

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

SAMSUNG ELECTRONICS CO., LTD.,

Petitioner,

v.

WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY

INC.,

Patent Owner.

Case No. IPR2025-01165

U.S. Patent No. 11,664,926

- - -

Monday, April 20, 2026

- - -

DEPOSITION OF MARK P. MAHON, PhD

- - -

- - -

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1 Videotaped deposition of MARK P.
2 MAHON, PhD, taken pursuant to notice,
3 was held remotely via videoconference,
4 commencing at 12:03 p.m. Eastern, on the
5 above date, before Lori A. Zabielski, a
6 Registered Professional Reporter,
7 CaseViewNet Realtime Reporter, and
8 Notary Public in and for the
9 Commonwealth of Pennsylvania.

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A P P E A R A N C E S
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5 DIRECTION TO WITNESS NOT TO ANSWER

6 Page Line

7 NONE

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10 REQUEST FOR PRODUCTION OF DOCUMENTS

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15 STIPULATIONS

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22 NONE

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2 PROCEEDINGS
3 - - -

4 THE VIDEOGRAPHER: We now on
5 the record. This begins Videotape
6 No. 1 in the deposition of Dr. Mark
7 P. Mahon in the matter of Samsung
8 Electronics Company versus Wilus
9 Institute of Standards and
10 Technology in the United States
11 Patent and Trademark Office before
12 the Patent Trial and Appeal Board,
13 Case No. IPR 2025-01165, U.S.
14 Patent No. 11,664,926.

15 Today is Monday, April 20th,
16 2026, and the our current time is
17 12:04 p.m. Eastern time. This
18 deposition is being taken remotely
19 at the request of Russ August &
20 Kabat, LLP.

21 My name is Peter Berg, and I
22 am the videographer. I represent
23 Magna Legal Services. And our
24 court reporter today is Lori

1 Zabielski of Magna Legal Services.

2 Will counsel and all parties
3 present please state their
4 appearance and whom they represent.

5 MR. TSUEI: Okay. Good
6 morning, everyone. My name is
7 James Tsuie. I am with the law
8 firm Russ August & Kabat, and in
9 this proceeding, I represent the
10 patent owner Wilus Institute of
11 Standards and Technology. Good
12 morning.

13 MR. KHAN: Good morning or
14 good afternoon. My name is Usman
15 Kahn, and I am an patent attorney
16 with Fish & Richardson. I am here
17 with my colleague, Daniel Jang,
18 also of Fish & Richardson. We are
19 representing petitioner, Samsung,
20 here and defending our expert,
21 Dr. Mark Mahon.

22 THE VIDEOGRAPHER: Okay.
23 Thank you.

24 And will the court reporter

1 please swear in the witness.

2 - - -

3 MARK P. MAHON, PhD, after
4 having been first duly sworn, was
5 examined and testified as follows:

6 - - -

7 EXAMINATION

8 - - -

9 BY MR. TSUEI:

10 Q. Okay. Good morning,
11 Dr. Mahon. How are you doing?

12 A. Good morning, sir.

13 Q. So I haven't had the
14 pleasure of meeting you before, so I
15 will likely be asking you some
16 preliminary or introductory questions,
17 so I hope you bear with me.

18 Throughout the deposition,
19 try and remember, if you can, to try to
20 respond to my questions and answer in a
21 verbal way such that the response can be
22 captured by the court reporter.

23 A. Yes.

24 Q. Okay. Very good. I have

1 some housekeeping matters for you,
2 Dr. Mahon, and it's the matter of the
3 exhibits that will be presented in the
4 deposition today.

5 Are you able to download
6 exhibits from the Zoom chat window?

7 A. Yes, I am.

8 Q. And just to confirm for me,
9 you are familiar with the process of
10 downloading exhibits from the Zoom chat
11 window?

12 A. Yes, I have done that
13 before. I am familiar.

14 Q. All right. Very good. So I
15 am going to upload into the chat window
16 a number of exhibits all at once. And
17 it's uploading now.

18 MR. TSUEI: And for the
19 benefit of the record, I am
20 uploading Exhibits 1003, 1004,
21 1005, 1006, as well as
22 Exhibit-3000, the latter of which
23 is just an excerpt of your expert
24 declaration that comprises your CV.

1 I may have also missed an
2 exhibit there in my listing. I
3 think it also includes
4 Exhibit-1009.

5 - - -

6 (Exhibits 1003, 1004, 1005,
7 1006, 1009, and 3000 marked for
8 identification.)

9 - - -

10 BY MR. TSUEI:

11 Q. Dr. Mahon, do you mind just
12 looking at the chat window and
13 confirming for me that you see those
14 exhibits and are downloading them to
15 your computer?

16 A. I do see them, and I am
17 downloading them as we speak.

18 Q. Okay. Just let me know when
19 you are done with that.

20 A. I will.

21 I believe I have all six
22 documents downloaded from the chat.

23 Q. Okay. All right. I won't
24 ask you to open the PDFs yet, but in the

1 course of my questioning today, if you
2 don't have them open and you think it's
3 useful to have them open, feel free to
4 just go ahead and do that. Just let me
5 know that -- when you are doing that so
6 the record is clear what is happening.

7 A. I will.

8 Q. All right. So I will
9 represent to you, also, in case it
10 wasn't totally clear from the titles of
11 the files that you have downloaded, I
12 have uploaded and you have downloaded a
13 copy of your expert declaration in this
14 IPR as well as the text of the asserted
15 references that make up the theories of
16 obviousness you have in Grounds 1 and 2.
17 So that's the Chu reference, that's the
18 IEEE-D1 reference, IEEE-D2 reference,
19 and IEEE-D3 reference.

20 Just to confirm, you are
21 familiar with the certain nomenclature
22 that I am using here, right, IEEE-D3?
23 It's the same nomenclature you have used
24 in your declaration.

1 A. Yes, I am.

2 Q. Okay. And Exhibit-3000 is,
3 as I said earlier, a copy of your CV.
4 So in case it's useful, feel free to
5 pull it up.

6 If there is anything else
7 helpful that you think would help
8 explain your testimony today, let me
9 know and I will do my best to try to
10 upload them and make them exhibits as
11 part of the deposition.

12 A. Okay. I will.

13 Q. Okay. So I am going to
14 start at the beginning. Dr. Mahon, can
15 you tell me a little bit about your
16 background and experience working with
17 wireless communications networks?

18 A. Yes. I began working with
19 wireless communications systems and
20 networks back in 1988. At my first job
21 out of college was working for the CIA,
22 and as part of that job, I interacted
23 with collections of wireless signals,
24 including telecommunication signals, and

1 local protocol signals.

2 That continued in my next
3 phase of my career, which is I worked at
4 the Applied Research Lab as a research
5 faculty member for over 25 years, and
6 that began in the early '90s, after I
7 completed my master's and while I was
8 pursuing my PhD. And I worked on --
9 continued to work on classified projects
10 during that time associated with
11 wireless communication systems, sensors,
12 signaling through the -- all the through
13 the '90s and into -- through the 2000s
14 and 2010s.

15 During that time, I worked
16 with many proprietary and standard
17 wireless protocols analyzing them,
18 studying them, implementing them in
19 various aspects to perform proof of
20 concept as well as testing and also
21 doing field testing on these systems,
22 which would include or be led up to,
23 preceded by mathematical modeling,
24 laboratory testing, sandbox testing, in

1 controlled environments and then field
2 testing against live networks.

3 After my work at the Applied
4 Research Lab as a faculty member, where
5 I was primarily focused on research,
6 with some teaching and guidance of
7 graduate students, I transferred over to
8 the computer science -- well, School of
9 Electrical Engineering and Computer
10 Science at Penn State University, which
11 is also the entity the Applied Research
12 Lab is under.

13 I became a teaching
14 professor, and I began teaching and
15 guiding research more regularly for
16 graduate and undergraduate students.
17 And that's where I am at this point in
18 time. And my work with those students
19 as well as my teaching is associated
20 with wireless systems, communication
21 networks as well as neural networks,
22 artificial intelligence, and some other
23 areas.

24 Q. I have taken a look at your

1 CV, and I couldn't help but note that
2 you seem extremely experienced in --
3 both in the context of litigation
4 consulting and outside the context of
5 litigation consulting, working with
6 cellular communications networks, so
7 things like 3GPP, 4G LTE, and 5G.

8 Would you agree with that
9 characterization?

10 A. Well, that was one of the
11 protocols I was focused on, and within
12 my research work, as I mentioned, I
13 focused on proprietary protocols as well
14 as various IEEE 802. protocols,
15 including 802.3, 802.15, 802.11 as part
16 of my research work as well as, for
17 example, continuing to work with
18 students in terms of those wireless
19 protocols, including and encompassing
20 cellular systems as you mentioned, 3GPP.

21 So I am certainly very
22 involved in all those wireless
23 protocols, including the cellular
24 protocols on both the research,

1 teaching, and the consulting site.

2 Q. Okay. So just to set the
3 context here, the wireless
4 communications standards and protocols
5 you are referring to include the
6 cellular communications protocol, the
7 3GPP and its sort of descendents; is
8 that correct?

9 A. When I say "wireless
10 protocols," I am including the 3GPP as
11 well as the IEEE protocols, and I would
12 also, as I mentioned several times, the
13 proprietary protocols I haven't
14 evaluated.

15 Q. Okay. 3GPP is the
16 organization, the standards setting
17 organization, that manages the
18 development and publication and
19 maintenance of, I guess, what people
20 refer to in the industry as the cellular
21 communications standards, right?

22 A. When a POSITA, person of
23 ordinary skill in the art, talks about
24 3GPP, yes, they would be drawn to

1 understanding that is referencing the
2 cellular protocols.

3 Q. Okay. Cellular protocols
4 are structured and written and managed
5 by a different organization than the
6 organization that manages the
7 development of wireless LAN
8 communication, right?

9 A. IEEE is a separate
10 organization. It's the largest
11 professional organization in the world.
12 It's made up of electrical and
13 electronic engineers, and that --
14 protocols they develop are focused on
15 PANs and LANs and similar technology as
16 opposed to the cellular systems,
17 although obviously the protocols do
18 overlap in terms of integration efforts
19 in the past, such as the WAP and some
20 other protocols.

21 Q. Right. Integration between
22 different wireless communication
23 standards is important for a bunch of
24 reasons; for example, you need to know

1 sort of which device is using which
2 protocols can take control of which
3 portions of the wireless spectrum,
4 right?

5 MR. KHAN: Objection,
6 leading.

7 THE WITNESS: So I am sorry.
8 The context of what you are asking
9 is understanding of the protocols
10 in order to understand the -- how
11 devices operate with respect to
12 both those protocols?

13 BY MR. TSUEI:

14 Q. Not quite. It's much more
15 of a narrow question. You mentioned
16 that the standards and protocols are
17 integrated. The term you used was
18 "integration efforts."

19 I am just trying to figure
20 out what you mean by integration
21 efforts. So can you tell me what you
22 meant?

23 A. What I meant was for a
24 POSITA or an engineer in general, if,

1 for example, you want to understand how
2 a device, a handset -- hands off from a
3 local area network to a cellular
4 network, understanding how both the
5 local area network is operating and how
6 and -- with respect to the protocols as
7 well as how the cellular network
8 operates helps you to have insight into
9 that structure and how the communication
10 and signaling happens and evaluating the
11 messaging and protocols associated with
12 that.

13 Q. Okay. Would it be fair to
14 say that each different wireless
15 communications protocol can have
16 different structure, different roles,
17 different operation mechanisms from
18 another wireless communication protocol
19 or standard?

20 MR. KHAN: Objection, vague.

21 THE WITNESS: It's a very
22 broad question. I certainly -- a
23 protocol is defined by the --
24 whatever body is putting it out,

1 and that document and/or set of
2 documents defines the roles,
3 regulations, messaging associated
4 with that protocol.

5 And any two protocols that
6 you might be evaluating or three or
7 four, you want to look at each one
8 of those to understand how they
9 operate. And then if, for example,
10 you are doing some type of research
11 or development work that requires
12 knowledge in each one of those, you
13 would have to be able to pull from
14 each one of those to perform
15 whatever work or analysis you are
16 targeted towards.

17 BY MR. TSUEI:

18 Q. Okay. Are you familiar with
19 the IEEE 802 organization?

20 A. Yes.

21 Q. And what is the IEEE 802
22 organization?

23 A. Well, IEEE has varies
24 standards bodies, and they designate

1 them based on numbering systems like
2 many standards of bodies.

3 802 is IEEE's top level,
4 essentially, standards body focused on
5 developing wireless networking
6 communication protocols and, for
7 example, you have 802.15, 802.11, you
8 have 802.16 under there. So those are
9 subentities under the 802. umbrella.

10 Q. So these subentities, which
11 you referred to -- and the examples you
12 gave were 802.15, 802.11, and 802.16 --
13 are these separate units or
14 organizations within the broader 802
15 organization at IEEE?

16 MR. KHAN: Objection,
17 relevance.

18 THE WITNESS: Yeah, it's a
19 -- the standard bodies organize
20 themselves in various ways and
21 structures, and in terms of an
22 engineer's perspective on what that
23 means is it's organized in an
24 hierarchical structure for

1 understanding how the organization
2 has things laid out in a logical
3 fashion for you to be able to
4 interact with, discover, and
5 consume whatever products and
6 information they are putting out.

7 I am not sure how else to
8 characterize that other than it's a
9 logical layout based upon the
10 organization's desire to
11 communicate both standards and
12 documents to members as well as the
13 broader community, a technical
14 community, and quite frankly the
15 public.

16 BY MR. TSUEI:

17 Q. Okay. So let's start with
18 802.15, which is the personal area
19 network subgroup of the 802
20 organization. I see in your CV that you
21 have mentioned your past work in 802.15.

22 Do you know -- do you recall
23 what I am talking about in your CV?

24 A. I know I mentioned it in my

1 CV. I am going to open my CV and take a
2 look here, at least the concise -- or
3 the excerpted version that you have
4 pulled out as Exhibit-3000.

5 Q. Okay.

6 A. Yeah. So, for example, I
7 guess you are referring to something
8 like my work with the low-rate wireless
9 PAN for software-defined radio's
10 implementation of a realtime scanner.

