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. IPR2025-00935
U.S. Patent No. 11,129,163

SAMSUNG ELECTRONICS CO., LTD.,
Petitioner,
v.
WILUS INSTITUTE OF STANDARDS AND TECHNOLOGY INC.,
Patent Owner.

Case No. IPR2025-00936
U.S. Patent No. 11,700,597

- - -

Tuesday, February 3, 2026

- - -

DEPOSITION OF MARK P. MAHON, PhD

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1 Oral deposition of MARK P. MAHON,
PhD, taken pursuant to notice, was held
2 remotely via videoconference, commencing
at 12:17 p.m. Eastern, on the above
3 date, before Lori A. Zabielski, a
Registered Professional Reporter,
4 CaseViewNet Realtime Reporter, and
Notary Public in and for the
5 Commonwealth of Pennsylvania.
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18 Shashank Sharma, Fish & Richardson
19 Winette Smith, Texas notary
20 - - -
21
22
23
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1 - - -
2 PROCEEDINGS
3 - - -
4 THE NOTARY: Raise your
5 right hand for me, Mark.
6 - - -
7 MARK MAHON, PhD, after
8 having been first duly sworn by
9 Winette Smith, a Texas notary, was
10 examined and testified as follows:
11 - - -
12 MR. MILKEY: So just for the
13 record, the court reporter is
14 located in Pennsylvania. The
15 witness today is located in Texas.
16 And we had a Texas notary come and
17 administer the oath.
18 And my understanding is that
19 neither party objects to the
20 validity of the swearing in in this
21 procedure.
22 Is that correct, Jenny?
23 MS. HUANG: That is, that's
24 correct. Petitioner has no issue.
25 MR. MILKEY: Okay.

1 - - -
2 EXAMINATION
3 - - -
4 BY MR. MILKEY:
5 Q. All right. So with that out
6 of the way, Dr. Mahon, good morning to
7 you. I guess it's still technically
8 morning where you are at, right?
9 A. Good morning, sir. Yeah,
10 well, it just flipped over to past
11 noon -- or no, I am sorry. My computer
12 is on Eastern Coast time. So yeah, it's
13 still morning.
14 Q. Well, good morning,
15 Dr. Mahon. Thank you for taking the
16 time today despite what sounds like a
17 very busy schedule on your end.
18 So you understand that you
19 are being deposed today in two
20 proceedings?
21 A. That's my understanding.
22 Q. Okay. And the patents in
23 these proceedings relate to the '163 and
24 '597 patents, correct?
25 A. Correct.

1 Q. Okay. And you issued two
2 separate declarations in each of those
3 proceedings?
4 A. Correct.
5 Q. Okay. Do you have an
6 understanding of the difference in scope
7 of your opinions between those two
8 proceedings?
9 MS. HUANG: Objection, form.
10 THE WITNESS: So I -- I
11 authored both declarations. The
12 specifications for the patents are
13 basically identical, so yes.
14 BY MR. MILKEY:
15 Q. Okay. And you have set
16 forth several grounds of invalidity for
17 each of the proceedings that you have
18 issued opinions in, correct?
19 A. Yes.
20 Q. Okay. And between the --
21 the '163 and '597 patent opinions, do
22 your invalidity grounds operate in the
23 same way? So, for example, when you are
24 proposing a combination of references,
25 are there any substantive differences

1 with how those references would operate
2 between the two proceedings?
3 MS. HUANG: Objection, form.
4 THE WITNESS: Well, if I
5 look at my -- back at my
6 declarations in to particular
7 combination, I could provide you a
8 comment on the content of each one
9 of the declarations and how they
10 might be different. I -- at the
11 top of my head, I -- nothing is
12 coming to mind. I would have to go
13 back and review each section and do
14 a comparison.
15 BY MR. MILKEY:
16 Q. Okay. Off the top of your
17 head, are you aware of any substantive
18 differences between your opinions
19 between the two declarations?
20 A. Again, without reviewing
21 both side by side closely, nothing comes
22 to mind.
23 Q. Okay. Do you have copies of
24 the -- of the declarations that you
25 submitted in -- in each of these

1 proceedings?
2 A. I do.
3 MR. MILKEY: And so for the
4 record, most of the things that we
5 will be discussing today are
6 pre-admitted exhibits, and again,
7 this -- this deposition relates to
8 two different proceedings.
9 So for the court reporter's
10 benefit, I am going to upload
11 Exhibit-1003 in the IPR2025-00935
12 proceeding. I am also uploading
13 Exhibit-1003 in the IPR2025-00936
14 proceeding.
15 I anticipate that most of
16 the questions today will relate to
17 the first of those -- the first of
18 those exhibits, which is the one
19 that -- the proceeding ending in
20 935. But we can address that as we
21 go.
22 And there is no need to
23 separately mark these exhibits.
24 They are already in the record of
25 the -- the respective proceedings.

1 BY MR. MILKEY:
2 Q. So, Dr. Mahon, could you
3 please turn to Exhibit-1003 regarding
4 the '163 patent, and let me know when
5 you have it open.
6 A. I have it open.
7 Q. Okay. So I want to turn to
8 your opinions starting on page 40 of
9 this declaration regarding your Ground
10 1A regarding Lee. If you could let me
11 know when you are at page 40. Okay?
12 A. Okay. I am at page 40.
13 Q. And do you see that this is
14 the beginning of your Ground 1A analysis
15 regarding Lee?
16 A. Yes, I do.
17 Q. Okay. And then with that
18 context, if you could turn to page 43,
19 and let me know when you are there.
20 Oak?
21 A. Okay. I am there.
22 Q. And you see that this is the
23 beginning of your analysis of Lee with
24 respect to limitation 1.4 of the '163
25 patent?

