

UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE PATENT TRIAL AND APPEAL BOARD

Case No. IPR2023-00601

Case No. IPR2023-00602

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SAMSUNG ELECTRONICS CO., LTD. and SAMSUNG
ELECTRONICS AMERICA, INC.,
Petitioners,

- against -

APEX BEAM TECHNOLOGIES, LLC,,
Patent Owner.

Patent No. 10,568,113

Filing Date: August 9, 2018

Issue Date: February 18, 2020

Inventor: Xiaobo Zhang

Title: METHOD AND DEVICE IN UE AND BASE
STATION USED FOR WIRELESS COMMUNICATION

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December 13, 2023

10: 19 a.m.

Remote video-teleconference
deposition via Zoom of DR. HARRY V. BIMS,
before Jineen Pavesi, a Registered
Professional Reporter, Registered Merit
Reporter, Certified Realtime Reporter and
Notary Public of the State of New York.

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A P P E A R A N C E S :

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2 D R. H A R R Y V. B I M S,
3 having first been duly sworn by a Notary
4 Public of the State of New York, was
5 examined and testified as follows:

6 EXAMINATION BY

7 MR. PYMENTO:

8 Q. Good morning, Dr. Bims.

9 Could you please state your
10 full name for the record.

11 A. Harry von Bims.

12 Q. I am Julian Pymonto, counsel
13 for Apex Beam Technologies, LLC, in this
14 proceeding, I will be taking your
15 deposition today.

16 Just to go quick, the same
17 ground rules are going to apply as the
18 deposition I took of you on November 21st,
19 does that make sense?

20 A. Yes.

21 Q. Dr. Bims, is there any reason
22 that you can't testify truthfully today?

23 A. No.

24 Q. Have you taken any drugs or
25 alcohol that could impair your ability to

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think today?

A. No.

Q. Where are you located right now physically?

A. In the law offices of Finnegan.

Q. Where is that location?

A. In Washington, D.C.

Q. Is there anyone in the room with you?

A. Yes.

Q. Who is it?

A. Attorneys Nick Cerulli and Josh Goldberg.

Q. If that changes, would you please let me know?

A. Yes.

Q. Dr. Bims, what programs do you currently have running on your computer, aside from this Zoom meeting?

A. So this is not my computer that I'm using, it's a computer supplied by Finnegan, and from what I can see, it's running Windows and I believe that Adobe Acrobat is running to view pdfs.

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2 Q. Okay.

3 Do you have any communications
4 programs open, such as Outlook or any
5 e-mail program or chat program?

6 A. No.

7 MR. PYMENTO: Just for the
8 record, the exhibits have already been
9 premarked, but I will just note what each
10 exhibit is on the record.

11 Exhibit 1 is U.S. Patent No.
12 10,568,113, that's the subject matter in
13 this proceeding.

14 (Bims Exhibit 1, U.S. Patent
15 No. 10,568,113, was marked for
16 identification, as of this date.)

17 MR. PYMENTO: Exhibit 2,
18 Dr. Bims, is your declaration that was
19 submitted in IPR2023-00601.

20 (Bims Exhibit 2, Dr. Bims'
21 declaration submitted in IPR2023-00601,
22 was marked for identification, as of this
23 date.)

24 MR. PYMENTO: Exhibit 3 is your
25 declaration that was submitted in

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2 IPR2023-00602.

3 (Bims Exhibit 3, Dr. Bims'
4 declaration submitted in IPR2023-00602,
5 was marked for identification, as of this
6 date.)

7 MR. PYMENTO: Exhibit 4 is U.S.
8 Patent Application Publication No.
9 2019-0053294 to Xia.

10 (Bims Exhibit 4, Patent
11 Application Publication No. 2019-0053294
12 to Xia, was marked for identification, as
13 of this date.)

14 MR. PYMENTO: Exhibit 5 is U.S.
15 Patent Application Publication No.
16 2015-0141026 to Jover.

17 (Bims Exhibit 5, Patent
18 Application Publication No. 2015-0141026
19 to Jover, was marked for identification,
20 as of this date.)

21 MR. PYMENTO: Exhibit 6 is U.S.
22 Patent Publication No. 2018-0367374 to
23 Liu.

24 (Bims Exhibit 6, U.S. Patent
25 Publication No. 2018-0367374 to Liu, was

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2 marked for identification, as of this
3 date.)

4 MR. PYMENTO: Exhibit 7 is the
5 Institution Decision in IPR2023-00601.

6 (Bims Exhibit 7, Institution
7 Decision in IPR2023-00601, was marked for
8 identification, as of this date.)

9 MR. PYMENTO: Finally, Exhibit
10 8 is the Institution Decision in
11 IPR2023-00602.

12 (Bims Exhibit 8, Institution
13 Decision in IPR2023-00602, was marked for
14 identification, as of this date.)

15 Q. Dr. Bims, I would like you to
16 open your declaration in IPR2023-00601,
17 which is Exhibit 2, let me know when you
18 have it open.

19 (Witness complying.)

20 A. It's open.

21 Q. Sitting here today, do you
22 believe that you considered any other
23 materials aside from the documents cited
24 in this declaration?

25 A. You mean in the creation of the

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2 declaration?

3 Q. Right, or cited inside the
4 declaration itself.

5 A. So as part of the declaration
6 itself...

7 (Witness perusing document.)

8 A. So Section 4 of the declaration
9 itself has a list of exhibits that I
10 considered in writing the declaration.

11 Q. Did you consider any other
12 materials other than those listed there?

13 A. No.

14 Q. Is the same answer true for the
15 other declaration that's Exhibit 3?

16 (Witness perusing document.)

17 A. In my declaration to
18 IPR2023-00602, from what I see here, that
19 declaration is Exhibit 1002.

20 MR. CERULLI: This is just a
21 point of clarification.

22 The exhibit numbers that we
23 have are the actual filed exhibit numbers
24 and I think, counsel, you renamed them
25 Exhibits 1 through 6, so I think what

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2 counsel is referring to is Exhibit 3 of
3 the renumbered exhibit.

4 MR. PYMENTO: That's right.

5 I am only renumbering it
6 because I think that's just the procedure
7 with Veritext, I had to do that last time
8 as well, I am not trying to make it more
9 difficult.

10 MR. CERULLI: I think just
11 periodic clarifications throughout,
12 referring to Exhibit 6, this refers to
13 Exhibit, you know, 100 whatever, would be
14 helpful.

15 MR. PYMENTO: I will try to do
16 that where I can.

17 Q. Dr. Bims, did you consider any
18 other materials aside from the documents
19 cited in your declaration, Exhibit 1002 in
20 IPR2023-602?

21 A. No.

22 Q. What I have marked as Exhibit 7
23 and 8 are the decisions granting
24 institution in both of these cases; these
25 are documents created by the Patent Office

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2 after you submitted your declarations in
3 these proceedings.

4 Have you reviewed these
5 decisions?

6 A. I have seen a copy of those
7 decisions, yes.

8 Q. Have you read them, reviewed
9 them?

10 A. I did look through it, I didn't
11 spend a lot of time analyzing it, but I
12 did look through it.

13 Q. About how much time did you
14 spend analyzing them?

15 A. Maybe an hour each.

16 Q. About how much time did you
17 spend preparing for this deposition?

18 A. So I arrived in D.C. on Sunday
19 and spent Monday and Tuesday with the
20 attorneys preparing for today's
21 deposition.

22 Q. So how much time during those
23 two days did you spend preparing for this
24 deposition?

25 A. I don't know if I have a

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2 precise number, but I spent at least two
3 full days working on preparing for today's
4 deposition.

5 Q. Would you say that's
6 approximately 20 hours?

7 A. As a general ballpark, maybe.

8 Q. Just for clarification, that's
9 maybe 20 hours?

10 A. It may be around that time, I
11 haven't double-checked, but it may be
12 around that number of hours.

13 Q. What's the ballpark?

14 A. It may be around 20 hours, I'd
15 have to double-check for sure.

16 Q. About how much time did you
17 spend preparing each of the declarations
18 in these proceedings?

19 A. So I began preparing for the
20 declarations when I received the '113
21 patent about a year ago and during the
22 course of that year I've been working
23 towards creating the declaration.

24 Q. Could you give me a ballpark
25 number of hours that you worked on each

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2 declaration?

3 A. That's kind of hard to do
4 because they were worked on jointly; as
5 you know, the prior art references that I
6 relied on in both declarations have
7 significant overlap, so I don't know that
8 I can divide out hours specifically for
9 one versus the other over the course of
10 the past year.

11 It's hard sitting here without
12 my records to be able to give you a firm
13 answer.

14 Q. How about an approximate
15 collective number for both declarations
16 then.

17 A. It's hard to say; like I said,
18 I have been working on the declarations
19 for about a year and I'd have to go back
20 and look at my records to see how many
21 hours I actually spent in the past year
22 collectively working on both declarations.

23 Q. Would it be approximately 50
24 hours, closer to 50 hours or a hundred
25 hours?

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2 MR. CERULLI: Objection, form.

3 A. It's hard to put a firm number
4 on it, but it did take a fair amount of
5 work.

6 I just don't know that I have a
7 firm answer for you on that.

8 Q. Dr. Bims, all I'm asking is an
9 approximate number of hours.

10 You can give a pretty wide
11 range, I won't mind.

12 MR. CERULLI: Objection, form.

13 A. It was certainly more than, you
14 know, 20 or 30 hours, but it's hard to say
15 how many I actually worked.

16 Q. Aside from your counsel at
17 Finnegan, did you communicate with anyone
18 else about your deposition today in
19 preparation for it?

20 A. No.

21 Q. Did you communicate with anyone
22 at Samsung directly about your deposition
23 today?

24 A. No.

25 Q. Have you corresponded with

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2 Samsung prior to today, notwithstanding
3 the preparation for this deposition?

4 A. No.

5 Q. Aside from your attorneys at
6 Finnegan, was anyone else involved in the
7 preparation of your declarations in these
8 actions?

9 A. No.

10 Q. Aside from the '113 patent,
11 which is the patent owned by Apex Beam in
12 these proceedings, can you tell me how the
13 prior art documents were located in this
14 case, in these cases?

15 A. No.

16 Q. Just to clarify, the prior art
17 documents were provided to you or did you
18 do the searching for the prior art
19 documents?

20 A. I was provided with the prior
21 art documents.

22 Q. And they were provided to you
23 by your attorneys, correct?

24 A. Yes.

25 Q. Did you personally conduct a

1 BIMS

2 search for any other prior art documents?

3 A. No.

4 Q. Just to quickly go through
5 this, because I know we've talked about
6 this in the last deposition, but could you
7 take a look at your CVs in each of the
8 declarations, that would be Exhibit 1002
9 in each of the proceedings, and just let
10 me know if each of those CVs are still
11 accurate.

12 (Witness complying.)

13 A. Both of these CVs are listed as
14 last update December 23rd, 2022, which is
15 about a year ago, so there have been
16 updates to my current CV since then.

17 Q. Just briefly could you provide
18 a summary of what those updates would be.

19 A. The updates would be additional
20 patent litigations in which I've been
21 retained as a testifying expert.

22 Q. Is that the only addition that
23 would be made to each of these
24 declarations with respect to the CV?

25 A. Yes.

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2 Q. Could you please turn to page
3 30 of your declaration in IP R 601, that's
4 Exhibit 1002 or IPR2023-00601.

5 (Witness complying.)

6 A. Okay.

7 Q. In paragraph 77 you say that "A
8 person of ordinary skill in the art would
9 have had at least a master's degree in
10 electrical engineering or similar field
11 and at least two years of experience
12 working with telecommunications systems,
13 including multiple-input, multiple-output,
14 MIMO, technology. Additional relevant
15 work experience would compensate for less
16 education and vice versa," correct?

17 A. Yes.

18 Q. Can you confirm that this
19 description of the person of skill in the
20 art in your other declaration, which I
21 marked as Exhibit 3, is the same.

22 (Witness perusing document.)

23 A. Yes, it's the same.

24 Q. Do you have experience working
25 with MIMO telecommunications systems?

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2 A. Yes, I have experience with
3 MIMO technology.

4 Q. About how many years?

5 A. So that experience began when I
6 was a Ph.D. student at Stanford working in
7 the information systems laboratory and
8 interacting with professors there, such as
9 Professor Paul Raj, who is one of the
10 pioneers in MIMO technology.

11 Q. Approximately when was that?

12 A. This was starting in the early
13 1990s, between 1990 and 1993.

14 Q. And working with Mr. Paul Raj,
15 is that the only experience you've had
16 working with MIMO telecommunications
17 systems?

18 A. No.

19 Q. Could you describe others.

20 A. So my Ph.D. advisor invented
21 DSL technology while I was one of his
22 Ph.D. students, and in DSL technology they
23 used a form of MIMO technology over the
24 digital subscriber line or the telephone
25 line.

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2 Q. Are there any other experiences
3 related to MIMO telecommunications
4 systems?

5 A. On page A-2 of my CV it lists
6 as a work experience a time in which I was
7 a member of technical staff at --

8 (Witness perusing document.)