11 Q. Yeah, that could be it. Is
12 that the only work you have ever done in
13 connection with 802.15?

14 A. No. There were -- well, so
15 I will explain this so you can have a
16 better understanding of my work at the
17 Applied Research Lab. It's very
18 expansive in terms of the type of work
19 and the research I was able to and
20 others were able to have funded. And
21 our organization would operate -- and
22 especially in the class environment --
23 depending upon the type of work that was
24 being performed, whether it was 6.1,

1 6.2, 6.3 work, with respect to the
2 number of engineers or researchers
3 involved.

4 And so in that way, it was
5 kind of like a skunk's work, where you
6 have -- sometimes certain things came up
7 where the government, in particular, the
8 DOD wanted something done very quickly,
9 meaning get something built and proven
10 so they can then take it to a defense
11 contractor to implement if the ideas and
12 theories are proven out.

13 So you may have a couple of
14 engineers working on it or you might
15 have a large group of engineers
16 depending upon the type of work, it was
17 follow-on work, more mature work, et
18 cetera.

19 So to answer your question,
20 there were many kind of research thrusts
21 during my time at the Applied Research
22 Lab dealing with things such as 802.15.
23 And so some of those efforts were study
24 efforts, some of those efforts were

1 mathematical modeling, other efforts
2 were actually developing and proving
3 prototype systems or an engineering
4 model to show a government what
5 can/can't be done.

6 We were a trusted agent for
7 the government in terms of being able to
8 evaluate ideas, technologies, theories,
9 with respect to wireless systems in
10 general -- it's even broader than what
11 we have been talking about so far.

12 Q. Sure.

13 A. -- to say whether
14 such-and-such is true or not based on an
15 objective observer and researcher
16 perspective.

17 Q. Okay. So your work,
18 specifically sticking with 802.15, did
19 it ever involve work within the IEEE
20 802.15 organization to revise or draft
21 portions of, like, the next iteration of
22 the 802.15 standards or protocols with
23 which you were working?

24 MR. KHAN: And I just object

1 to relevance here for 802.15
2 standards and any questions related
3 to it.

4 THE WITNESS: With respect
5 to that particular standard, the
6 technical process was for us to
7 download standards, download
8 documents, download technical
9 studies to perform an analysis and
10 come up with ideas for both
11 research proposals as well as in
12 conformance of my work, and, you
13 know, in general, that's the path
14 we took.

15 I did not attend IEEE
16 meetings in order to do that. That
17 was -- they were pulled and
18 provided to us also by our
19 sponsors.

20 BY MR. TSUEI:

21 Q. Okay. These meetings that
22 you are talking about, can you tell me a
23 little bit more about those meetings?

24 MR. KHAN: Objection,

1 relevance.

2 THE WITNESS: Which parts of
3 the meetings are you referring to?

4 BY MR. TSUEI:

5 Q. Well I am talking about the
6 meetings that you just mentioned in the
7 last fragment of the sentence in your
8 testimony. And let me just recite for
9 the record.

10 You have said: I did not
11 attend IEEE meetings in order to do
12 that. That was -- they were pulled and
13 provided to us also by our sponsors.

14 So these meetings that you
15 are talking about, what are those
16 meetings?

17 A. I understood your question
18 to be focused on standards bodies
19 meetings where they are meeting within
20 these subareas as defined its 802.15,
21 for example, for deciding on standards
22 incorporation or development, the actual
23 meetings where the engineers got
24 together and discussed these issues.

1 Q. Okay. By these meetings in
2 which these engineers got together and
3 discussed these issues, have you been to
4 any IEEE 802 meeting in the past?

5 A. My work as I functioned and
6 described in the last 35 years has
7 mainly been classified or highly
8 classified work with -- working with our
9 government sponsors. I did approach
10 those sponsors for -- and I am sure
11 others did -- for approval to attend and
12 to be incorporated, at least an observer
13 to these meetings, and due to
14 classification concerns, we were denied
15 even trying to do that. So my answer to
16 that is no, I did not attend the
17 standards bodies meetings.

18 Q. So these --

19 MR. KHAN: And sorry. Just
20 objection to the last question.

21 MR. TSUEI: On what grounds?

22 MR. KHAN: Relevance.

23 MR. TSUEI: Okay. Just to
24 confirm, Mr. Khan, your objection

1 as to relevance to a question about
2 whether or not Dr. Mahon attended
3 IEEE 802 standards setting
4 organization body meetings? That's
5 your objection, relevance?

6 MR. KHAN: Your question was
7 have you been to any IEEE 802
8 meeting in the past. I object to
9 relevance of that question, to
10 those current proceedings. Thanks.

11 MR. TSUEI: Okay. I will
12 take it up with the PTAB, if
13 necessary.

14 BY MR. TSUEI:

15 Q. So, Dr. Mahon, have you ever
16 attended an IEEE meeting relating to the
17 development of the 802.11 wireless
18 protocol?

19 A. No. As I have said several
20 times is that my work and research work
21 was focused on understanding and
22 analyzing the protocols so that I can
23 implement them at both a mathematical
24 modeling level and at a bit level to

1 create and possibly modify as well as
2 test these protocols, understand how
3 they function at a very low level, and
4 actually build engineering prototypes
5 both at the transmitter and receiver
6 sides, which required detailed expertise
7 for understanding all the other -- these
8 protocols, the ones we were researching,
9 at a very intimate level in order to be
10 able to make a determination and/or, as
11 I said, build or modify these protocols.

12 So I have an intimate
13 knowledge as -- for decades associated
14 with all the wireless protocols, but
15 since 1999, including 802.11 protocol,
16 followed its development very closely
17 with my engineers as I was developing my
18 research work that was funded for
19 looking at various wireless protocols,
20 including 802.11, and how they operate,
21 where the flaws might be, security
22 vulnerabilities, messaging breakdowns,
23 as well as interoperating with them for
24 various end goals or purposes in mind to

1 solicit objectives, whether it was a
2 device level or a more administrative
3 level response from either the device
4 itself or the system, is how I would
5 answer that. But I -- that did not
6 require me to attend an IEEE meeting in
7 order to do that.

8 Q. Dr. Mahon, my question was
9 -- I am reading from the record here.
10 So, Dr. Mahon, have you ever attended an
11 IEEE meeting relating to the development
12 of the 802.11 wireless protocol?

13 I believe your answer is no;
14 is that correct?

15 A. Well, I provided my answer
16 in context of my work and the fact that,
17 number one, while I had requested
18 permission, I was denied to attend
19 various meetings, such as the 802.11
20 standards meetings, but my work closely
21 -- was closely coupled and related to
22 it, the development of the standards in
23 terms of when the standards were
24 published and what they meant and how

1 they function. But I did not attend a
2 meeting of IEEE 802.11.

3 Q. Dr. Mahon, I know this is
4 not your first deposition. I am going
5 to ask you -- and you can do what you
6 want with my request. But I am going to
7 ask you and my request is, please at
8 least try to limit the scope of your
9 answers to what I am actually asking.

10 If you think that there is,
11 like, rehabilitation you think your
12 attorney, Mr. Kahn, can do in redirect,
13 let him do that, and instead, to try to
14 keep this deposition flowing and to, you
15 know, proceed as efficiently as
16 possible, could you please try to, in
17 fact, answer the question that I asked?
18 Can you agree to do that?

19 A. Of course.

20 Q. Okay. Thank you.

21 MR. KHAN: Counsel, I will
22 just say that, you know, we are
23 here in a good faith effort to try
24 to answer your questions. If you

1 are not getting the answers you
2 like, then perhaps consider
3 rephrasing the questions.
4 Dr. Mahon has made a good faith
5 effort to answer your questions so
6 far, and we are here in that
7 spirit.

8 MR. TSUEI: Okay, Mr. Khan.

9 BY MR. TSUEI:

10 Q. So, Dr. Mahon, have you ever
11 contributed written materials or other
12 comments or suggestions to the 802.11
13 subunit of the 802 organization for any
14 purpose?

15 MR. KHAN: Objection.

16 - - -

17 (Clarification by the
18 stenographer.)

19 - - -

20 MR. KHAN: Relevance.

21 THE WITNESS: To answer that
22 questions, I have to put it in a
23 little context because as I said,
24 associated with my work, we would

1 present findings to our sponsors
2 with respect to such elements as,
3 for example, security
4 vulnerabilities that were
5 identified, and our sponsors then
6 would make decisions of whether
7 to -- how to use that information,
8 whether they were, for example,
9 going to interface with others
10 associated with the various
11 standards, including 3GPP and
12 802.11. So it's certainly possible
13 that particular work analysis I
14 performed was passed on, but I have
15 no knowledge of that.

16 BY MR. TSUEI:

17 Q. Okay. So your answer is no,
18 but if your sponsors had passed on some
19 of the content of your work to the IEEE
20 802.11 organization, you have no
21 knowledge of that, right?

22 A. My answer is that I don't
23 know if my sponsor passed anything on.
24 If they did, I would consider that a

1 contribution. If they didn't, then
2 obviously that was not communicated to
3 them so it wouldn't be a contribution to
4 that body.

5 Q. Okay. Are you familiar with
6 what 802.11ac is?

7 A. It's a version of the 802.11
8 protocol.

9 Q. Okay. Can you tell me with
10 any more detail about what version of
11 the protocol it is, for example, if it's
12 referred to by any other name, what year
13 it was introduced, and so on?

14 A. Sure. To my recollection,
15 802.11ac is -- 2013 is when it was
16 published and defined, and it's
17 generally referred to -- I believe
18 that's Wi-Fi 5 just because they
19 renumbered -- yeah, if, like me, you had
20 been following this from the beginning
21 where they were just using date stamps
22 for the most part for defining the
23 protocols as well as the extensions onto
24 the designation of the protocols, it was

1 a little easy to get lost. And anyway,
2 they renumbered, they put a numbering
3 system on it afterwards, meaning in like
4 the 20-teens sometimes. And I believe
5 it's mapped to Wi-Fi 5.

6 Q. Okay. So I will try to
7 refer to AC here as AC, but sometimes I
8 may refer to it as Wi-Fi 5. If I do
9 that, you will understand that that's a
10 reference to 802.11ac, right?

11 A. Yes.

12 Q. Okay. Would it be fair to
13 say that you personally did not have a
14 role in contributing to or drafting any
15 portions of the 802.11ac standard or
16 protocol?

17 MR. KHAN: Objection,
18 relevance.

19 THE WITNESS: Well, as I
20 said before, with respect to my
21 work in this area, I was not part
22 of the IEEE standards body
23 development cycle.

24 BY MR. TSUEI:

1 Q. Okay. The standards body
2 development cycle is managed by what are
3 called working groups within the IEEE
4 organization.

5 Are you familiar with that
6 concept?

7 A. Yes.

8 Q. And can you confirm for me
9 what a working group is in the context
10 of IEEE 802.11 in your own words?

11 A. It's a group that's put
12 together in order to work on a
13 particular topic associated with a
14 particular entity, meaning standards
15 body typical sub-element.

16 Q. Okay. Do you know how many
17 people are in, let's say, a given
18 working group within IEEE 802.11 in,
19 say, 2016?

20 MR. KHAN: Objection, vague.

21 THE WITNESS: Yeah, there is
22 many different working groups,
23 obviously. In general, for each
24 standards body, the working groups

1 are put together based upon the
2 complexity of the topic, the number
3 of companies involved, the number
4 of engineers involved in developing
5 the standard, and then obviously
6 there are subcommittees within each
7 one of those just as a general
8 matter of functioning. So that
9 would be the general answer.

10 There is no set defined. It
11 must be -- that I am ever aware of
12 or run across, and I have seen many
13 different listings. For example,
14 in all of the 802.11 specs, you
15 will see a listing of people
16 involved in the beginning of those,
17 but I have never seen it must be a
18 certain number in order to qualify
19 as a working group.

20 BY MR. TSUEI:

21 Q. And just to confirm for me,
22 you have not been a member of the
23 working group of either 802.11ac or
24 802.11ax projects, right?

1 MR. KHAN: Objection, asked
2 and answered.

3 THE WITNESS: Yeah, as I --
4 as I have alluded to before with
5 respect to my previous answers, for
6 the same reasons, I have not been
7 involved.

8 BY MR. TSUEI:

9 Q. Okay. What is VHT?

10 - - -

11 (Clarification by the
12 stenographer.)

13 - - -

14 THE WITNESS: Very high
15 throughput.

16 BY MR. TSUEI:

17 Q. And in the context of your
18 opinions in this case, what is VHT, or
19 very high throughput?

20 A. Well, as I relate to it in
21 my declaration -- and we can go to that
22 to see what specifically you are
23 wondering about -- but it's a
24 development -- technological development

1 would be a good characterization as far
2 as the standards were evolving over
3 time, and VHT is nomenclature used to
4 identify at a broad level aspects of the
5 protocol that would improve throughput
6 of the 802.11 wireless standard based
7 upon those technological changes as they
8 are implemented within the protocol.

9 Q. Okay. VHT in the context of
10 your opinions in this case refers to
11 specific aspects of the wireless
12 communications protocol described in the
13 802.11ac standard, right?

14 A. 802.11ac was the first
15 frozen protocol that referenced VHT, to
16 my recollection. There are some other
17 standards that are published from time
18 to time dealing with specific subareas
19 for each one of the 802.11 standards.
20 For example, when they are doing
21 spectrum extensions or something like
22 that, they will put out a special
23 essentially standard. But with respect
24 to 802.11ac, yes, that's the -- the one

1 associated with VHT.

2 Q. Okay. So with the AC
3 standard introducing VHT to the 802.11
4 standard, would it be fair to say that
5 VHT in the context of your opinions in
6 this case refers to, among other things,
7 a specific type or format in which data
8 packets can be structured?

9 A. In my report, I do refer to
10 it with reference to structures and
11 field structures and overall kind of
12 messaging structure.

13 We would have to look at
14 each reference to see if I have a
15 broader meaning as I cite it within my
16 declaration, but in general, that's what
17 I am referring to.

18 Q. Yeah. I am not trying to
19 pigeonhole your opinions here. I am
20 just saying one of the ways you use the
21 term "VHT" in the context of your
22 opinions in this case is to refer to
23 things like VHT MPDU, for example, and
24 that connotes a certain set of MPDU

1 delimiters that are in the packet and so
2 on.

3 Would you agree with sort of
4 that general description of your use of
5 VHT in your report?

6 MR. KHAN: Objection, vague,
7 ambiguous.

8 THE WITNESS: So, again, as
9 I just said about -- or with
10 respect to my report and the use of
11 that, I am discussing at various
12 points elements inclusive of what
13 you just asked, meaning I am
14 pointing to message structure, for
15 example, as part of those
16 disclosures in my -- or statements
17 in my declaration.

