, it depends on the situation. You	12:21:49
10	could use it set to zero or not.	12:21:52
11	Q So we haven't really talked about	12:21:57
12	transient mode. In transient mode, the circuits	12:22:00
13	are switched from sleep mode to active mode and	12:22:05
14	vice versa. Is that your understanding?	12:22:09
15	A Yes.	12:22:11
16	Q So what has to happen to the circuits	12:22:17
17	for them to be switched from sleep mode to	12:22:20
18	active mode?	12:22:24
19	A Well, presumably, because we are	12:22:38
20	talking about going from a low energy or power	12:22:40
21	state to a higher power state, the process of	12:22:43
22	going through this transient state would include	12:22:48

1	powering up the circuits, so increasing the	12:22:51
2	power applied to the circuits, certainly	12:22:55
3	increasing the power applied to, for instance,	12:22:57
4	the power amplifier, which would be transmitting	12:23:00
5	the RF signal. And there may be other kinds of	12:23:04
6	circuits that may need to be brought online that	12:23:07
7	might not have been enabled, such as the phase	12:23:10
8	lock loop.	12:23:15
9	Q So switching from sleep mode to	12:23:16
10	active mode would require powering on the	12:23:17
11	circuits that were powered off, correct?	12:23:22
12	A I would probably characterize that as	12:23:26
13	powering up the circuits that were shut down in	12:23:28
14	order to use the language of Cui.	12:23:33
15	Q Let's go to Exhibit 5, which is the	12:24:13
16	Institution Decision. Let me know when you have	12:24:16
17	it up.	12:24:18
18	A Okay.	12:24:20
19	Q And, if you would, I'd like you to	12:24:22
20	turn to page 40. 4-0.	12:24:24
21	A Okay. I'm at 40.	12:24:58
22	Q So on page 40 it states, "Cui 2003	12:25:03

1 teaches a multi-mode operation that provides 12:25:09
2 significant energy savings by placing the 12:25:12
3 transceiver in sleep mode when the transceiver 12:25:15
4 is waiting to send data." 12:25:19

5 Do you see that? 12:25:21

6 A Yes. 12:25:22

7 Q Do you agree that in sleep mode the 12:25:24
8 transceiver is waiting to send data? 12:25:34

9 A Yes, I do. 12:25:39

10 Q In sleep mode the transceiver could 12:26:00
11 be powered off, correct? 12:26:08

12 A Well, I think we discussed this. In 12:26:16
13 sleep mode, Cui discloses it as having circuits 12:26:19
14 that are shut down. I suppose shut off could be 12:26:24
15 a possibility when it is shut down, but I don't 12:26:30
16 think it necessarily has to be completely off to 12:26:32
17 be in sleep mode. 12:26:36

18 Q There's only three states in Cui, 12:26:41
19 right, active, transient and sleep? 12:26:44

20 A Correct. 12:26:47

21 Q Sleep mode would cover times when the 12:26:50
22 mobile station is completely off, correct? 12:26:53

1	A	No. I believe the mobile station is	12:26:55
2		still on when it is in sleep mode. It wouldn't	12:27:00
3		really make sense to have a mobile station that	12:27:03
4		is completely off and in a sleep mode because	12:27:08
5		then it would not be part of that period capital	12:27:10
6		T, which is the time devoted to -- or the	12:27:13
7		deadline devoted to transmission.	12:27:15
8	Q	Maybe I wasn't saying myself	12:27:25
9		correctly.	12:27:29
10		Sleep mode would cover times when the	12:27:31
11		transceiver is off, correct?	12:27:33
12	A	Well, when it is in sleep mode, as we	12:27:34
13		discussed, the circuits in the circuit path are	12:27:40
14		shut down. And so that's the definition. I	12:27:45
15		suppose if the circuit were completely turned	12:27:50
16		off and not having any power, it would still	12:27:54
17		fall within sleep mode as long as it is within	12:27:57
18		that total time T for transmission. But I don't	12:28:01
19		think that's necessary. It certainly doesn't	12:28:05
20		need to be completely off to be in sleep mode.	12:28:08
21	Q	Sleep mode would cover that	12:28:12
22		circumstance, though, correct? Wouldn't it?	12:28:14

1	A	"That circumstance" being?	12:28:16
2	Q	Completely turned off.	12:28:26
3	A	Well, my reading of Cui is when it is	12:28:31
4		in sleep mode, it -- the circuits are not	12:28:34
5		necessarily completely off. I suppose they	12:28:38
6		could be, but I don't think having them	12:28:40
7		completely off is necessary for Cui.	12:28:43
8	Q	I mean, it would accomplish power	12:28:55
9		savings, correct?	12:28:59
10	A	What do you mean by "it"?	12:29:01
11	Q	Being completely turned off.	12:29:06
12	A	Sure, I would agree to the extent	12:29:08
13		that you mean the circuits. If you were to turn	12:29:10
14		circuits off, that does accomplish a power	12:29:15
15		savings, if you're able to turn them off.	12:29:18
16		The fact is, with this type of	12:29:20
17		circuitry, it is actually kind of difficult to	12:29:21
18		have a circuit be completely turned off, mostly	12:29:24
19		owing to the current drain problem.	12:29:27
20	Q	Would you agree that if a mobile	12:30:01
21		station is using 60 percent of its battery	12:30:03
22		energy, most of its circuits are powered on?	12:30:05

1	A	Well, if you're talking about the	12:30:15
2		entire mobile station, including the screen and	12:30:17
3		processor and things like that, if it were	12:30:21
4		consuming 60 percent of its power, I think that	12:30:26
5		would imply that it has got 60 percent, roughly,	12:30:29
6		of its circuits on throughout the entire mobile	12:30:32
7		device.	12:30:37
8	Q	A mobile station that is powered off	12:30:52
9		would not be consuming 60 percent of its battery	12:30:55
10		energy, right?	12:30:59
11	A	Right. I would agree that if the	12:30:59
12		mobile station were completely off, that it	12:31:01
13		would be consuming zero percent. If it truly	12:31:03
14		were off, it would be consuming zero percent of	12:31:09
15		its power.	12:31:12
16	Q	And if a mobile station were in sleep	12:31:13
17		mode, it wouldn't be consuming 60 percent of its	12:31:15
18		battery energy either, right?	12:31:19
19	A	Oh, sure it could. So if you're	12:31:24
20		talking about the mobile station, absolutely,	12:31:26
21		because there are so many other things on your	12:31:28
22		mobile station that consume power, most notably,	12:31:30

1 the screen and also a processor. So if you're 12:31:33
2 playing a game or something on your iPhone, 12:31:37
3 then, yeah, it could certainly be consuming a 12:31:39
4 significant amount of power and not 12:31:42
5 communicating and possibly in some kind of an 12:31:46
6 idle or sleep mode. 12:31:49

7 Q And in Cui 2003, the reason why sleep 12:32:04
8 mode is able to conserve energy is because it is 12:32:07
9 not consuming significant processing and 12:32:09
10 transceiver power, correct? 12:32:15

11 A Yes, I think that's fair enough. So 12:32:16
12 in Cui, when it is in the sleep mode, it is not 12:32:19
13 consuming significant resources, and so it is 12:32:24
14 consuming much less power. 12:32:27

15 MR. BROWAND: I think we're at a good 12:32:38
16 point for a break. 12:32:39

17 THE WITNESS: Okay. 12:32:40

18 MR. BROWAND: Let's go off the 12:32:44
19 record. 12:32:45

20 THE VIDEOGRAPHER: We are going off 12:32:45
21 the record at 12:32. 12:32:46

22 (A luncheon recess was taken.) 12:32:48

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

101

1	THE VIDEOGRAPHER: We are back on the	01:17:52
2	record at 13:17.	01:17:54
3	BY MR. BROWAND:	01:17:55
4	Q Dr. Valenti, we have talked a bunch	01:18:02
5	about the Li reference. I just want to ask a	01:18:05
6	couple more questions about it. You know, Li	01:18:08
7	discusses this idle mode in one sentence and	01:18:10
8	identifies that as a problem; is that fair?	01:18:15
9	DR. COOK: Object to the form.	01:18:23
10	A I'm sorry, I'm actually looking for	01:18:40
11	the Li reference. I'm not sure if I still have	01:18:43
12	it up.	01:18:47
13	Q Let me know when you have it up.	01:18:52
14	DR. COOK: It's Exhibit 7, if that	01:19:07
15	helps.	01:19:09
16	THE WITNESS: Yeah, it does. I must	01:19:12
17	have accidentally closed it. Okay, I have it	01:19:15
18	open.	01:19:23
19	A So to answer your question, yeah, the	01:19:32
20	power it is referring to is that of power	01:19:34
21	consumption in general. And it characterizes	01:19:37
22	the idle mode using 60 percent of battery energy	01:19:42