1 A. I do see that.
2 Q. Okay. Okay. And limitation
3 1.4 of the '163 patent recites: Wherein
4 the processor is configured to receive a
5 physical layer convergence procedure
6 (PLCP) Processing Data Unit (PPDU) by
7 using the transceiver, and not to use a
8 Basic Service Set (BSS) color when
9 signaling information indicates that an
10 operation based on the BSS color is not
11 allowed.
12 Do you see that?
13 A. Yes, I do.
14 Q. Okay. And my question is --
15 this limitation cites signaling
16 information, and my question is, what
17 are you mapping in Lee to the signaling
18 information of the claim?
19 A. So I am mapping in light of
20 '163's disclosure regarding a signaling
21 field and that it may include signaling
22 information, that Lee's coloring disable
23 bit in the PPD -- PPDU of the HE-SIG is
24 signaling information. So that's what I
25 am mapping it to.

1 Q. Okay. So for purposes of
2 your analysis in Ground 1A as applied to
3 the '163 patent, is it your opinion that
4 Lee's coloring disable bit is the
5 signaling information of limitation 1.4?
6 A. Yes.
7 Q. And when an STA receives a
8 frame with the coloring disable bit set
9 to 1, how does that change the operation
10 of Lee's system?
11 A. Well, based on my analysis,
12 I determined that given Lee's disclosure
13 of the color- -- use of the coloring
14 disable bit in the Lee system that it
15 renders obvious that the coloring bit is
16 not used when the coloring disable bit
17 indicates that a CC level change is not
18 allowed. So when that bit is set, it's
19 indicating that a level change is not
20 allowed.
21 Q. Other than disabling a CCA
22 level change, does receiving a frame
23 with the color disable bit set to 1
24 change the operation of Lee's system in
25 any other way?

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1 A. Well, for limitation 1.4, I
2 am noting in my analysis here that Lee's
3 coloring disable bit disables the use of
4 the BSS color and that the station
5 operates without regard to information
6 indicated by the coloring bit.
7 And so for -- within the
8 context of the 1.4 analysis, that's the
9 only other element that I can -- or
10 aspect I can think of.
11 Q. Are you aware of any
12 operations using Lee's coloring bit that
13 are disabled by the color disable bit
14 other than a CCA level change?
15 MS. HUANG: Objection to
16 form.
17 THE WITNESS: Again, based
18 on Lee's disclosure, my
19 characterization is that when that
20 coloring disable bit is set, that
21 it disables the use of the BSS
22 color, so therefore it would affect
23 other operations or an operation
24 that would be based on using that
25 BSS color.

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1 BY MR. MILKEY:
2 Q. What operations other than
3 CCA level change are affected by Lee's
4 color disable bit?
5 A. My analysis for element 7 in
6 paragraph 94, I am pointing out that --
7 let's see here. I lost my place --
8 that, for example, the spatial reuse
9 operation is not performed when the
10 coloring disable bit indicates that a
11 received frame is a trigger frame
12 related to a multi-user transmission as
13 disclosed in Lee.
14 Q. Okay. How is a CCA level
15 change different than a spatial reuse
16 operation?
17 A. Well, in general, a CCA
18 level change is a threshold that is used
19 for comparison to determine whether the
20 station -- or there is a collision or
21 not that what -- it could be intra or
22 inter, but it's used for comparison
23 purposes, as opposed to when you say
24 spatial reuse operation, that is reusing
25 the available resources which

1 is obviously -- the fundamental
2 resources in a channel are frequency and
3 time. But that operation is
4 specifically referring to using the
5 channel for a transmission.
6 Q. Okay. So it's your opinion
7 that the color disable bit would disable
8 both a CCA level change and the spatial
9 reuse operation?
10 MS. HUANG: Objection to
11 form.
12 THE WITNESS: What I am
13 referring to specifically in
14 paragraph 94 is the fact that the
15 coloring disable bit in this
16 context is indicating that the
17 frame is a received trigger frame
18 which is then preventing this -- or
19 is causing the spatial reuse
20 operation not to be performed.
21 So within that context,
22 that's specifically what Lee
23 discloses, and I -- I guess I would
24 leave it within that context of Lee
25 that I am referring to there in

1 paragraph 68.
2 BY MR. MILKEY:
3 Q. Okay. That's helpful.
4 Okay.
5 Other than a CCA level
6 change or a spatial reuse operation, do
7 you identify any other color-based
8 operations in Lee that are affected by
9 color disable bit?
10 A. Well, addressing Lee in this
11 section of my report, I don't
12 specifically point to anything else, but
13 in the context of the Lee specification
14 from a perspective of POSITA, to me,
15 it's clear with respect to how Lee is
16 disclosing the use of the coloring
17 disable bit in the operations associated
18 with BSS color, so I wouldn't limit it
19 to that over the entire Lee
20 specification but within the section
21 certainly. I do not address anything
22 else.
23 Q. Okay. Where does Lee -- and
24 feel free to refer to the Lee reference,
25 by the way, or any other references that

1 are helpful in responding to the
2 questions throughout today.
3 MR. MILKEY: But --
4 actually, before I ask this
5 question, let me upload for the --
6 at least for the benefit of the
7 reporter -- if you have your own
8 copy, feel free to refer to that.
9 But I am uploading
10 Exhibit-1005 to the chat in the
11 '163 patent IPR, so feel free to
12 refer to this or -- or your own
13 copy.
14 BY MR. MILKEY:
15 Q. But my question is, where
16 does Lee specify that operations other
17 than CCA level change for spatial reuse
18 operations are not performed when the
19 color disable bit is set to 1?
20 A. In the context of Lee, which
21 is the inventions disclosed, obviously
22 with an 802.11 system and the
23 understanding of a POSITA of how legacy
24 and/or 802.11 systems operated up to
25 this point in time, which means that

there are -- when collisions happen, there are certain difficulties and challenges that are created in the system. So those would come to mind to a POSITA when reading this, but I don't see any other specific explicit references within Lee itself other than those two.