18 BY MR. TSUEI:

19 Q. All right. So a VHT MPDU --
20 and by "MPDU," I simply refer to, you
21 know, what that term means in this
22 context, which is, I think, like, MAC
23 layer protocol data unit -- the VHT MPDU
24 is a specific format that's defined in

1 the 802.11ac protocol, right?

2 MR. KHAN: Objection.

3 THE WITNESS: Yeah, the VHT
4 MAC PDU is defined -- is a defined
5 structure within that protocol.
6 Obviously, MAC PDUs have been
7 around forever, and when it's
8 referred to in the protocols --
9 referred to in the context of
10 disclosed structure in that
11 protocol, is the way I would answer
12 that question, but to a person of
13 ordinary skill in the art, they
14 understand both where the MAC PDU
15 came from, what its purpose is,
16 what it consisted of previously.

17 BY MR. TSUEI:

18 Q. Okay. Are you familiar with
19 what the acronym HE means in the context
20 of your opinions in this case?

21 A. So, in general, HE refers to
22 high efficiency.

23 Q. Okay. And does high
24 efficiency here, specifically in the

1 context of your opinions in this case,
2 refer to a specific format of messages
3 defined in the 802.11ax protocol?

4 A. The 802.11ax protocol
5 presented some additional evolution of
6 the standard to address and enhance, I
7 think is how they termed it, the high
8 efficiencies associated with the 802.11
9 standard, and I do refer to that
10 protocol in my report.

11 Q. All right. It seems to me
12 -- let me know if you disagree -- that
13 the drafters of these respective 802.11
14 standards chose the acronym HE for high
15 efficiency to describe, I guess, their
16 new iteration on message formats and as
17 a way to distinguish what they were
18 developing in the AX context when
19 compared to what was previously done in
20 AC, where the format was described as
21 VHT.

22 Would you agree with that?

23 MR. KHAN: Objection,
24 leading.

1 THE WITNESS: What I would
2 -- what I would say is from a
3 POSITA's perspective and
4 understanding how these -- how the
5 protocol is developing, that there
6 is a reason why they are using, you
7 know, the label enhancements to
8 efficiency; that is, efficiency has
9 been a goal for any wireless
10 standard but including 802.11, and,
11 in particular, the emphasis in the
12 AX standard was on increasing or
13 continuing that process or
14 evolution and with respect to what
15 is being -- what was and what is
16 disclosed in the 802.11ax standard.
17 But it is certainly a label they
18 used to provide a high level
19 description of what they were
20 trying to accomplish in that
21 standard.

22 BY MR. TSUEI:

23 Q. Okay. Let's say you have a
24 terminal that is a non-AP terminal which

1 is programmed to understand messaging in
2 the 802.11ac protocol, that is the Wi-Fi
3 5 protocol. What if it receives an MPDU
4 or PPDU that is formatted using the HE
5 structure defined in the 802.11ax
6 context? Do you know what happens at
7 this terminal when it receives such a
8 message?

9 MR. KHAN: Objection,
10 hypothetical, calls for
11 speculation, vague.

12 THE WITNESS: If you can --
13 if you can give me a specific
14 context of the system at the state
15 at that time, how that device is,
16 for example, connected to the
17 network and the particular
18 parameters that were passed between
19 the device and the network and what
20 was accepted and what was rejected,
21 I can give you a more responsive
22 answer, I would say.

23 BY MR. TSUEI:

24 Q. Sure. And if it's unclear

1 of what I am getting at, feel free to
2 let me know. I am going to be upfront
3 with you. My purpose is to ask you what
4 would happen with, like, a mismatch in
5 protocol compatibility between terminals
6 and APs or -- when I say "AP," I mean
7 axis point, for purposes of the
8 reporter.

9 So if, like, the terminal is
10 only able to understand messages in
11 Wi-Fi 5 but it's receiving PPDUs from
12 the axis point that are structured in
13 Wi-Fi 6, what result? What happens at
14 the terminal?

15 MR. KHAN: Objection,
16 hypothetical, calls for
17 speculation.

18 THE WITNESS: So at a high
19 level, one particular example to
20 your question is if I am a 802.11
21 end station talking to an axis
22 point that is talking to other
23 stations in the AX standard -- and
24 everybody sees those packets. So

1 as a normal cause of -- normal
2 process of transmitting and
3 receiving, it's looking at packets.
4 If it's destined for it, it will
5 analyze it. In that case, it would
6 analyze it and say it's not
7 destined for me. It won't process
8 it.

9 BY MR. TSUEI:

10 Q. Okay. And this process
11 where you are saying the station
12 receives the packet and determines it's
13 not intended for it, does the terminal
14 make that determination by looking at
15 the TID that's in the packet?

16 MR. KHAN: Same objection.

17 THE WITNESS: In the
18 particular example that I was
19 putting forward, again, in a broad
20 way, it's looking at the packets to
21 see if it is the intended recipient
22 and it doesn't have to go beyond
23 that to know and so therefore it
24 doesn't process the packet.

1 BY MR. TSUEI:

2 Q. Okay. Well, how does the
3 recipient device determine if the packet
4 is intended for it?

5 A. Based on scheduling from the
6 axis point, based on signaling from the
7 axis points, and if a connection has
8 been established, if it's gone through
9 the authentication procedures and then
10 granted access to the system, if it
11 established a link and sent up a
12 request, the axis point is communicating
13 with the station and telling it where to
14 look for resources and information.

15 Q. Okay. So the receiving
16 device is looking at the scheduling
17 information as well as the signaling
18 information in the packet to decide if
19 the message is intended for itself,
20 right?

21 MR. KHAN: Objection,
22 leading.

23 THE WITNESS: In a broad --
24 again, in a broad construct at a

1 general level of how things operate
2 within a wireless communication
3 system, and particularly --
4 including, I should say, 802.11, is
5 that it is analyzing those -- the
6 received information, energy in
7 general, and deciding whether it is
8 something it should be coding and
9 wasting its resources on, is it
10 valid or not.

11 And within that context is
12 what I was describing -- and
13 another context or a high level,
14 you can say that if I have already
15 registered with the axis point,
16 it's only going to send me what I
17 can decode within, again, the
18 structure of the scheduling and
19 allocation of the system.

20 BY MR. TSUEI:

21 Q. Right. So it seems like if
22 in sort of ordinary operation the
23 terminal has already communicated to the
24 axis point, hey, look, I am only

1 compatible with Wi-Fi 5, what's going to
2 happen when the AP communicates with the
3 terminal, is the AP is going to send
4 Wi-Fi 5-structured packets to the
5 terminal, right? It's not going to send
6 Wi-Fi 6-structured packets, for example?

7 MR. KHAN: Objection, calls
8 for speculation. Objection, form,
9 leading.

10 THE WITNESS: Well, as I
11 said, in general, the systems are
12 going to operate at a cooperative
13 level to try to enable every device
14 to connect to the network. I can't
15 say whether there is going to be an
16 axis point that does something
17 anomalous, and I don't want to go
18 down because I haven't performed an
19 analysis on a particular device,
20 for example, to see what it does or
21 how it does it or why it does it.

22 Anything is possible in
23 terms of products that are
24 developed and how they decide to

1 transmit. Whether that's going to
2 work or not depends upon, again,
3 the receiving device and how it's
4 structured. But in general, if one
5 is talking French and the other is
6 talking, you know, Italian, while
7 they are related, maybe they would
8 have a problem hearing each other.

9 BY MR. TSUEI:

10 Q. Right. My question brings,
11 I think, us back to the issue I
12 sign-posted a few minutes ago, which is
13 what happens if there is an
14 incompatibility or mismatch between the
15 capabilities of the devices that are
16 talking to each other?

17 Your testimony is, you know,
18 under ordinary operation, as far as you
19 know, if they know that the only
20 language they can communicate with each
21 other intelligibly is French, they are
22 going to speak French to each other,
23 right?

24 A. What I am referring to is

1 based upon the general knowledge of how
2 these things work, it's the goal of
3 being able to communicate to each other
4 so that messaging can be successfully
5 passed, and if there is structures out
6 of line from what's expected or
7 messaging that isn't expected, you are
8 going to have difficulties in your com
9 system. Is that possible? Sure. Is it
10 likely in terms of commercial products?
11 It's not very conducive to operations of
12 in selling your product if it's not
13 working well with a communication system
14 and a wireless system. We all have
15 problems with wireless systems, but --
16 devices not working. But the reason
17 why, it would have to be analyzed to see
18 what's happening on a particular device
19 that's causing the problem.

20 Q. Okay. One of the concepts
21 that is addressed in your testimony --
22 in your declaration, that is, is the
23 concept of a type of a response frame
24 that's referred to as a multi-station

1 block acknowledgment response frame.

2 Are you familiar with that
3 concept?

4 A. Yes. I am going to open up
5 my Exhibit-1003 so I have it in front of
6 me. Is there a particular aspect of my
7 declaration that you would like to
8 discuss?

9 Q. Not yet. And if it's
10 helpful, it's also language from the
11 challenged claims here, so it's like the
12 second-to-last limitation of Claim 1
13 which you have addressed in, you know,
14 large portions of your report.

15 So, again, just for the
16 record, I am talking about specifically
17 the multi-station block acknowledgment
18 response frame type.

19 A. Okay.

20 Q. So sticking with that
21 concept right now, can you tell me if
22 this type of response frame is the type
23 of response frame that was present or
24 introduced in the 802.11ac context or

1 did it occur later?

2 MR. KHAN: Objection,
3 relevance.

4 THE WITNESS: The claim
5 discloses that a multi-station
6 block ack frame is according to a
7 combination of a type of MPDU
8 determined by the end-of-frame
9 field and the length field and ack
10 policy information.

11 And based upon my analysis
12 of that claim elements with respect
13 to the protocols that I discuss in
14 my declaration, I evaluated from
15 the perspective of a POSITA using
16 the plain and ordinary meaning, and
17 with respect to the multi-station
18 block ack, I do address that
19 several times with respect to
20 referencing 802.11 VH and VHT. And
21 I would be happy to discuss that
22 with you in a particular section.

23 BY MR. TSUEI:

24 Q. Sure. So multi-station

1 block ack is a type of response frame
2 which was created specifically in the
3 context of 802.11ax, right?

4 A. The nomenclature of the
5 802.11 use of the multi-station block
6 ack is and does show up in the 802.11ax
7 specification itself, yes.

8 Q. So what exactly is a
9 multi-station block ack frame?

10 A. Well, again, according to
11 the claim language, that the
12 multi-station station block ack is a
13 response frame which is a type of ack
14 and the element discloses three
15 possible, it being one of them, and it's
16 determined based upon in the claim
17 element a combination of the EOF field,
18 the length field, and the ack policy
19 information.

20 Q. Okay. Can a device
21 receiving a VHT MPDU ever provide a
22 response frame in the format of a
23 multi-station block ack?

24 MR. KHAN: Objection, vague.

1 THE WITNESS: As I have gone
2 through in my analysis in my
3 declaration, with respect to the
4 claim element and the claim
5 language, I discuss how the prior
6 art that I analyzed satisfies that
7 claim element and particularly the
8 multi-station block ack.

9 BY MR. TSUEI:

10 Q. I understand you think your
11 opinions are in your declaration. I am
12 asking a simple question. In a terminal
13 that is receiving a very high throughput
14 MPDU and is trying to figure out how to
15 respond to that MPDU ever respond with a
16 response format that is the
17 multi-station block acknowledgment?

18 MR. KHAN: Objection, vague.
19 Objection, calls for speculation.

20 THE WITNESS: In my
21 declaration, I analyzed the '926
22 patent and the prior art and based
23 on my analysis, I present how the
24 combinations that I discuss render

1 that claim element, including the
2 multi-station block ack frame, from
3 Element 1H as obvious.

4 BY MR. TSUEI:

5 Q. Okay. I am going to ask the
6 question again. If a terminal receives
7 a VHT, a PDU, can it respond with a
8 multi-station block ack frame? Now, I
9 understand your opinions are you can
10 combine references to render the claim
11 obvious. I am asking you a technical
12 question to which I am hoping to receive
13 a technical, fact-based answer.

14 MR. KHAN: Objection, asked
15 and answered. Objection, vague.
16 Objection, calls for speculation.

17 THE WITNESS: So I think I
18 am very clear in my declaration of
19 how I rely on the perspective of a
20 person of ordinary skill in the art
21 using the plain, ordinary meaning
22 of the claim language of the '926
23 patent in performing my analysis,
24 and I present my analysis in my

1 declaration, which includes whether
2 the multi-station block ack is
3 rendered obvious, which is what the
4 purpose of my -- in terms of my
5 validity analysis of the patent
6 with respect to prior art is
7 concerned and directed to.

8 And as part of that, I do
9 discuss the prior protocols that
10 disclose the VHT, for example, and
11 how that prior art in combination
12 and/or with other technical
13 documents, render that obvious.

14 BY MR. TSUEI:

15 Q. Okay. So your opinion is --
16 for Ground 1 of your opinions in this
17 case, is that a POSITA would start with
18 the Chu reference, right?

19 A. Ground 1 is based on Chu in
20 combination, yes.

21 Q. And you have two
22 subcombinations asserted for Ground 1
23 that's respectively Chu plus IEEE-D1 and
24 Chu plus IEEE-D2, right?

1 A. That is correct.

2 Q. Would it be fair to say that
3 Chu alone does not disclose a type of
4 response frame where the type is
5 multi-station block acknowledgment?

6 A. In my analysis -- obviously
7 you just stated -- I am using
8 combinations to perform my analysis. As
9 part of that analysis, if you go through
10 my declaration, I do disclose how Chu in
11 combination with those disclosed or make
12 obvious the elements of the claims that
13 I address, and I reference Chu and the
14 VHT -- I am sorry -- the VHT PPDU's and
15 their structures within that context.

16 With respect to the --
17 satisfying the claim elements, I do
18 reference Chu for satisfying the
19 determination based upon what's
20 disclosed in the claim elements. I
21 don't have an independent analysis of
22 whether Chu -- I didn't perform an
23 analysis of whether Chu alone satisfies
24 all the claim elements.

1 Q. Okay. So is Chu alone
2 missing some aspect which would
3 otherwise render the entirety of Claim 1
4 of the '926 patent obvious?