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1	as an example of the problem of power	01:19:46
2	consumption.	01:19:49
3	Q And in that passage Li is basically	01:19:56
4	saying that idling consumes significant	01:19:59
5	processing and transceiver power if it takes up	01:20:01
6	60 percent of the battery energy, correct?	01:20:06
7	DR. COOK: Object to the form.	01:20:11
8	A Well, I don't know if I would draw	01:20:13
9	that exact conclusion. It is talking about	01:20:15
10	60 percent of battery energy, but as we	01:20:18
11	discussed earlier, that may include more than	01:20:20
12	just transceiver. I think what it is trying to	01:20:23
13	get at is just that, yeah, there is a	01:20:26
14	non-negligible energy consumption when idling	01:20:29
15	and there is a desire to improve that.	01:20:32
16	Q But you agree that idling consumes	01:20:37
17	significant processing and transceiver power,	01:20:41
18	right?	01:20:46
19	A Not necessarily. It may. It maybe	01:20:48
20	depends on how things are implemented. So it	01:20:50
21	may consume some non-negligible power, but it	01:20:53
22	may also consume a small amount of power.	01:20:57

1	Q	Well, you said that before, right,	01:21:10
2		that idling consumes significant processing and	01:21:12
3		transceiver power, right?	01:21:16
4	A	I don't know if I used the word	01:21:20
5		"significant." I mean, it is non-zero. It is	01:21:21
6		non-negligible. I don't know if it's	01:21:27
7		significant.	01:21:30
8		MR. BROWAND: So let's have Tab 10	01:21:31
9		added as Exhibit 10.	01:21:33
10		(Valenti Exhibit 10 marked for	01:21:34
11		identification and attached to the transcript.)	01:21:34
12		REMOTE TECH: It should be in there	01:21:43
13		now, Counsel.	01:21:43
14	Q	Dr. Valenti, let us know when you can	01:21:43
15		see Exhibit 10.	01:21:58
16	A	Okay, I have it up.	01:22:18
17	Q	And Exhibit 10 is an article entitled	01:22:19
18		"Position-Based Relaying with Hybrid-ARQ for	01:22:22
19		Efficient Ad Hoc Networking." And you're an	01:22:28
20		author on this article, correct?	01:22:32
21	A	Yes, correct.	01:22:33
22	Q	And this article is from 2004, 2005.	01:22:36

1	Do you see that?	01:22:40
2	A Correct.	01:22:42
3	Q And in this article you're discussing	01:22:43
4	ways to basically conserve energy and wireless	01:22:46
5	networks; is that fair?	01:22:50
6	A Yes, I think that's fair.	01:22:51
7	Q And then in the "Introduction," you	01:22:53
8	have a sentence that states, "Another way to	01:22:57
9	conserve energy is to periodically put each	01:23:03
10	radio into a sleep mode, since listening to idle	01:23:06
11	channels consumes significant processing and	01:23:10
12	transceiver power."	01:23:13
13	Do you see that?	01:23:14
14	A Yes.	01:23:15
15	Q So this sentence is distinguishing	01:23:18
16	sleep mode from idling, right?	01:23:20
17	A No. It is only talking about what is	01:23:25
18	called "sleep mode" in this paper. I don't	01:23:30
19	think this paper actually uses anything called	01:23:33
20	"idle mode."	01:23:36
21	Q So sleep mode is a way to conserve	01:23:38
22	energy, according to what you're saying,	01:23:40

1	correct?	01:23:42
2	A Correct, yeah, it is a way to	01:23:42
3	conserve.	01:23:44
4	Q And listening to idle channels	01:23:45
5	consumes significant processing and transceiver	01:23:47
6	power, correct?	01:23:51
7	A Right. Listening to idle channels	01:23:52
8	would consume energy. Of course, idle channel	01:23:54
9	is not meant to mean the same thing as idle	01:23:59
10	mode. Idle channel is a channel with no	01:24:01
11	activity on it.	01:24:06
12	Q You mean no transmitting?	01:24:08
13	A No activity, yes, so no transmissions	01:24:09
14	or reception. It is listening, so it would be	01:24:13
15	listening for signals.	01:24:16
16	Q It's like camping, right?	01:24:18
17	A I don't know the analogy.	01:24:21
18	Q Oh, I'm sorry, have you ever heard of	01:24:24
19	camping on a cell?	01:24:26
20	A Yeah, camping on a cell, yeah, that's	01:24:28
21	kind of complicated. I mean, you still have to	01:24:31
22	wake up to listen for pages and things like	01:24:34

1	that.	01:24:37
2	Q So camping on a cell is not like	01:24:39
3	idling?	01:24:43
4	A No. Well, even when you're camping	01:24:44
5	on a cell, you go in and out of active receive	01:24:48
6	mode through what's called a DRX cycle. So you	01:24:51
7	have, like, a paging cycle where you need to	01:24:55
8	actually wake up to listen to potential incoming	01:24:58
9	pages.	01:25:02
10	MR. BROWAND: Let's look -- if I	01:25:09
11	could have Tab 11 added as Exhibit 11.	01:25:11
12	(Valenti Exhibit 11 marked for	01:25:14
13	identification and attached to the transcript.)	01:25:14
14	REMOTE TECH: This one is taking a	01:25:38
15	little bit longer to upload, but it should be	01:25:40
16	there in just a second.	01:25:41
17	THE WITNESS: I see it in the share.	01:25:43
18	I just need to download it.	01:25:44
19	Okay, I have it.	01:25:46
20	Q So Exhibit 11 is another article, and	01:25:46
21	which you have coauthored, entitled, "Hybrid-ARQ	01:26:14
22	Based Intra-Cluster Geographic Relaying."	01:26:15

1 Do you see that? 01:26:19

2 A Yes. 01:26:20

3 Q And this article has a sentence very 01:26:25

4 similar to the one that we looked at in the 01:26:27

5 previous article. It is actually the first 01:26:28

6 sentence of the introduction, and it reads, "A 01:26:29

7 common technique for saving energy in wireless 01:26:35

8 sensor networks is to periodically put each 01:26:38

9 radio into a sleep mode, since listening to idle 01:26:41

10 channels consumes considerable processing and 01:26:44

11 receiver power." 01:26:46

12 Do you see that? 01:26:49

13 A Correct, yes. 01:26:50

14 Q So, again, you are differentiating 01:26:51

15 between a sleep mode and listening to idle 01:26:54

16 channels, correct? 01:26:56

17 A Yes, correct. 01:26:57

18 MR. BROWAND: If we could have Tab 12 01:27:28

19 added as Exhibit 12. 01:27:30

20 (Valenti Exhibit 12 marked for 01:27:31

21 identification and attached to the transcript.) 01:27:31

22 REMOTE TECH: It should be in there 01:27:34

1	now.	01:27:34
2	Q Let us know when you can see	01:27:34
3	Exhibit 12, Dr. Valenti.	01:27:54
4	A Okay, I have that exhibit.	01:28:06
5	Q And this is another article and which	01:28:09
6	you coauthored, and this one is entitled,	01:28:11
7	"Geographic Random Forwarding with Hybrid-ARQ	01:28:13
8	for Ad Hoc Networks with Rapid Sleep Cycles."	01:28:18
9	Do you see that?	01:28:21
10	A Yes.	01:28:22
11	Q And, again, in the "Introduction"	01:28:25
12	there is a similar sentence to the other two	01:28:28
13	articles, and it reads, "Perhaps the most	01:28:31
14	effective way to conserve energy is to	01:28:34
15	periodically put each radio into a sleep mode,	01:28:37
16	since listening to idle channels consumes	01:28:39
17	significant processing and transceiver power."	01:28:43
18	Do you see that?	01:28:46
19	A Yes.	01:28:47
20	Q So, again, your point is that you can	01:28:50
21	conserve energy by putting radios into a sleep	01:28:52
22	mode?	01:28:57

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

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1	A	Correct.	01:28:58
2	Q	And that is contrasted with listening	01:29:00
3		to idle channels because doing so consumes	01:29:04
4		significant processing and transceiver power,	01:29:07
5		correct?	01:29:10
6		DR. COOK: Form.	01:29:12
7	A	Yes, that's what I stated there, and	01:29:14
8		I was referencing listening to idle channels,	01:29:16
9		not an idle mode.	01:29:20
10	Q	I'm going to have to strike that as	01:29:23
11		non-responsive, Dr. Valenti.	01:29:25
12		MR. BROWAND: If we could have Tab 13	01:29:33
13		added as Exhibit 13.	01:29:35
14		(Valenti Exhibit 13 marked for	01:29:36
15		identification and attached to the transcript.)	01:29:36
16		REMOTE TECH: It should be added now.	01:29:37
17	Q	Dr. Valenti, let us know when you can	01:29:37
18		see Exhibit 13.	01:29:59
19	A	Yes, I see it.	01:30:00
20	Q	So this is another article -- a more	01:30:03
21		recent article that you coauthored, entitled,	01:30:04
22		"Bridging the Security Gap: Lessons from 5G and	01:30:06