9 A. -- sorry, that's page A-4 of
10 my CV, I list work experience at a company
11 called Gigabit Wireless.

12 Gigabit Wireless is a company
13 founded by Professor Paul Raj to implement
14 his ideas about wireless technology,
15 including MIMO technology, and that
16 company not only developed a complete
17 product, including MIMO technology, but
18 was eventually sold to Intel.

19 Q. Are there any other experiences
20 listed under your employment history
21 related to MIMO telecommunications
22 systems.

23 (Witness perusing document.)

24 A. On page A-3 of my CV it lists
25 my involvement in the IEEE 802.16 working

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2 group, which developed the WiMAX standard;
3 the WiMAX standard is a version of
4 cellular communications that includes
5 within it MIMO technology.

6 And while I was participating
7 in that working group I also participated
8 in the IEEE 802.11 working group on WiFi
9 technology standards that also include
10 MIMO technology.

11 Q. Was the work on MIMO technology
12 telecommunications systems both with
13 respect to WiMAX and WiFi done over this
14 continuous length of time, October 2009 to
15 January 2017, or were there certain
16 durations of time in which you focused on
17 that?

18 A. Well, I'm still currently a
19 voting member of the IEEE 802.11 standard
20 as we continue to work on updates to that
21 technology, which includes MIMO
22 technology.

23 I'm also still participating in
24 future developments of the IEEE 802.16
25 standard as the technical editor and as a

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2 person listed on the website as an expert
3 in WiMAX technology.

4 So even though in my CV it
5 lists particular roles that I played from
6 October 2009 until January of 2017, I've
7 continued to be actively involved in the
8 development of both standards until the
9 present.

10 Q. Is there a reason you mentioned
11 the IEEE 802.16 working group but not the
12 IEEE 802.11 working group on your CV in
13 this?

14 A. As of the time of this CV I did
15 not have a working group officer role in
16 IEEE 802.11 working group.

17 What I've listed here were the
18 officer roles that I've had in the IEEE
19 802.16 working group.

20 Q. So if you were to give a
21 current version of your CV, would you
22 include the IEEE 802.11 working group and
23 any officer roles therein?

24 A. So currently I am a voting
25 member of both the IEEE 802.11 working

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2 group as well as a voting member of the
3 IEEE 802.15 working group, which has
4 assumed the role for development of future
5 IEEE 802.16 standards.

6 As I mentioned earlier, I have
7 assumed the role of technical editor for
8 development of future 802.16 standards,
9 but do not have an officer role in the
10 development of 802.11 standards, though I
11 am a voting member in both working groups.

12 Q. Could you just describe to me
13 what being a voting member of either the
14 802.16 or 802.11 working groups entails.

15 A. So that involves establishing
16 and maintaining voting rights in both
17 working groups; to do that one must attend
18 several meetings sequentially.

19 At each meeting you have to
20 participate in at least 80 percent --
21 sorry -- 75 percent of the meetings in
22 order to establish enough credit for
23 attendance at that particular meeting and
24 the rules are quite complicated because
25 they are two different types of meetings,

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2 they are plenary meetings and then there
3 are interim meetings.

4 The rules on qualifying as a
5 voting member vary depending on whether
6 you've attended an interim meeting or have
7 attended a plenary meeting, with
8 attendance of at least 75 percent of the
9 sessions.

10 In addition to that, voting
11 members are required to vote on any
12 amendment to the standard in what's called
13 a letter ballot and if one does not
14 respond to the call for a vote on a letter
15 ballot on an amendment, then you can lose
16 your voting rights even though you've
17 attended prior meetings.

18 Q. Could you describe your role --
19 strike that.

20 In this description of the IEEE
21 802.16 working group, you note under one
22 of the positions that you're task group
23 secretary; what does that entail?

24 A. The task group secretary is
25 responsible for recording the minutes of

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2 each meeting that takes place during a
3 particular meeting session for that week.

4 The minutes that are recorded
5 have to meet certain documentation
6 criteria because the meeting itself cannot
7 take place unless the secretary is in the
8 room to record proper minutes, including
9 the motions brought to the floor and the
10 voting results on those motions.

11 Q. What does the position of task
12 -- what are the responsibilities of the
13 position of task group vice-chair?

14 A. A task group vice-chair fills
15 in for the chair in that person's absence
16 when it comes to running -- conducting
17 the meetings; so everything from creating
18 the agenda or organizing the sequence of
19 presentations that are performed, making
20 sure that proper meeting rules are adhere
21 to, et cetera.

22 Q. Likewise, what are the
23 responsibilities of the role of task group
24 chair, you touched on it briefly just now?

25 A. Yes, so the task group chair is

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1
2 responsible for organizing and conducting
3 each of the meetings that take place,
4 which can be face-to-face and/or virtual,
5 in a hybrid meeting situation, as well as
6 teleconferences that happen in between
7 those meetings and those meetings take
8 place six times per year, every two
9 months.

10 The teleconferences happen in
11 between those meetings.

12 The working group chair is
13 responsible for organizing all of those
14 things, scheduling all of those things, is
15 responsible for making announcements to
16 the group concerning essential patent
17 claims as well as rules governing the
18 conduct of members in the meeting and as
19 well the chair is responsible for
20 organizing letter ballots as well as
21 sponsor ballots as well as reporting to
22 the executive committee on the status of
23 the working group and its progress towards
24 adopting an amendment.

25 The working group chair is also

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2 responsible for creating the project
3 authorization request, or what we call the
4 PAR, as well as the five criteria document
5 that's required in order to launch a
6 project to create an amendment to the
7 standard.

8 Q. What are the responsibilities
9 of the working group vice-chair and
10 secretary of the IEEE 802.16 working
11 group?

12 A. As I mentioned before, the
13 vice-chair supports the chair in the
14 duties of the chair, including acting in
15 place of the chair when the chair is not
16 present in the meeting to conduct the
17 meetings.

18 The secretary is responsible
19 for recording the minutes of the meeting
20 and presenting those minutes to the
21 working group for working group approval.

22 And the secretary is also
23 required to be in attendance at every
24 meeting, because a meeting is not allowed
25 to proceed without the presence of the

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2 secretary.

3 Q. Is there a difference between
4 the terms task group and working group
5 under these positions?

6 A. Yes.

7 So a working group consists of
8 one or more task groups; each of these
9 task groups is responsible for developing
10 an amendment to the base standard.

11 Q. Under the positions you note
12 IEEE 802.16 expert under the IEEE 802.16
13 working group; what does that entail?

14 A. That's simply noting that on
15 the IEEE 802.16 website they list roughly
16 half a dozen individuals who are points of
17 contact for anyone in the general public
18 who has any questions about the technology
19 included in the IEEE 802.16 standard.

20 So on an ongoing basis I'm
21 listed as one of the experts in IEEE
22 802.16 on that website.

23 Q. Did you draft the person of
24 skill in the art sections in these
25 declarations yourself?

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2 A. The level of person of ordinary
3 skill in the art is a level that I
4 discussed with the attorneys and based on
5 that discussion I finalized the definition
6 that you see in this declaration.

7 Q. Did you provide the first draft
8 of this section and there was a back and
9 forth?

10 MR. CERULLI: I just caution
11 the witness not to divulge attorney-client
12 privileged information.

13 I think you can answer that
14 yes, no, or I don't know.

15 A. What was the question again?

16 Q. Did you provide a first draft
17 of this section, level of ordinary skill
18 in the art, and then there was a back and
19 forth with your attorneys to reach the
20 final draft?

21 A. I don't know exactly how that
22 happened.

23 Q. Just so we're straight, you're
24 not sure who provided the first draft of
25 this section?

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2 A. I'm not sure how I can fully
3 answer that question without getting into
4 the issues brought up by my attorney.

5 Q. You don't need to disclose what
6 exactly was said between you and your
7 counsel, but all I'm asking is who
8 provided the first draft for this section,
9 that's all I'm asking.

10 A. So as I mentioned, there was a
11 discussion that preceded the creation of
12 the declaration.

13 So with respect to particularly
14 the level of ordinary skill in the art,
15 there was a discussion about what that
16 level should be prior to the creation of
17 the declaration and, from what I recall,
18 that discussion took place prior to the
19 first draft.

20 Q. Right, and the first draft was
21 ultimately written by who?

22 A. Well, the content in the first
23 draft is a result of discussions that I
24 had with attorneys.

25 I think I submitted the first

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2 draft to the attorneys, from what I
3 recall, but either way the content in the
4 first draft was a result of my discussions
5 with the attorneys.

6 Q. Is that also true for the
7 remainder of the declaration?

8 A. From what I recall, the first
9 draft was not a complete draft with every
10 single word in the final declaration
11 present in the original draft.

12 But over time the declaration
13 was improved to include everything you now
14 see in the final version.

15 Q. Can you point me to sections in
16 the declaration where you did not provide
17 the first draft.

18 A. I would say that would be
19 Section 4 and 5.

20 Q. Just for the record, what are
21 those section titles?

22 A. Section 4, the title is
23 "Materials Considered," and for Section 5,
24 the title is "Legal Standard."

25 Q. I think before we move on,

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2 maybe it's worth taking a break.

3 How's ten minutes sound?

4 A. That's fine.

5 (Recess taken.)

6 BY MR. PYMENTO:

7 Q. Dr. Bims, could you please turn
8 to claim 1 of the '113 patent, that's I
9 believe Exhibit 1001 in either of the
10 proceedings.

11 (Witness complying.)

12 A. Okay.

13 Q. You're at claim 1.

14 Do you see the claim
15 limitations, there is a few of them,
16 transmitting a first radio signal,
17 transmitting a second radio signal and
18 monitoring a third radio signal, do you
19 see that?

20 A. Yes.

21 Q. Does the third radio signal
22 have the same content as the first radio
23 signal?

24 A. In claim 1, for the first radio
25 signal, the second radio signal, and the

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2 third radio signal, there is no
3 description of the content.

4 Q. Based on your understanding as
5 a person of skill in the art, would a
6 person of skill in the art reading that
7 interpret first radio signal and the third
8 radio signal to have the same content?

9 MR. CERULLI: Objection, scope.

10 A. No, I don't see any description
11 in claim 1 that says the first radio
12 signal has the same content as the third
13 radio signal.

14 Q. That's not exactly my question.
15 My question is, would a person
16 of ordinary skill in the art reading the
17 claim, although the claim doesn't say
18 anything about the content, would a person
19 of ordinary skill in the art interpret the
20 first radio signal and the third radio
21 signal to have the same or different
22 content?

23 MR. CERULLI: Objection, scope.

24 A. So a person of ordinary skill
25 reading claim 1 would not reach a

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2 conclusion about the content of any of the
3 radio signals listed in claim 1.

4 Q. Based on your vast experience
5 of MIMO telecommunications systems, have
6 you seen systems where the content was the
7 same between what would be the equivalent
8 of a first radio signal and third radio
9 signal?

10 MR. CERULLI: Objection, form,
11 scope.

12 A. So in my experience, I have not
13 seen a system, a wireless system, that has
14 the particular radio signals described in
15 claim 1.

16 Q. Is it possible in your
17 experience that a system would have a
18 first radio signal and third radio signal
19 with the same content?

20 A. Depending on the system, there
21 could be a system in which a base station
22 transmits content that is the same as the
23 content transmitted by a UE, depending on
24 the circumstance.

25 And then there could be other

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2 systems in which a base station transmits
3 different content than the UE has
4 transmitted, depending on circumstances.

5 Q. Could you describe those
6 circumstances?

7 A. So, for example, if a user
8 equipment were to transmit an identifying
9 address of the user equipment in certain
10 prior art systems, the base station might
11 transmit to that user equipment
12 information or content that includes the
13 identifying address of the user equipment.

14 Or, in other circumstances, the
15 content might be different depending on
16 the overall procedures that are being
17 performed, such as the UE may request
18 information from the base station that was
19 not transmitted to the base station.

20 Q. Similar question for the second
21 radio signal and the first radio signal;
22 what circumstances would enable the first
23 radio signal to be the same or different
24 from the second radio signal?

25 MR. CERULLI: Objection, form.

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2 (Witness perusing document.)

3 A. So in column 5, for example, in
4 the '113 patent, starting at line 57, it
5 says, "In one embodiment, the first radio
6 signal and the second radio signal both
7 carry second information and the second
8 information is used for determining the
9 multi-antenna related transmitting of the
10 third signal. In that embodiment, the
11 first radio signal and the second radio
12 signal both carry the same content,
13 meaning second information."

14 In column 10, starting at line
15 17, it says, "In one embodiment, the first
16 radio signal is used for determining a
17 first antenna port group."

18 Starting at line 29, it says,
19 "In one embodiment, the second radio
20 signal is used for determining a second
21 antenna port group."

22 Those two statements suggest
23 that the first radio signal and the second
24 radio signal could have different content.

25 Q. What was the first citation

1 BIMS

2 that you noted just now?

3 A. In column 5 of the '113 patent,
4 starting at line 57.

5 Q. Thank you.

6 Is it usually your experience
7 that in such a system where the first
8 radio signal and second radio signal both
9 carry second information, that the second
10 information would be expressed in the same
11 way between both the first radio signal
12 and the second radio signal?