5 A. The analysis I present in my
6 declaration, I do, as I said, a combined
7 analysis. I don't do an independent
8 analysis, meaning Chu stand-alone
9 analysis. I use the 802.11 standards
10 for, in particular, bringing in the
11 mixed -- what I call mixed combination
12 of EOF fields, but within my analysis of
13 Chu, I do reference each one of those
14 requirements within the claim element,
15 for example, 1H.

16 Q. What is a mixed combination
17 of EOF fields?

18 A. Well, if we -- what I was
19 referring to, if we look at -- sorry.
20 Give me one second.

21 If you look at my
22 declaration on page P -- well,
23 declaration page 76, I am specifically
24 referring to the fourth column in where

1 I provide my summary of the IEEE
2 references and, in particular, if you go
3 down that column, I am referencing the
4 delimiter information at the end of
5 that. And that particular combination
6 disclosure discusses or provides the
7 amplification for MPDUs having an EOF
8 of -- equal to 1 and a nonzero length
9 field coexisting within the aggregated
10 MPDU with MPDUs having an EOF equal to
11 zero in a nonzero length field. That's
12 what I am referring to.

13 Q. So the disclosure, you are
14 saying here, a POSITA would recognize,
15 again -- staying with your table 4 at
16 page 76 through 77 of your report -- is
17 supplied by IEEE-D1 or IEEE-D2; is that
18 correct?

19 A. That is correct.

20 Q. Okay. So you don't have an
21 opinion that Chu alone supplies any
22 teaching that renders obvious, let's
23 call it, the mixed combination or
24 coexistence scenario that's the subject

1 of your right-handed column in table 4?

2 MR. KHAN: Objection,
3 mischaracterization.

4 THE WITNESS: In my analysis
5 of Chu, I discuss the context of
6 the aggregated MPDUs and with
7 respect to them disclosing the use
8 of the EOE [sic] field which does
9 include both end-of-frame field
10 equal 1, end-of-frame field equal
11 zero, if not length -- nonzero
12 length, so I use the IEEE
13 references to further amplify that.

14 I did not say that Chu does
15 not address those field values. It
16 does as well as the zero length as
17 well as the policy information
18 field.

19 BY MR. TSUEI:

20 Q. So your testimony is in Chu,
21 the VHT MPDUs include things like the
22 EOF field and the length field, right,
23 and you say -- you are saying that your
24 testimony addresses that aspect of Chu?

1 MR. KHAN: Objection,
2 mischaracterization of the
3 testimony.

4 THE WITNESS: Well, again,
5 my analysis of Chu is pretty
6 thorough in my declaration, and
7 what I am saying is during that
8 analysis, I am -- I do discuss
9 whether Chu discloses the required
10 aspects of Claim Element 1H, which
11 says that that multi-station block
12 ack frame is determined based on a
13 combination of those fields' EOF,
14 the nonzero or the length field and
15 the ack policy information.

16 What I further said is that
17 in my summary analysis, I provide,
18 for example, in a table on page 62
19 a clear layout of the mapping
20 between the acks disclosed in 1H as
21 well as how my analysis above that
22 reflected each one of those
23 aspects. And so as part of that
24 analysis and as part of this

1 summary, I do address the EOF
2 fields as part of that.

3 BY MR. TSUEI:

4 Q. Staying with your table at
5 page 62 of your declaration, and keeping
6 your attention on the right-hand column,
7 whose header is named multi-TID block
8 acknowledgment response --

9 A. Yes.

10 Q. -- is it your opinion that
11 Chu teaches determining an A-MPDU type
12 based on EOF equals 1 and length, not
13 equal to zero?

14 A. My analysis as presented,
15 for example, in that column is that the
16 response frame is in response to the
17 received PPDU where that type of
18 response is determined as one of the ack
19 frames which I address in that column
20 also -- or in other -- in that table, I
21 should say, including that third column
22 which is the multi-TID block, and my
23 analysis shows with reference to Chu
24 that MPDUs having an EOF equal to 1 and

1 a length field not equal to zero
2 associated with each MPDU having
3 different TIDs does meet that claim
4 language of a type of response and a
5 type of MPDU determined based on the
6 referenced information in that column.

7 Q. Okay. Where in Chu does it
8 teach determining a type of MPDU using
9 the EOF field and length field? And
10 just to be clear, I am talking
11 specifically about the type of MPDU as
12 opposed to a type of the response frame.

13 A. So in my declaration, I
14 discuss beginning at paragraph 100, my
15 discussion of the response type, but I
16 begin with disclosing -- as I --
17 introduction to my analysis that Chu
18 discloses a determination based on a
19 type of MPDU which is determined by the
20 EOF and length field and the policy.

21 And then below this, I go
22 through a discussion of the MPDUs
23 received by Chu and specifically the
24 delimiter structures which contain the

1 EOF and length fields, for example,
2 determining a type of MPDU based upon
3 the full disclosure in Chu and my
4 analysis.

5 Q. Is there any particular
6 paragraph you would like to direct my
7 attention to or your testimony that you
8 have opined Chu describes delimiter
9 structures which contain the EOF and
10 length fields for determining a type of
11 MPDU?

12 A. Yeah, in paragraph 102 -- I
13 have the -- 100 and 101 further
14 discussing the determination of the
15 response, and I amplify that in 102 with
16 respect to the delimiter structure and
17 that Chu explains that the
18 acknowledgment behavior is controlled by
19 various aspects and that the bits are
20 set to specific values indicating a type
21 of acknowledgment.

22 For example -- and I am
23 quoting here -- Chu states that when the
24 EOF field in the MPDU delimiter is set

1 to a, quote, first predetermined value,
2 end quote, such as 1, it indicates a
3 normal acknowledgment policy to
4 acknowledge a single data unit to be
5 transmitted in the second communication
6 device, end quote.

7 And I am referring to the
8 contents of the MPDU in that analysis of
9 saying how Chu is making a determination
10 based upon the contents of the type of
11 MPDU to determine the acknowledgment, so
12 that the acknowledgment is based upon a
13 type of MPDU.

14 Q. Okay. I think I understand
15 your testimony.

16 I see that in the portion of
17 your paragraph 102 that you just read
18 you assert that Chu states that EOF
19 field is set to predetermined values
20 which in turn indicates the
21 acknowledgment policy.

22 Is that correct?

23 A. Yes, I do state that.

24 Q. So staying with paragraph

1 102, where is your analysis or opinion,
2 if it exists, where you say Chu teaches
3 using EOF and length fields to determine
4 the type of MPDU received?

5 A. Well, my analysis is
6 performed -- as I present not only in
7 102 but in the following paragraphs,
8 this is a pretty lengthy discussion --
9 from the perspective of a person of
10 ordinary skill in the art, analyzing Chu
11 and obviously the '926 and that it would
12 be understood by a person that different
13 MPDU types would be or -- the MPDU type
14 would be determined or could be
15 determined based upon the contents of
16 the delimiter field, so that type of
17 MPDU would -- or I am sorry -- the type
18 of MPDU would be obvious to be
19 determined based upon the contents of
20 that delimiter which is associated with
21 the specific MPDU being received.

22 MR. KHAN: Sorry, Counsel,
23 James, I don't mean to interrupt
24 your line of questioning, but we

1 have been going for about an hour
2 and 25 minutes. After this line of
3 questioning, do you mind if we take
4 a short break?

5 MR. TSUEI: Yeah, that's
6 totally fine.

7 Dr. Mahon, please bear with
8 me. I will try to keep this brief
9 until we take a break.

10 BY MR. TSUEI:

11 Q. So I understand your
12 testimony, Dr. Mahon, to be that you
13 believe Chu discloses to a POSITA the
14 use of the delimiters in the MPDU to
15 determine the type of the MPDU that it
16 has received; is that correct?

17 A. Yes. My analysis is from
18 the perspective of the plain and
19 ordinary meaning and the POSITA's
20 analysis.

21 Q. Is it your opinion that Chu
22 explicitly discloses the use of a given
23 MPDU type -- it could be any type, for
24 example, those listed in your tables --

1 for determining the type of response
2 frame?

3 A. Well, it's -- as I disclose
4 or discuss in my declaration, it's
5 contained within Chu with respect to the
6 plain, ordinary meaning in the claim
7 language that it is making that
8 determination based upon a type of the
9 MPDU. If you are asking me if Chu uses
10 those words in combination, I do not
11 recall that being in Chu.

12 Q. Okay. It seems like you are
13 understanding where I am going with
14 this, and I -- I can't help but notice
15 that I think your opinions are well --
16 are well fleshed out about how Chu
17 discloses EOF and length fields to set
18 the particular response frame. And you
19 read a portion from your declaration
20 essentially to that effect.

21 I just want to know if there
22 is anything else in Chu where instead of
23 using EOF and length field to determine
24 a response type frame, you instead use a

1 type of MPDU to do that. And is there
2 anything else in your declaration where
3 you would explain where Chu discloses
4 that?

5 MR. KHAN: Objection,
6 compound question and -- hold on
7 one second, please.

8 THE WITNESS: Sure.

9 MR. KHAN: Yeah, objection,
10 vague.

11 THE WITNESS: If you could
12 be more explicit in the question,
13 maybe I can break it down. I can
14 say in general.

15 As I said before, Chu
16 references all the 802.11 previous
17 specifications up to that point in
18 time, including the VHT fields and
19 VHT MPDUs, for example, as part of
20 that, but if you can narrow the
21 question down or make it a little
22 more precise, hopefully I can give
23 you a better answer.

24 BY MR. TSUEI:

1 Q. All right. I mean, let's go
2 back to your table 2 which is on page 62
3 of your declaration.

4 A. One second, please.

5 Q. Okay.

6 A. Okay.

7 Q. So in your table 2, you have
8 listed three separate potential A-MPDU
9 types, and that's respectively VHT
10 single-user MPDU, single TID A-MPDU, and
11 multi-TID A-MPDU.

12 Do you see that?

13 A. Yes, I do.

14 Q. Is it your testimony that
15 Chu discloses the receiving device
16 making a determination of which of these
17 potential MPDU types the receiver has
18 received?

19 A. That nomenclature
20 corresponds to, as I mentioned, legacy
21 802.11 protocols and specifically my
22 analysis in Chu that discusses those
23 protocols and various MPDU structures
24 and, again, from the perspective of a

1 POSITA, understanding that the delimiter
2 information is part of the understanding
3 of what a VHT single-MPDU and how it's
4 used and what it contains as well as a
5 single TID A-MPDU, what it contains.
6 And that table is referencing that
7 understanding of a POSITA as well as
8 referencing the above-discussed
9 disclosures in Chu to support my
10 analysis and my understanding of what
11 Chu discloses with respect to the claim
12 language.

13 So yes, Chu does disclose
14 these types from my analysis of Chu and
15 the plain and ordinary meaning of the
16 claim language and from the perspective
17 of a POSITA.

18 Q. Is it your testimony that if
19 you perform an action in response to EOF
20 equals zero and length equals 1, you are
21 at the same time performing an action
22 based on a different type of information
23 that is correlated with those two
24 delimiters?

1 MR. KHAN: Objection, vague.
2 Objection, calls for speculation.

3 MR. TSUEI: If you don't
4 understand my question, let me know
5 because your counsel has continued
6 to object relevance and vague, so
7 if there is any misunderstanding or
8 ambiguity, let me know.

9 THE WITNESS: Well, I don't
10 understand your question with
11 respect to the claim elements that
12 we had been discussing. And with
13 respect to my analysis and my
14 declaration and how I have laid it
15 out of those particular items that
16 you have discussed, and I discuss
17 those independent and in
18 combination in my declaration.

19 BY MR. TSUEI:

20 Q. Okay. Let's --

21 MR. KHAN: I am sorry,
22 Counsel. I just wanted to say the
23 burden of asking clear questions is
24 on the deposer. The burden is not

1 on the deponent for figuring out
2 what the question is meant to be.

3 MR. TSUEI: Okay. Mr. Khan,
4 that's an interesting colloquy
5 interjection from you. If you
6 think that there is some unfairness
7 in the questioning, feel free to
8 identify it. Otherwise, I will
9 insist at this point, an hour and
10 30 into the deposition, that you
11 keep your highly improper speaking
12 objections to a minimum.

13 MR. KHAN: Well, Counsel, I
14 am -- can make the objection. It
15 is my right. And, you know, we can
16 continue. I can repeat the -- I
17 can repeat the transcript if you
18 would like and clarify to you if
19 it's not unclear to you -- if it is
20 unclear to you what the speculation
21 reason is. If you would like me to
22 further dig into that, I can
23 provide those reasons.

24 Again, you can disagree with

1 me. Our expert is answering your
2 questions, but I am entitled --
3 it's my right to object to your
4 question as you are entitled to
5 your right to ask your questions.

6 MR. TSUEI: Okay. Let's
7 continue for a few more minutes,
8 Dr. Mahon, and I trust that we can
9 break after that.

10 THE WITNESS: Okay.

11 BY MR. TSUEI:

12 Q. So, Dr. Mahon, let's say a
13 single-user VHT MPDU, or let's call it a
14 PPDU in that case, is known by a POSITA
15 to be associated with a specific EOF
16 value and a specific length value. Are
17 you following me?

18 A. Yes. You are talking about
19 -- I am sorry. Which A-MPDU type or
20 PPDU?

21 Q. I am talking about the
22 leftmost A-MPDU type which you have
23 listed in your various tables. So, for
24 example, that's on your table 2 and it's

1 the VHT single-MPDU type.

2 A. Okay.

3 Q. Does Chu disclose that this
4 MPDU type is associated with a specific
5 EOF value and a specific length field
6 value?

7 A. Chu discloses or discusses
8 the reception of VHT single-MPDUs and
9 also discusses the use of delimiter
10 information or the information that I
11 cite further down in the table.
12 Associated with that analysis in Chu,
13 again, from a -- to a POSITA, they would
14 understand that's consistent of how
15 those field values are used, and in
16 combination with the ack policy's
17 information that's disclosed, that
18 that's consistent with my analysis, as I
19 present in that table, that the VHT
20 single-MPDU type is being disclosed and
21 discussed with respect to the particular
22 ack response.

23 So I do that analysis, it is
24 in combination in discussion throughout

1 my declaration, and it's within -- and
2 it's found in Chu.

3 Q. Okay. So I will grant you
4 that Chu discloses and teaches different
5 values for EOF and length fields. I
6 just want to ask you if Chu actually
7 discloses concluding at the recipient
8 device that the MPDU type is this or
9 that MPDU type based on EOF and length
10 fields?