1	What 6G Should Do Better." Do you see that?	01:30:11
2	A Correct.	01:30:15
3	Q And here you talk about camping on a	01:30:21
4	cell on page 2. Do you see that discussion?	01:30:29
5	A Yes.	01:30:31
6	Q And there's a number of acronyms	01:30:36
7	here, but UE refers to user equipment, right?	01:30:38
8	A Yes.	01:30:42
9	Q And what's PLMN?	01:30:45
10	A That would be the Public Land Mobile	01:30:49
11	Radio Network.	01:30:51
12	Q And HPLMN is the Home Public Land	01:30:59
13	Mobile Network?	01:31:06
14	A Yes.	01:31:10
15	Q And what's USIM?	01:31:12
16	A So the USIM stands for Universal	01:31:14
17	Subscriber Identity Module.	01:31:25
18	Q And there is another acronym in which	01:31:35
19	the user equipment enters "RRC_IDLE mode."	01:31:43
20	Do you see that?	01:31:49
21	A Yes.	01:31:50
22	Q What is that?	01:31:51

1	A	Well, RRC stands for radio resource	01:31:55
2		control, and then that's a higher layer protocol	01:31:58
3		in the 3GPP standards, and it has several modes,	01:32:04
4		one of which is idle mode. So this is referring	01:32:09
5		to the idle mode of the RRC layer.	01:32:12
6	Q	And it says that in this RRC_IDLE	01:32:23
7		mode the user equipment begins "camping on the	01:32:25
8		cell." Do you see that?	01:32:30
9	A	Correct.	01:32:32
10	Q	And camping on the cell is when the	01:32:33
11		user equipment is listening for incoming	01:32:39
12		notifications; is that fair?	01:32:42
13	A	Yes.	01:32:44
14	Q	Is camping a term of art in wireless	01:32:46
15		communication?	01:32:50
16	A	Yes. I mean, it is used extensively	01:32:51
17		in, like, the 3GPP standards, such as LTE or 5G	01:32:55
18		New Radio. Those standards use camping	01:33:01
19		consistent with the way I have described it in	01:33:05
20		this paragraph.	01:33:08
21	Q	And the way you have described	01:33:10
22		camping in this paragraph, is that different	01:33:12

1	than how you understand idle mode in the context	01:33:15
2	of the '120 patent?	01:33:18
3	A Yes. There are some differences.	01:33:22
4	First and foremost, in here, when you're in this	01:33:24
5	RRC_IDLE mode, you're not even transmitting, so	01:33:32
6	you're listening. So it is not in a position	01:33:35
7	where it is ready to transmit the way it might	01:33:38
8	be in the '120 patent. But also, probably more	01:33:41
9	importantly, it is receiving, but it is not	01:33:46
10	always listening. So it will only listen during	01:33:49
11	certain periods of time, which I describe here	01:33:55
12	as the discontinuous reception paging cycle, or	01:33:58
13	DRX. So, basically, the UE will listen only	01:34:03
14	during those times, and at other times it will	01:34:08
15	not be listening.	01:34:11
16	Q So it may be waiting to receive at	01:34:16
17	some times but not at others? Is that what	01:34:18
18	you're saying?	01:34:21
19	A Correct. So within the RRC_IDLE	01:34:21
20	mode, you could almost imagine kind of two sub	01:34:25
21	modes. So one mode would be receiving when the	01:34:29
22	DRX cycle is on and another mode would be not	01:34:35

1 listening when DRX cycle is off. 01:34:39

2 Q Is your understanding that in idle 01:34:45

3 mode in the '120 patent the mobile station is 01:34:48

4 always waiting to send? 01:34:53

5 A Yes, it would be waiting to send or 01:34:59

6 receive. Importantly, it would never be 01:35:01

7 receiving or sending when it's idle -- in idle 01:35:06

8 time. And I don't think the patent ever uses 01:35:11

9 the term "idle mode." But idle time is just 01:35:13

10 times in which the transceiver is idle, and so 01:35:17

11 if the transceiver is idle, it is neither 01:35:19

12 transmitting nor receiving. 01:35:23

13 Q So let's go back to Cui for a second. 01:35:49

14 I think we can put your articles to the side. 01:35:51

15 And we've talked a lot about the 01:36:03

16 sleep mode in Cui 2003, right? 01:36:04

17 A Yes. 01:36:07

18 Q And you're relying on the sleep mode 01:36:09

19 in Cui 2003 for this second wherein clause in 01:36:11

20 claim 25, "wherein the control signal is based, 01:36:20

21 at least in part, on an idle power consumption 01:36:24

22 of the mobile station," correct? 01:36:27

1	DR. COOK: Object to the form.	01:36:31
2	A Well, I'm using Cui in part, and it	01:36:32
3	is in combination with Li and Siam. But yes, I	01:36:35
4	am using Cui or that particular claim	01:36:40
5	limitation.	01:36:43
6	Q But you're using the sleep mode in	01:36:45
7	Cui -- that's my question, right, for -- with	01:36:48
8	the clause, "wherein the control signal is	01:36:51
9	based, at least in part, on an idle power	01:36:54
10	consumption of the mobile station," right?	01:36:57
11	A Yes, I think that is a fair way to	01:37:00
12	explain that. So the idle power consumption is	01:37:03
13	power that is consumed in Cui when it is in the	01:37:07
14	sleep mode.	01:37:13
15	Q So if Cui's sleep mode does not	01:37:17
16	disclose the idle power consumption, which I	01:37:20
17	know is contrary to your opinion, but if that's	01:37:26
18	the case, would you agree that there is nothing	01:37:31
19	else in the Cui reference that discloses the	01:37:35
20	limitation "wherein the control signal is based,	01:37:39
21	at least in part, on an idle power consumption	01:37:43
22	of the mobile station"?	01:37:46

1	DR. COOK: Object to the form.	01:37:53
2	A I really hadn't considered that. If	01:37:55
3	I understand your question, you're asking me to	01:37:57
4	set aside what was found in Cui that I found to	01:37:59
5	meet the limitation relating to idle power	01:38:03
6	consumption and tell you if there is anything	01:38:09
7	else in Cui that would meet that. And that's	01:38:14
8	not something I have considered, and it's not	01:38:19
9	something I think I can answer quickly.	01:38:20
10	Q But sitting here today, you're not	01:38:22
11	aware of anything else that you're relying on in	01:38:24
12	Cui for the "wherein the control signal is	01:38:27
13	based, at least in part, on an idle power	01:38:32
14	consumption of the mobile station" limitation,	01:38:35
15	right?	01:38:37
16	DR. COOK: Object to the form.	01:38:37
17	A When you say that I'm relying on, do	01:38:44
18	you mean in the sense that it was in my expert	01:38:47
19	report?	01:38:49
20	Q Correct.	01:38:52
21	A Let me check the expert report to	01:39:00
22	kind of confirm your answer.	01:39:02

1	(Witness reviewing document.)	01:39:03
2	Yeah, looking at my report, I don't	01:39:30
3	seem to point to anything else other than the	01:39:32
4	power consumed while in sleep mode as meeting	01:39:36
5	the idle mode -- or idle power consumption of	01:39:39
6	the patent.	01:39:44
7	Q Now, in addition to the 2003 Cui	01:39:53
8	article, your declaration also references a Cui	01:39:55
9	article from 2005.	01:40:00
10	Do you recall that?	01:40:02
11	A I think I may have, yeah, included	01:40:10
12	that in the technical background.	01:40:14
13	MR. BROWAND: Well, let's have Tab 14	01:40:17
14	marked as Exhibit 14.	01:40:23
15	(Valenti Exhibit 14 marked for	01:40:24
16	identification and attached to the transcript.)	01:40:24
17	REMOTE TECH: It should be in the	01:40:24
18	chat now -- or in the window now.	01:40:24
19	Q Dr. Valenti, let us know when you can	01:40:46
20	see Exhibit 14.	01:40:48
21	A Okay. Yeah, I see it.	01:41:03
22	Q And Exhibit 14 is another article by	01:41:11

1	Cui. It is entitled, "Energy-Constrained	01:41:15
2	Modulation Optimization." Do you see that?	01:41:19
3	A Yes.	01:41:25
4	Q And if I refer to Exhibit 14 as "Cui	01:41:27
5	2005," will you understand that shorthand?	01:41:33
6	A Yes.	01:41:37
7	Q Now, you are not relying on Cui 2005	01:41:39
8	for any of the prior art references you're	01:41:43
9	combining for unpatentability, correct?	01:41:50
10	A That's correct.	01:41:53
11	Q And do you see that Cui 2005 has the	01:41:57
12	same authors as the Cui 2003 article?	01:42:02
13	A Yes, it has the same authors.	01:42:17
14	Q And you have read both of these	01:42:24
15	references, correct?	01:42:26
16	A Yes, I have.	01:42:27
17	Q And would you agree that these	01:42:29
18	references are substantially the same?	01:42:30
19	A Yes. There is a lot of overlap	01:42:41
20	between the two.	01:42:43
21	Q And do you agree that the disclosure	01:42:44
22	that you're relying upon in Cui 2003 also	01:42:45