13 A. It's possible a person of
14 ordinary skill would understand that there
15 are systems in which the same information
16 is repeated and there are systems in which
17 slightly different information is
18 repeated.

19 Q. In other words, you're saying
20 that certain systems can carry
21 redundancies on purpose, correct?

22 A. My answer to the previous
23 question is that a person of ordinary
24 skill would understand that there are
25 certain prior art systems in which the

1 BIMS

2 same information is repeated and there are
3 other prior art systems in which the
4 information that is repeated is different.

5 Q. Could you tell from reading
6 that section of column 5 of the '113
7 patent which of those two possibilities
8 this is?

9 MR. CERULLI: Objection, form.

10 A. No; claim 1 does not make a
11 distinction about the content of the first
12 and second radio signals.

13 Q. Could you please go to column
14 8, lines 1 through 6.

15 (Witness complying.)

16 A. Okay.

17 Q. I will just represent that this
18 paragraph reads, "In one subembodiment,
19 the first radio signal and second radio
20 signal are used for determining the values
21 of different bit positions in a first bit
22 block respectively, and the value of the
23 first bit block is equal to the index
24 value of the fourth antenna port group in
25 K antenna port groups, wherein K is

1 BIMS

2 positive integer greater than 1."

3 In this subembodiment, would
4 you be able to make a conclusion regarding
5 the content of the first and second radio
6 signal?

7 A. No.

8 Q. If two signals each determine
9 different bit positions, does that mean
10 the signals indicate different content?

11 A. As an initial matter, this
12 paragraph in column 8, from lines 1
13 through 6, has a logical inconsistency in
14 it that is confusing.

15 Q. Could you describe that.

16 A. In this paragraph it concludes
17 by saying "The value of the first bit
18 block is equal to the index value of the
19 fourth antenna port group in K antenna
20 port groups wherein K is a positive
21 integer greater than 1. So, for example,
22 the value of K could be the value 2 or
23 even the value 3. In such a case it would
24 not make sense that there would be a
25 fourth antenna port group when there are

1 BIMS

2 only two or three antenna port groups."

3 Q. But doesn't the fourth antenna
4 port group in K antenna port groups, at
5 least for the subembodiment, assume that
6 there are at least four antenna port
7 groups?

8 A. In reading this paragraph in
9 column 8 from lines 1 through 6, the
10 paragraph makes clear that the value K is
11 a positive integer greater than 1.

12 Q. In any case, just going back to
13 my previous question, if two signals each
14 determine different bit positions, as this
15 language says, right, the first radio
16 signal and the second radio signal are
17 used for determining the values of
18 different bit positions in a first bit
19 block respectively, does that mean that
20 the first and second radio signals
21 indicate different content, at least in
22 this subembodiment?

23 A. Not necessarily.

24 Q. Could you describe that.

25 A. As a person of ordinary skill

1 BIMS

2 would understand that this paragraph is
3 describing using a first and second radio
4 signal to determine values in different
5 bit positions.

6 But this paragraph does not
7 describe the content in the first and the
8 second radio signals that is used for
9 determining the values of different bit
10 positions.

11 Q. As a person of ordinary skill
12 in the art, how does a radio signal
13 determine the value of different bit
14 positions?

15 A. This paragraph does not say
16 that a radio signal determines the value
17 of different bit positions in a first bit
18 block respectively.

19 Q. How is a first radio signal
20 used for determining the values of a bit
21 position, as a person of ordinary skill in
22 the art?

23 A. This paragraph does not
24 describe how that determining is
25 performed, so a person of ordinary skill

1 BIMS

2 in the art would have to consult the
3 entire specification to see if other parts
4 in the specification provide more
5 information about how the determining is
6 performed.

7 Q. This paragraph shows that the
8 first radio signal and second radio signal
9 are used for determining different values,
10 correct?

11 A. That's not what the paragraph
12 says.

13 It says that the first radio
14 signal and the second radio signal are
15 used for determining the values of
16 different bit positions; it does not say
17 that the first and second radio signals
18 are used for determining different values.

19 Q. In your testimony, then,
20 different bit values are not different
21 values?

22 A. Again, as I've said, this
23 paragraph states that the first and second
24 radio signals are used for determining the
25 values of different bit positions, which

1 BIMS

2 is different than determining different
3 values.

4 Q. Is a value of one bit position
5 different than the value of another bit
6 position?

7 A. One can't say categorically,
8 because it depends on the values in those
9 bit positions.

10 Q. It is a pretty simple question.
11 There are different bit
12 positions, right, so if I take the value
13 of one bit position and the value of a
14 different bit position, those could
15 possibly be the same values, in your
16 opinion?

17 A. In my opinion, the values
18 stored in different bit positions can be
19 the same or different.

20 Q. Can you provide me an example
21 of where they're the same.

22 A. For example, if there are two
23 bit positions and in position 1 the value
24 zero is stored and in position 2 the value
25 zero is stored, then in that example the

1 BIMS

2 values of different bit positions are the
3 same.

4 Q. And what would those zeros
5 indicate?

6 A. In my example, the value zero
7 is a logical value which is not tied to a
8 particular indication.

9 Q. You'll have to describe that
10 further for me, what does that mean?

11 A. The value zero is a logical
12 value, meaning that it is a value that is
13 associated with a logical system that has
14 mathematical meaning.

15 It is not, in that sense in
16 which I used my example, tied to a
17 particular indication.

18 Q. Let's turn to column 7, line 42
19 to 48.

20 (Witness complying.)

21 Q. Specifically line 46, where it
22 says, "In one embodiment, the above method
23 is advantageous in making full use of
24 aerial resources to report more
25 information."

1 BIMS

2 As a person of ordinary skill
3 in the art, what is your interpretation of
4 that paragraph?

5 A. So as a person of ordinary
6 skill in the art, the term aerial
7 resources would not be understood to be a
8 term of art.

9 So a person of ordinary skill
10 in the art reading only lines 46 through
11 48 in column 7 would not have a clear
12 understanding about the aerial resources
13 described in just those lines.

14 Q. But a person reading it, as you
15 are reading it, you would just not provide
16 any interpretation of that paragraph at
17 all during reading the specification in
18 that portion of it?

19 MR. CERULLI: Objection, form.

20 A. Again, as I've described, if a
21 person of ordinary skill only read lines
22 46 through 48 of column 7 and no other
23 lines in the specification claims or file
24 history, they would not understand what is
25 meant by aerial resources, since that is

1 BIMS

2 not a term of art.

3 Q. For someone who has read the
4 full specification and prosecution history
5 and the claims, what meaning would a
6 person of ordinary skill in the art have
7 to that line, including the term aerial
8 resources?

9 MR. CERULLI: Objection, scope.
10 (Witness perusing document.)

11 A. In my review of the
12 specification for the '113 patent, it is
13 not clear to me where it provides a
14 definition of the term aerial resources.

15 Q. So how would you interpret
16 aerial resources in the absence of --
17 what you said is the absence of clarity?

18 MR. CERULLI: Objection, scope.

19 A. Reading this as a person of
20 ordinary skill in the art, I would not try
21 to read into the specification things that
22 are not described in the specification or
23 previously understood by a person of
24 ordinary skill.

25 Q. Is time an aerial resource?

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2 MR. CERULLI: Objection, scope.

3 A. As I mentioned earlier, it's
4 not clear to me in reading the
5 specification what is meant by aerial
6 resources as used in column 7.

7 Q. In reading the patent
8 specification, you would gloss over that
9 section, is that your testimony?

10 MR. CERULLI: Objection, form.

11 A. I'm simply saying that a person
12 of ordinary skill in the art reading
13 column 7 would not have a clear
14 understanding as to what is meant by
15 aerial resources.

16 Q. That's not really my question.
17 My question is would you skip
18 that portion because you don't have a
19 clear understanding of that term or
20 sentence?

21 A. That portion is in the
22 specification, so a person of ordinary
23 skill would read it.

24 Q. Yes, they would read it and I
25 understand that you read it, too.

1 BIMS

2 What would you interpret it is
3 or would you not interpret it at all?

4 MR. CERULLI: I will just say
5 again objection, scope.

6 (Witness perusing document.)

7 A. So in my reading of the claims,
8 I don't recall seeing the word or the term
9 aerial resources listed in any of the
10 claims that I analyzed in my declaration.

11 Q. Again, that may be the case.
12 I'm just asking how you would
13 interpret this line, whether you put an
14 opinion in the declaration or it's in the
15 claims, what is your interpretation of
16 this line, to the extent that you have
17 one; or if your opinion is that you would
18 not provide one because it's not clear.

19 MR. CERULLI: Objection, scope.

20 A. From what I recall in my
21 declaration, I have not provided a
22 construction for the term aerial
23 resources.

24 In addition, from what I
25 recall, none of the claims I analyzed uses

1 BIMS

2 the term aerial resources.

3 So I guess what you're asking
4 is that I perform an analysis of the
5 specification with respect to the term
6 aerial resources outside the scope of my
7 declaration.

8 Q. What I am asking is that
9 normally the specification informs your
10 understanding of the claims, and while I
11 understand that the term, the specific
12 term aerial resource, is not in the
13 claims, perhaps this part will inform your
14 understanding of the claims.

15 It seems to me that it's not,
16 but just to clarify, let's just say, it
17 says "In one embodiment the above method
18 is advantageous in making full use of
19 aerial resources to report more
20 information," what does the "report more
21 information" aspect of this line refer to?

22 MR. CERULLI: Objection, form
23 and scope.

24 (Witness perusing document.)

25 A. Column 7, lines 46 through 48,

1 BIMS

2 makes reference to "the above method."

3 A person of ordinary skill
4 reading that passage would understand that
5 lines 46 through 48 are referencing an
6 above method.

7 Above lines 46 through 48, the
8 specification describes "According to one
9 aspect of the present disclosure,"
10 starting at line 42, "the method is
11 characterized in that the first radio
12 signal and the second radio signal
13 together are used for determining the
14 multi-antenna related transmitting of the
15 third radio signal."

16 Following that passage
17 immediately is the passage that we have
18 been talking about, starting at line 46,
19 "In one embodiment, the above method is
20 advantageous in making full use of aerial
21 resources to report more information."

22 So the description of making
23 full use of aerial resources to report
24 more information is related to this above
25 method described starting in line 42, but

1 BIMS

2 how it's related is not clear.

3 Q. So you have no interpretation
4 of lines 46 through 48 in view of what you
5 just read from lines 42 to 45, is that
6 correct?

7 A. So what I said before is
8 describing what appears to be the above
9 method referred to starting at line 46.

10 And based on that, it appears
11 that lines 46 through 48 are referencing
12 the method described starting at line 42
13 and saying that that method is
14 advantageous in making full use of aerial
15 resources to report more information.

16 But lines 46 through 48 do not
17 describe what are the aerial resources
18 that are in line 42 through 45 nor does it
19 describe what is the, quote, more
20 information.

21 Q. Is it possible that the more
22 information relates to the fact that the
23 first radio signal and the second radio
24 signal together are used for determining
25 the transmission of the third radio

1 BIMS

2 signal, is that possible?

3 MR. CERULLI: Objection, scope.

4 A. What you read is part of the,
5 quote, above method; what you read does
6 not state what are the aerial resources or
7 what is the more information.

8 Q. Well, I just described or
9 posited that perhaps using the first radio
10 signal and the second radio signal
11 together to determine the transmission of
12 a third radio signal might be referencing
13 the more information in the subsequent
14 lines, and I'm asking you a yes or no
15 question, is that a possible
16 understanding?

17 MR. CERULLI: Objection, scope.

18 A. So lines 46 through 48 don't
19 say that the more information is
20 necessarily determining multi-antenna
21 related transmitting.

22 Q. We're going to be here a long
23 time if you're not answering my question.

24 I am just saying is it a
25 possible interpretation that the first

1 BIMS

2 radio signal and the second radio signal
3 being used together in order to determine
4 the transmitting of third radio signal is
5 possibly what the reporting more
6 information in the subsequent lines is
7 referring to, is it possible, I'm not
8 saying necessarily, as you mentioned, I'm
9 saying is it possible?

10 MR. CERULLI: Objection, form
11 and scope.

12 A. I don't know how that could be
13 possible without understanding what are
14 aerial resources.

15 Q. How about the term more
16 information, as in if a -- if two signals
17 together, as opposed to separate, are used
18 for determining a transmission of a third
19 radio signal, is that togetherness
20 possibly correlated for reporting more
21 information?

22 MR. CERULLI: Objection, form
23 and scope.

24 A. So what lines 46 through 48
25 make clear is that the aerial resources

1 BIMS

2 are what are used to report more
3 information.

4 Lines 42 through 45 do not
5 describe aerial resources and the
6 specification as a whole does not define
7 aerial resources, which are described in
8 lines 46 to 48 as being used to report
9 more information.

10 Q. Again, it's not answering my
11 question.

12 So if I have one radio signal
13 with some information and I have a second
14 radio signal with additional information
15 and I send both those two radio signals
16 together, would I receive on the other end
17 more information than if I sent each
18 signal separately?