11 MR. KHAN: Objection,
12 confusing -- form, vague,
13 confusing.

14 THE WITNESS: My analysis I
15 perform in my declaration is with
16 respect to -- and what we are
17 discussing of the type of the MPDU
18 determined by the EOF field, the
19 length field, and ack policy
20 information and whether Chu
21 discloses that or not. And as I
22 present in my analysis, Chu does
23 disclose the use of those fields
24 and it does disclose -- it

1 associated with a type of MPDU,
2 such as the VHT single-MPDU for
3 determining a particular ack type.

4 So it's in there, and a
5 POSITA would understand that that
6 response is based upon the type of
7 MPDU determined by the normal
8 operation of the device and looking
9 at that information to figure out
10 what kind of ack response to
11 implement.

12 BY MR. TSUEI:

13 Q. Okay. I couldn't help but
14 notice that in your most right-hand
15 column with your table 2, which is
16 respectively addressing your mapping for
17 multi-TID block acknowledgment response,
18 that you have put in the last row EOF
19 equals 1 and length not equals zero.

20 Do you see that?

21 A. Yes.

22 Q. So in your most left-hand
23 column, starting with the ack response
24 column, you have also put EOF equals 1,

1 length not equal to zero.

2 Do you see that?

3 A. I do.

4 Q. Is it your testimony that
5 Chu discloses that the recipient device
6 will make a determination of what type
7 of MPDU it has received based on EOF and
8 length field values again?

9 A. It certainly makes that
10 determination based on those fields, and
11 as I have specifically delineated in
12 that third -- fourth column, I guess it
13 is, the column all the way to the left
14 -- I am sorry -- right is that MPDUs
15 having that EOF field equal to 1 and the
16 nonlength equal zero, with each MPDU
17 having a different traffic ID would
18 correspond to and would be in responsive
19 to a multi-TID MPDU and that would
20 constitute in my analysis the
21 determination of the type of MPDU based
22 upon including the information cited as
23 well as the TID information.

24 Q. Okay. Is it your testimony

1 that Chu actually teaches a
2 determination that the recipient device,
3 where it has received a PPDU with EOF
4 equals 1, length not equal to zero,
5 whether in looking at whether or not
6 there are different TIDs in the MPDU to
7 make that MPDU type determination, and
8 if so, where is that in Chu?

9 MR. KHAN: Objection, asked
10 and answered.

11 THE WITNESS: As I said
12 previously many times is that
13 what's disclosed in Chu is
14 consistent with both the legacy
15 systems as well as the
16 understanding of a POSITA and the
17 plain, ordinary meaning of the
18 claim terms with respect to how Chu
19 does or does not meet or make
20 obvious this claim element, which
21 would include the type of MPDU
22 determined by, as required in the
23 claim element, the EOF field, the
24 length field, and the ack policy

1 information, and to a POSITA as
2 well as what's clearly disclosed in
3 Chu with respect to the response to
4 the MPDU is that that response is
5 based upon the type of MPDU
6 received which I have summarized in
7 that table.

8 BY MR. TSUEI:

9 Q. In your declaration, what is
10 the most informative opinion or
11 paragraph where you explain how Chu
12 teaches a recipient device determining
13 an MPDU type using EOF and length field
14 values? If there are multiple
15 paragraphs, you can list those, too.

16 A. Well, I would list all the
17 paragraphs in my Chu declaration because
18 I do a development, a discussion to Chu,
19 I discuss the disclosures in Chu,
20 including those fields and the ack
21 policy information, which is, again -- I
22 am doing an analysis of the claim
23 elements and the language in the claim
24 and how I map that based upon the

1 disclosures in Chu from the perspective
2 of a POSITA using plain and ordinary
3 meaning to say based on my analysis, I
4 conclude that Chu does disclose or make
5 obvious the -- all the elements of 1H,
6 for example.

7 Q. Okay. So I am going to give
8 you another opportunity to identify a
9 specific paragraph or even a number of
10 paragraphs. If your answer is it's the
11 entire Chu section, that's okay. But I
12 am going to give you one more shot to
13 identify, you know, a smaller number of
14 paragraphs to describe where your
15 opinion on this specific issue is found.

16 Can you do that?

17 MR. KHAN: Objection, asked
18 and answered.

19 THE WITNESS: Yeah, I am
20 going to stay with my previous
21 answer that that's -- I did a lot
22 of work to do this analysis. It's
23 all contained. It's not
24 subsectioned. There is certainly

1 information contained throughout my
2 discussion in Chu that I would rely
3 upon, and its fulsome. So I will
4 cite to my declaration, including
5 the section of Chu.

6 BY MR. TSUEI:

7 Q. Okay. If at any point in
8 this deposition later today that you
9 come to a point you find that there is a
10 particular section in your declaration
11 describing how Chu discloses this sort
12 of claim limitation we have been
13 discussing, feel free to mention it on
14 the record so that we have it in the
15 transcript.

16 Is that all right?

17 A. Well, my answer is fulsome,
18 and it's included in that analysis and
19 so -- but, sure, if I think of something
20 that would satiate you better than my
21 fulsome analysis in my declaration, I
22 will try to bring that up.

23 Q. Okay. And just to be clear,
24 I am not sure it's an issue of whether I

1 am satiated or not; it's I need you to
2 identify for the record and for the
3 judges in the PTAB proceeding which
4 portion of your declaration is
5 specifically directed to this very
6 discrete claim limitation. So if you
7 want to supplement your testimony, you
8 can do that before the end of the
9 deposition.

10 A. No. I am saying that I've
11 performed an analysis of Chu with
12 respect to my experience and the
13 knowledge of a POSITA at the time of the
14 invention of looking at Chu and I
15 present in my analysis, in my
16 declaration and I address all those
17 elements within that claim element
18 exhaustively within my declaration to
19 show my analysis and present my
20 analysis, including the type of the MPDU
21 as well as how it responds and does an
22 ack determination.

23 Q. Okay.

24 MR. TSUEI: All right.

1 Let's take a break.

2 MR. KHAN: Thanks, Counsel.

3 When -- how long of a break
4 would you like?

5 MR. TSUEI: I am happy to
6 come back really at Dr. Mahon's
7 convenience, but let's go off the
8 record.

9 MR. KHAN: Okay.

10 THE VIDEOGRAPHER: One
11 moment.

12 We are now going off the
13 record, and the current time is
14 1:45 p.m. Eastern time. One
15 moment. We're now off the record.

16 - - -

17 (Off the record at this
18 time.)

19 - - -

20 THE VIDEOGRAPHER: We are
21 now back on the record, and the
22 current time is 2:01 p.m. Eastern
23 time. Back on the record.

24 BY MR. TSUEI:

1 Q. Dr. Mahon, welcome back from
2 the break.

3 A. Thank you.

4 Q. During the break, did you
5 speak with anyone?

6 A. No.

7 Q. Okay. Is it important for a
8 receiving device in the WLAN context to
9 be able to determine whether the type of
10 MPDU it has received is, for example, a
11 VHT, a PDU, or an HE MPDU?

12 MR. KHAN: Objection, form,
13 vague.

14 THE WITNESS: So the claim
15 in Element 1C does disclose
16 receiving a PPDU that includes an
17 aggregated MPDU which includes
18 multiple aggregated MPDUs per the
19 claim element.

20 With respect to the device
21 receiving that and then responding
22 to it within the claim elements as
23 disclosed further on through the
24 claim, certainly whether the device

1 operates that way within the
2 disclosures that I cite to would be
3 pertinent.

4 BY MR. TSUEI:

5 Q. Right. There is a technical
6 benefit from the perspective of the
7 receiving device from being able to
8 determine the type of MPDU it has
9 received, right?

10 MR. KHAN: Objection,
11 leading.

12 THE WITNESS: Well, as I
13 said previously, that my analysis
14 of the references do show that the
15 response frame is determined as
16 required by the claim elements in
17 Chu as one of a type of the blocks
18 listed, and according to, for
19 example, in 1H, the requirements
20 within that for the type of MPDU.

21 So my analysis is that yes,
22 Chu does disclose that device
23 operating in that form from the
24 perspective of a POSITA or renders

1 it obvious.

2 BY MR. TSUEI:

3 Q. Okay. My question was a
4 different one, which is somewhat
5 restated here now. Is there a technical
6 benefit to the recipient device from the
7 perspective of a POSITA to being able to
8 determine the MPDU type of the MPDU it
9 has received?

10 MR. KHAN: Objection, form,
11 vague.

12 THE WITNESS: Well, again,
13 if you are asking in general, with
14 respect to a device receiving an
15 MPDU and then operating per the
16 contents of that MPDU, including
17 information associated with that
18 MPDU, such as a POSITA would know,
19 inclusive delimiter fields for that
20 particular MPDU, it's certainly
21 important for that device to
22 process that according to the
23 protocol it's operating under.
24 Outside of this claim element,

1 sure, I think it has to respond in
2 a particular way based upon what
3 it's decoding or receiving.

4 BY MR. TSUEI:

5 Q. Okay. Let's say you have a
6 device that is Wi-Fi 5-capable that is
7 in shorthand able to interpret and
8 respond to messaging that has been
9 structured in a VHT format.

10 Are you with me?

11 A. Uh-huh, yes.

12 Q. If the recipient device
13 receives a message that is structured in
14 the HT format, or high throughput
15 format, that's defined in the Wi-Fi 4
16 standard, is it useful for the recipient
17 device to know that the message is
18 either in an HT or VHT format?

19 MR. KHAN: Objection, form,
20 vague.

21 THE WITNESS: Again,
22 speaking in general, in terms of
23 the device's operation on a
24 wireless network, if it is

1 connected to the network -- as a
2 particular example, if it's
3 connected to the axis point and it
4 says that it's compatible with
5 802.11n, then it expects to get
6 802.11n frames from the axis point
7 and the axis point is going to send
8 it 802.11n frames.

9 If it is connected, as
10 another example, in the 802.11ac
11 protocol under that and it says it
12 can operate under that, the axis
13 point and the devices would be able
14 to send frames and information and
15 messaging all based upon that
16 protocol.

17 So certainly, it's helpful
18 because if you want to make use of
19 the aspects of the protocol, you
20 accurately communicate what
21 protocol you can support and that
22 the axis point and the device both
23 transmit with respect to that
24 protocol as indicated.

1 BY MR. TSUEI:

2 Q. Is it fair to say that
3 another technical benefit to the
4 recipient device being able to
5 discriminate between different types of
6 MPDUs is that it can discard MPDUs
7 structured in a format that it is
8 incapable of reading or using?

9 A. So that, again, is a very
10 broad question. If I am designing,
11 again, as a particular example, a device
12 that's supposed to operate under
13 802.11ax and I am coding that device,
14 that I am advertising it as I am
15 compatible with that standard, and then
16 I write my code such that I am not using
17 that protocol, then that will cause
18 problems in the communications system.

19 If I am coding that device
20 under the normal use case and under the
21 prospective of a POSITA that it's
22 operating under the given protocol, then
23 my messaging format, my structure has
24 all been tested and approved that it

1 meets the protocol requirements and
2 therefore when a frame is coming in and
3 I am expecting a particular frame
4 format, I am going to process it as that
5 frame format.

6 If there was some scenario
7 where the -- another frame format was
8 being transmitted, I would have to know
9 that ahead of time and that would have
10 to be communicated under the protocol to
11 say I am falling back to X and Y
12 protocol, expect it, here it comes.

13 So the scenario you laid out
14 is -- I can't imagine a case where
15 that's actually going to happen because
16 you have already set up an understanding
17 of what protocol you are going to use
18 and therefore structures within that
19 protocol at the various layers to
20 communicate.

21 Q. A PPDU transmitted by an
22 axis point can contain multiple MPDUs
23 each in a different wireless
24 communication protocol format, correct?

1 A. It can aggregate MPDUs, and
2 if the device is capable of receiving
3 MPDU of multiple types, it could
4 theoretically do that.

5 Q. Well, it's not just
6 theoretical, is it, Dr. Mahon? In the
7 wild, axis point and routers are
8 generally reverse-compatible with prior
9 wireless communication standards.
10 You are aware of that,
11 right?

12 A. Absolutely. It should be
13 compatible with prior com standards as
14 required by the standards bodies of
15 being backward-compatible, yes.

16 Q. Right. So -- and a given
17 axis point can send a PPDU in a given
18 time slot to multiple devices with each
19 of those devices potentially having
20 different levels of compatibility with a
21 given wireless communication protocol,
22 right?

23 MR. KHAN: Objection, calls
24 for speculation, hypothetical

1 situation. Objection, vague,
2 ambiguous.

3 MR. TSUEI: Okay.

4 THE WITNESS: In terms of
5 the structure of the protocols, in
6 terms of what protocols it's
7 compatible with and under what
8 conditions it is responding, again,
9 the device is to operate within
10 that protocol requirements, has to
11 meet the ability to read these
12 frame structures as indicated under
13 the protocol. And if there is a
14 given scenario where the devices
15 are receiving multiple types of
16 protocol-based MPDUs, it has to be
17 able to read those, is the way I
18 would describe it.

19 BY MR. TSUEI:

20 Q. And if your device is
21 expecting an AX or high-efficiency MPDU
22 but within the aggregated MPDU, it also
23 sees another frame that's structured in
24 AC, does the recipient device discard

1 that second frame because it's for some
2 other device?

3 MR. KHAN: Objection, calls
4 for speculation, hypothetical.
5 Objection, vague.

6 THE WITNESS: Again, under
7 the -- under the protocol
8 requirements, you are coming up
9 with a scenario -- I have to see
10 kind of the layout of the specifics
11 of the scenario because the devices
12 have to be compatible with the
13 protocol, and I am not envisioning
14 a case where the processing that
15 you are alluding to would occur at
16 a particular device based upon the
17 requirements of being compatible
18 with the protocols that are being
19 transmitted in -- to a particular
20 individual device in the context of
21 a local area network regardless of
22 what the other devices are doing.

23 I don't have a more specific
24 answer to that, and I haven't done

1 that analysis of looking at
2 particular devices which may fall
3 into that. Again, nothing is
4 coming to mind in that context.

5 BY MR. TSUEI:

6 Q. Okay. Would it be fair to
7 say that your analysis of Chu focuses on
8 Chu's disclosure of devices receiving
9 VHT MPDUs?

10 A. I would say that as part of
11 my analysis, I certainly discuss that
12 and Chu does disclose that. The
13 elements in Chu are consistent with and
14 references VHT, so that's certainly a
15 part of that that I included. And I
16 would just characterize it as it is part
17 and part of my declaration. There is
18 other elements that I bring in as I
19 reference throughout my declaration, but
20 yes, that is part of it.