1	appears in Cui 2005?	01:42:50
2	A Yes, to the extent that Cui 2005 has	01:43:06
3	in it energy that includes sleep mode energy,	01:43:10
4	there is that overlap between the two	01:43:14
5	references.	01:43:17
6	Q Well, it actually uses almost some of	01:43:19
7	the exact same sentences and language, right?	01:43:21
8	A Yes. I haven't done a side-by-side	01:43:26
9	comparison, but yes, I would agree that there is	01:43:28
10	a lot of overlap, especially in the parts that I	01:43:31
11	point to in the ground.	01:43:33
12	Q Are you aware of any substantive	01:43:51
13	difference -- differences between Cui 2003 and	01:43:52
14	Cui 2005?	01:43:58
15	DR. COOK: Objection to form.	01:44:04
16	A Well, that is a rather vague	01:44:22
17	question. There are differences to the extent	01:44:24
18	that this 2005 article is quite a bit longer so	01:44:26
19	it has quite a bit more disclosure in it.	01:44:30
20	Q Are you aware of anything in the Cui	01:44:39
21	2003 article that is not in the Cui 2005	01:44:41
22	article?	01:44:46

1	DR. COOK: Object to the form.	01:44:51
2	(Witness reviewing document.)	01:44:51
3	A Well, I do agree there is a	01:45:52
4	significant overlap. I do note, I think	01:45:54
5	figure -- let's see. Here in the figures, there	01:45:57
6	may be a difference in some of the figures.	01:46:04
7	But, yeah, sitting here -- you know,	01:46:15
8	I haven't done a side-by-side comparison of	01:46:15
9	everything in the two papers. So sitting here	01:46:20
10	today, I can't point you to any difference.	01:46:23
11	Q Can we agree that for the purpose --	01:46:28
12	for the material that you're relying on in Cui	01:46:28
13	2003 for your analysis appears in the Cui 2005	01:46:36
14	article?	01:46:44
15	DR. COOK: Object to the form.	01:46:47
16	A Again, I mean, we could do a	01:46:56
17	side-by-side comparison. It is kind of hard for	01:46:57
18	me to quickly answer that. I mean, if you want	01:47:00
19	to walk through it, we could -- I'm not sure if	01:47:03
20	you want to engage in this, but we could look at	01:47:05
21	each quote I have or citation from Cui 2003 and	01:47:08
22	then confirm whether or not it is in Cui 2005.	01:47:15

1 We could do that, or if there is a specific 01:47:19
2 package you want to hone in onto, I'd be happy 01:47:24
3 to do that. 01:47:27

4 Q So maybe you need to identify the 01:47:29
5 paragraphs in Cui 2003 that you're relying on 01:47:31
6 and then we can find those in Cui 2005. 01:47:35

7 A Okay. Sure. 01:47:40

8 (Witness reviewing document.) 01:47:41

9 So, you know, an important aspect 01:48:23
10 would be the equation from Cui 2003. You know, 01:48:25
11 there is an Equation 1 on page 2806. There is a 01:48:34
12 similar, if not identical, equation on page 2350 01:48:44
13 of Cui '05. There is surrounding description of 01:48:47
14 the equation. I don't know if we want to 01:48:54
15 compare it word by word. I mean, it looks 01:48:58
16 substantially the same. 01:49:03

17 I mean, there could be some subtle 01:49:23
18 differences in here. I think Cui 2005 may go 01:49:27
19 into a little more detail that maybe Cui did not 01:49:30
20 have in mind in 2003. 01:49:39

21 Q Yeah, I'm just looking for anything 01:49:41
22 in Cui 2003 that you're relying on that is not 01:49:43

1 in Cui 2005.

01:49:46

2 (Witness reviewing document.)

01:49:48

3 A Yeah, I mean, looking at it now, I
4 can't identify anything that I'm relying on in
5 Cui 2003 that's not in Cui 2005, but, again, I
6 hope you appreciate this is kind of a hard
7 activity to do on the fly. But if there is
8 anything that you have in mind that you would
9 like to point me to, I would be happy to
10 discuss.

01:50:31

01:50:33

01:50:36

01:50:42

01:50:45

01:50:48

01:50:51

01:50:53

11 Q Sure. I'm not aware of anything
12 either. And, you know, I wanted to see if you
13 were, but it seems like you're not either. So I
14 think we can probably move on. I just wanted to
15 note that if you would look at the cover of the
16 '120 patent, Exhibit 3 -- let me know when you
17 have that up.

01:50:54

01:50:55

01:50:59

01:51:02

01:51:07

01:51:16

01:51:22

18 A Okay. By "cover," you mean first
19 page?

01:51:32

01:51:35

20 Q Yeah. And if you would, on the
21 right-hand column, under "Other Publications,"
22 do you see that one of the items identified is

01:51:35

01:51:37

01:51:39

1	the Cui 2005 article entitled,	01:51:42
2	"Energy-Constrained Modulation Optimization"?	01:51:46
3	A Yes, I do see it listed there.	01:51:53
4	Q So that means that Cui 2005 was	01:52:05
5	previously considered by the patent office	01:52:08
6	before the issuance of the '120 patent, correct?	01:52:11
7	DR. COOK: Object to the form.	01:52:16
8	A Well, it is listed on the face as a	01:52:17
9	reference cited. And I did look at the file	01:52:19
10	history. I don't recall that particular	01:52:22
11	reference being brought up in any of the	01:52:25
12	examiner actions. I believe you look at the	01:52:28
13	file history to confirm that.	01:52:32
14	I do recall the examiner brought up a	01:52:33
15	different Cui reference in the proceeding, which	01:52:36
16	I believe was from 2004. It may be listed on	01:52:39
17	the next page -- or the one below it, yeah.	01:52:46
18	There's three Cui references listed as	01:53:02
19	references cited. So there was one that was	01:53:05
20	dated 2004 that I believe the examiner	01:53:08
21	discussed, but I don't know if the examiner	01:53:11
22	considered the other ones.	01:53:13

1	Q	Is it your understanding that the	01:53:24
2		"References Cited" section of the patent	01:53:26
3		identifies references that were either	01:53:32
4		identified by the applicant for the examiner's	01:53:37
5		consideration or were references that the	01:53:43
6		examiner independently identified?	01:53:45
7		DR. COOK: Object to the form.	01:53:50
8	A	Sorry. Correct, my understanding	01:53:51
9		would be, yeah, these are references that were	01:53:53
10		either disclosed by the inventors or were	01:53:56
11		identified by the examiner. Usually there is an	01:53:59
12		asterisk if it was identified by the examiner.	01:54:02
13		So these would have been, you know, before the	01:54:05
14		examiner. There are a lot of references here,	01:54:08
15		so to the extent that the examiner used any one	01:54:11
16		reference, I don't know. You know, we can	01:54:14
17		certainly look at the file history to see which	01:54:17
18		ones the examiner thought were most relevant.	01:54:19
19		MR. BROWAND: I would like to have	01:54:23
20		Tab 15 added as Exhibit 15.	01:54:25
21		(Valenti Exhibit 15 marked for	01:54:26
22		identification and attached to the transcript.)	01:54:26

1	REMOTE TECH: It should be in there	01:54:50
2	now, Counsel.	01:54:50
3	Q Right. Dr. Valenti, can you let us	01:54:50
4	know when you have Exhibit 15 available for	01:54:53
5	viewing.	01:54:59
6	A Okay, I have it open.	01:55:09
7	Q And do you recognize this document?	01:55:16
8	A Yes, this is a reference by Walton.	01:55:17
9	I may have cited to it in my technical	01:55:23
10	background and perhaps somewhere else.	01:55:26
11	Q And -- I think that's correct. And	01:55:29
12	you're not relying on Exhibit 15, Walton, as one	01:55:30
13	of the prior art references that are a part of	01:55:35
14	your combinations for alleged unpatentability,	01:55:40
15	correct?	01:55:44
16	A No, it is not an alleged prior art	01:55:44
17	document that I am using.	01:55:51
18	Q So if I refer to Exhibit 15 as	01:55:52
19	"Walton," will you understand that shorthand?	01:55:54
20	A Yes.	01:55:58
21	Q So Walton is entitled	01:56:01
22	"Power-Efficient Multi-Antenna Wireless Device."	01:56:02

1	Do you see that?	01:56:06
2	A Yes.	01:56:07
3	Q And paragraph 8 of Walton says that	01:56:09
4	"There is a need in the art for a multi-antenna	01:56:26
5	wireless device that is power efficient," right?	01:56:31
6	A Yes.	01:56:36
7	Q And it also says there was a need for	01:56:42
8	this improvement because multi-antenna wireless	01:56:47
9	devices "may consume much more power than a	01:56:51
10	single-antenna wireless device," right?	01:56:57
11	A Could you orient me? Where is that?	01:57:00
12	Q I think it is in paragraph 7.	01:57:02
13	A Okay. What was the quote again? I'm	01:57:10
14	sorry.	01:57:12
15	Q Well, Walton says there was a need	01:57:13
16	for this improvement because multi-antenna	01:57:14
17	wireless devices "may consume much more power	01:57:18
18	than a single-antenna wireless device," right?	01:57:22
19	DR. COOK: Object to the form.	01:57:25
20	A Right. So I would agree in	01:57:27
21	paragraph 7 he makes that statement, observing	01:57:29
22	that multi-antenna wireless devices may consume	01:57:31