19 MR. CERULLI: Objection, form
20 and scope.

21 A. You're asking this question
22 generally, not necessarily tied to the
23 '113 patent, is that the context?

24 Q. No, the question is the
25 question, that's all.

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2 If I have one signal with one
3 information, if I have a second signal
4 with additional information, and I send
5 the two signals, do I receive more
6 information on the receiving side than I
7 would if I sent the signals separately,
8 that's the question?

9 MR. CERULLI: Same objections.

10 A. Well, again, as I'm hearing the
11 question, it sounds like a generic
12 hypothetical, not necessarily tied to the
13 '113 patent, but just as a general matter
14 what would a person of ordinary skill
15 think about the question outside even the
16 context of the '113 patent.

17 Q. You can answer it generically
18 if you insist on saying it's outside of
19 the scope of '113 patent.

20 Again, the question remains the
21 question, which is, it is a hypothetical,
22 right, and in this hypothetical, the first
23 radio signal has some information, second
24 radio signal has additional information,
25 and I send both those radio signals

1 BIMS

2 together and it's received on the other
3 side; would I necessarily be receiving
4 more information on the other side, on the
5 receiving side, than if I had sent each
6 signal separately?

7 MR. CERULLI: Objection, form
8 and scope.

9 A. So if the content of the first
10 and second radio signals sent together is
11 identical to the content of the first and
12 second radio signals sent separately, then
13 the content would be the same; however,
14 the timing of the transmission when the
15 signals are separate could provide
16 additional information not available when
17 the two signals are sent jointly.

18 Q. Put a different way, if I sent
19 the two signals, first and second radio
20 signals, which each have different sets of
21 information, on the receiving side would I
22 receive more information if I only sent
23 the first signal?

24 MR. CERULLI: Objection, scope.

25 A. If only the first signal was

1 BIMS

2 transmitted and only the first signal was
3 received, then what is communicated to the
4 receiver would be the content of the first
5 signal and the time in which it was
6 received.

7 Q. And therefore sending both
8 first and second radio signals with
9 different information would be more
10 information than what you just described,
11 which is just receiving the content of the
12 first signal, correct?

13 MR. CERULLI: Objection, scope.

14 A. So what I just described is
15 that transmitting two signals separately
16 can provide more information than
17 transmitting two signals jointly
18 irrespective of the content.

19 Q. I guess simplifying it a little
20 more, I'm just saying if you sent two
21 signals separately, would that be more
22 information than if you sent only one of
23 those signals alone?

24 MR. CERULLI: Objection, scope.

25 A. It depends.

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2 Q. Depends on what?

3 A. It depends, for example, it
4 depends on whether the receiver received
5 either of those signals, both of those
6 signals, or none of those signals as an
7 initial matter.

8 And in addition to that, it
9 depends on how the reception of those
10 signals is processed by the receiver.

11 Q. Okay.

12 Assuming that all of the
13 signals are received, No. 1, and are
14 received completely, would receiving two
15 signals report more information than
16 receiving only one of those two signals?

17 MR. CERULLI: Same objection.

18 A. It depends.

19 Q. Okay, describe that, please.

20 A. The receiver may or may not
21 consider the reception of two signals at
22 different times as conveying additional
23 information.

24 Q. So receiving two signals at the
25 same time would convey more information,

1 BIMS

2 is that correct?

3 MR. CERULLI: Objection, form
4 and scope.

5 A. Conveying two signals jointly
6 versus conveying two signals at different
7 times could be important information to a
8 receiver or it may not be important
9 information to the receiver, it depends on
10 the receiver and how it's processing the
11 reception of the signals.

12 Q. Disregarding whether the
13 information is important or not, is it
14 more information when it's sent joint
15 versus separate?

16 MR. CERULLI: Same objections.

17 A. So your question now is with
18 respect to the transmitter, not the
19 receiver, is that the question?

20 Q. It is whether the receiver is
21 receiving more information or not, is the
22 question.

23 A. It depends on what the receiver
24 has chosen to receive.

25 If the receiver has chosen to

1 BIMS

2 receive the signals in such a way that it
3 understands the difference between the
4 joint reception of two signals and the
5 separate reception of two signals, then
6 the receiver is taking that into account
7 and understands that there is a
8 distinction.

9 However, if the receiver does
10 not care if the two signals are sent
11 jointly or the signals are sent
12 separately, then the receiver is not
13 receiving this information about the
14 difference and would not understand that
15 there is a difference.

16 Q. Would not understand there is a
17 difference in what?

18 A. Between sending two signals
19 jointly versus two signals separately.

20 Q. I guess going back to my
21 original question, if I sent two signals,
22 each of them has different information --
23 assuming it is going to be fully received
24 at the receiver -- is sending two signals
25 reporting more information than if I sent

1 BIMS

2 only one of those two signals at the
3 receiver?

4 MR. CERULLI: Objection, scope.

5 Q. It is a pretty simple question.

6 A. Well, as I said earlier, it
7 depends on whether or not the receiver
8 understands that there is a difference
9 between receiving two signals jointly
10 versus receiving two signals separately
11 and processes what's received based on the
12 fact that it understands that there is a
13 difference.

14 Q. But that was not the
15 hypothetical I just posed.

16 The hypothetical I posed is two
17 signals versus one signal, not two signals
18 jointly versus two signals separately.

19 Do you understand my
20 hypothetical?

21 A. Okay, I now I understand your
22 hypothetical.

23 So in your hypothetical two
24 signals are transmitted jointly versus one
25 signal is transmitted?

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2 Q. Correct.

3 A. So there are many examples in
4 which multiple signals are sent jointly,
5 but no, quote, more information is
6 conveyed to the receiver than simply
7 sending one signal by itself.

8 Q. All right.

9 So I'm not necessarily
10 referring to what is conveyed or what's
11 actually processed by the receiver.

12 I'm talking more from the
13 transmission side, whether more
14 information is being transmitted or more
15 information is being reported,
16 transmitted, to the receiver side; is more
17 information reported when I have two
18 signals or when I have only one of those
19 two signals transmitted?

20 MR. CERULLI: Objection, form
21 and scope.

22 A. So in this hypothetical in
23 which multiple signals are transmitted
24 jointly versus one signal transmitted by
25 itself, again, there are just numerous

1 BIMS

2 examples in which it doesn't matter if
3 multiple signals are sent jointly or a
4 single signal is sent by itself when it
5 comes to conveying information to a
6 receiver.

7 Q. I just said I'm not talking
8 about conveying or necessarily at the
9 receiver what's processed.

10 And I understand your point,
11 you know, you can take certain bits of
12 information, neglect others, and that's
13 conveying information, right, what is
14 processed by the receiver; I'm asking a
15 different question.

16 I'm asking is more information
17 provided, still on the transmission side,
18 is more information provided by two
19 signals or only one of those two signals?

20 MR. CERULLI: Objection, form
21 and scope.

22 A. So, again, when you talk about
23 providing information, what comes to mind
24 is the concept of communicating
25 information from the transmitter to a

1 BIMS

2 destination and just because the
3 transmitter transmits multiple signals
4 jointly doesn't mean that the transmitter
5 is transmitting multiple signals to a
6 particular intended receiver.

7 So, for example, a base station
8 can transmit multiple signals destined for
9 different receiving devices jointly with
10 different encodings that can only be
11 understood by one of the individual
12 receivers; in that scenario, the base
13 station is transmitting multiple signals,
14 but is only providing, as you mentioned,
15 one signal to a particular receiving
16 device.

17 Q. I think that's perhaps
18 complicating things a little more than I'm
19 contemplating and I will try this one more
20 time, we spent like an hour on this.

21 Is there more information in
22 two signals or only one of those two
23 signals, let me keep it as simple as that?

24 MR. CERULLI: Objection, form
25 and scope.

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2 MR. PYMENTO: I will rephrase
3 it.

4 Q. Is there more information in
5 two signals or only one of those two
6 signals, where the information in the
7 first and second of those signals are
8 different?

9 MR. CERULLI: Same objections.

10 A. So your question as you posed
11 may, in how you're describing it, appear
12 to you to be a simple question, but in
13 actuality, from what I'm hearing, it has
14 far-reaching implications from an
15 information theory perspective, and as we
16 know, information theory is the
17 foundational principles that drives
18 wireless communications.

19 And the reason I say that is
20 because in your question you're asking
21 about the providing information through a
22 transmitter even if there's no receiver
23 and that raises a profound question about
24 whether or not information can be provided
25 when no one is listening to it, which then

1 BIMS

2 has implications for things like integer
3 and things like if you don't observe an
4 event did it really happen.

5 So I don't know that I can
6 really say that transmitting information
7 when there's no listener to receive it is
8 providing information.

9 Q. As an absolute value --

10 Let's put it this way; where A
11 and B are positive integers, is A plus B
12 greater than A?

13 A. Not necessarily.

14 Q. Okay.

15 What example is that true or is
16 that not true, rather?

17 A. For example, in the binary
18 system, if A is one and B is one, A plus B
19 equals zero.

20 In that sense, A plus B is less
21 than A or B.

22 Q. You're saying in the binary
23 system, you're saying one plus one is not
24 equal to one in the binary system, is that
25 what you're saying?

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2 A. In the binary system, one plus
3 one equals zero.

4 Q. In the decimal system, where A
5 and B are positive integers, is A plus B
6 greater than A?

7 A. In the decimal system, the only
8 allowed values are zero through 9, so you
9 run into the same problem.

10 Q. You see how we're just like
11 wasting time here, right, this is a really
12 simple question.

13 A plus B is greater than A,
14 where these numbers are positive integers,
15 right or wrong?

16 MR. CERULLI: Objection, form.

17 A. So in the domain of integers,
18 if two integers are positive numbers, then
19 the summation of those two integers will
20 be greater than either -- greater than or
21 equal to either of those integers.

22 Q. Why greater than or equal to,
23 that doesn't follow mathematically if both
24 A and B are positive integers, correct?

25 A. If A or B is zero, then A plus

1 BIMS

2 B equals --

3 Q. Yes, zero is not a positive
4 integer; A and B are positive integers, so
5 A plus B is necessarily greater than A,
6 correct?

7 MR. CERULLI: Objection, form.

8 A. You're talking about integers?

9 Q. Yes, I'm saying A plus B is
10 greater than A where A and B are positive
11 integers, I'm talking about integers.

12 A. Yes, in that scenario, yes.

13 Q. I just have one more question
14 and we can take a break.

15 This is another hypothetical
16 and now I'm worried.

17 Suppose you have a system where
18 the first and second radio signals of the
19 '113 patent are transmitted on the same
20 channel, whether that's PUCCH or PRACH; in
21 your opinion, how would a person of
22 ordinary skill in the art convert that
23 system to one where the first and second
24 radio signals are transmitted on different
25 channels?

1 BIMS

2 MR. CERULLI: Objection, form.

3 A. So you're saying the PUCCH and
4 PRACH are not different channels?

5 Q. No, I am saying they are
6 different channels, they are different
7 channels.

8 What I'm saying is you have a
9 system where the first and second radio
10 signals are transmitted on the same
11 channel, so let's just say the first and
12 second radio signals are transmitted on
13 PUCCH.

14 How would a person of ordinary
15 skill in the art convert that system to
16 one where, say, the first signal is
17 transmitted by PUCCH, but the second radio
18 signal is transmitted by PRACH?

19 MR. CERULLI: Same objection.

20 A. In your hypothetical, both
21 channels are available to the transmitter,
22 both the PUCCH and the PRACH are channels
23 available to the transmitter and in your
24 hypothetical only one of the channels is
25 used to send signals and the question is

1 BIMS

2 would it be obvious to convert such a
3 system to a system that utilizes both of
4 the available channels, the PUCCH --

5 Q. Not really, that's not really
6 my question, I am not really saying it's
7 obvious.

8 I am asking as a person of
9 ordinary skill in the art and indeed as an
10 expert how would you design or make that
11 design improvement or whatever, the design
12 implementation, from a system where you
13 don't have the option, it's only sent by
14 one channel, PUCCH or PRACH, but both the
15 first and second radio signals are
16 transmitted on one channel and that's the
17 system, I want to convert that system to
18 one where the first and second radio
19 signals can be transmitted each on
20 different channels; how can I design such
21 a system?

22 MR. CERULLI: I will object to
23 form and scope and note for the record
24 that the witness was interrupted during
25 the middle of his answer.

1 BIMS

2 MR. PYMENTO: I did not catch
3 that, but, okay, if you say so.

4 A. Okay.

5 In such a system where the
6 PUCCH and the PRACH channels are available
7 for use and in that system only one of
8 them, let's say the PUCCH, is used for
9 transmission, a person of ordinary skill
10 would consider it obvious to send
11 information also using the available
12 PRACH.

13 Q. Okay, you're representing that
14 it's obvious to me and I'm saying what are
15 the design implementations that would
16 occur to make that a reality?

17 A. The way to design such a system
18 would be to make a very tiny change in the
19 implementation so that information sent
20 through the PUCCH could alternatively be
21 sent on the PRACH.

22 Q. What is that tiny change?

23 A. The tiny change would be, for
24 example, let's say that the implementation
25 was performed in software, although this

1 BIMS

2 example could apply in hardware as well,
3 then what would be required is a
4 modification to the source code that would
5 send the information on the PUCCH to
6 instead designate the information be sent
7 on the PRACH, which may be something as
8 simple as changing the function that gets
9 called to transmit the message.