21 Q. Okay. I want to turn your
22 attention to your Ground 2. The
23 relevant portion of your declaration
24 starts at your page 84. Please --

1 A. One second.

2 Q. Okay.

3 A. Okay. D3, yes.

4 Q. That's right. And you
5 should have a copy of IEEE-D3 as
6 Exhibit-1009. So it's a very large
7 document, so feel free to open it if you
8 want. So --

9 A. I am opening it. I am
10 sorry.

11 Q. I am sorry. You are what?

12 A. I am opening it.

13 Q. Okay.

14 A. Okay. I have it opened.

15 Q. Okay. So IEEE-D3 is the
16 2016 revision in the 802.11ac wireless
17 communication protocol standard,
18 correct?

19 A. Yes, it's the revision of --
20 as it states on the cover page, that it
21 is a revision of the 802.11 2012, which
22 would be the 802.11 -- it would be
23 referring to the 802.11ac development.

24 Q. Okay. And so for purposes

1 of your opinion in this case, at least
2 at this point in time in 2016 when this
3 2016 document was published, the
4 technical concept of a multi-station
5 block acknowledgment response was not
6 included in 802.11ac, correct?

7 A. 802.11ac discloses the
8 aggregated MACs with respect to a single
9 station -- operation within a single --
10 for a single station.

11 Q. I think I agree with you
12 there. Because in 802.11ac,
13 communications from, for example, an AP
14 to a terminal could include information
15 and messaging for only one TID; is that
16 correct?

17 MR. KHAN: Objection,
18 leading.

19 THE WITNESS: Chu discloses
20 the multi-TID A-MPDU as part of its
21 embodiment, and that is building on
22 the 802.11ac protocol which it
23 encompasses. And that
24 functionality is basically a

1 disclosure within -- or extension
2 of the protocol based on -- or that
3 Chu is aggregating into its
4 inventive disclosures.

5 BY MR. TSUEI:

6 Q. I confess, I didn't quite
7 understand your answer which talks about
8 Chu and what you are saying Chu
9 discloses.

10 I am talking about
11 Exhibit-1009, which is the single and
12 sole reference you use for your Ground
13 2.

14 My question was, in
15 802.11ac, an AP to a terminal -- sorry
16 -- a communication from an AP to a
17 terminal could include information and
18 messaging for only one TID; is that
19 correct?

20 MR. KHAN: Objection, broad,
21 form, vague.

22 THE WITNESS: With respect
23 to my citation to D3, I am citing
24 -- and I do it in various -- well,

1 that part of my declaration
2 discussing D3 but also in my
3 previous section where I reference
4 Exhibit-1009, with respect to the
5 multi-TID, that -- and I
6 specifically state that here from
7 -- in paragraph 65, I state the use
8 of the M-BA for single user
9 multi-TID began to appear around
10 January 2016, and I state also in
11 Exhibit-1009 in several places
12 where the multi-TID is disclosed.
13 I do not reference that I can
14 recall the 802.11ac standard for
15 the multi-TID.

16 BY MR. TSUEI:

17 Q. Okay. So staying in your
18 Ground 2, which is a single reference
19 obviousness ground based on 802.11ac,
20 would you agree with me that 802.11ac
21 does not teach a response frame that is
22 a multi-station block acknowledgment?

23 MR. KHAN: Objection,
24 leading.

1 THE WITNESS: My
2 recollection is that D3 is building
3 on the 802.11ac protocol. It
4 discusses the multi-station
5 acknowledgment and that -- I do not
6 recall the 11ac standard discussing
7 or applying to multiple stations
8 within its acknowledgment.

9 BY MR. TSUEI:

10 Q. Okay. Let's stick with
11 IEEE-D3 then and the portions of your
12 report addressing Ground 2.

13 Do you offer an opinion that
14 IEEE-D3 discloses one of the three
15 possible response types required by the
16 claims, specifically multi-station block
17 ack?

18 A. I am sorry. One second. I
19 have -- switching back and forth between
20 D3 and my declaration, and I have
21 misplaced D3. Okay. Actually, I have
22 misplaced my declaration. Where the
23 heck is that? Okay. All right.

24 So if you would, Counsel, if

1 you wouldn't mind re-asking the question
2 so I can orient myself in my
3 declaration, please.

4 Q. Sure. Let me break it down
5 so that the record is a little bit more
6 clear.

7 The challenge claims here in
8 the independent claims requires that
9 there be three -- at least three
10 possible response types being
11 determined; is that right?

12 A. That the claim does require
13 a type of response and it does list
14 three as part of -- as one of three and
15 it does list those.

16 Q. Okay. And are you familiar,
17 generally speaking, with what the
18 conjunction "and" means in patent
19 claiming, or is that not something you
20 have thought about before?

21 A. Well, my analysis of using
22 conjunctive terms in a claim element
23 would be based upon the plain, ordinary
24 meaning within the context of the claim

1 element and within the claim itself.

2 Q. Okay. Now, if I represented
3 to you that the use of the word "and" as
4 a conjunction in a list of limitations
5 in a patent claim means by default that
6 all of the members of that list must be
7 present or disclosed in order for there
8 to be infringement and/or invalidity,
9 would you agree with that assertion?

10 MR. KHAN: Objection, calls
11 for the conclusion and objection,
12 speculation.

13 THE WITNESS: With respect
14 to my analysis of the claim and the
15 use of the conjunctive "and" and
16 specifically associated with the 1H
17 claim element and then 1I, I
18 analyze that and I present that in
19 my declaration from the perspective
20 of a POSITA using the plain and
21 ordinary meaning, and within the
22 context of the claim element, it
23 discloses with respect to a
24 multi-station block ack frame and

1 the type of MPDU determined by the
2 EOF and the length field and the
3 ack policy information.

4 If that's what you are
5 referring to, I performed my
6 analysis with respect to the plain
7 and ordinary meaning of those
8 terms, and with respect to D3. I
9 can go to my declaration and
10 discuss those particular fields and
11 1H, if that's what your question is
12 getting at.

13 BY MR. TSUEI:

14 Q. No. My question is sort of
15 a predicate question, which is, do you
16 have an understanding of what the claim
17 scope is when you have a list of three
18 things and the word "and" is used as a
19 conjunction, you know, to sort of end
20 the list? So, for example, are all
21 three things required in the prior art
22 in order for there to be invalidity or
23 is only one of the three required to be
24 shown by you in order for there to be

1 obviousness or invalidity?

2 MR. KHAN: Objection,
3 compound question. Objection,
4 calls for legal conclusion.
5 Objection, vague.

6 THE WITNESS: So with
7 respect to my analysis in D3,
8 again, in the context of the claim
9 and from the plain and ordinary
10 meaning, when "and" is used, it
11 depends upon the context of the
12 claim elements and their plain and
13 ordinary meaning. I did not do a
14 determination or do a construction
15 on the claim other than from the
16 perspective of a POSITA using plain
17 and ordinary meaning, and I do
18 discuss, for example, in D3 how it
19 satisfies 1H and 1I, and I did not
20 make a determination of whether all
21 three had to be there or one was
22 sufficient. I did it from the
23 perspective of a POSITA and the
24 plain and ordinary meaning, and I

1 do discuss that in my declaration.

2 BY MR. TSUEI:

3 Q. Does IEEE-D3 disclose a
4 message that's inclusive of an
5 aggregated MPDU with more than one TID?

6 MR. KHAN: Objection, form,
7 vague.

8 THE WITNESS: So your
9 question was with respect to D3 and
10 multi-TID?

11 BY MR. TSUEI:

12 Q. That's right.

13 A. Yeah, D3 discusses multi-TID
14 acknowledgments and responses, and I do
15 reference that in my declaration. And
16 in the D3 reference itself, it does --
17 it is discussing throughout multi-TID
18 context. So it certainly addresses
19 multi-TID.

20 Q. Okay. You say that you
21 reference that in your declaration with
22 respect to D3.

23 Can you identify which
24 paragraph or paragraphs where you

1 discuss the D3 reference you refer to or
2 discuss multi-TID messages?

3 A. Yes. Beginning in that
4 section, following the introduction, I
5 am referencing the D3 reference here in
6 paragraphs 161 and then continuing on
7 discussing the multi-TID block
8 acknowledgments, how D3 discloses that
9 and where it is in D3 and I reference
10 various tables and pages. With respect
11 to D3, continuing down -- let me see --
12 down through -- let's see -- 174, I am
13 referencing the block ack for multi-TID.

14 So I would say -- let me see
15 if there is anything else below that
16 that I am specifically referencing that.

17 It looks like through 174 is
18 the last element. No, I continue to
19 discuss overall the acknowledgment
20 following that, but it looks like that's
21 the last place I actually specifically
22 referenced the multi-TID block ack.

23 Q. Yeah. So I see the last
24 sentence fragment in your paragraph 174,

1 where it says you think that there is a
2 disclosure in the reference of a
3 multi-TID block ack frame. That's what
4 I want to know about because I have not
5 seen in the reference and as well as in
6 other portions of your declaration where
7 the reference does, in fact, disclose
8 that as a potential response type.

9 So beyond the paragraphs
10 that you have mentioned here, for
11 example, paragraph 162, 163, 164, is
12 there somewhere else in your declaration
13 that identifies a disclosure from the
14 reference that meets this limitation?

15 A. I am inclusive obviously of
16 the specific references to D3, such as I
17 reference pages 676 in the reference and
18 there is -- as you can see within those
19 cited references, it's discussing
20 multi-TID block acknowledgments. So
21 certainly, I discuss it. That's the
22 last place it shows up as a term.

23 Further on down, I just
24 provide additional support based on my

1 analysis from the perspective of a
2 POSITA how they understand what's
3 disclosed in D3 as well as the
4 discussion after paragraph 174
5 associated with the type of responses.
6 And beyond that, I don't recall citing
7 to anything else.

8 Q. Okay. In the context of the
9 patent, if a recipient device receives a
10 multi-TID message, that is, in other
11 words, an aggregated MPDU with different
12 frames with more than one TID associated
13 with, you know, the plurality of frames,
14 the correct response type that's
15 discussed in the context of the Wilus
16 patent here is a multi-station block
17 acknowledgment frame; is that right?

18 MR. KHAN: Objection, vague.
19 Objection, leading.

20 THE WITNESS: So could you
21 ask that question again, please?

22 BY MR. TSUEI:

23 Q. Sure. Let's stay more
24 general and specifically keeping in mind

1 the context of the '926 patent claims
2 and specification.

3 When a receiving device
4 receives an MPDU that's inclusive of a
5 number of sub-MPDUs, that is, it's an
6 aggregated MPDU, but there are -- there
7 is more than one TID associated with,
8 you know, the multiple frames, what is
9 the correct response type that the
10 receiver should be sending back to the
11 transmitter?

12 A. So in 1H, we have the
13 disclosure obviously of the
14 determination of the three block ack
15 types -- or frames, I should say, and
16 that's according to, as it says, a
17 combination of the type of MPDU. And
18 then in 1I, it's stating that wherein
19 the compressed block ack is used to
20 transmit a response to the one or more
21 MPDUs corresponding to one TID when the
22 one or more MPDUs corresponding to the
23 one TID among and one or more TIDs.

24 So within the plain and

1 ordinary meaning of that term, it's
2 saying that a compressed block ack is in
3 response to the particular TID or the
4 one TID from more than one -- one or
5 more MPDUs.

6 So it's referring to a block
7 ack acknowledgment. It's not addressing
8 specifically -- a block ack
9 acknowledgment where the one TID is
10 among either one or more TIDs. It's not
11 saying that a particular block ack is in
12 response to a receiving of a TID with or
13 requiring multiple TIDs, is the way I
14 understand from the perspective of a
15 POSITA and the plain and ordinary
16 meaning of that because it does include
17 "and one or more TIDs."

18 Q. Okay. Let's stick with this
19 response-type determination issue for a
20 little bit longer. I want to direct
21 your attention to your paragraph 180,
22 which is on your page 95.

23 A. Okay.

24 Q. So this is the portion of

1 your declaration which contains
2 the specifically subtitled opinions
3 about how the D3 reference discloses an
4 ack frame response type and a block ack
5 response type.

6 Can you just go ahead and
7 take a look at that section from its
8 beginning to its end, which is at
9 paragraph 190, and confirm for me that's
10 true.

11 A. Okay.

12 That is correct.

13 Q. Okay. In the, let's call
14 it, standard or ordinary ack frame
15 response scenario, the type of MPDU the
16 recipient would be responding to is a
17 single user MPDU, correct?

18 A. Yeah, I do point to D3 in
19 saying it does disclose in the context
20 of a VHT single MPDU that the resulting
21 response is an ack frame.

22 Q. Okay. D3, or 802.11ac, more
23 generally, doesn't teach the use of a
24 ack frame response to an MPDU that has

1 anything other than a single user MPDU;
2 is that right?

3 MR. KHAN: Objection, form,
4 vague.

5 THE WITNESS: Sorry. In
6 reading this, I kind of lost track
7 of your question, if you would
8 please repeat that.

9 BY MR. TSUEI:

10 Q. Sure. I will restate it.
11 And it is: D3 does not teach the use of
12 an ack frame response to an MPDU that
13 has anything other than a single user
14 MPDU? So put another way, in Wi-Fi 5
15 when the terminal receives an SVHT MPDU,
16 it can respond with an ack frame
17 response, right?

18 MR. KHAN: Objection,
19 leading. Objection, vague.

20 THE WITNESS: So your
21 question was for a -- I am sorry --
22 for a single MPDU or a single TID
23 A-MPDU? I lost track there in
24 terms of the question. I know we

1 were originally focused on the
2 acknowledgment request with respect
3 to a VHT single MPDU. Are we
4 expanding that to include anything
5 else within the exhibit or in the
6 D3 reference?

7 BY MR. TSUEI:

8 Q. Let me re-ask the question
9 and hopefully in a more clear way.

10 Does the IEEE-D3 reference
11 teach the use of a ack response frame to
12 an aggregated MPDU?

13 A. As I discuss in paragraph
14 182, that D3 defines the VHT single
15 MPDU, that is the only MPDU and an
16 aggregated MPDU. So in that context,
17 it's specifically saying that an
18 aggravated MPDU -- and this is
19 consistent with the POSITA's
20 understanding at that time -- could
21 contain a single MPDU. And it's
22 contained in aggregated MPDU subframe.
23 And that depending upon the policy bits
24 I have further down in that paragraph

1 182 where the D3 reference talks about
2 responding to the single MPDU VHT case
3 where the policy could be a normal ack
4 or immediate ack.