1	much more power than single-antenna wireless	01:57:36
2	devices. And that, I think, is part of the	01:57:40
3	motivation for the patent, a multi-antenna	01:57:42
4	wireless device that is power efficient.	01:57:44
5	Q And it says that if you use higher	01:58:02
6	power consumption, you deplete the available	01:58:06
7	battery resources more quickly, right?	01:58:09
8	A Yeah, that would be the end of	01:58:16
9	paragraph 7. He says, "The higher power	01:58:17
10	consumption depletes the available battery	01:58:20
11	resources more quickly, which then shortens both	01:58:23
12	the standby time between battery recharges and	01:58:26
13	the on time for active communication."	01:58:29
14	Q So Walton describes three states in	01:58:42
15	Figure 3A, an idle state, a sleep state and a	01:58:54
16	communication state, right?	01:58:59
17	A Yes.	01:59:01
18	Q And in 3B we see that the idle state	01:59:01
19	is -- includes two substates, a monitoring	01:59:19
20	substate and an access substate, correct?	01:59:24
21	A Yes.	01:59:30
22	DR. COOK: Object.	01:59:31

1	Q	And in the monitoring substate, the	01:59:34
2		wireless device detects for the presence of	01:59:38
3		signals from other entities, right?	01:59:42
4	DR. COOK:	Object to the form.	01:59:46
5	A	That's not immediately obvious from	02:00:01
6		the figure, but paragraph 47 does say that "In	02:00:03
7		the Monitoring substate, wireless device 100a	02:00:06
8		detects for the presence of signals from other	02:00:11
9		entities."	02:00:14
10	Q	And it goes on to say that if the	02:00:18
11		"signal is detected, the wireless device	02:00:20
12		attempts to acquire the frequency and timing of	02:00:24
13		the signal and to recover overhead information	02:00:27
14		in signaling messages from the signal," right?	02:00:30
15	A	Yes, I think that is a quote from the	02:00:35
16		third sentence of paragraph 47, yes.	02:00:37
17	Q	And then it goes on to say that "If	02:00:41
18		the signal is acquired and the signaling message	02:00:43
19		indicates that a data transmission is requested,	02:00:47
20		then the wireless device transitions to the	02:00:50
21		Access substate," right?	02:00:54
22	A	Correct.	02:00:57

1 Q So is it your understanding that in 02:01:08
2 the monitoring substate, the wireless device is 02:01:09
3 powered and waiting to see if a signal is 02:01:14
4 detected? 02:01:17

5 A Yeah, I think that's fair enough. I 02:01:21
6 mean, this is the way the authors have defined 02:01:23
7 this. This particular idle mode has two sub 02:01:26
8 modes. When it is in this particular sub mode, 02:01:30
9 the monitoring substate, it is trying to detect 02:01:34
10 signals. 02:01:38

11 Q And then "In the Access substate, the 02:01:43
12 wireless device attempts to establish a 02:01:48
13 communication session with another entity, which 02:01:51
14 is called a 'target' entity." 02:01:54

15 Do you see that? 02:01:57

16 A Are we still in paragraph 47? 02:02:02

17 Q I think we're in 48 now. 02:02:06

18 A Just give me a minute to review 47 02:02:13
19 and 48. 02:02:15

20 (Witness reviewing document.) 02:02:16

21 Okay. I've read it. Could you 02:02:54
22 repeat your pending question. 02:02:57

1	Q	"In the Access substate, the wireless	02:02:58
2		device attempts to establish a communication	02:03:05
3		session with another entity, which is called the	02:03:08
4		'target' entity," right?	02:03:10
5	A	Yes. That's what is stated and	02:03:12
6		disclosed in paragraph 48.	02:03:15
7	Q	And the "Wireless device transitions	02:03:19
8		to the Communication state if access is	02:03:22
9		successful and a communication session is	02:03:24
10		opened," right?	02:03:27
11	A	Yes. That is also stated in	02:03:29
12		paragraph 48.	02:03:31
13	Q	So in the access substate, you would	02:03:32
14		agree that the wireless device is powered on and	02:03:35
15		waiting to see if it can establish a	02:03:38
16		communication session, right?	02:03:41
17	DR. COOK:	Object to the form.	02:03:44
18	A	So during the access state, it	02:03:55
19		discloses that the "wireless device may exchange	02:03:57
20		short messages with the target entity." So yes,	02:04:00
21		that would imply that there is some	02:04:03
22		communication taking place. And so, for at	02:04:05

1 least some of the time, the circuits would be 02:04:07
2 powered on and the device would be actively 02:04:10
3 transmitting. 02:04:15

4 Q So Walton also says that in the idle 02:04:36
5 state, the wireless device may enable only a 02:04:40
6 subset of receiving units and processing units 02:04:43
7 used for signal detection and acquisition, 02:04:46
8 right? 02:04:49

9 A Yes. I think that is disclosed in 02:04:49
10 paragraph 49. 02:04:53

11 Q And then it also says that in an idle 02:04:59
12 state, "The wireless device may disable all 02:05:08
13 other receiver units, all N transmitter units 02:05:11
14 and all processing units that are not needed for 02:05:16
15 signal detection and acquisition," right? 02:05:19

16 A Yes. 02:05:22

17 Q And would you agree that it does this 02:05:22
18 to conserve energy that would otherwise be 02:05:37
19 consumed in the idle state? 02:05:40

20 A Yes. I think a purpose of disabling 02:05:42
21 some of the transmitter and receiver units would 02:05:46
22 be to conserve energy. 02:05:50

1	Q	So in the communication state, the	02:06:03
2		wireless device may transmit data to or from --	02:06:05
3		MR. BROWAND: Sorry. Strike that.	02:06:11
4	Q	"In the Communication state, the	02:06:13
5		wireless device may transmit data to and/or	02:06:15
6		receive data from the target entity," right?	02:06:20
7	A	Yes. Yes, I think that is disclosed	02:06:24
8		in paragraph 50.	02:06:27
9	Q	And in the sleep state, "The wireless	02:06:42
10		device does not transmit or receive data,"	02:06:44
11		right?	02:06:47
12	A	Yeah, correct. Sleep state, it is	02:06:52
13		not transmitting or receive data. That's	02:06:55
14		disclosed in paragraph 51.	02:06:59
15	Q	And "In the sleep state, the wireless	02:07:01
16		device may shut down as many circuit blocks as	02:07:04
17		possible to conserve power," right?	02:07:09
18	A	Correct. It uses the terminology	02:07:11
19		"shut down."	02:07:13
20	Q	It is the same terminology that Cui	02:07:17
21		uses, correct?	02:07:21
22	A	Yes, I believe Cui also uses "shut	02:07:22

1	down."	02:07:25
2	Q To describe the sleep state -- sleep	02:07:27
3	mode, correct?	02:07:30
4	A Correct, yeah. I will note this	02:07:30
5	particular reference, Walton, does also talk	02:07:35
6	about cutting off power as something that would	02:07:38
7	be distinct from shut down.	02:07:41
8	Q So let's go back to your declaration,	02:08:09
9	Exhibit 2, page 83.	02:08:11
10	Let me know when you're there.	02:08:41
11	A Okay. I'm there.	02:08:45
12	Q Do you see that this section is	02:08:47
13	entitled "A POSITA would have been motivated to	02:08:49
14	combine Li-Siam's teaching and Cui 2003's	02:08:53
15	teaching"?	02:08:57
16	A Yes.	02:08:58
17	Q So this section provides the	02:09:03
18	motivations to combine with respect to Ground 2;	02:09:05
19	is that fair?	02:09:08
20	A Yes, I think that's fair.	02:09:10
21	Q And are all of your motivations to	02:09:14
22	combine Li, Siam and Cui 2003 set forth in this	02:09:17

Transcript of Matthew C. Valenti, Ph.D.
Conducted on March 7, 2025

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1	section of your declaration?	02:09:23
2	A Yes, I believe so. I mean, my	02:09:34
3	opinion at the time of writing this regarding	02:09:37
4	motivations to combine were placed into this	02:09:39
5	section.	02:09:43
6	Q And you're not aware of any further	02:09:46
7	motivations to combine that you haven't set	02:09:49
8	forth in this section, correct?	02:09:52
9	A Correct. I'm not aware of any other	02:09:53
10	motivations to combine.	02:09:56
11	MR. BROWAND: Let's go off the	02:10:41
12	record.	02:10:42
13	THE VIDEOGRAPHER: We are going off	02:10:43
14	the record at 14:10.	02:10:44
15	(A recess was taken.)	02:10:50
16	THE VIDEOGRAPHER: We are back on the	02:18:49
17	record at 14:18.	02:18:49
18	MR. BROWAND: If I can have Tab 16	02:18:52
19	marked as Exhibit 16.	02:18:54
20	(Valenti Exhibit 16 marked for	02:18:57
21	identification and attached to the transcript.)	02:18:57
22	Q So Dr. Valenti, just if you would,	02:18:57