Q. Okay. And where does Lee disclose that the color disable bit reflects a color collision within the system?

MS. HUANG: Objection, form.

THE WITNESS: Lee's disclosures with regard to collision itself is mainly -- well, is during the discussion of and motivation for the CCA level change and whether that level is changed higher or lower depending upon the context.

And then as I mentioned before, with respect to the coloring disable bit, he provides a -- an example of how that could

1 be used when it's associated with a
2 trigger frame because Lee, in
3 paragraph 68, says since a current
4 frame corresponds to a trigger
5 frame, the coloring disable bit can
6 also be comprehended as a bit
7 indicating that CC level -- CCA
8 level change is not performed and
9 whether or not a medium is busy is
10 not determined.
11 But specifically, outside of
12 those contexts and the general
13 statement on the use of the disable
14 bit, I don't -- I am not finding
15 and I am not recalling a specific
16 discussion of the disable bit
17 outside of the implementation of
18 the level changes and then
19 obviously the -- not performing a
20 change based on the received frame
21 as a trigger frame.
22 BY MR. MILKEY:
23 Q. Okay. So I understand that
24 Lee might not explicitly disclose that
25 the color disable bit indicates a color

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1 collision. But in your opinion, would
2 it be obvious for the color disable bit
3 to indicate a color collision in Lee?
4 A. Could you ask the question
5 again, please?
6 Q. Yeah. So my question is, I
7 understand that Lee might not explicitly
8 disclose that the color disable bit
9 indicates a color collision, but in your
10 opinion, would it be obvious for the
11 color disable bit to indicate a color
12 collision in Lee?
13 A. My opinion based on my
14 analysis of Lee, Lee doesn't prevent or
15 explicitly teach away from that, but the
16 coloring bit -- or disable bit that's --
17 as it's being used specifically
18 associated with the disclosures would --
19 I guess in my analysis a person of
20 ordinary skill in the art could
21 contemplate that usage but -- therefore,
22 it certainly would come to mind. But I
23 don't recall that Lee directly discusses
24 that, and I don't recall anything in Lee
25 from the general teachings that would

1 preclude that from the perspective of a
2 POSITA.
3 Q. Okay. Okay. I think you
4 mentioned earlier that the coloring
5 disable bit indicates a trigger frame in
6 Lee; is that correct?
7 A. I mentioned that Lee does
8 disclose that since the current frame
9 that is discussed in that paragraph or
10 the language used in that practiced --
11 is focused on the current frame being a
12 trigger frame, so I read it as a
13 specific example of the use of the
14 coloring disable bit to indicate that
15 the frame is a trigger frame.
16 Q. Are you aware of any
17 instances in Lee where a trigger frame
18 is indicated by anything other than a
19 coloring disable bit?
20 A. Lee's discussion of the
21 coloring disable bit is, as we have been
22 talking about, a trigger frame related
23 to multi-user transmission. In the
24 earlier part of the specification, the
25 discussion of the trigger frame is

1 general, so that would encompass the
2 normal use and header information
3 associated with a trigger frame for
4 determination by the receiving station.
5 But other than that, I don't see any
6 other references to the determination
7 that the frame is a trigger frame.
8 Q. Okay. What is a trigger
9 frame?
10 A. A trigger frame is a message
11 sent in an 802.11 system for telling
12 re- -- stations to which it is addressed
13 that they are given certain resources
14 for transmitting on the uplink.
15 Q. And how is a trigger frame
16 different than an uplink frame?
17 A. Well, a trigger frame is
18 coming from the access point which is
19 controlling the resource utilization,
20 and the uplink is a transmission between
21 a station and access point.
22 Q. Is every frame that a
23 station receives a trigger frame?
24 A. You mean just in general in
25 an 802.11 system?

1 Q. Let's actually -- that's an
2 excellent clarifying question. Let's
3 just talk about in the context of Lee
4 for purposes of clarity.
5 So in the context of Lee, is
6 every frame that a station receives a
7 trigger frame?
8 A. Well, I did ask the question
9 for clarification. However, as I
10 mentioned, Lee disclosed towards 802.11
11 systems. It specifically in the lead-in
12 paragraph is discussing and telling the
13 POSITA that that's what the context is,
14 presents and discusses trigger frames,
15 which a POSITA would be familiar with,
16 and introduces the concept of this
17 disabling bit within that frame.
18 So therefore, I would say in
19 this context in Lee, the POSITA would
20 understand that there is many frames
21 being sent, types of frames, under
22 normal conditions in the system. So
23 frames other than a trigger frame coming
24 from a base station.
25 Q. Okay. What are some

1 examples of frames other than a trigger
2 frame that a station could receive in
3 the context of Lee?
4 A. Well, when you go to
5 associate with a BSS, you put out a
6 query to -- if you do not see specific
7 BSS IDs that you are familiar with and
8 you request an association, for example,
9 and then the base station will respond
10 and ask for your capabilities and then
11 you will respond back and the base
12 station will usually present an
13 authentication request and the access
14 point -- or maybe the station will
15 respond. You are given information
16 about routing and other conditions
17 within the network from the base station
18 also. So there is many kind of
19 housekeeping frames that are sent from
20 the base station down to the station to
21 associate the station with that BSS.
22 Q. Okay. Do you identify in
23 your opinions any instances of Lee
24 having the coloring bit set to 1 -- or
25 strike that.