10 Q. I get you, but I'm wondering
11 that's almost assuming that another
12 function already exists, right?

13 I guess what I'm asking is
14 specifically what is different function or
15 how would one change the function or
16 create the alternative function in the
17 system that you're describing?

18 A. Again, in the system that I'm
19 describing, both the PUCCH and the PRACH
20 are available for use by the transmitter.

21 And for such a system, the
22 change necessary to send a message over
23 the PRACH versus the PUCCH could be as
24 simple as sending that information to a
25 different software function.

1 BIMS

2 Q. How about a system where those
3 two options are not available at the
4 outset, only one is available, one channel
5 is available; how do I then design a
6 system to implement the availability of
7 both channels?

8 MR. CERULLI: Objection, scope.

9 A. Well, if both the PUCCH and
10 PRACH are well-known channels, then a
11 person of ordinary skill would understand
12 how to implement both channels.

13 So in a system that can only
14 support a PUCCH channel, a person of
15 ordinary skill would understand how to add
16 the PRACH capability since the PRACH
17 capability would be well-known and
18 understood to a person of ordinary skill
19 in the art.

20 As such, those modifications to
21 the original system, which is PUCCH only,
22 would be straightforward.

23 Q. You mentioned that those
24 changes could be implemented both --
25 could be implemented in both software or

1 BIMS

2 hardware.

3 For software you noted it would
4 be adding a function.

5 What would be the design around
6 or the design for hardware to add the
7 capability of another channel?

8 A. So I wouldn't consider this
9 necessarily to be a, quote, design around;
10 we're talking about a system that is only
11 capable of transmitting on the PUCCH
12 channel being modified to include the
13 capability of transmitting on both the
14 PUCCH and the PRACH channels.

15 And to do so in hardware, a
16 person of ordinary skill would apply known
17 techniques for implementing the PRACH
18 using hardware circuitry to add such
19 capability to the hardware.

20 And, in addition, a person of
21 ordinary skill would use well-known
22 techniques to add additional logic gates
23 that would redirect the message to the
24 PRACH circuitry that was added to the
25 system.

1 BIMS

2 Q. Could you describe those
3 well-known techniques, I guess at a high
4 level.

5 A. So, for example, the techniques
6 could be applied in a BLSI design by
7 adding logic gates that will receive
8 information from a hardware component and
9 those logic gates would direct the
10 received signal to a portion of the
11 hardware circuitry designed to transmit
12 information on the PRACH and that would
13 occur using transistor logic to redirect
14 the message.

15 Q. Do you want to take a break or
16 we could power ahead too.

17 THE COURT REPORTER: I would
18 like to take a quick break, please.

19 MR. PYMENTO: Sure.

20 (Recess taken.)

21 BY MR. PYMENTO:

22 Q. Dr. Bims, let's go back to
23 claim 1 in the '113 patent.

24 A. Okay.

25 Q. Do you see the claim limitation

1 BIMS

2 monitoring a third radio signal in a
3 first-time window?

4 A. Yes.

5 Q. What is your understanding of
6 the term time window?

7 (Witness perusing document.)

8 A. In reading this claim
9 limitation, my understanding of time
10 window is in part coming from looking at
11 Figure 6, in the descriptions of Figure 6.

12 Q. I'm sorry, was that the end of
13 the response?

14 A. Yes; Figure 6 and the
15 descriptions of Figure 6 in the
16 specification, for example, starting in
17 column 22 at line 44.

18 Q. So I'm reading column 22, line
19 44, as you mentioned, and it does note
20 that "Embodiment 6 illustrates example of
21 a first time window, second time window
22 and a third time window as shown in Figure
23 6."

24 My question is, what is your
25 understanding of the term time window,

1 BIMS

2 what is a time window?

3 A. Again in the context of the
4 claims, the specification is referring you
5 to Figure 6.

6 Q. Right, and Figure 6 shows time
7 windows; my question is what is a time
8 window?

9 A. A time window as shown in
10 Figure 6 is a period of time on the time
11 axis.

12 Q. Is it your understanding that a
13 time window can be any length of time?

14 A. In the claims, the first,
15 second and third time windows have
16 constraints on their timing.

17 Q. In your opinion, how would the
18 length of each time window be determined
19 based on the language in claim 1, Figure
20 6, in specification?

21 A. So there are a couple of places
22 in claim 1 that provide some insight.

23 For example, at line 57 in
24 column 25 it says that "A time domain
25 resource occupied by the first radio

1 BIMS

2 signal is used for determining a second
3 time window," and then at line 62 it says,
4 "A time domain resource occupied by the
5 second radio signal is used for
6 determining a third time window and the
7 end time of the third time window is the
8 end time of the first time window."

9 So those two passages in claim
10 1 provide some insight about the time
11 window when taking into account Figure 6.

12 Q. What is your understanding of a
13 time domain resource?

14 A. A time domain resource is a
15 structure that is used for determining a
16 second time window as well as used for
17 determining a third time window, depending
18 on whether the first radio signal or the
19 second radio signal occupies that time
20 domain resource.

21 Q. Would you describe for me how a
22 time domain resource is occupied by a
23 radio signal.

24 A. The claim does not describe how
25 it's occupied; what the claim describes is

1 BIMS

2 that the time domain resource is occupied
3 by either a first or second radio signal.

4 Q. Right, and I'm asking you just
5 to describe that technologically, what
6 does that mean is essentially what I'm
7 asking you.

8 (Witness perusing document.)

9 A. In column 23, starting at line
10 13, I believe, it says, "In one
11 subembodiment, a time domain resource
12 occupied by the first radio signal is the
13 start time of the second time window."

14 Q. Is that your full response?

15 A. Yes, I simply read what the
16 specification says about the time domain
17 resource occupied by the first radio
18 signal.

19 Q. Got it.

20 Could you describe what that
21 means.

22 A. What it means is that the start
23 time of the second time window can be
24 understood from a time domain resource
25 occupied by the first radio signal.

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2 Q. You kind of just restated the
3 language there.

4 I guess what I am trying to
5 understand is, I understand it says a time
6 domain resource occupied by the first
7 radio signal is the start time, which
8 means that a time domain resource is a
9 particular instant in time, is that
10 correct?

11 MR. CERULLI: Objection, form.

12 A. Not necessarily.

13 In reading this passage it is
14 clear that the start time of the second
15 time window is an instant in time.

16 Q. Right.

17 And the language says the time
18 domain resource occupied by the first
19 radio signal is the start time, and I'm
20 not trying to give you a got-you moment,
21 I'm actually just asking what this means,
22 what does that mean, does that mean a
23 resource is an instant in time too, or
24 does it mean something else, and if it's
25 something else, describe that, please.

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2 MR. CERULLI: Objection, form.

3 A. It's simply saying that the
4 time domain resource occupied by the first
5 radio signal tells you the start time of
6 the second time window.

7 Q. Does it mean that the time
8 occupied by the first radio signal
9 indicates the start time of the second
10 time window or does it mean something
11 else?

12 A. I don't know that this language
13 is expressly saying that there is some
14 inherent indication of the start time of
15 the second time window.

16 From reading this passage, I
17 believe that a person of ordinary skill
18 would understand that the time domain
19 resource occupied by the first signal
20 tells the system what the start time is
21 for the second time window.

22 Q. Sorry, could you repeat that
23 last part.

24 A. The time domain resource
25 occupied by the first radio signal, as

1 BIMS

2 stated here in column 23, is understood by
3 a person of ordinary skill to convey the
4 start time of the second time window.

5 Q. Okay.

6 And when the language says "a
7 time resource occupied by the first radio
8 signal" in claim 1, is that referring to
9 the full duration of time of the first
10 radio signal?

11 MR. CERULLI: Objection, form.

12 A. I don't think the claim says
13 that, when I read the claim.

14 Q. I am referring to line 55 in
15 particular, "a time resource occupied by
16 the first radio signal is used."

17 What is the first radio signal
18 occupying?

19 A. The first radio signal occupies
20 a time domain resource.

21 Q. Right, and what is a time
22 domain resource?

23 MR. CERULLI: Objection, form.

24 A. So what we know from reading
25 claim 1 is that time domain resources are

1 BIMS

2 associated with the second and third time
3 windows and the time domain resources can
4 overlap.

5 We also know from reading claim
6 1 that time domain resources can be
7 occupied by radio signals.

8 Q. So is your testimony we really
9 don't know what the time resource is,
10 other than what the claim is saying?

11 MR. CERULLI: Objection, form.

12 A. What was the question again?

13 Q. Is it your testimony that we
14 don't actually know what a time domain
15 resource is, other than what's in the
16 claim?

17 MR. CERULLI: Objection, form.

18 A. Well, the claim certainly does
19 provide constraints on what a time domain
20 resource is and a person of ordinary skill
21 would apply those constraints when trying
22 to understand claim 1.

23 In reviewing the specification
24 and its description of time domain
25 resource, much of the language in the

1 BIMS

2 specification is exactly the same as the
3 claim language, describing the time domain
4 resources being within time windows and
5 being occupied by radio signals.

6 Beyond that there's not much
7 discussion in the specification about what
8 is a time domain resource.

9 Q. In your opinion, what's the
10 unit of measurement of a time domain
11 resource?

12 MR. CERULLI: Objection, scope.

13 A. Figure 6 shows three time
14 windows and what we see from the claims is
15 that time domain resources have associated
16 time windows or, in other words, a second
17 and third time windows have overlapped
18 time domain resources.

19 So given that second and third
20 time domain -- time windows, rather, as
21 shown in Figure 6, have overlapped time
22 domain resources, that means that time
23 domain resources can be expressed in units
24 of time.

25 Q. Are time domain resources

1 BIMS

2 instants of time or durations of time?

3 A. Well, it's not clear from claim
4 1 which one it is.

5 However, claim 1 does describe
6 overlapping time domain resources
7 associated with the second and third time
8 window.

9 And because of that
10 description, it suggests that time domain
11 resources would have a time duration
12 associated with them.

13 Q. Based on your reading of claim
14 1, what is the distinction between the
15 time domain resource and time window?

16 MR. CERULLI: Objection, scope.

17 A. From reading claim 1, time
18 windows, such as the second and third time
19 window, have overlapped time domain
20 resources.

21 Claim 1 does not say whether
22 time domain resources have overlapped time
23 windows.

24 So what claim 1 says is that a
25 time window can have a time domain

1 BIMS

2 resource and a time domain resource
3 occupied by a first or second radio signal
4 suggests that a time domain resource can
5 have a time duration associated with it.

6 Q. Just to clarify, one of the
7 lines, line 59, says, "A time domain
8 resource occupied by the second radio
9 signal is within the second time window."

10 In that case, the time domain
11 resource occupied by the second radio
12 signal is smaller than the second time
13 window, correct?

14 MR. CERULLI: Objection, scope.

15 A. In reading this passage in the
16 claim, that a time domain resource
17 occupied by the second or the first radio
18 signal is used for determining a second
19 time window, I don't think it's clear that
20 it excludes a radio signal or a time
21 domain resource, rather, that spans the
22 duration of a time window.

23 Q. Again, on line 66, also claim 1
24 of column 25, it says, "The second time
25 window and the third time window have

1 BIMS

2 overlapped time domain resources."

3 Could you describe what your
4 understanding of that means; as opposed to
5 just saying the second time window and the
6 third time window overlap, what is the
7 distinction in saying the second time
8 window and the third time window have
9 overlapped time domain resources?

10 A. So the way the claim reads, the
11 second and third time windows have
12 overlapped time domain resource,
13 parenthesis S, parenthesis, meaning that
14 the second and first time windows --
15 rather, the first and second time windows
16 can have one or more time domain resources
17 within them.

18 These time domain resources
19 overlap and taken in the context of the
20 claim language along with Figure 6, that
21 overlapping of time domain resources
22 contained within the second and third time
23 windows would appear in a duration of time
24 shown in Figure 6 in which the second and
25 third time windows overlap.

1 BIMS

2 Q. Let's go to Figure 5 in the
3 same exhibit, the '113 patent, and I am
4 just going to ask a series of questions
5 based on this figure.

6 Let me know when you're at
7 Figure 5.

8 A. I'm there.

9 Q. We're going to go through these
10 based on the prospective of the UE, which
11 is on the right side of the figure, okay?

12 A. Okay.

13 Q. So first the UE receives a
14 target radio signal, correct?

15 A. Yes.

16 Q. Then the UE transmits the first
17 radio signal on a first channel, correct?

18 A. Yes.

19 Q. Then the UE transmits a second
20 radio signal on a second channel, correct?

21 A. Yes.

22 Q. The UE then monitors a third
23 radio signal in the first time window,
24 correct?

25 A. Yes.

1 BIMS

2 Q. So if the first time window
3 expires, does the UE stop monitoring a
4 third radio signal?

5 MR. CERULLI: Objection, scope.

6 A. When you say the first time
7 window expires, what do you mean by that?

8 Q. Sure.

9 It means so the first time
10 window, as you mentioned, is a certain
11 duration of time; if that duration of time
12 runs out, does the UE stop monitoring the
13 third radio signal?