1	please let us know when you have Exhibit 16	02:18:57
2	before you.	02:19:01
3	A I have it.	02:19:30
4	Q And do you recognize Exhibit 16?	02:19:31
5	A Yes. Exhibit 16 is the reference by	02:19:35
6	Tirola, spelled T-I-I-R-O-L-A, that I used for	02:19:39
7	support for the last ground.	02:19:44
8	Q So if I refer to Exhibit 16 as the	02:20:00
9	"Tirola" or the "Tirola reference," will you	02:20:05
10	understand that shorthand?	02:20:09
11	A Yes.	02:20:10
12	Q And, as you said, you are relying on	02:20:12
13	Tirola exclusively for the last limitation of	02:20:16
14	claim 29 in Ground 5, correct?	02:20:25
15	A Well, the last element of the claim	02:20:29
16	is a combination of Li, Siam and Tirola, but	02:20:37
17	the additional feature where "the control	02:20:42
18	signature is based, at least in part, on a	02:20:46
19	number of users of the communication system,"	02:20:50
20	that feature is found in Tirola.	02:20:52
21	Q And you're not relying on Tirola for	02:20:55
22	any other element in claim 29, correct?	02:20:58

1	A	That's correct. That's correct. I	02:21:03
2		mean, it would just be, you know, the	02:21:07
3		combination of the three references, but Tirola	02:21:08
4		would be used for this last element.	02:21:12
5	Q	Let's turn to your declaration, and I	02:21:28
6		wanted to direct you first to paragraph 179.	02:21:32
7		Let me know when you're there.	02:21:37
8	A	Okay.	02:22:06
9	Q	And you state, "A POSITA would have	02:22:30
10		understood, based on Tirola's teachings, that	02:22:34
11		channel noise considerations might favor, for	02:22:37
12		example, a MIMO mode over a SIMO mode based on	02:22:41
13		the noise rise in the presence of a large number	02:22:46
14		of users."	02:22:49
15		Do you see that?	02:22:49
16	A	Yes.	02:22:50
17	Q	Do you stand by that opinion?	02:22:52
18	A	Yes, I do.	02:22:54
19	Q	And in the next sentence you state	02:23:11
20		that "For the conditions simulated in	02:23:38
21		Figure 2(a), it would generally be preferable to	02:23:41
22		pick the 2-by-2 MIMO mode over the 1-by-2 SIMO	02:23:45

1	mode because the 2-by-2 MIMO mode's noise rise	02:23:51
2	curve is below that of the 1-by-2 SIMO mode."	02:23:57
3	Do you see that?	02:24:02
4	A Yes.	02:24:02
5	Q Do you stand by that opinion?	02:24:09
6	A Yes, I do.	02:24:11
7	Q Is "Figure 2(a)" a typo?	02:24:19
8	A Oh. Let me verify that, please.	02:24:23
9	(Witness reviewing document.)	02:24:33
10	Yes, my apologies. That should be	02:24:43
11	2 -- 4(b) -- well, I was pointing to 4(b).	02:24:46
12	2(a) -- I don't think there actually is a	02:24:58
13	Figure 2(a). So there is a Figure 2. That	02:25:06
14	figure would support this opinion. And there is	02:25:10
15	also a Figure 4(b).	02:25:12
16	So the one I'm showing -- so you look	02:25:28
17	at page 115, there is a figure in the middle of	02:25:29
18	the page. That is Figure 4(b). So that would	02:25:33
19	be one place to draw this conclusion. And then,	02:25:38
20	in addition, there is a Figure 2, which also	02:25:44
21	shows some improvement by going from SIMO to	02:25:49
22	MIMO.	02:25:56

1 Q So you're relying on both Figure 2 02:26:13
2 and Figure 4(b); is that right? 02:26:15

3 A Well, I think both support the 02:26:18
4 opinion. I think the one I'm pointing to 02:26:19
5 specifically in paragraph 179 is, in fact, 02:26:23
6 Figure 4(b) because that figure shows noise rise 02:26:27
7 and I'm talking about noise rise in this 02:26:32
8 paragraph. So thank you for noting the typo, 02:26:35
9 but as I correctly put at the top of the page, 02:26:39
10 it is Figure 4(b), and that is what I'm 02:26:45
11 referencing in this paragraph. 02:26:48

12 Q So for the conditions simulated in 02:26:54
13 Figure 4(b), it would generally be preferable to 02:26:56
14 pic, the 2x2 MIMO mode over the 1x2 SIMO mode 02:26:59
15 because the 2x2 MIMO mode's noise rise curve is 02:27:05
16 below that of the 1x2 SIMO mode, correct? 02:27:10

17 A Yes, correct, that would be the 02:27:13
18 corrected statement and I stand by that. 02:27:15

19 Q Let's turn to Tirola. And in the 02:27:22
20 abstract it says that "In this study, uplink 02:27:31
21 performance was studied in the third generation 02:27:34
22 Universal Mobile Telecommunications System 02:27:39

1	assuming different SIMO and MIMO approaches."	02:27:43
2	Do you see that?	02:27:49
3	A Yes.	02:27:50
4	Q It also says that "Link simulations	02:27:51
5	and theoretical analysis were used to	02:27:53
6	investigate the uplink capacity and coverage of	02:27:56
7	the considered antenna configurations," right?	02:27:59
8	A Correct.	02:28:03
9	Q And then the last sentence of the	02:28:13
10	abstract states, "Based on this study, the MIMO	02:28:16
11	concept does not seem feasible for improving	02:28:22
12	UMTS uplink performance."	02:28:26
13	Do you see that?	02:28:30
14	A Correct, that's what the last	02:28:32
15	sentence of the abstract says.	02:28:33
16	Q Do you agree with Tirola's statement	02:28:37
17	about its study?	02:28:40
18	A No. I think his conclusions are more	02:28:42
19	subtle than that. And, in fact, if you just	02:28:48
20	look at one sentence previous to that, it does	02:28:51
21	espouse several benefits of increasing the	02:28:54
22	number of transmit antennas. Actually, if you	02:29:01

1 go two sentences prior, he states, "Results show 02:29:05
2 also that MIMO transmission will provide some 02:29:09
3 benefit (up to 2 dB) for UL coverage and UE 02:29:14
4 battery consumption." 02:29:18

5 So my take on this is when he drew 02:29:19
6 the conclusion in the last sentence, he was 02:29:22
7 strictly looking at one dimension of performance 02:29:25
8 and wasn't considering other benefits that are 02:29:30
9 shown in this very paper, including improving 02:29:34
10 uplink coverage and improving uplink battery 02:29:39
11 consumption. 02:29:43

12 Q So let's look at Figure 4. And 02:30:16
13 Figure 4 presents the simulated noise rise 02:30:22
14 curves for the considered MIMO and SIMO 02:30:30
15 transmission schemes, right? 02:30:34

16 A Yes. 02:30:36

17 Q And in each of the four figures in 02:30:39
18 Figure 4, there is a simulated noise rise as a 02:30:43
19 function of number of users, correct? 02:30:52

20 A Yes. 02:30:58

21 Q And in each of the graphs there is a 02:31:00
22 simulated noise rise curve as a function of the 02:31:09

1	number of users for a 1x2 SIMO mode, a 2x2 MIMO	02:31:12
2	mode, a 1x4 SIMO mode and a 2x4 MIMO mode,	02:31:20
3	right?	02:31:27
4	A Yes.	02:31:30
5	Q So let's first look at Figure 4(a).	02:31:32
6	Figure 4(a) shows that the noise rise for the	02:31:36
7	1x2 SIMO mode and the 2x2 MIMO mode are about	02:31:42
8	the same, fair?	02:31:51
9	A Yes, I think that's fair. I will	02:31:55
10	note that it does appear in the figure that	02:31:57
11	2x2 MIMO is universally better than 1x2 SIMO in	02:32:01
12	the figure, but only by a very small amount.	02:32:08
13	Q And Figure 4(a) also shows that the	02:32:16
14	noise rise for the 1X --	02:32:22
15	MR. BROWAND: Sorry. Strike that.	02:32:29
16	Q Figure 4(a) also shows that the noise	02:32:31
17	rise for the 2x4 MIMO mode is larger than the	02:32:36
18	1x4 SIMO mode, correct?	02:32:40
19	A Yes. Those two curves are also very	02:32:47
20	close, but certainly for a large number of	02:32:50
21	users, it would appear that 2x4 MIMO has a	02:32:53
22	slightly higher noise rise than 1x4 SISO.	02:32:58

1	I'm sorry --	02:33:08
2	Q 1x4 would be SIMO, correct?	02:33:09
3	A Thank you, yes. I meant to say the	02:33:15
4	end of that should be 1x4 SIMO, S-I-M-O.	02:33:16
5	Q So let's look at Figure 4(b). And	02:33:20
6	Figure 4(b) is the graph that you are relying on	02:33:23
7	in your declaration, correct?	02:33:26
8	A Yes, that is the one that I point to.	02:33:29
9	Q And Figure 4(b) shows that the noise	02:33:35
10	rise for the 1x2 SIMO mode is larger than for	02:33:38
11	the 2x2 MIMO mode. That's the one you're	02:33:44
12	relying on, correct?	02:33:48
13	A Yes.	02:33:49
14	Q Figure 4(b) also shows that the noise	02:33:50
15	rise for the 1x4 SIMO mode and the 2x4 MIMO mode	02:33:52
16	are about the same as the number of users	02:33:57
17	increases, correct?	02:34:01
18	A Yes, I think that would be a fair	02:34:03
19	characterization. I mean, there were a few	02:34:06
20	places where 1x4 has a slightly -- very slightly	02:34:08
21	higher noise rise than 2x4. But for the most	02:34:13
22	part, they are about the same.	02:34:17