1 Do you identify in your
2 declarations any instances of Lee having
3 the coloring disable bit set to 1 other
4 than in the context of a trigger frame?
5 A. I would say that within the
6 context of my analysis and quoting Lee
7 several times with respect to Lee's
8 disclosures of -- for example, in
9 paragraph 89, I say, however, if the
10 coloring disable bit indicates that the
11 frame corresponds to a trigger frame
12 related to multi-user transmission...
13 Lee uses that language several times
14 throughout the specification, and a
15 POSITA would normally understand that a
16 coloring disable bit indicating, you
17 would naturally think of that as set to
18 1. But I guess technically, Lee is not
19 precluding it being inverted, where a
20 zero indicates disable or not. But that
21 would not be what a POSITA would
22 normally contemplate with reading that
23 contextual disclosure.
24 So -- but I don't recall
25 anywhere else where I discuss that

1 disabling bit specifically being set to
2 a 1 and preventing the level change or
3 an operation, I should say.
4 Q. Okay. So in your opinion,
5 would a POSITA understand Lee to
6 disclose that the color disable bit
7 being set to 1 indicates that the frame
8 is a trigger frame?
9 MS. HUANG: Objection to
10 form.
11 THE WITNESS: Well, what I
12 pointed to within the disclosures
13 of Lee uses that as a specific
14 example of how the coloring disable
15 bit could be used. So to a POSITA,
16 certainly that's an example of how
17 it could be used. But Lee is not
18 restricting it or precluding it
19 from being used otherwise.
20 BY MR. MILKEY:
21 Q. Okay. Does Lee disclose
22 that the color disable bit would ever be
23 used in a way that would not indicate
24 that the received frame is a trigger
25 frame?

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1 MS. HUANG: Object to the
2 form.
3 MR. MILKEY: Strike that. I
4 will ask a slightly more precise
5 question.
6 BY MR. MILKEY:
7 Q. Does Lee disclose that the
8 color disable bit being set to 1 would
9 ever be used in a way that would not
10 indicate that the received frame is a
11 trigger frame?
12 MS. HUANG: Objection, form.
13 THE WITNESS: Embodiment 3,
14 Lee is discussing the request to
15 send clear to send transmissions
16 within the 802.11ax frame format
17 and discusses that the transmitter
18 can set the BSS coloring disable
19 bit including -- included in the
20 HE-SIG field of the frame to 1 to
21 indicate that it corresponds a
22 request to send a clear to send
23 frame.
24 I am still looking to see if
25 there are other disclosures.

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1 In paragraph 89, Lee is
2 discussing, again, the use of that
3 disabling bit within RTS/CTS but
4 also includes in that discussion a
5 trigger frame.
6 BY MR. MILKEY:
7 Q. Okay.
8 A. And I guess I would also
9 point out within -- what I discussed
10 previously, in paragraph 68 and 69,
11 discussion of a disable bit, where Lee's
12 nomenclature there regarding the
13 coloring disable bit where it says it is
14 included in the trigger frame and the
15 coloring bit -- disable bit plays a role
16 in indicating that a current frame
17 corresponds to a trigger frame.
18 So that language is
19 certainly a little broader than just
20 saying that the coloring disable bit is
21 -- or is what indicates it's a trigger
22 frame, which as we discussed in just
23 regular 802.11 transmissions trigger
24 frames are used in general.
25 Q. Okay. So following up on

1 that, I think you are referring to a
2 discussion in Lee, including in
3 paragraph 82 of Lee --
4 A. 82 and 89, yes.
5 Q. Okay. So in paragraph 82,
6 Lee discloses that the coloring disable
7 bit included in the HE-SIG of the
8 802.11ax frame is set to 1 to indicate
9 that the frame corresponds to the
10 RTS/CTS frame; is that correct?
11 A. Yes, that's what's disclosed
12 in Lee.
13 Q. Okay. What is an RTS/CTS
14 frame?
15 A. Within an 802.11 system, a
16 station -- there is something called the
17 hidden terminal problem, and an RTS/CTS
18 is signaling that's designed to -- for a
19 station that wants to transmit, to
20 basically say, hey, I would like to have
21 a channel and for the access point to
22 respond, go ahead and -- and transmit.
23 That's the clear to send part. So you
24 can get a request, you receive a clear
25 to send. That's part of 802.11 for

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1 many, many years. To -- to solve the
2 problem where terminal A can see, you
3 know, terminal B but terminal C can't
4 see terminal A but the access point can
5 see all three and you don't want the
6 terminals stepping on each other, so
7 there is this operation of RTS/CTS
8 that's part of 802.11.
9 Q. Okay. And paragraph 82 is
10 talking about an 802.11ax frame format
11 in Lee, correct?
12 A. Yes. It is -- it does
13 disclose 802.11ax.
14 Q. And how is an 802.11ax frame
15 format different from an OFDM-based
16 frame format?
17 A. I am not sure what you are
18 asking.
19 Q. Are you familiar with the
20 concept of an OFDM-based frame format?
21 A. Intimately, yes. OFDM
22 frames, OFDM systems, OFDM transmission,
23 physical layer, yes.
24 Q. And is that different than
25 an 802.11ax frame format?

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1 A. Well, it depends on what
2 version of OF -- 802.11 you are
3 discussing.
4 Q. Okay. So in Embodiment 3 of
5 Lee, Lee discusses that the BSS coloring
6 disable bit can be set to 1 to indicate
7 that the frame corresponds to the
8 RTS/CTS frame. My question specifically
9 is, are you aware of any instances in
10 Lee where the coloring disable bit could
11 be set to 1 other than in a trigger
12 frame or an RTS/CTS frame?
13 A. I would answer that by
14 saying with respect to the embodiments
15 disclosed in Lee, I don't recall any
16 specific discussions of other frame
17 types, I don't recall preclusion of
18 other frame types, and I would want to
19 go to my declaration to be able to
20 discuss how that relates to my opinions
21 within my declaration that you are
22 trying to understand.
23 MS. HUANG: Counsel, we have
24 been going about an hour, so if
25 there is a good spot for a break,