14 MR. CERULLI: Same objection.

15 A. So Figure 5 does affirmatively
16 say that monitoring of third radio signal
17 happens in a first time window.

18 This particular embodiment
19 doesn't say what happens after the first
20 time window.

21 Q. So is it your opinion that even
22 after the first time window expires, the
23 UE can continue monitoring a third radio
24 signal?

25 MR. CERULLI: Objection, form.

1 BIMS

2 A. So it's my opinion that Figure
3 5 does not show what happens after the
4 first -- after the end of the first time
5 window, that's not shown in Figure 5.

6 Q. Based on your understanding of
7 claim 1, would the UE monitor the third
8 radio signal after the first time window?

9 MR. CERULLI: Objection, scope.

10 A. In the scope of claim 1, the
11 third radio signal is monitored in a first
12 time window.

13 Q. Let me put it this way.

14 If a UE continues monitoring
15 the third radio signal after the first
16 time window expires, what is the point of
17 the first time window?

18 MR. CERULLI: Objection, form
19 and scope.

20 A. That's not a hypothetical that
21 I considered nor is it a hypothetical
22 that's claimed.

23 What is claimed is within a
24 first time window monitoring of a third
25 radio signal takes place.

1 BIMS

2 Q. What is the purpose of the
3 first time window in claim 1?

4 MR. CERULLI: Objection, scope
5 and form.

6 A. Claim 1 describes that there
7 are time windows, the first, second and
8 third time windows, which is enough for a
9 person of ordinary skill to understand the
10 claim.

11 The claim does not go on
12 further to describe or assign purposes to
13 each one of the time windows.

14 Q. Let me use a different word.
15 What's the function of a time
16 window in claim 1 in the '113 patent?

17 MR. CERULLI: Objection, form
18 and scope.

19 A. In claim 1 there is not an
20 assigned functionality to a time window,
21 there is simply a description of a time
22 window in which certain functions take
23 place.

24 Q. In your opinion, would claim 1
25 function the same way if there were no

1 BIMS

2 time windows?

3 MR. CERULLI: Objection, scope
4 and form.

5 A. So you're asking me if I were
6 to remove all references to the first,
7 second, and third time windows from claim
8 1, would it be identical?

9 Q. Well, not identical, but would
10 it function in the same way?

11 MR. CERULLI: Same objections.

12 A. That's something I have not
13 considered, removing those terms from
14 claim 1.

15 It's hard to give an
16 off-the-cuff answer, the words first,
17 second and third time window appear
18 repeatedly throughout claim 1, so time
19 windows are an important part of the
20 claim.

21 I don't see any claim where all
22 three time windows are removed, so I
23 really can't answer that question until I
24 see a claim that has all those terms
25 removed.

1 BIMS

2 Q. So the claim limitation, one of
3 the claim limitations of claim 1 is
4 monitoring a third radio signal in a first
5 time window.

6 What you have represented to me
7 before is that because claim 1 doesn't say
8 what happens after the first time window
9 expired, it is conceivable that the third
10 radio signal can continue to be monitored,
11 is that correct?

12 A. No, that's not correct.

13 Q. Okay, what is not correct about
14 that?

15 A. My answer to your question was
16 in reference to Figure 5, which is an
17 embodiment in the specification; it was
18 not in reference to claim 1.

19 In claim 1, the scope of claim
20 1 is limited to monitoring a third radio
21 signal in a first time window.

22 Q. So in the context of claim 1,
23 when the UE stops -- when the first time
24 window expires, does the UE stop
25 monitoring the third radio signal?

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2 MR. CERULLI: Objection, scope.

3 A. What's clear in claim 1 is it's
4 limited to monitoring the third radio
5 signal in a first time window.

6 Q. Let's turn to Figure 6 of
7 Exhibit 1.

8 (Witness complying.)

9 MR. CERULLI: Dr. Bims, if you
10 have more, you can finish your answer.

11 A. Well, I was going to say that
12 claim 1 is limited to monitoring a third
13 radio signal in a first time window, which
14 means whatever happens outside of a first
15 time window with respect to monitoring a
16 third radio signal is not within the scope
17 of claim 1, so we would be describing
18 something that is not claimed.

19 Q. Okay, then let's stick with
20 claim 1.

21 If the first time window does
22 not limit the monitoring of third radio
23 signal, despite the fact that it's not
24 explicitly noted what happens after the
25 first time window, why would there be a

1 BIMS

2 first time window in claim 1.

3 MR. CERULLI: Objection, scope
4 and form.

5 A. Again, I wasn't the one who
6 drafted the claims, I am not listed as an
7 inventor on the '113 patent, I can't speak
8 for why the claim was written the way it
9 is written.

10 I can only speak from the
11 perspective of a person with ordinary
12 skill who is reading the claims.

13 Q. A person of ordinary skill in
14 the art would try to ascertain why certain
15 features are present in the claim,
16 correct?

17 A. A person of ordinary skill does
18 not have to ascertain why the claims were
19 written the way they were written; a
20 person of ordinary skill only needs to
21 understand the claim.

22 Q. That's not exactly what I was
23 saying.

24 I was saying a person of
25 ordinary skill in the art reading the

1 BIMS

2 claim, in order to fully understand the
3 claim, would need to understand why
4 certain elements and limitations exist in
5 the claim, correct?

6 A. A person of ordinary skill, it
7 would be nice if the specification
8 provided information as to why the claim
9 included certain features.

10 But, again, a person of
11 ordinary skill only needs to understand
12 the claim in order to be able to practice
13 the invention or to know how the invention
14 works.

15 The why factor is not required
16 to understand what the claim scope is
17 covering.

18 Q. So are you testifying that you
19 don't need to know the purpose or the why
20 factor of a component of a system in order
21 to understand its function, is that your
22 testimony?

23 MR. CERULLI: Objection, form.

24 A. The method described in claim 1
25 is what it is whether or not you know why,

1 BIMS

2 whether --

3 Q. So you don't know the function
4 of a time window in this claim limitation,
5 right?

6 MR. CERULLI: Objection, form.

7 A. Claim 1 describes functions
8 that take place within time windows, but
9 it doesn't describe that the time window
10 itself has certain functions.

11 Q. So what does a first time
12 window do in this claim limitation?

13 MR. CERULLI: Objection, form.

14 A. As I've said earlier, in claim
15 1 it describes certain functions or
16 operations that take place within time
17 windows.

18 Q. Specifically the claim
19 limitation says that there is monitoring a
20 third radio signal in a first time window,
21 correct?

22 A. Yes.

23 Q. What you're telling me is that
24 you don't know what happens after the
25 first time window expires, am I

1 BIMS

2 understanding that correctly?

3 MR. CERULLI: Objection, form.

4 A. What I'm saying is that the
5 monitoring function of a third radio
6 signal is within the scope of the claims
7 when it's in a first time window.

8 After a first time window the
9 scope of the claims does not cover that
10 scenario.

11 Q. As a person of ordinary skill
12 in the art, does it make sense for UE to
13 continue monitoring a third radio signal
14 in perpetuity, beyond the first time
15 window?

16 MR. CERULLI: Objection, scope.

17 A. There is no discussion in claim
18 1 or the rest of the specification about
19 third radio signals being monitored
20 outside of a first time window, so the
21 claim 1, for example, is silent on what
22 happens outside a first time window with
23 respect to monitoring a third radio
24 signal.

25 Q. Again, that's not really

1 BIMS

2 responsive to my question, which is, would
3 a person of ordinary skill in the art
4 assume that an UE would monitor a third
5 radio signal in perpetuity past the first
6 time window?

7 MR. CERULLI: Objection.

8 Q. Whether claim 1 covers it or
9 not is sort of irrelevant to my question.

10 A. I guess the way I would respond
11 is by prefacing my answer and saying the
12 behavior of certain wireless systems not
13 claimed by the '113 patent is irrelevant
14 to my declaration.

15 There are certain systems
16 outside the context of the '113 patent in
17 which a mobile device has limitations on
18 when it will listen for communications
19 from a base station.

20 But given that we're talking
21 outside the context of the '113 patent, I
22 don't know how that relates to claim 1.

23 Q. So what's the answer to my
24 question, I'm struggling throughout this
25 whole deposition to get sort of answers

1 BIMS

2 responsive to my questions and the one
3 that I posed here, again, is a simple one.

4 Would a person of ordinary
5 skill in the art assume that a third radio
6 signal would be monitored in perpetuity or
7 is it usually the case that it's
8 restricted during a certain time frame?

9 MR. CERULLI: Objection, scope.

10 A. Again, a person of ordinary
11 skill in the art would not try to fill in
12 various details to the claim and assume
13 that all these details are part of the
14 claim.

15 A person of ordinary skill
16 would know how to implement a system that
17 has time limitations on receiving various
18 communications.

19 But that doesn't mean a person
20 of ordinary skill would read in all of
21 those constraints into a claim that
22 doesn't require that.

23 Q. I just want to get this on
24 record.

25 Can you clarify the function of

1 BIMS

2 the first time window as claimed in claim
3 1.

4 MR. CERULLI: Objection, form.

5 A. Well, as I said before, claim 1
6 describes functions that happen within
7 time windows.

8 Claim 1 does not describe the
9 function of a time window.

10 Q. So it's your testimony that the
11 first time window does not have a
12 function, correct?

13 MR. CERULLI: Objection, form.

14 A. It's my testimony that claim 1
15 does not describe time window functions;
16 what it describes is functions that take
17 place within time windows.

18 Q. It's also your testimony that a
19 person of ordinary skill in the art would
20 have no reason to ascertain why those
21 functions occur during time windows,
22 correct.

23 MR. CERULLI: Objection, form.

24 A. In reading claim 1, the person
25 of ordinary skill would simply read what

1 BIMS

2 the method is claiming.

3 The specification, it would be
4 nice if the specification described why
5 claim 1 exists, but claim 1's scope, which
6 is a method of a user equipment, is
7 describing functionality of a user
8 equipment, but a person of ordinary skill
9 doesn't have to know why the claim claims
10 what it claims.

11 Q. Let's turn to Figure 6 of
12 Exhibit 1.

13 Let me know when you're there.

14 A. I am there.

15 Q. In Figure 6, the first time
16 window extends from the UE transmission of
17 the first radio signal to when the third
18 radio signal is received from the base
19 station, correct?

20 A. Yes.

21 Q. If the third radio signal is
22 not received, would the first time window
23 extend longer?

24 MR. CERULLI: Objection, scope.

25 A. So claim 1 says that, starting

1 BIMS

2 at line 63, "A time domain resource
3 occupied by the second radio signal is
4 used for determining a third time window
5 and the end time of the third time window
6 is the end time of the first time window,"
7 which means the time domain resource
8 occupied by the second radio signal is
9 used for determining not only the third
10 time window, but because it's determining
11 the third time window, it's determining
12 the end time of the first time window.

13 Q. So the first time window and
14 the third time window are independent of
15 the third radio signal, correct?

16 MR. CERULLI: Objection, form.

17 A. The first time window ending
18 has to be simultaneous with the ending of
19 the third time window.

20 And the third time window is
21 determined by the time domain resource
22 occupied by the second radio signal.

23 Q. Again I will repeat the
24 question.

25 Therefore the first time window

1 BIMS

2 and the third time window are independent
3 of the third radio signal, correct?

4 MR. CERULLI: Objection, form.

5 A. I wouldn't say they're
6 independent, because the claim says that
7 monitoring of a third radio signal happens
8 in a first time window.

9 Q. I am asking you almost a
10 chicken or eggs situation; what comes
11 first, the first time window or the third
12 radio signal?

13 I understand the claim
14 limitation says monitoring a third radio
15 signal in a first time window.

16 Is the first time window, and
17 also the third time window, defined,
18 configured, sort of regardless of when the
19 third radio signal is received?

20 MR. CERULLI: Objection, form
21 and scope.

22 (Witness perusing document.)

23 A. I would say that the monitoring
24 of a third radio signal in a first time
25 window occurs whether or not the base

1 BIMS

2 station has transmitted the third radio
3 signal.

4 And support for that is in
5 column 22, where it says, starting at line
6 56, "The UE conducts monitoring of the
7 third radio signal in a time interval
8 between the start time of the first time
9 window and the time domain resource
10 occupied by the second signal, but does
11 not detect the third radio signal. The
12 third radio signal is transmitted after
13 the second radio signal."

14 Then it says, "In one
15 subembodiment the base station does not
16 transmit the third radio signal in the
17 time interval between the start time of
18 the first time window and the time domain
19 resource occupied by the second radio
20 signal."

21 So it's certainly possible that
22 monitoring of the third radio signal can
23 occur in a time interval in which the base
24 station does not transmit a third radio
25 signal.

1 BIMS

2 Q. In Figure 6, the second time
3 window extends from the UE transmission of
4 the first radio signal to the UE
5 transmission of the second radio signal,
6 correct?

7 MR. CERULLI: Objection, form.

8 A. From Figure 6, it looks like
9 the second time window extends past the
10 second radio signal.

11 Q. Why do you think that is?

12 A. Because that's how Figure 6 was
13 drafted.

14 Q. Based on the specification,
15 would a person of ordinary skill in the
16 art expect a second radio signal to fall
17 within the second time window?