5 So if your question is are
6 you redefining what it defines as an
7 aggravated MPDU, I would need to
8 understand that. It certainly discloses
9 an aggravated MPDU and the context of a
10 single VHT MPDU.

11 Q. Right. The D3 reference
12 does disclose aggravated MPDUs. That's
13 sort of the subject of your opinions
14 starting on paragraph 186, right?

15 A. I was referring to 182. 186
16 is a single-TID aggravated MPDU.

17 Q. Yeah, that's right. So in
18 the scenario that you are describing
19 starting at paragraph 186 through
20 paragraph 190, what you are talking
21 about is the scenario in the standard
22 where you have a single aggravated MPDU,
23 but the information contained within
24 that MPDU is only for one station or one

1 device, right?

2 MR. KHAN: Objection,
3 leading.

4 THE WITNESS: My analysis of
5 D3 there is with respect to the
6 compressed block ack and that D3
7 explicitly discloses, as I state
8 there, is that you have an
9 aggravated MPDU all with the same
10 TID and therefore it goes -- I do
11 the analysis and therefore map that
12 to the compressed block ack frame
13 response, type in that reference.

14 I am not addressing -- I
15 think you were asking about whether
16 those multiple blocks or multiple
17 -- that aggravated MPDU would come
18 from multiple stations I guess is
19 what my question -- I need to ask
20 that question to clarify to make
21 sure I understand your question.

22 BY MR. TSUEI:

23 Q. I am not sure I can answer
24 that since I am not an expert, but maybe

1 let's just stick with the words in your
2 opinion for now, which, you know,
3 staying in the same section, you know,
4 paragraph 186 through 190, the opinion
5 that you are giving here is when the
6 recipient device receives an aggravated
7 MPDU but there is only one TID
8 associated with various frames contained
9 within that aggravated MPDU, the mapping
10 to the claims that you provide there is
11 to the block ack portion of 1H, right?

12 MR. KHAN: Objection,
13 leading.

14 THE WITNESS: So my --

15 MR. KHAN: Sorry.
16 Objection, misstates testimony.

17 - - -

18 (Clarification by the
19 stenographer.)

20 - - -

21 MR. KHAN: Just for the
22 record, objection leading and
23 objection misstates testimony.

24 MR. TSUEI: Yeah, I think I

1 did misstate itself. I apologize,
2 Dr. Mahon.

3 BY MR. TSUEI:

4 Q. Let me reframe and re-ask
5 the question.

6 Your opinion in this portion
7 of your report from -- in paragraphs 186
8 through 190 is that there are portions
9 in the prior art here you say map to the
10 compressed block ack frame limitation of
11 the claims, right?

12 MR. KHAN: Objection,
13 leading.

14 THE WITNESS: So I do the
15 mapping of D3 in this section in
16 these paragraphs to its disclosure
17 based on my analysis that it is --
18 it does cover the discussion or the
19 inclusion of the compressed block
20 ack as disclosed within Claim 1,
21 including those Elements 1H and 1I.

22 BY MR. TSUEI:

23 Q. Okay. The opinion here in
24 paragraph 186 through 190 is not

1 intended by you to be mapped to the
2 multi-station block ack frame
3 requirement in the claims, right?

4 MR. KHAN: Objection,
5 leading.

6 THE WITNESS: I don't
7 perform that analysis here. I
8 haven't done that analysis for my
9 -- I hadn't presented that analysis
10 this year and I haven't done that
11 specific analysis.

12 I performed the analysis
13 with respect to the compressed
14 block ack, so I -- you won't find
15 that here in paragraphs 186 and
16 190. I can certainly do that, but
17 I have not done that.

18 MR. TSUEI: Okay.

19 Let's go off the record.

20 THE VIDEOGRAPHER: Okay.

21 One moment.

22 We are now going off the
23 record, and the current time is
24 3:04 p.m. Eastern time.

1 One moment. We are now off
2 the record.

3 - - -

4 (Off the record at this
5 time.)

6 - - -

7 THE VIDEOGRAPHER: We are
8 now back on the record, and the
9 current time is 3:14 p.m. Eastern
10 time. Back on the record.

11 BY MR. TSUEI:

12 Q. Dr. Mahon, can you please
13 open up IEEE-D1, which is Exhibit-1005.

14 A. Yes. One second.

15 Q. All right.

16 A. Okay. I have it open.

17 Q. Okay. Is it okay if I refer
18 to this reference as the D1.0 draft?

19 A. Yes.

20 Q. Your opinion for Ground 1A
21 comprises a combination of the Chu
22 reference with D1.0, correct?

23 A. Yes.

24 Q. For your opinions of

1 invalidity in Ground 1A, you rely on
2 draft D1.0 to supply teachings to a
3 POSITA regarding the multi-station block
4 ack response frame type, correct?

5 I don't intend to hide the
6 ball here, but you have an opinion as to
7 this specific issue in your paragraph 66
8 starting on page 27 and the relevant
9 portion of your opinion begins near the
10 top of page 28.

11 A. Yes, that's where I am at.
12 I am just reviewing that to make sure I
13 remind myself of what I have analyzed
14 here and how I presented it.

15 Yes. In these 65, 66, and
16 67, I am citing to D1.0. That is
17 Exhibit-1005 as part of my analysis --
18 or to support my analysis for the
19 multi-station block ack format.

20 Q. Are you familiar with the
21 requirement that a prior art publication
22 for purposes of obviousness be publicly
23 accessible to a POSITA at the time of
24 the priority date or critical date of

1 the patent that's being challenged?

2 THE WITNESS: Counsel, you
3 are muted.

4 MR. KHAN: Thank you.

5 Objection, calls for a legal
6 conclusion. Objection, relevance.

7 THE WITNESS: I did not
8 perform a prior art analysis in
9 terms of whether it qualified as
10 prior art. I just performed my
11 analysis to the cited art as they
12 are -- were presented to me as
13 prior art. So I didn't do an
14 analysis of that.

15 BY MR. TSUEI:

16 Q. Are you aware that Samsung
17 in this proceeding has offered the
18 declaration from Dr. Chris Hansen
19 regarding the prior art status of
20 various publications that Samsung has
21 submitted with its petition?

22 A. I am not aware of that, no.

23 Q. And just to confirm, you
24 have not and are not currently providing

1 opinions as to the prior art status of
2 any of the art on which you rely to
3 supply your obviousness opinions, right?

4 A. That is correct, I am not --
5 I have not done an analysis of the --
6 whether the art qualifies as prior art.
7 I just did my analysis based upon the
8 representation that it was prior art.

9 Q. Okay. Would you please open
10 up IEEE-D2, which is Exhibit-1006?

11 A. Okay. I have that open.

12 Q. So I am sure you know that
13 this Exhibit-1006 is the combination
14 reference you rely on for your Ground 1B
15 where you say Chu can be combined with
16 Exhibit-1006.

17 Can you tell me what
18 Exhibit-1006 is as a high level matter?

19 A. Yes. This is basically a
20 document that proposes, as it says here,
21 and addresses multiple comments that
22 were related to ongoing discussions and
23 proposals and presenting some
24 resolutions to ongoing discussions with

1 respect to the protocol development.

2 Q. On page 1, there is a
3 section that's titled Abstract, and it
4 reads that the --

5 - - -

6 (Clarification by the
7 stenographer.)

8 - - -

9 MR. TSUEI: Sorry.

10 BY MR. TSUEI:

11 Q. I will start over. On page
12 1, there is a section that is subtitled
13 Abstract.

14 Do you see that, Dr. Mahon?

15 A. I do.

16 Q. It says there that the
17 submission of this exhibit proposed as
18 resolutions for multiple comments
19 related to TGax D0.1.

20 Do you see that?

21 A. I do.

22 Q. What is TGax D0.1?

23 A. That would be a technical
24 document associated with the development

1 -- the protocol development that it's
2 referring to.

3 Q. Have you offered any
4 opinions based on any of the content in
5 this technical document associated with
6 the development of the protocol that
7 it's referring to?

8 A. So my analysis is based upon
9 what disclosures are within this
10 document and how it relates to the
11 development of the protocol. I did not
12 do a separate analysis on that TGax
13 D0.1.

14 Q. Where it says AX in TGax, is
15 that a reference to 802.11ax?

16 A. That would be a reasonable
17 conclusion based upon what this is
18 directed to and I believe that is
19 correct, but I would have to go back
20 and, well, look for that reference to be
21 sure, but certainly that protocol
22 designation as part of the process of
23 protocol development is decided early
24 on, even before you even get a full

1 draft standard, so that's not uncommon
2 to be able to have that designation
3 available early on in the process.

4 Q. And just to confirm, the
5 802.11ax protocol development is the
6 wireless protocol associated with the
7 HE, or high efficiency, BPDU and MPDU
8 format; is that right?

9 MR. KHAN: Objection,
10 leading.

11 THE WITNESS: The standard
12 does refer to stations that are
13 going to be or are compliant with
14 this standard as HE stations, for
15 example.

16 BY MR. TSUEI:

17 Q. And that's distinct from VHT
18 stations which is the nomenclature used
19 to refer to stations compliant with
20 802.11ac; is that correct?

21 MR. KHAN: Objection,
22 leading.

23 THE WITNESS: The
24 designation within the documents

1 common throughout the protocol
2 history is that you are using that
3 designation to anchor the person to
4 what's disclosed that's new in this
5 protocol or, you know, further
6 developed in the protocol. So a
7 VHT station would draw a person of
8 ordinary skill in the art to the
9 previous standard, but that does
10 not mean an HE station is not
11 compatible with a VHT station,
12 backward-compatibility.

13 BY MR. TSUEI:

14 Q. So I want to direct your
15 attention to page 4 of Exhibit-1006, and
16 the very last sentence on page 4 begins
17 with "an HE station that receives."

18 Do you see that sentence?

19 A. I do see that.

20 Q. The full sentence is: An HE
21 station that receives a multi-TID,
22 A-MPDU, should respond with a
23 multi-station block ack frame that
24 contains -- and then there is sort of

1 additional content including two bullet
2 points below.

3 Do you see that?

4 A. Yes, I do.

5 Q. And HE station here refers
6 to a station that is intended to have
7 been configured to receive and transmit
8 in 802.11ax, correct?

9 A. Well, as I said, that
10 nomenclature is being used to describe a
11 station that's compliant with the
12 particular protocol, in this case, the
13 developing 11ax protocol. And
14 therefore, yes, it would be able to
15 perform the functionalities as disclosed
16 in the protocol based upon that
17 understanding but also would be capable
18 of performing the functionality and
19 implement the prior protocols, the
20 legacy protocols.

21 Q. Right. The way that at
22 least in real life, wireless devices are
23 set up is that they can communicate
24 using the standard that's like available

1 when they are developed, but the hope
2 and idea is that they are also
3 backwards-compatible to be able to
4 interoperate with other devices in the
5 wild which may not be so up to date; is
6 that correct?

7 MR. KHAN: Objection, vague.
8 Objection, calls for speculation.

9 THE WITNESS: Well, again,
10 in general, the development of
11 these standards are based upon the
12 device meeting the current standard
13 and in general at a high level,
14 sure, they are supposed to be
15 backward-compatible. That's why
16 they have conformance testing and
17 applications testing, et cetera.

18 So to a person of ordinary
19 skill in the art, you expect,
20 again, your device compliant with
21 standard 5 to be compliant with
22 previous standards unless it's been
23 depreciated. Then it wouldn't be
24 necessary.

1 BY MR. TSUEI:

2 Q. A device that is receiving a
3 VHT, A-MPDU -- strike that.

4 Turning your attention back
5 to this same sentence here, where it
6 says multi-TID aggravated MPDU, that
7 refers to the development in the Wi-Fi 6
8 protocol where devices can transmit
9 multi-TID aggravated MPDUs, right?

10 A. This disclosure is
11 specifically -- says that it's receiving
12 the multi-TID aggregated MPDU and
13 responding with a multi-station block
14 ack to that multi-TID aggregated MPDU.
15 So it certainly encompasses that.

16 Q. Okay. Well, the concept of
17 a multi-TID aggregated MPDU is actually
18 defined in the Wi-Fi 6 standard, right?
19 The section at least -- there is a
20 reference to a particular section of the
21 standard in the previous paragraph,
22 first sentence, correct?

23 MR. KHAN: Objection,
24 leading.

1 Counsel, if you want to
2 testify and make your arguments,
3 you can go ahead. These are all
4 leading questions.

5 And also objection for
6 compound question.

7 THE WITNESS: So the
8 paragraph you cited to is talking
9 about the station constructing a
10 multi-TID aggregated MPDU. It does
11 reference particular sections, 9.7
12 and 10.13, and it goes on to add
13 amplification there. I am not
14 sure -- beyond that, I think that's
15 a clear indication that it's
16 referencing those. And it's in
17 black and white. I am not sure how
18 to address that other than that's
19 -- it just says that in that
20 sentence. And it's referring to
21 the development of the current
22 protocol and it is referencing the
23 HE station and what it shall do.
24 Beyond that, I am not sure what

1 other context of your question you
2 are asking.

3 BY MR. TSUEI:

4 Q. You will agree with me that
5 the last sentence on page 4 says that a
6 high-efficiency station that receives a
7 multi-TID aggregated MPDU shall respond
8 with a multi-station block ack frame,
9 right?

10 MR. KHAN: Objection,
11 leading.

12 THE WITNESS: Well, the
13 sentence is stating that a station
14 that's receiving a multi-TID
15 aggregated MPDU is -- in this
16 document is stating that it's going
17 to respond with a multi-station
18 block ack, and then it refers to a
19 particular section. I mean, that's
20 what the sentence says.

21 BY MR. TSUEI:

22 Q. I think that is what it
23 says.

24 A. Is there a question about

1 the meaning? I don't understand. Is
2 the question about the meaning of that
3 or --

4 Q. No. My question was, you
5 agree that it says what it says. So let
6 me just ask the next question.

7 So this sentence is the
8 sentence you rely on to supply
9 multi-station block ack response frames
10 in your obviousness theory for Ground
11 1B, right?