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1 just keep it in mind, please.
2 MR. MILKEY: Okay. Thanks.
3 BY MR. MILKEY:
4 Q. Okay. So sitting here
5 today, are you aware of any disclosures
6 in Lee where anything other than a
7 trigger frame or an RTS/CTS frame would
8 have a coloring disable bit set to 1?
9 MS. HUANG: Objection, form.
10 THE WITNESS: I think within
11 the embodiments that Lee discusses
12 as well as the description of the
13 possibility of a legacy BSS
14 coloring bit field being used for
15 the same purposes without
16 separately defining a coloring
17 disable bit and in the context of
18 the disclosures in Lee, I don't --
19 I can't point to anything
20 specifically other than the frames
21 that we have discussed that Lee
22 talks about. But Lee's disclosures
23 do from the -- lead a person of --
24 person of ordinary skill in the art
25 to contemplate the use of the

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1 coloring disable bit outside of
2 just those frames. It's not locked
3 down to just those frames.
4 BY MR. MILKEY:
5 Q. Okay. What disclosures in
6 Lee would cause a person of ordinary
7 skill in the art to contemplate the use
8 of the coloring bit outside of the
9 trigger frame and the RTS/CTS frame
10 context?
11 MS. HUANG: Objection, form.
12 THE WITNESS: Well, Lee is
13 discussing the disable -- coloring
14 disable bit, and I think that's
15 what you meant to -- to ask about,
16 correct?
17 BY MR. MILKEY:
18 Q. Yeah. Let me re-ask that.
19 What disclosures in Lee
20 would cause a person of ordinary skill
21 in the art to contemplate the use of the
22 coloring disable bit outside of the
23 trigger frame and the RTS/CTS frame
24 context?
25 A. My opinion is that the

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1 discussion in Lee makes it clear that
2 the coloring disable bit is being used
3 to prevent a specific operations
4 associated with an 802.11ax context that
5 is a high spatial reuse context.
6 And outside of that, I -- I
7 would say that I don't see anything
8 limiting from the POSITA's perspective
9 and understanding of 802.11 up to this
10 time that would preclude that
11 contemplation, but if we wanted to go to
12 a section in my report to see how my
13 opinion is affected by that, I would be
14 happy to do that.
15 Q. Okay. That's hopeful.
16 MR. MILKEY: Let's go off
17 the record.
18 - - -
19 (Off the record at this
20 time.)
21 - - -
22 MR. MILKEY: Back on the
23 record.
24 BY MR. MILKEY:
25 Q. Dr. Mahon, do you have any

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1 opinion regarding whether it would be
2 obvious in Lee for operations other than
3 CCA level change and spatial reuse to
4 make use of their received BSS color?
5 A. Your question was directed
6 at Lee?
7 Q. Correct.
8 A. As part of my discussion of
9 Lee, of course, I disclose or discuss in
10 paragraph 90 the fact that it was
11 well-known to a POSITA but also that Lee
12 discloses the BSS colors and identifier
13 of the BSS, so certainly that's
14 contemplated and understood within Lee.
15 Q. So does that disclose an
16 operation that makes use of the received
17 BSS color in Lee?
18 A. No, I didn't say that. I
19 just said that it was a -- it's how the
20 BSS is understood to be used to identify
21 a transmitting station. The operations
22 I point to are obviously the CCA change
23 and the other aspect -- I am sorry --
24 that I mentioned.
25 I am just looking to see if

1 there is anything else. I don't see
2 anything else that I contemplate within
3 my opinions associated with Lee.
4 Q. Okay. Does Lee rule out
5 using the received BSS color for
6 operations other than CCA level change
7 and spatial reuse?
8 A. Not that I can recall any
9 language in Lee that would lead a POSITA
10 to understand that.
11 Q. Okay. What is a CCA level
12 change?
13 A. I am sorry. What is it?
14 Q. Yes.
15 A. It's a changing of the CCA
16 threshold.
17 Q. And what is the CCA
18 threshold? Apologies. I am still
19 getting up on the -- the technology
20 here.
21 A. It's a -- a CCA level
22 threshold or CCA level is a power level
23 that which you are making a
24 determination of the received signal, is
25 it -- you are doing a comparison with

1 the level to the received signal power
2 to do whatever. And in this case, it's
3 to determine whether an operation should
4 be formed such as transmitting spatial
5 reuse. That's why it's called the clear
6 channel assessment, is the channel clear
7 or not.
8 Q. Okay. And the CCA level
9 adjustment makes use of the BSS color
10 field, correct?
11 A. B -- I am not sure in the
12 context of -- how you are asking that
13 question or what you are asking
14 specifically.
15 Q. Yeah, so let me rephrase.
16 I believe in Lee, they refer
17 to it as the coloring bit.
18 A. Yes.
19 Q. Is it your opinion that in
20 Lee, the CCA level adjustment makes use
21 of the coloring bit?
22 A. Lee's discussion of the CCA
23 level change and how the coloring bit is
24 used to determine whether the received
25 frame is from the access point

1 associated with the station or an
2 overlapping BSS, that is a BSS not
3 associated with the station, normally
4 leads to a determination whether the
5 level should be changed, and then Lee
6 discusses how the coloring disable bit
7 comes into play. So Lee contemplates
8 using that coloring bit to identify the
9 BSS and make a determination then of
10 whether an operation such as a CCA level
11 change should occur.
12 Q. Okay. And in the event that
13 a CCA level change should occur, how
14 does Lee's station actually implement
15 the CCA level change?
16 A. It discusses setting the
17 level to either level -- a first level
18 or a second level.
19 Q. Okay. And is that some sort
20 of, like, internal threshold that's set
21 within the station?
22 A. That's a value that's
23 changed within the station, and yes, it
24 is a threshold. But -- yes, and it is
25 within the station that would be