18 MR. CERULLI: Objection, scope.

19 (Witness perusing document.)

20 A. In column 11, starting at line
21 24, it says, "According to one aspect of
22 the present disclosure, the above method
23 is characterized in that a time domain
24 resource occupied by the first radio
25 signal is used for determining a second

1 BIMS

2 time window. A time domain resource
3 occupied by the second radio signal is
4 within the second time window and the
5 second time window is within the first
6 time window."

7 So that passage suggests that
8 the second radio signal is within the
9 second time window.

10 MR. PYMENTO: It is 1:38 p.m.
11 here, what do you think about a lunch
12 break now until maybe 2:10, is 30 minutes
13 okay?

14 MR. CERULLI: 35 minutes.

15 (Lunch recess: 1:38 p.m.)

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

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2:18 p.m.

4

D R. H A R R Y V. B I M S, resumed.

5

EXAMINATION CONTINUED

6

BY MR. PYMENTO:

7

Q. Welcome back.

8

9

Let's turn to Exhibit 4, which
is Xia, also referred to as Exhibit 1004
in the 601 proceeding.

10

11

A. Yes.

12

13

Q. Let's go to Figure 6B in that
document.

14

15

Please let me know when you're
there.

16

A. I'm there.

17

18

Q. The figure shows sending a
PUCCH-BFRQ at time t1, correct?

19

A. Yes.

20

21

Q. The figure also shows sending
BRACH-BFRQ at time t2, correct?

22

A. Yes.

23

24

Q. The figure also shows waiting
for PUCCH-BFRP until t3, correct?

25

A. Yes.

1 BIMS

2 Q. The figure also shows waiting
3 for BRACH-BFRP until t4, correct?

4 A. Yes.

5 Q. When the system of Xia receives
6 a PUCCH-BFRQ, must it also wait for a
7 BRACH-BFRP?

8 MR. CERULLI: Objection, scope.
9 (Witness perusing document.)

10 Q. If it helps I can direct you to
11 Xia paragraph 102 and then I will repeat
12 the question.

13 So when the system of Xia
14 receives a PUCCH-BFRP, must the system
15 also wait for a PRACH-BFRP as well?

16 A. It depends; in certain
17 embodiments of Xia it will wait for both
18 responses if the base station and the UE
19 have been preconfigured for that scenario.

20 There are other embodiments in
21 which the UE will receive the first BFRP
22 that's transmitted by the base station.

23 In either case, Xia says that
24 the UE will search for a beam failure
25 recovery response within a first response

1 BIMS

2 time window, so it will search within the
3 first response time window and when it
4 receives that response, whether it also
5 will wait for a second response depends on
6 which embodiment you're looking at.

7 Q. Do you mind pointing me to an
8 embodiment for either scenario.

9 (Witness perusing document.)

10 A. For example, in paragraph 105
11 it says, "In one embodiment, the first
12 BFRQ is sent using one of a PUCCH and a
13 PRACH for beam failure recovery. In one
14 other embodiment, the first response
15 window is a PUCCH response window when the
16 BFRQ is sent using the PUCCH and the first
17 response window is a beam failure random
18 access channel, PRACH, response window
19 when the BFRQ is sent using the PRACH for
20 beam failure recovery."

21 So in that situation where the
22 UE chooses between the two requests, it
23 will listen in a response window that is
24 different if the request was sent on the
25 PRACH or the PUCCH.

1 BIMS

2 Q. So in that case you're saying
3 that the system of Xia will wait for both
4 responses on both channels?

5 A. In this scenario there's one
6 response, it's either -- there's one
7 request on either the PUCCH or the PRACH,
8 and depending on which request went out,
9 there's a different response time window.

10 Q. Right.

11 What I'm talking about is the
12 scenario which we discussed in Figure 6B
13 where both requests were sent on both
14 channels.

15 Do we have to receive under Xia
16 responses on both channels?

17 (Witness perusing document.)

18 A. So in paragraph 103 it says,
19 "The gNB 402 responds to the UE's 404 two
20 BFRQs based on the aforementioned
21 algorithm. For example, the UE 404 sends
22 a PUCCH-BFRQ at t1 and a PRACH-BFRQ at t2.
23 The UE 404 then waits for a PUCCH-BFRP at
24 t3 and a PRACH-BFRP at t4."

25 Q. What do you make of the

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BIMS

following line which says "In response,"
directly after what you just read, "the
gNB sends out a single BFRP as follows"?

MR. CERULLI: Objection, form.

A. What's the question?

Q. What is your understanding of
the line that directly follows what you
just read, which is, "In response, the gNB
sends out a single BFRP as follows"?

A. So the rest of that sentence
describes the gNB sending out a PRACH-BFRP
at time t4 and sending out a PUCCH-BFRP at
time t3, so that sentence you were
mentioning lines up with the UE waiting
for both the PUCCH-BFRP and PRACH-BFRP.

Q. So, in other words, there are
two time periods in which the UE is
waiting for a response to the request sent
on the two channels, correct?

MR. CERULLI: Objection, form.

A. Well, paragraph 103 doesn't
talk about two time periods, it talks
about two times in which it looks for
response, but it doesn't say that there

1 BIMS

2 are two different time periods.

3 Q. Let's go directly up to
4 paragraph 102, which reads, "As
5 illustrated in example of Figure 6B, a
6 single BFRP is sent in response to two
7 BFRQs. In the example, the UE 404 sends
8 two BFRQs, a PUCCH-BFRQ at time t1, and a
9 PRACH-BFRQ at time t2. The UE 404 then
10 waits for a single BFRP, a PUCCH-BFRP at
11 time t3 or a PRACH-BFRP at t2, from the
12 gNB 402."

13 So in this example, which
14 they're saying is the example of Figure
15 6B, does this describe waiting for one
16 response or two responses?

17 MR. CERULLI: Objection, form.

18 (Witness perusing document.)

19 A. So in this embodiment, the UE
20 can wait for either the time t3 or it can
21 wait for the time t4, either one is part
22 of this particular embodiment.

23 Q. Just to clarify, it is waiting
24 for the time or it's waiting for the
25 response?

1 BIMS

2 A. It's waiting for response
3 either at PUCCH-BFRP at time t3 or at
4 PRACH BFRP at time t4.

5 Q. Referring to the same example,
6 which is describing the figure of 6B,
7 whichever BFRP comes first, PUCCH or
8 PRACH, that would end what you're
9 describing in your declaration to be the
10 first time window, correct?

11 MR. CERULLI: Objection, form.

12 A. I don't see that language in
13 paragraph 102.

14 Q. Right, I'm not saying it's
15 described in 102, I'm really talking about
16 your declaration, which is what you're
17 saying is that the first time window is
18 disclosed through Figure 6B, correct?

19 A. Yes.

20 Q. Right.

21 And so what you're saying is
22 that the first time window ends when first
23 BFRP, whether that's PUCCH or PRACH, is
24 received, correct?

25 MR. CERULLI: Objection, form.

1 BIMS

2 A. I am trying to find that
3 paragraph in my report, where it says the
4 time window ends when the first BFRP is
5 received.

6 Q. I am just questioning it; you
7 have at least the annotated figure on
8 paragraph 51 of your declaration in the
9 601 proceeding, so that one I've marked as
10 Exhibit 2, you can take a look at that
11 paragraph if that helps.

12 A. Okay, I'm looking at it.
13 (Witness perusing document.)

14 Q. So on the picture or the
15 annotated Figure 6B, it shows the first
16 time window extending from t1 to t4,
17 correct?

18 A. Yes.

19 Q. So it's basically saying the
20 first time window ends when it receives
21 the PRACH BFRP at time t4, correct?

22 A. It says the first time window
23 extend to t4, that's what it says, that's
24 what it shows on Figure 6.

25 Q. And my question now is whether

1 BIMS

2 it would extend to t4 regardless of
3 whether the PUCCH-BFRP is received prior
4 to t4, for example, at t3?

5 MR. CERULLI: Objection, form.

6 A. In this annotated example out
7 of Xia, the first time window would always
8 extend from t1 to t4 regardless of where
9 within t1 to t4 the BFRP is received.

10 Q. Understood.

11 Let's turn to Exhibit 6, which
12 is Liu, and we'll go to Figure 5B, let me
13 know when you reach there.

14 (Witness perusing document.)

15 A. Okay, I'm there.

16 Q. What does Figure 5B show?

17 A. Figure 5B shows two beam
18 failure requests transmitted by the UE,
19 each one with a time offset before an
20 expected beam failure response occurring
21 within an overall time duration.

22 Q. This Figure 5B, the first BFRR
23 response, which underneath it says UL
24 downlink BPL1, corresponds to the first
25 request, which is BFRR, and underneath it

1 BIMS

2 says UL BPL1, correct?

3 A. Yes.

4 Q. And likewise, the BFRR response
5 UL BPL2 corresponds to the second request,
6 which is BFRR noted as UL BPL2, correct?

7 A. Yes.

8 Q. Let's turn to paragraphs 98 to
9 99 of Liu.

10 A. Okay.

11 (Witness complying.)

12 Q. These paragraphs describe
13 Figure 5B of Liu, correct?

14 A. Yes.

15 Q. And based on these paragraphs,
16 are the two BFRRs in Figure 5B
17 simultaneous transmissions?

18 MR. CERULLI: Objection, form.

19 A. They may be transmitted
20 simultaneously is what it says in
21 paragraph 99.

22 Q. So really at the end of
23 paragraph 99, the last sentence says,
24 "Although only two simultaneous
25 transmissions are illustrated in Figure

1 BIMS

2 5B, it is appreciated that any number of
3 simultaneous number of transmissions may
4 occur."

5 It is still your testimony that
6 Figure 5B does not show simultaneous
7 transmissions?

8 A. So it is still my testimony
9 that paragraph 99 says the two
10 transmissions may occur simultaneously and
11 when you pair that with paragraph 98,
12 which says Figure 5B illustrates an offset
13 between the DL beam pair for a BFRR
14 response by the base station 402 and the
15 DL beam pair for the BFRR from the user
16 equipment 404 for multiple transmissions,
17 I think it's clear that Figure 5B allows
18 for the BFRR to be sent simultaneously or
19 as separate multiple transmissions.

20 Q. Despite the fact that the last
21 sentence of paragraph 99 says that
22 although only two simultaneous
23 transmissions are illustrated in Figure
24 5B, it is your testimony that in fact
25 Figure 5B may or may not show two

1 BIMS

2 simultaneous transmissions?

3 MR. CERULLI: Objection, form.

4 A. So it's my testimony that
5 paragraph 99 is one embodiment described
6 in Figure 5B, and paragraphs 97 and 98 are
7 different embodiments illustrated in
8 Figure 5B.

9 And so both are illustrated in
10 Figure 5B; the example where the two BFRRs
11 are transmitted simultaneously and is one
12 embodiment, and the example where the two
13 BFRRs are in different transmissions is a
14 different embodiment, both reflected in
15 Figure 5B.

16 Q. So specifically in Figure 5B,
17 it is not clear from Figure 5B whether the
18 requests are transmitted simultaneously?

19 MR. CERULLI: Objection, form.

20 Q. Just from looking at Figure 5B.

21 A. Right, so looking at Figure 5B
22 and specifications description of Figure
23 5B, there are two embodiments reflected in
24 Figure 5B, one embodiment where the two
25 BFRRs are transmitted simultaneously and a

1 BIMS

2 different embodiment where the two BFRRs
3 are transmitted in multiple transmissions.

4 Q. Does it describe anywhere in
5 those paragraphs multiple nonsimultaneous
6 transmissions, aside from the use of the
7 word may?

8 A. Again, you're focused on the
9 embodiment described in paragraph 99,
10 which talks about Figure 5B.

11 And what I'm trying to
12 highlight is paragraphs 97 and 98, which
13 also describe Figure 5B in a separate
14 embodiment and in that separate embodiment
15 there can be multiple BFRR transmissions.

16 Q. One, I am focusing on paragraph
17 99, but just a quick question.

18 How do you ascertain that
19 paragraph 97 is related to Figure 5B?

20 A. Paragraphs 97 and 98 are an
21 embodiment; paragraph 98 specifically
22 talks about what Figure 5B illustrates.

23 Q. When paragraph 98 refers to
24 multiple transmissions, is it referring to
25 multiple requests?

1 BIMS

2 A. It's referring to multiple
3 transmissions of the BFRR on the uplink,
4 so it's referring to multiple requests.

5 Q. Do you see there is a
6 parenthetical 3 within paragraph 99 that
7 says, "Indicating a preferred downlink DL
8 beam pair in the BFRR to the base station
9 402 in which the user equipment 404
10 monitors the indicated DL beam pair
11 according to the time offset (in this case
12 the user equipment 404 may only monitor
13 one downlink beam, so a recommendation is
14 made as to the best performing beam)."

15 Do you see that?

16 A. I see that passage within
17 paragraph 99, yes.

18 Q. Can you describe what it means
19 in the context of Figure 5B to determine
20 that the recommendation is made as to the
21 best performing beam.