1	Q	And if we go down to Figure 4(c),	02:34:20
2		4(c) shows that the noise rise for the 2x2 MIMO	02:34:22
3		mode is slightly larger than for the 1x2 SIMO	02:34:32
4		mode, that large number of users, correct?	02:34:39
5	A	Yes, I think that's fair. I mean,	02:34:44
6		they are approximately the same for most number	02:34:45
7		of users, and then at the highest number, 2x2	02:34:48
8		MIMO for this channel model has a slightly	02:34:51
9		higher noise rise than 1x2.	02:34:57
10	Q	And Figure 4(c) also shows that the	02:35:00
11		noise rise for the 2x4 MIMO mode is larger than	02:35:04
12		the 1x4 SIMO mode, right?	02:35:11
13	A	Yes. This one, for both of these	02:35:21
14		curves, the 2x4 MIMO has a higher noise rise	02:35:23
15		than 1x4 SIMO. Similarly, it would appear that	02:35:28
16		the 2x2 MIMO for this channel model is higher	02:35:33
17		than 1x2 SIMO.	02:35:38
18	Q	So let's look at 4(d), and	02:35:41
19		Figure 4(d) shows that the noise rise for the	02:35:45
20		2x2 MIMO mode is larger than the 1x2 SIMO mode,	02:35:49
21		right?	02:35:59
22	A	Yes. And my apologies, I thought we	02:35:59

1 had already progressed to Figure (d) when I gave 02:36:01
2 my last answer. That's why I included both the 02:36:08
3 2 receive antenna and the 4 receive antenna, but 02:36:11
4 the same observations can be made for this 02:36:16
5 figure that we made for Figure 4(c). 02:36:19

6 Q So to round out, then, Figure 4(d) 02:36:23
7 also shows that noise rise for the 2x4 MIMO mode 02:36:26
8 is larger than for the 1x4 SIMO mode, right? 02:36:30

9 A Yes. 02:36:34

10 Q So the graphs in Figure 4 show eight 02:36:36
11 comparisons between SIMO mode and MIMO mode 02:36:41
12 noise rise as a function of users, right? 02:36:48

13 A Yes. These would correspond to 02:36:51
14 different channel models and different number of 02:36:53
15 receive antennas, correct. 02:36:59

16 Q And looking at -- having looked at 02:37:01
17 these eight comparisons, is it fair to say that 02:37:05
18 in five of the graphs the noise rise for the 02:37:09
19 MIMO mode is larger than for the SIMO mode, in 02:37:12
20 two of the graphs the noise rise for the MIMO 02:37:16
21 mode and the SIMO mode are about the same and in 02:37:21
22 one of the eight graphs, the noise rise for the 02:37:25

1	SIMO mode is larger than the MIMO mode?	02:37:29
2	A Yes, I think that would be a fair	02:37:34
3	characterization of these figures.	02:37:36
4	Q On page 660, one of the conclusions	02:38:04
5	that Tirola draws is that "doubling of the	02:38:06
6	number of receiving antennas will almost double	02:38:17
7	the isolated cell capacity, whereas the increase	02:38:22
8	of the number of transmit antennas will mostly	02:38:27
9	have a negative impact on the isolated cell	02:38:31
10	capacity."	02:38:35
11	Do you see that conclusion?	02:38:39
12	A Are you in the section called	02:38:44
13	"Conclusion"?	02:38:46
14	Q I'm on page 660. There is a sentence	02:38:50
15	that starts, "As a summary."	02:38:53
16	A Oh, okay. You said you were in	02:38:54
17	"Conclusions," which is its own separate section	02:38:56
18	on the right column. Okay.	02:38:59
19	Q So let me read it again.	02:39:08
20	A Thank you.	02:39:09
21	Q Tirola says, "It can be said that	02:39:10
22	the doubling of the number of receiving antennas	02:39:13

1 will almost double the isolated cell capacity, 02:39:18
2 whereas the increase of the number of transmit 02:39:20
3 antennas will mostly have negative impact on the 02:39:25
4 isolated cell capacity." 02:39:28

5 Do you see that? 02:39:30

6 A Okay, yes. 02:39:46

7 Q And do you agree with that conclusion 02:39:47
8 in Tiirola? 02:39:49

9 A I would agree, especially to the 02:40:08
10 extent that he does use the term or the word 02:40:11
11 "mostly," so -- and, as we discussed, "most" 02:40:13
12 meaning the majority of the cases that he looked 02:40:16
13 at showed kind of a negative gain from going 02:40:19
14 from SIMO to MIMO. But he does show at least 02:40:25
15 one case where there is a benefit, and, you 02:40:29
16 know, he doesn't say uniformly better. He just 02:40:31
17 says mostly. 02:40:33

18 THE COURT REPORTER: I'm sorry, I 02:40:47
19 didn't hear you. 02:40:47

20 THE WITNESS: I'm sorry. 02:40:47

21 A He didn't say uniformly or always. 02:40:47
22 He said "mostly," where the quote is "mostly 02:40:47

1	have negative impact."	02:41:00
2	Q Dr. Valenti, let's go back to your	02:41:09
3	declaration. And I'd like to direct your	02:41:12
4	attention to paragraph 166. Let me know when	02:41:32
5	you're there.	02:41:35
6	A Okay.	02:42:06
7	Q And in the last sentence you state,	02:42:07
8	"A POSITA would have understood that as the	02:42:10
9	noise penalty of a SIMO mode grows with the	02:42:13
10	number of users, it may be advantageous at some	02:42:16
11	point to switch to MIMO operation."	02:42:19
12	Do you see that?	02:42:22
13	A Correct.	02:42:23
14	Q And you stand by that opinion, right?	02:42:25
15	A Yes, I do, especially when you look	02:42:27
16	at the paragraph as a whole, where I say that,	02:42:31
17	for instance, "A POSITA would have understood	02:42:45
18	that a MIMO mode may require more circuit power,	02:42:47
19	but a SIMO mode may result in a noisier	02:42:50
20	channel." So I'm not claiming nor do I think I	02:42:55
21	need to claim that MIMO is always going to be	02:42:57
22	better than SIMO with respect to noise power,	02:43:02

1 but I'm saying that it may be better. And in 02:43:05
2 those situations, then yes, it would be 02:43:10
3 advantageous at some point to switch to MIMO 02:43:12
4 operation. 02:43:16

5 Q And are you relying on an outlier 02:43:16
6 case in Tirola as support for that opinion? 02:43:19

7 A No, I don't think I would regard that 02:43:24
8 as an outlier. There is a case in Tirola. It 02:43:26
9 is a situation that certainly could happen in an 02:43:29
10 actual channel, and when that situation occurs, 02:43:32
11 then yes, it would be advantageous to switch to 02:43:36
12 MIMO operation in that situation. And there may 02:43:40
13 be lots of cases in between that are not shown 02:43:43
14 that could also have the same advantageous MIMO 02:43:48
15 operation as well. 02:43:52

16 Q Are you -- you're asking the board to 02:43:54
17 focus on one comparison that favors your opinion 02:43:56
18 and give no weight to the other seven 02:44:00
19 comparisons that are in Tirola, right? 02:44:03

20 DR. COOK: Object to the form. 02:44:08

21 A I believe I'm asking the board to 02:44:09
22 look at the Tirola reference as a whole, and 02:44:11

1	Tirola does articulate what the benefits and	02:44:15
2	disadvantages are between SIMO and MIMO. And so	02:44:19
3	by weighing all of these benefits, advantages	02:44:25
4	and disadvantages, I think a POSITA would	02:44:27
5	understand that, yes, there are instances where	02:44:30
6	using MIMO is advantageous over SIMO. It may	02:44:33
7	not always be the case, but there are certainly	02:44:38
8	real instances where there is a benefit.	02:44:41
9	Q And there are some instances where	02:44:46
10	the opposite may also be true?	02:44:48
11	A Yes, I think that would be fair. And	02:44:50
12	one reading that would really be looking to it	02:44:53
13	for a balanced analysis of the pros and cons of	02:44:56
14	MIMO versus SIMO, and they would understand	02:45:02
15	that, yes, there are some situations where SIMO	02:45:05
16	is better than MIMO.	02:45:08
17	Q Let's go to page 103 of your	02:45:17
18	declaration. Let me know when you're there.	02:45:27
19	A Okay.	02:45:40
20	Q And on this page there is a heading	02:45:40
21	that says, "A POSITA would have been motivated	02:45:42
22	to combine Li-Siam's teachings and Tirola's	02:45:46