1 changed.
2 Q. Okay. How soon after
3 receiving a frame that triggers the CCA
4 level change does Lee's station actually
5 change the CCA level?
6 MS. HUANG: Objection, form.
7 THE WITNESS: I don't recall
8 a timeline either being discussed
9 in my declaration or a specific
10 discussion in Lee, but you can
11 certainly -- if you can help me out
12 and point me to a section where I
13 am contemplating or seemingly
14 stating that, I would be happy to
15 discuss.
16 BY MR. MILKEY:
17 Q. Okay. So would the actual
18 CCA level change be something like
19 changing a register value within the
20 station?
21 A. Well, I wouldn't want to
22 speculate as to the many possible ways
23 you can do it. There is certainly many,
24 many ways you can maintain a CCA level
25 or any value associated with any type of

1 thresholding operation and ways to
2 implement that.
3 Certainly, registers are
4 known within a processing environment,
5 and they hold values. It certainly
6 wouldn't be excluded.
7 But I don't -- I don't
8 recall having an analysis of that within
9 my declaration.
10 Q. Is it possible in the
11 context of Lee for a trigger frame to be
12 received even though no color collision
13 is occurring?
14 A. Lee's disclosures, including
15 pointing to 802.11ax where trigger
16 frames show up, doesn't preclude its
17 normal use, which would be multi-user
18 transmissions, so certainly a POSITA
19 reading that wouldn't say that a trigger
20 frame is limited to the context of
21 collisions.
22 Q. Okay. So understanding that
23 a trigger frame isn't necessarily
24 limited to the context of collisions,
25 does that mean that a trigger frame

1 necessarily implies that there is a
2 color collision?
3 MS. HUANG: Objection, form.
4 THE WITNESS: Lee's use of
5 the trigger frame is under normal
6 disclosed usage to a POSITA or
7 understanding of a POSITA how a
8 trigger frame is used in, for
9 example, an 802.11ax system or in
10 other systems, for that matter,
11 which is allocating resources and
12 specifically within a multi-user
13 context, which Lee has disclosed
14 towards in the 802.11ax context,
15 it's specifically for allocating
16 resources for multiple users to
17 respond without them colliding with
18 each other. That's what a trigger
19 frame normally is.
20 BY MR. MILKEY:
21 Q. Okay. So is it possible for
22 a trigger frame to be received even
23 though there is no color collision
24 within the system?
25 A. In the normal use of an

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802.11ax system or a system that's using a trigger frame, sure, yeah. That's ideally the case. You are isolated, you don't have the interference from neighboring BSSs.

Q. Okay. And is it possible for an RTS/CTS frame to be received even though there is no color collision within the system?

A. Yes. As I mentioned, the RTS/CTS, which the second part of that really is a type of triggering mechanism, can also be received without any interference from other BSSs coming into play so there is no collision.

Q. Okay. If you could please turn to page 62 of your declaration, and let me know when you are there.

A. 62. Okay.

Q. And do you see that this is the beginning of your analysis for Ground 1C which is Lee in combination with Zhou?

A. Yes, at the bottom of the page, yes.

1 Q. Okay. Okay. And then going
2 on to the next page which includes the
3 beginning of paragraph 134 of your
4 declaration, you state: Zhou discloses
5 a STA that detects a color collision.
6 Do you see that?
7 A. Yes.
8 Q. Okay. And just for the
9 record, I know that that was just a
10 partial quote. I am not trying to
11 misrepresent your testimony so, you
12 know, feel free to clarify with
13 whatever.
14 With that context, my
15 question is, in combination -- in your
16 proposed combination with Lee and Zhou,
17 how would the combined system actually
18 detect that a color collision has
19 occurred?
20 A. Well, Zhou is --
21 contemplates actually identifying that
22 the color codes are the same -- or that
23 is, the colors are the same for both
24 base stations and then looks at the MAC
25 addresses of the received frames to see

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1 if they are the same or not and
2 therefore may generate a collision
3 report. So I am pointing to that as far
4 as a function that Zhou discloses.
5 Q. Okay. And which received
6 frames are analyzed to determine whether
7 there is a color collision?
8 A. My recollection in Zhou is
9 that it discusses a first and a second
10 frame and the frames are coming from the
11 access point. So it's a downlink --
12 certainly contemplates downlink frames.
13 But it just in general uses the word
14 "frames." So basically, it would
15 contemplate any received frame within
16 Zhou's disclosure.
17 Q. Okay. And in your proposed
18 combination with Lee, which frames would
19 be analyzed to determine whether there
20 is a color collision or not?
21 A. From my analysis of the
22 combination in specifically Lee and Zhou
23 and the motivation to combine from a
24 POSITA's perspective, given Zhou's
25 disclosure of the color collision

1 associated with frames that contain the
2 coloring bits and the fact that the
3 collision should be reported to prevent
4 additional collisions, Zhou is not
5 limiting the frame. So certainly, Lee's
6 disclosed -- specific disclosures would
7 be encompassed within that, as we have
8 talked about the trigger frames, the
9 RTS/CTS combination, as well as
10 contemplated other frames from the
11 access point would be included in Zhou's
12 disclosures.
13 So the frames that this
14 would be applied to would be frames
15 containing the BSS color, and then you
16 could include and therefore combine it
17 with Lee to add a coloring disable bit
18 as part of that combination.
19 Q. Okay. And in your proposed
20 combination of Lee with Zhou, how would
21 a station's recognition of a color
22 collision impact the use of the coloring
23 disable bit?
24 MS. HUANG: Objection, form.
25 THE WITNESS: Well, my

1 analysis later on in paragraphs 136
2 and 137 discusses my perspective
3 from a -- I am sorry -- my analysis
4 from the perspective of a POSITA
5 that -- my opinion is that the
6 combination would lead a POSITA to
7 implement the combination to
8 achieve specific results, that is,
9 a known combination achieving
10 predictable results, which is -- I
11 delineate it as, one, receiving a
12 coloring disable bit, two,
13 recognize a BSS color collision,
14 and then, three, transmit a
15 collision report, so in that
16 context.
17 And the way the combination
18 would be done, they would be
19 working in synergy. There is no
20 limitation associated with the use
21 of the coloring disable bit there.
22 BY MR. MILKEY:
23 Q. Okay. Does the transmission
24 of a collision report in your proposed
25 combination of Lee with Zhou involve a