22 MR. CERULLI: Objection, form.

23 A. In paragraph 99 it does not
24 describe how the recommendation is
25 performed, whether the recommendation is

1 BIMS

2 an internal recommendation within the UE
3 or it came from the base station, nor does
4 it describe when the recommendation took
5 place.

6 So, for example, the
7 recommendation on best performing beam
8 might have been made prior to the
9 transmission of the BFRRs, either
10 internally within the UE or as a
11 communication from the base station.

12 Q. When that parenthetical says
13 that the user equipment or UE may only
14 monitor one downlink beam, is that
15 referring to monitoring a response to the
16 BFRR request?

17 A. What was the question again,
18 sorry.

19 (Record read.)

20 (Witness perusing document.)

21 A. So in paragraph 99 it says that
22 each beam pair has a corresponding SQCL DL
23 beam pair and so when the user equipment
24 transmits multiple BFRRs simultaneously,
25 the user equipment can then monitor the

1 BIMS

2 SQCL downlink beam pairs for the BFRR
3 response simultaneously, in other words,
4 the UE can wait for multiple responses
5 from the base station and is not limited
6 to only waiting for one.

7 Q. And so the part of the
8 parenthetical that describes a
9 recommendation is made as to the best
10 performing beam, is that referring to,
11 between the two beam pairs, at least the
12 two beam pairs in Figure 5B, which of
13 those is the best performing beam pair?

14 A. For that ultimate method within
15 paragraph 99, the UE would listen to the
16 recommendation for the best performing
17 beam so that it may monitor that one beam.

18 MR. CERULLI: Just a
19 clarification of the transcript, I think
20 it says "ultimate," but Dr. Bims said
21 "alternate."

22 THE WITNESS: "Alternate," yes.

23 Q. So is it your testimony now
24 that a recommendation is made in order to
25 monitor the DL beams, or is it vice versa,

1 BIMS

2 that you monitor the DL beams in order to
3 come up with a recommendation?

4 MR. CERULLI: Objection, form.

5 A. The context of what you're
6 reading as a parenthetical describing a
7 recommendation made as to the best
8 performing beam, that actually is part of
9 the third alternate in paragraph 99, which
10 is indicating a preferred downlink beam
11 pair in the BFRR to the base station, in
12 which the user equipment 404 monitors the
13 indicated DL beam pair according to the
14 time offset.

15 So, in other words, the UE is
16 indicating a preferred downlink beam pair
17 in the BFRR to the base station and then
18 in parenthesis it says that a
19 recommendation is made as to the best
20 performing beam.

21 Q. Just to simplify that for the
22 record, so the recommendation is made as
23 to the best performing beam prior to
24 monitoring the one DL beam in the
25 parenthetical?

1 BIMS

2 MR. CERULLI: Objection, form.

3 A. It appears that No. 3 method,
4 that the recommendation would occur prior
5 to monitoring.

6 Q. Sitting here today does
7 paragraph 99 explain how that
8 recommendation is made?

9 MR. CERULLI: Objection, form.

10 A. As I indicated earlier, the
11 recommendation could have been made as an
12 internal recommendation within the UE to
13 select the best performing beam, or it
14 could have been made earlier by the base
15 station and communicated from the base
16 station to the UE.

17 Q. Just going back to the
18 parenthetical, and this is more a
19 grammatical thing than anything else, it
20 says, "In this case the user equipment 404
21 may only monitor one DL beam, so a
22 recommendation is made as to the best
23 performing beam."

24 What is your understanding of
25 the word "so" in that phrase?

1 BIMS

2 A. In the context of paragraph 99,
3 it appears that what this number 3 option
4 is describing is a recommendation is made
5 as to the best performing beam so that the
6 UE may only monitor one DL beam.

7 Q. Can you repeat that last part.

8 MR. CERULLI: Objection, form.

9 (Record read.)

10 Q. Dr. Bims, is it your testimony
11 that the recommendation or -- strike
12 that.

13 Is it your testimony in the
14 context of the parenthetical 3 that the
15 monitoring is not done so that a
16 recommendation is made as to the best
17 performing beam?

18 MR. CERULLI: Objection, form.

19 A. It appears that the
20 recommendation is prior to monitoring,
21 which is consistent with other paragraphs
22 in this reference, including paragraph
23 101, which describes monitoring the
24 preferred downlink beam pair or what's
25 called the best SQCL downlink beam pair.

1 BIMS

2 Q. How does the UE determine the
3 best SQCL downlink beam pair?

4 A. So what's described in
5 paragraph 101 is one example for how the
6 best SQCL downlink beam pair can be
7 determined, when it says the candidate
8 having the best channel quality.

9 Within the context of paragraph
10 101, there are multiple candidate beams
11 and the UE can transmit multiple requests
12 on multiple candidate beams, but the
13 monitoring that occurs in the UE is with
14 respect to the best SQCL downlink beam
15 pair, which is the candidate beam having
16 the best channel quality out of all of the
17 candidates.

18 Q. Let's turn to claim 2 of the
19 '113 patent, which is Exhibit 1.

20 (Witness complying.)

21 A. Okay.

22 Q. Claim 2 reads, at least in
23 part, "Wherein at least one signal of the
24 following set of signals, the first radio
25 signal, the second radio signal, is used

1 BIMS

2 for determining a multi-antenna related
3 transmitting of the third radio signal."

4 Do you see that?

5 A. Yes.

6 Q. What is your understanding of a
7 multi-antenna related transmitting?

8 A. A multi-antenna related
9 transmitting is a transmission that uses
10 multiple antennas.

11 Q. So based on the claim language,
12 does the transmission of the third radio
13 signal require more than one antenna on
14 the base station?

15 A. For claim 2, the transmission
16 of the third radio signal requires
17 multiple antennas, in other words, more
18 than one.

19 Q. Let's turn back to Xia, which
20 is Exhibit 4, and we'll go to Figure 6B
21 again.

22 Let me know when you're there.

23 A. I'm here.

24 Q. In your declaration, you opined
25 that the second of the BFRPs shown in Xia

1 BIMS

2 Figure 6B shows a third radio signal,
3 correct?

4 A. Yes.

5 Q. How does the system of Xia
6 determine which antenna port on the base
7 station is used to transmit that second
8 BRACH-BFRP signal?

9 A. You're asking how the UE
10 determines that?

11 Q. Yes.

12 (Witness perusing document.)

13 A. As described in paragraph 103,
14 the UE does not have to determine which
15 transmission, whether it's PRACH or PUCCH,
16 is made by the base station.

17 In this particular embodiment
18 it is the base station that runs an
19 aforementioned algorithm to respond to the
20 multiple requests from the UE.

21 Q. Is part of that aforementioned
22 algorithm the determination of antenna
23 ports that would transmit the BFRP
24 response?

25 (Witness perusing document.)

1 BIMS

2 A. In paragraph 50 it says that
3 the UE can be capable of receiving a
4 plurality of Tx beams from the base
5 station or supporting a plurality of base
6 station Tx user equipment Rx beam pairs.

7 Q. Pardon me, this is paragraph
8 50 you said?

9 A. Yes.

10 Q. Can you point me again to where
11 in paragraph 50 of Xia you see the
12 determination of antenna ports on the base
13 station to transmit the BFRP.

14 (Witness perusing document.)

15 A. So paragraph 50 establishes
16 that the UE can receive on a plurality of
17 beams simultaneously.

18 There is another paragraph
19 which talks about the base station
20 selecting one of the candidate beam pairs
21 and transmitting that to the UE.

22 In paragraph 69 it says that
23 "The UE will monitor the base station 402
24 downlink beams SQCL'd with the base
25 station 402 UL receive beam for BFRQ

1 BIMS

2 reception. Specifically the user
3 equipment 404 monitors the PDCCH region of
4 a DL beam with the assumption that the
5 corresponding PDCCH demodulation reference
6 signal, DMRS, is SQCL'd with the RS of the
7 identified candidate beams by the user
8 equipment 404. To make this
9 determination, the user equipment 404 may
10 be provided with the SQCL'd information
11 between the active downlink/uplink beam
12 pairs directly from the base station 402."

13 Q. Is it your testimony that
14 indicates the antenna ports on the base
15 station that are used to transmit the
16 BFRP?

17 MR. CERULLI: Objection, form.

18 A. Paragraph 69 is an embodiment
19 in the context of paragraph 68, which
20 describes the antenna ports that may be
21 SQCL'd and those antenna ports that may be
22 SQCL'd form the candidate beams which can
23 be linked to the base station through
24 SQCL'd information provided by the base
25 station.

1 BIMS

2 Q. Let's turn to Liu, Figure 5B
3 again, that's Exhibit 6, also noted as
4 Exhibit 1007 in the 602 proceedings.

5 (Witness complying.)

6 A. Okay, I'm there.

7 Q. Is it your testimony from your
8 declaration that the second of the BFRR
9 responses in Figure 5B shows the claim's
10 third radio signal?

11 (Witness perusing document.)

12 A. You said Exhibit 6?

13 Q. Sorry, Figure 5B in Liu, which
14 is Exhibit 6.

15 (Witness perusing document.)

16 A. I'm in Liu Figure 5B.

17 Q. Yes, I will repeat the
18 question.

19 Is it your testimony that the
20 second of the BFRR responses in Figure 5B
21 shows the claim's third radio signal?

22 A. Yes.

23 Q. How does the UE of Liu
24 determine which antenna port on the base
25 station is used to transmit that second

1 BIMS

2 BFRR response?

3 (Witness perusing document.)

4 A. In paragraphs 84 through 88, it
5 gives a description for how this is
6 accomplished; for example, in paragraph
7 84, two-thirds of the way down it says,
8 "In either case the BFRR sent by the user
9 equipment 404 requires a response message,
10 BFRR response, from the base station 402
11 if beam failure is to be recovered.
12 However, the user equipment 404 does not
13 know which DL beam will be used by the
14 base station 402 to transmit a BFRR
15 response."

16 It then goes on further to talk
17 about, for example, in paragraph 88, "To
18 determine the candidate beam, the user
19 equipment 402 uses the spatial quasi
20 co-located (SQCL'd) information between
21 the base station 402 transmission (DL) and
22 receive (UL) beams. Two antenna ports may
23 be said to be SQCL'd if large-scale
24 properties of a radio channel over which a
25 symbol on one antenna port is conveyed can

1 BIMS

2 be inferred from a radio channel over
3 which a symbol on the other antenna port
4 is conveyed."

5 So in paragraph 89 it says in
6 one embodiment the UE 110 will monitor the
7 base station 402 downlink beams, plural,
8 SQCL'd with the base station 402 uplink
9 receive beam for BFRR reception.

10 So it's describing how, through
11 using the method of SQCL, the UE is able
12 to monitor more than one beam for the
13 response from the base station.

14 Q. Let's look at claim 5 of the
15 '113 patent, let me know when you're
16 there.

17 (Witness complying.)

18 A. Okay, I'm there.

19 Q. This claim uses the terms first
20 antenna port group, second antenna port
21 group and third antenna port group.

22 What is your understanding of
23 the term antenna port group in this claim?

24 A. An antenna port group is a
25 grouping of antenna ports.

1 BIMS

2 Q. And a grouping, does a grouping
3 mean more than one antenna port?

4 A. A grouping means one or more
5 antenna ports.

6 MR. PYMENTO: I have no further
7 questions at this time.

8 I will pass the witness.

9 MR. CERULLI: Can we take a
10 ten-minute break just to review our notes.

11 MR. PYMENTO: Yes.

12 (Recess taken.)

13 (Continued on next page.)
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1 BIMS

2 MR. CERULLI: We have no
3 further questions at this time.

4 THE COURT REPORTER:
5 Mr. Pymonto, what did you want for final
6 transcript?

7 MR. PYMENTO: A rough and
8 expedited, please.

9 MR. CERULLI: We will just take
10 the copy, the slowest.

11 THE COURT REPORTER: Okay,
12 thank you.

13 (Time noted: 3:40 p.m.)

14 -----
15 DR. HARRY V. BIMS

16
17 Subscribed and sworn to before me
18 this ____ day of _____, 20 .

19
20 -----
21 NOTARY PUBLIC

C E R T I F I C A T I O N

I, Jineen Pavesi, a Registered Professional Reporter, Registered Merit Reporter, Certified Realtime Reporter and a Notary Public, do hereby certify that the foregoing witness, DR. HARRY V. BIMS, was duly sworn on the date indicated, and that the foregoing is a true and accurate transcription of my stenographic notes.

I further certify that I am not employed by nor related to any party to this action.



JINEEN PAVESI, RPR, RMR, NB

E X H I B I T S

Bims

EXHIBIT	DESCRIPTION	PAGE
Exhibit 1	U.S. Patent No. 10,568,113	5
Exhibit 2	Dr. Bims' declaration submitted in IPR2023-00601	5
Exhibit 3	Dr. Bims' declaration submitted in IPR2023-00602	6
Exhibit 4	Patent Application Publication No. 2019-0053294 to Xia	6
Exhibit 5	Patent Application Publication No. 2015-0141026 to Jover	6
Exhibit 6	U.S. Patent Publication No.	6

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2018-0367374 to Liu

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Exhibit 7

Institution

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Decision in

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IPR2023-00601

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Exhibit 8

Institution

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Decision in

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IPR2023-00602

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