12 MR. KHAN: Objection,
13 leading question. Objection,
14 mischaracterization of testimony.

15 MR. TSUEI: So, Dr. Mahon, I
16 will stop you before you answer.

17 Mr. Khan, I keep hearing you
18 object, and the grounds for
19 objection include leading. My
20 understanding is leading questions
21 are permitted during
22 cross-examination of an adverse
23 expert witness in a PTAB
24 proceeding. Now, you, as an

1 admitted PTAB practitioner,
2 Mr. Kahn, would know better than
3 me. Can you confirm for me that
4 leading questions are or are not
5 permitted in a cross-examination of
6 an adverse party's witness?

7 MR. KHAN: Leading questions
8 are fair grounds for objections.

9 MR. TSUEI: I apologize to
10 everyone for taking the time in
11 this colloquy.

12 Mr. Khan, can you tell me
13 rules or a rule or even a
14 presidential decision that would
15 support your -- I think your
16 apparent position that leading
17 questions are objectionable in a
18 cross-examination of an adverse
19 party's witness?

20 MR. KHAN: If you have
21 concerns of my objections, then
22 please go ahead and show me the
23 rule where it's not permitted and I
24 can stop my objections.

1 MR. TSUEI: Mr. Khan, I take
2 your inability to answer as an
3 admission that there is, in fact,
4 no rule against leading questions
5 in a cross-examination of an
6 adverse party's witness. If you
7 disagree, please state the basis of
8 your belief on the record, and I
9 trust and I hope, if necessary, we
10 can bring this to a resolution with
11 the judges at the board.

12 Is that okay?

13 MR. KHAN: Well, I have
14 already given you my answer. How
15 you chose to interpret it is up to
16 you.

17 MR. TSUEI: Okay. Your
18 answer is show me where it's
19 allowed and I will stop objecting?
20 Is that correct your objection?

21 MR. KHAN: I think if you
22 read what I said, that is not what
23 I said.

24 MR. TSUEI: All right. Very

1 good. Now, if you continue to
2 obstruct this deposition, Mr. Khan,
3 I am afraid we will have to move
4 for relief here and keep the
5 deposition open because so far, you
6 have taken a lot of time in this
7 deposition with clearly coaching
8 objections as well as speaking
9 objections. So please keep that in
10 mind.

11 MR. KHAN: I am very well
12 familiar, and I respectfully
13 disagree with your
14 characterizations of my objections.

15 MR. TSUEI: Okay. With the
16 record being perfected, Dr. Mahon,
17 I apologize for that exchange. Let
18 me re-ask the question that's open.

19 BY MR. TSUEI:

20 Q. On Exhibit-1006 at the
21 bottom of page 4 is the sentence that we
22 have been discussing. That sentence is
23 the one on which you rely in your Ground
24 1B to supply a teaching of a

1 multi-station block ack frame; is that
2 correct?

3 A. I cite to that reference and
4 page 4 and 5 in that reference in my
5 analysis in -- certainly in -- I use it
6 in -- let me just -- I cite it early on
7 and then I do cite it in my discussions
8 on the combined references, for example,
9 page 47 and then further -- continuing
10 down through and discussing Chu and
11 combining it as well as -- I am trying
12 to get my page numbers correct here --
13 as specifically my combination with D2
14 and 2.

15 - - -

16 (Clarification by the
17 stenographer.)

18 - - -

19 BY MR. TSUEI:

20 Q. Can a multi-TID aggregated
21 MPDU contain any VHT structured MPDUs?

22 MR. KHAN: Objection,
23 hypothetical.

24 THE WITNESS: I am sorry.

1 What's your question again? I
2 didn't hear the beginning of it.

3 BY MR. TSUEI:

4 Q. Can a multi-TID aggregated
5 MPDU contain any VHT MPDUs?

6 MR. KHAN: Same objection.

7 THE WITNESS: Yeah, I didn't
8 perform that analysis. I don't
9 recall performing that analysis
10 and/or discussing that in my
11 declaration. I obviously discuss
12 all those issues and how I found
13 the combinations I supported in the
14 prior art.

15 Are you talking about a
16 specific section of my declaration?

17 BY MR. TSUEI:

18 Q. I am not. I am asking you a
19 technical question which I -- you know,
20 I am hoping for a technical, fact-based
21 answer to, which is, can a multi-TID
22 aggregated MPDU contain any VHT MPDUs?

23 MR. KHAN: Counsel, since
24 you were reminding me of the rules

1 earlier, maybe I will return the
2 favor. I think you know that scope
3 of the deposition is regarding the
4 statements made in the declaration.

5 In your previous statement,
6 you just acknowledged that your
7 question is not related to the
8 scope of the declaration. So if
9 you can frame your question within
10 -- and not just this question but
11 all your questions -- within the
12 scope of the declaration, I think
13 that would be very helpful. So I
14 will, again, object to the line of
15 questioning.

16 MR. TSUEI: Thank you,
17 Mr. Khan, for that addition to the
18 record.

19 BY MR. TSUEI:

20 Q. Let me clarify for you,
21 Dr. Mahon, why I am asking these
22 questions, and I trust that will assist
23 in the proceeding of this deposition.

24 Earlier, Dr. Mahon, you

1 testified and confirmed that your
2 opinions about Grounds 1A and 1B include
3 a discussion about Chu's teaching of
4 receiving and transmitting VHT MPDUs. I
5 will stop there.

6 Would you agree with that?

7 A. I agree that I performed an
8 analysis in the combination of Chu's
9 disclosures from the perspective that
10 it's including the VHTs as well as
11 combining those with the references that
12 I cite to, D1 and D2.

13 Q. Okay. Can a device which is
14 receiving a VHT MPDU also be a device
15 which is able to receive a multi-TID
16 aggregated MPDU?

17 MR. KHAN: Objection,
18 hypothetical.

19 THE WITNESS: Yeah, so I
20 didn't perform an analysis on that.
21 I performed an analysis with
22 respect to the claim language,
23 which is my job, to see if the
24 prior art discloses and/or makes

1 obvious the claim language. And I
2 do that throughout my report and in
3 my report. So I would need to take
4 the specific question and do an
5 analysis aggregation of the prior
6 art to come up with an opinion
7 outside of the -- what's disclosed
8 in the claim language, which is,
9 again, what I was supposed to do in
10 my declaration.

11 BY MR. TSUEI:

12 Q. So at a high level, is it
13 fair to say that you use the claim
14 language here to guide your analysis of,
15 you know, what each prior art reference
16 disclosed and what can be combined with
17 what from another prior art reference?

18 A. No, I did not say that.
19 What I said was is I performed an
20 analysis of the prior art with respect
21 to what's disclosed in the claim from
22 the perspective of a POSITA using plain
23 and ordinary meaning of the terms as
24 disclosed to see whether the prior art

1 either made obvious or disclosed those
2 claim elements.

3 Q. Dr. Mahon, you are also
4 familiar with a general rule against the
5 application of hindsight bias in
6 creating opinions of obviousness for
7 purposes of invalidating a patent,
8 right?

9 A. Absolutely. And as a matter
10 of fact as far as my experience goes
11 working in this area, myself being a
12 POSITA at the time, as well as working
13 with engineers that were either
14 graduated and began working, you know,
15 two or three years before we were
16 working on these protocols,
17 understanding what they would know and
18 what we knew at the time of the
19 development of the protocols and how the
20 protocol stacks were implemented within
21 the 802.11 context as well as how the
22 configurations were analyzed and
23 understanding what was meant by various
24 fields, such as the delimiter fields and

1 how they related to your analysis of the
2 fields and the aggregated MPDUs, I
3 performed my analysis based on that and
4 did not include hindsight bias.

5 Q. The critical date for which
6 you have been supplied for your opinions
7 is in December 2016, right?

8 A. My recollection is
9 December 21st, 2016.

10 Q. By December 2016, can you
11 describe for me your work experience
12 with specifically 802.11 wireless
13 communication protocols?

14 A. Yes. I had spent over 17
15 years integrating with the 802.11
16 protocol standards, specifically taking
17 devices that were compliant with
18 whatever version of the standard,
19 reverse-engineering some of those
20 devices, testing those devices with
21 respect to signaling, analyzing and
22 building receivers and transmitters for
23 test devices that is, we call them
24 engineering platforms, for interacting

1 with those, developing the protocol
2 stacks to be able to develop our own
3 custom messaging or formats for the
4 message, investigating aspects of the
5 devices, commercial devices, that were
6 responsive based on various metrics,
7 such as receive power, interference
8 levels, et cetera, up through this time.

9 Q. Can you give me some
10 specifics for your 802.11 specific
11 experience as of December 2016, what
12 companies, what projects, what work that
13 you did, for example?

14 A. Well, as I had mentioned
15 before, the work I did was classified,
16 so it was mainly funded by the DOD in
17 various entities of the DOD and, as I
18 mentioned also before, is that we were
19 investigating various aspects of
20 wireless protocols. I mentioned LR
21 wireless protocol, I have mentioned --
22 or I didn't mention but the HART
23 protocol was also another one we
24 investigated as well as 802.11, WiMAX,

1 3GPP cellular protocols, all the
2 different versions, and specifically as
3 I just went through previously is that
4 based on those protocols, we would do an
5 analysis of the protocols at the various
6 layers of the protocol stack in terms of
7 the structure, the messaging, the
8 requirements, the optional features, the
9 field structures, the bit structures,
10 and then investigate aspects of them.

11 It may be -- and there is
12 techniques and tactics that cannot be
13 disclosed, but the messaging structures,
14 the power levels, the way devices
15 respond to signaling under the protocol
16 were investigated for specific purposes
17 of transmission and reception to either
18 determine how the devices responded,
19 were there any weaknesses associated
20 with, for example, security issues,
21 which is a broad term depending upon the
22 context and the agency that is funding
23 it, and then, again, doing rigorous
24 engineering analysis, building an

1 engineering prototype, and then taking
2 it in the lab and testing it and then
3 taking it out into the field to test its
4 actions or reactions based upon those
5 specific targeted areas.

6 Q. I am kind of curious,
7 Dr. Mahon, why you keep conflating your
8 work with LR, WiMAX, Bluetooth, with
9 802.11, which is a different subportion
10 of the 802 standard.

11 Is there a reason you are
12 doing that?

13 MR. KHAN: Objection,
14 mischaracterization of testimony.

15 THE WITNESS: Exactly. You
16 are mischaracterizing what I said.
17 I did not say that.

18 When I bring up other
19 wireless protocols, I am telling
20 you that my work involved various
21 wireless protocols and including
22 the 802.11 protocol.

23 BY MR. TSUEI:

24 Q. Okay. Can you give me any

1 specifics about the work or projects
2 that you have done specifically with
3 802.11, or have you exhausted your
4 testimony there?

5 MR. KHAN: Objection, asked
6 and answered.

7 THE WITNESS: Yeah, I am not
8 sure why you can't understand what
9 I am saying. Maybe if you were an
10 engineer, you would understand, and
11 if you were in the development
12 process of areas such as I was
13 involved in, when you are dealing
14 with these devices, you have to
15 understand how they work at a
16 fundamental low level to be able
17 to, number one, come up with
18 theories of how they might operate
19 under certain contexts, how to
20 develop mathematical modeling, how
21 to develop actual hardware to
22 interact with, for example,
23 commercial products, whether it's a
24 receive or a -- a receiver or a

1 transmitter, and how they would
2 operate in an integrated networking
3 environment, for example.

4 That all requires specific
5 detailed knowledge. And I gave you
6 in terms of what I can disclose
7 with respect to the specific work,
8 the acronyms for the projects -- I
9 have quite frankly forgotten most
10 of them, and they would not make
11 sense to you because the programs
12 being classified, we picked generic
13 acronyms to identify the funding
14 stream that it was coming from and
15 the work that was going on that
16 wouldn't disclose the specific
17 targeted work we were performing.
18 But I have described at length the
19 detail associated with that work.

20 BY MR. TSUEI:

21 Q. Did you write the entirety
22 of your declaration in this proceeding?

23 A. This declaration is my
24 declaration. I came up with a draft, I

1 worked with counsel, I gave them my
2 opinions, and I obviously wrote the
3 declaration in conjunction with counsel
4 as it's presented here and submitted.

5 Q. Who wrote the first draft of
6 the declaration?

7 A. From my recollection, which
8 is per my standard procedure, is I
9 provide a first draft to counsel after
10 meeting with counsel and receiving the
11 patents to prior art history, any other
12 documents that might be per -- put in
13 front of me, and then that begins the
14 process of further developing the draft
15 into the final submitted document.

16 Q. What did you do to prepare
17 for the deposition today?

18 A. I met with counsel and
19 reread through the -- obviously my
20 declaration and the other exhibits in
21 the case to prepare for this deposition.

22 Q. Approximately how long did
23 you meet with counsel to prepare for the
24 deposition?

1 A. Somewhere around six or
2 seven hours.

3 Q. Was it across one day, these
4 six or seven hours?

5 A. No. It was across three
6 days.

7 Q. Aside from counsel for
8 Samsung, did you speak with anyone else
9 in preparing for your deposition?

10 A. I did not.

11 MR. TSUEI: I will pass the
12 witness.

13 MR. KHAN: Thanks.

14 Can we go off the record.

15 THE VIDEOGRAPHER: Yeah, one
16 moment.

17 We are now going off the
18 record, and the current time is
19 3:59 p.m. Eastern time.

20 One moment. We are now off
21 the record.

22 - - -

23 (Off the record at this
24 time.)

1 - - -

2 THE VIDEOGRAPHER: We are
3 now back on the record, and the
4 current time is 4:02 p.m. Eastern
5 time. Back on the record.

6 MR. KHAN: Thank you.

7 At this time, we have no
8 questions for our expert.

9 MR. TSUEI: Okay. Thank
10 you.

11 THE VIDEOGRAPHER: Are we
12 ready to conclude?

13 MR. TSUEI: Yeah, I think we
14 are ready to conclude.

15 THE VIDEOGRAPHER: Okay.
16 All right. One moment.

17 This now concludes the video
18 deposition of Dr. Mark Mahon, and
19 the current time is 4:02 p.m.
20 Eastern time.

21 One moment. We are now off
22 the record.

23 - - -

24 (Off the record at this

1 time.)

2 - - -

3 THE STENOGRAPHER: Does
4 anyone want a rough draft or an
5 expedited copy?

6 MR. TSUEI: I will take a
7 rough draft, and our order is
8 three-day business.

9 THE STENOGRAPHER: Mr. Khan?

10 MR. KHAN: Not from us.

11 Thanks.

12 THE STENOGRAPHER: So just
13 normal turnaround?

14 MR. KHAN: Yes.

15 - - -

16 (The proceedings concluded
17 at 4:04 p.m.)

18 - - -

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