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1 coloring disable bit?
2 A. You are saying in the
3 combination, by contemplating that the
4 coloring disable bit is part of the
5 collision report?
6 Q. Correct.
7 A. The collision report is just
8 that, that it's a report to the access
9 point that a collision has been
10 detected.
11 Let me just review this
12 briefly. Right.
13 So in photograph 137, my
14 combination is contemplating the fact
15 that both the coloring disable bit and
16 the BSS color are being evaluated in the
17 combined system, and I give the specific
18 example of where an access point to
19 another station is indicating a color
20 collision via that disabling bit. And
21 therefore, the combined device operating
22 the LZD, I call it, is not using the BSS
23 color to perform operations or
24 associated operations at that point in
25 time based on that coloring disable bit.

1 But it also -- I also say
2 that the combined devices' capability of
3 recognizing color collision by receiving
4 two other frames with identical color
5 values and looking at the MAC addresses
6 is part of that proposed combination.
7 And then the collision report would be
8 sent based on that.
9 So the operation of the
10 device is using Lee's known disclosure
11 along with Zhou's disclosure in terms of
12 operation and integrating those two in
13 basically a serial process. So if the
14 collision -- if the disable bit is
15 there, the report would not be -- would
16 not be sent.
17 Q. Okay. And why would the
18 report not be sent if the coloring
19 disable bit was set to 1?
20 A. Well, in the contemplated
21 combination, that coloring disable bit
22 is sent based upon, again, an access
23 point or another station indicating to
24 the receiver, the -- the Lee-Zhou
25 receiver is saying that there has been a

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1 collision detected, coloring disable bit
2 is set, so don't perform any operations
3 based on the color bits.
4 So you know there is a
5 collision out there. The device already
6 knows there is a collision out there.
7 It's being informed of that. So it's
8 not necessary to perform the further
9 actions.
10 Q. Okay. So essentially, a
11 color collision report would be in some
12 sense redundant with the color disable
13 bit that was already received?
14 A. Yes. In that context, yes.
15 Q. In your proposed
16 combination, how -- strike that.
17 In your proposed combination
18 of Lee with Zhou, how does the system
19 know when a color collision no longer
20 exists?
21 A. Are you referring to a
22 specific section in my declaration for
23 this?
24 Q. This is generally in terms
25 of how your combination with Lee and

1 Zhou operates. Feel free to refer to
2 any part of your declaration addressing
3 that.
4 But my understanding is that
5 if a color collision occurs in these
6 systems, you wouldn't just want to never
7 use color again; there would be some
8 triggering mechanism that would say,
9 okay, now we can use color down the
10 road.
11 And so my question is, in
12 your proposed combination, how would
13 that reallowance of the use of color
14 work in your proposed combination?
15 A. It would be from the
16 perspective of a POSITA, the normal
17 operations which is typically you have
18 and you do have defined, for example,
19 packet sizes and transmission slots in
20 wireless systems and Wi-Fi included, and
21 your back-off is based on that. So that
22 would be -- a POSITA would understand
23 that there is a limited amount of time
24 you need to refrain from transmissions,
25 for example.

1 Q. Okay. So there might be,
2 for example, a set duration during which
3 color would be disabled, and then after
4 that has passed, it might re-enable
5 color?
6 A. Just like you would in
7 normal contention slot analysis, yes.
8 Q. Okay. Could you please turn
9 to page 74 of your declaration, and let
10 me know when you are there.
11 A. Yes, I am there.
12 Q. Okay. And do you see that
13 this is the beginning of your Ground 2A
14 analysis regarding Choudhury?
15 A. Yes, I do.
16 MR. MILKEY: Okay. And just
17 for the record, Choudhury is
18 Exhibit-1009 that has already been
19 entered in this proceeding. I am
20 uploading for the benefit of the
21 reporter the Choudhury reference.
22 But feel free to refer to your own
23 materials throughout your answers.
24 THE WITNESS: Okay. Thank
25 you.

1 BY MR. MILKEY:
2 Q. Okay. And then turning to
3 page 80, do you see the paragraph 165 of
4 your declaration is the beginning of
5 your analysis limitation 1.4?
6 A. Paragraph 165, yes.
7 Q. And so limitation 1.4, we
8 have read it before earlier in this
9 proceeding, but it refers to, quote,
10 signaling information, unquote, that
11 indicates that an operation based on the
12 BSS color is not allowed.
13 And my specific question is,
14 in your analysis of Choudhury, what do
15 you map to the claimed, quote, signaling
16 information, unquote?
17 A. Paragraph 166, I state that
18 Choudhury teaches multiple forms of this
19 signaling information, including, one,
20 low power/high power interference
21 indicator bit, and, two, a reserved
22 color field value, and pointing to
23 paragraphs 26 and 29 of 1009.
24 Q. Okay. So let's talk about
25 the first of those, which is the low

1 power/high interference indicator.
2 I understand that -- there
3 is the longer term. Is it fair if we
4 just refer to that as the low power
5 indicator for purposes of this
6 deposition?
7 A. Fair.
8 Q. Okay. So how does the low
9 power indicator in Choudhury indicate
10 that an operation based on the BSS color
11 is not allowed?
12 A. Based on my analysis, I have
13 this handy little chart derived from the
14 disclosures in Choudhury, and
15 specifically with respect to the low
16 power indicator, I am referring to the
17 disclosures associated with rows 4 and 5
18 there that, in combination with the
19 other disclosures within Choudhury, that
20 indicates that the interference
21 indicator bit there limits access when
22 it is set. So I am pointing to how it's
23 used and how it's disclosed within
24 Choudhury.
25 And I state specifically --

1 and I think it's in paragraph 170 -- the
2 receiving station detects the low power
3 indicator that equals 1 and thus, limits
4 the channel access by not reusing the
5 channel because it knows when the low
6 power equals 1, any station that is able
7 to decode the SIG should not reuse the
8 channel, pointing to paragraph 26.
9 And then I say: With this
10 operation, when the fifth row -- in that
11 table -- conditions are met, the station
12 does not use BSS color because the low
13 power indicator indicated that the
14 operation based on BSS color, example
15 allowing access and reusing the channel,
16 is not allowed.
17 So I am pointing to the
18 disclosures in Choudhury as I understood
19 them from POSITA's perspective to
20 discuss how that bit is being used.
21 Q. Okay. So at the bottom of
22 paragraph 170 of your declaration, you
23 provide an example of the operation
24 based on BSS color being -- allowing
25 access and reusing the channel.