1	teachings." Do you see that?	02:45:50
2	A Yes.	02:45:52
3	Q And are all of your motivations to	02:45:54
4	combine Li, Siam and Tirola set forth in this	02:45:58
5	section of your declaration?	02:46:02
6	A It's similar to when you asked me the	02:46:03
7	question for other combinations. I would say	02:46:09
8	that the motivations to combine that I had in	02:46:11
9	mind at the time I wrote the declaration, I	02:46:16
10	believe, are in here.	02:46:19
11	Q And you're not aware of any other	02:46:20
12	motivations to combine beyond those that are set	02:46:22
13	forth in this section, correct?	02:46:26
14	A Whereas there may be other	02:46:29
15	motivations to combine, I'm not aware that I	02:46:31
16	considered any beyond the ones that are listed	02:46:33
17	in this section.	02:46:35
18	Q And as you sit here today now, you're	02:46:42
19	not aware of any motivations to combine beyond	02:46:44
20	those that are set forth in this section, right?	02:46:48
21	A Correct.	02:46:51
22	Q Let's go back to Tirola. And	02:47:04

1	Tiirola is a simulated study that Nokia	02:47:12
2	performed, right?	02:47:17
3	A Yes, I think that's fair. And they	02:47:20
4	used some Monte Carlo simulations with	02:47:23
5	relatively accurate parameters and software.	02:47:27
6	Q So it is your understanding that the	02:47:35
7	simulations that were done in Tiirola and the	02:47:40
8	results that were obtained were entirely done in	02:47:44
9	software, correct?	02:47:48
10	A Yes, that's my understanding, is the	02:47:57
11	results that are given in Tiirola were obtained	02:47:59
12	through simulation.	02:48:04
13	Q And as far as you know, there was	02:48:15
14	never any physical apparatuses that were used to	02:48:17
15	confirm or corroborate any of these simulated	02:48:25
16	findings in Tiirola, correct?	02:48:33
17	A Well, the authors are with Nokia, so	02:48:35
18	I would fully expect them to have the ability to	02:48:41
19	implement these systems, but in terms of what's	02:48:44
20	within the confines of the paper, I don't see	02:48:47
21	anything in here that appears to be a	02:48:49
22	corroboration with a hardware implementation.	02:48:52

1 Q The Tirola study was done for 02:49:06
2 purposes of cellular transmissions with respect 02:49:10
3 to vehicles; is that fair? 02:49:16

4 A Not entirely, because the results 02:49:24
5 that we were looking at, for instance in 02:49:29
6 Figure 4, include what's called the ITU 02:49:31
7 Pedestrian A channel, which in the name would 02:49:34
8 imply that that would be for communications 02:49:39
9 amongst pedestrians that are not in vehicles. 02:49:42

10 Q So some of them -- some of the 02:49:53
11 simulations are meant to simulate wireless 02:49:57
12 communications in vehicles and some of them are 02:50:02
13 intended to simulate other circumstances? 02:50:07

14 A Yes, I think that would be fair 02:50:13
15 enough. So some of the results are for vehicles 02:50:15
16 and some are for pedestrians, presumably not in 02:50:18
17 vehicles. 02:50:22

18 Q Are you aware of any differences in 02:50:44
19 the different simulations that are run, shown in 02:50:49
20 Figures (a), (b) and (c) and (d), from a 02:50:58
21 reliability standpoint? 02:51:02

22 A What do you mean by "reliability"? 02:51:09

1	Like accuracy of simulation or reliability of	02:51:10
2	the system that's being simulated?	02:51:13
3	Q Well, so (a) and (b) are described as	02:51:15
4	"one-path Rayleigh." Can you explain that?	02:51:18
5	A Correct. So "one-path" would just	02:51:27
6	mean there is maybe a direct link between the	02:51:29
7	transmitter and the receiver. "Rayleigh"	02:51:32
8	corresponds to a certain type of channel model	02:51:35
9	that is commonly used both in practice and in	02:51:39
10	theory.	02:51:44
11	Q And then (c) and (d) are described as	02:51:46
12	"modified ITU" and then either "Pedestrian" or	02:51:50
13	"Vehicular A channel." Do you see that?	02:51:55
14	A Yes.	02:51:59
15	Q Can you explain that?	02:52:01
16	A Yeah. Those are channels that are	02:52:04
17	intended to model certain cases. So	02:52:06
18	Pedestrian A would model a pedestrian channel,	02:52:09
19	Vehicular A would model a vehicular channel,	02:52:12
20	under certain circumstances and settings.	02:52:17
21	Q And are these channel models	02:52:20
22	reliable, from your perspective as a person of	02:52:26

1 ordinary skill in the art, to be performing 02:52:30

2 these type of tests from? 02:52:33

3 A Yeah, I think it would be generally 02:52:36

4 accepted that the models in this figure are 02:52:38

5 acceptable by people working in this area, are 02:52:42

6 reasonably accurate models. 02:52:47

7 Q Is there any reason why you wouldn't 02:52:59

8 use any of these models if you were to perform 02:53:01

9 some type of simulation like this? 02:53:05

10 A Well, I think -- you know, given the 02:53:07

11 objectives, I think these are reasonable channel 02:53:09

12 models. I mean, if you're perhaps looking for a 02:53:12

13 different situation, maybe a different 02:53:15

14 frequency, you're up at millimeter wave or 02:53:18

15 something like that, you may want to adopt a 02:53:21

16 different channel model. 02:53:24

17 Q But for the third-generation UMTS, 02:53:31

18 this is certainly reasonable and acceptable at 02:53:34

19 the time that this study was performed; is that 02:53:37

20 fair? 02:53:39

21 A Yes, at the time it was performed, I 02:53:40

22 think these were pretty standard, widely 02:53:42

1	accepted types of models.	02:53:44
2	MR. BROWAND: Let's go off the	02:53:47
3	record.	02:53:53
4	THE VIDEOGRAPHER: We are going off	02:53:54
5	the record at 14:54.	02:53:55
6	(A recess was taken.)	02:53:57
7	THE VIDEOGRAPHER: We are back on the	03:01:26
8	record at 15:01.	03:01:27
9	BY MR. BROWAND:	03:01:28
10	Q Dr. Valenti, are you intending to	03:01:34
11	offer any further testimony in connection with	03:01:36
12	this IPR proceeding?	03:01:40
13	A No, I'm not.	03:01:42
14	Q So you don't intend to offer a reply	03:01:45
15	declaration, as far as you know?	03:01:48
16	A As far as I know. I mean, that may	03:01:50
17	be up to the attorneys. I have to admit, I	03:01:52
18	don't know the process after the deposition, but	03:01:54
19	my experience is that normally this would be the	03:01:57
20	end of my involvement, as far as I know.	03:02:00
21	MR. BROWAND: Well, Dr. Valenti,	03:02:05
22	thank you for your time. I have no further	03:02:05

1 questions. 03:02:08

2 THE WITNESS: Okay, thank you. It 03:02:09

3 was nice meeting you. 03:02:10

4 DR. COOK: Thank you. I have no 03:02:13

5 questions at this time. 03:02:15

6 THE VIDEOGRAPHER: All right. Should 03:02:21

7 we go off the video record or is there something 03:02:22

8 from someone else? 03:02:25

9 MR. BROWAND: No, we can go off the 03:02:26

10 record. 03:02:28

11 THE VIDEOGRAPHER: All right. This 03:02:29

12 marks the end of the video deposition of 03:02:30

13 Dr. Matthew C. Valenti. We are going off the 03:02:31

14 record at 15:02. 03:02:34

15 (Time noted: 3:02 p.m.)

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ACKNOWLEDGMENT OF DEPONENT

I, MATTHEW C. VALENTI, Ph.D., do
hereby acknowledge that I have read and examined
the foregoing testimony, and the same is a true,
correct and complete transcription of the
testimony given by me and any corrections appear
on the attached Errata sheet signed by me.

(Date)

(Signature)

1 CERTIFICATE OF SHORTHAND REPORTER - NOTARY PUBLIC

2
3 I, ADRIENNE M. MIGNANO, a Certified
4 Reporter and Notary Public within and for the
5 State of New York do hereby certify:

6 That MATTHEW C. VALENTI, PH.D., the
7 witness whose deposition is hereinbefore set
8 forth, was duly sworn by me before the
9 commencement of such deposition and that such
10 deposition was taken before me and is a true
11 record of the testimony given by such
12 witness.

13 I further certify that the adverse
14 party, SAMSUNG ELECTRONICS CO., LTD, was
15 represented by counsel at the deposition.

16 I further certify that the deposition
17 of MATTHEW C. VALENTI, PH.D., occurred remotely
18 via Zoom Videoconference equipment on Friday,
19 March 7, 2025, commencing at 10:06 A.M. to 3:02
20 P.M.

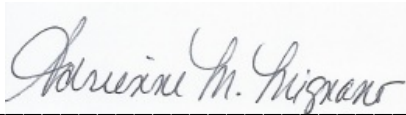
21 I further certify that I am not
22 related to any of the parties to this action by

1 blood or marriage, I am not employed by or an
2 attorney to any of the parties to this action,
3 and that I am in no way interested, financially
4 or otherwise, in the outcome of this matter.

5 IN WITNESS WHEREOF, I have hereunto set my
6 hand this 10th day of March, 2025.

7 My commission expires:

8 June 2026

9 
10 _____

11 ADRIENNE M. MIGNANO, RPR

12
13 NOTARY PUBLIC IN AND FOR THE
14 STATE OF NEW YORK

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