1 Are there any other
2 operations based on BSS color that are
3 disabled when the low power indicator is
4 set to 1 in Choudhury's disclosure?
5 A. Would you ask that question
6 again, please?
7 Q. Yeah. So my question is,
8 other than the example that you provide
9 in paragraph 170 of your declaration of
10 allowing access and reusing the channel,
11 are there any other operations based on
12 BSS color that are disabled when the low
13 power indicator is set to 1 in
14 Choudhury's disclosure?
15 A. Well, in paragraph 172, I am
16 discussing the fact that Choudhury
17 discloses the color field concept can be
18 generalized to achieve the functionality
19 of both low power and the color field,
20 and then I give a specific example. And
21 I talk about the station using
22 essentially a set value of all zeros in
23 the bits of the color field to indicate
24 the low power/high interference state
25 and that the devices decoding that are

1 required to defer access.
2 And then I further go on
3 based on my analysis is that,
4 accordingly, when the color field is set
5 to reserved value, it indicates that the
6 operations based on BSS color are not
7 allowed and the receiving station does
8 not use BSS color.
9 I am providing my analysis
10 as I understood it as disclosed in
11 Choudhury as it limiting BSS -- I am
12 sorry -- operation based on BSS color.
13 And I can go back to Choudhury to see if
14 I could find other specific examples,
15 but that's my analysis of the use of
16 Choudhury.
17 Q. Yeah. If you are able to
18 identify any examples in Choudhury of
19 disabling operations based on BSS color
20 other than allowing access and reusing
21 the channel, that would be very helpful.
22 A. Well, Choudhury discloses
23 obviously many uses of the BSS color
24 field with discussing the limitations or
25 limiting access. It's exemplars are for

1 accessing the channel. So I am not
2 recalling anything other than what I am
3 pointing out in my declaration.
4 Q. Are there ways to use BSS
5 color that do not involve accessing and
6 reusing the channel?
7 MS. HUANG: Objection, form.
8 THE WITNESS: Well, that's a
9 generally question, and certainly
10 you can contemplate many uses of
11 the BSS. Choudhury is specifically
12 discussing channel access.
13 So beyond that, I am not
14 really sure how to answer that. I
15 would be speculating as giving
16 examples, but that would be outside
17 of the context of my declaration.
18 To a POSITA, certainly would
19 be clear that if you are -- if a
20 collision is happening or indicated
21 due to -- or interference is
22 determined to be detected as
23 disclosed in Choudhury, for
24 example, that it makes sense to
25 limit the use of the BSS color to,

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1 for example, access the channel
2 and/or to perform another function
3 that would be associated with or
4 in -- I guess I would say in
5 counter-position to operating in a
6 collision environment.
7 So while I don't point to
8 anything else, I don't see anything
9 specifically discussed in
10 Choudhury. That would be my
11 general answer to the general
12 question.
13 BY MR. MILKEY:
14 Q. Okay. Turning back to page
15 80 of your declaration and, again, this
16 is the beginnings of your analysis of
17 limitation 1.4 of the '163 patent.
18 A. Yes, sir.
19 Q. So, of course, limitation
20 1.4 has lots of language, but I want to
21 focus you in on the language towards the
22 end which reference to, signaling
23 information indicates that an operation
24 based on the BSS color is not allowed.
25 And my question is, in your

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1 analysis of Choudhury, what are you
2 mapping to, quote, the BSS color,
3 unquote?
4 A. The BSS color is the color
5 that would be contained in the received
6 physical layer procedure, PLCP,
7 processing data unit, or the PPDU, is
8 what I am referring -- what I interpret
9 that as.
10 Q. Okay. And does that
11 correspond to the color field of
12 Choudhury shown after your paragraph 167
13 of your declaration?
14 A. Yes. I point to what we
15 have been talking about with respect to
16 the low power/high interference
17 indicator bit and the reserved color
18 field as being signaling information,
19 the BSS color being part of that as the
20 received PPDU -- or within the received
21 PPDU, and then go on to discuss how the
22 color is used in -- or disclosed as used
23 in Choudhury and that includes the BSS
24 color field as being associated with the
25 BSS color.

1 MS. HUANG: Hey, Jim, we
2 have gone about an hour, so if
3 there is a good time for a break,
4 that would be good.
5 MR. MILKEY: Yeah. Let's go
6 off the record.
7 MS. HUANG: Okay.
8 - - -
9 (Off the record at this
10 time.)
11 - - -
12 BY MR. MILKEY:
13 Q. Okay. So in Choudhury,
14 there is a color field and the received
15 color field will include a value.
16 And my question is, are you
17 mapping the field to the BSS color of
18 the claim or are you mapping the value
19 contained in that color field to the BSS
20 color of the claim?
21 A. The POSITA -- I guess I
22 don't understand the distinction in the
23 question.
24 Q. So, for example, the claim
25 says not to use a BSS color when

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1 signaling information indicates that an
2 operation based on the BSS color is not
3 allowed.
4 And my question is, is it
5 your opinion that in Choudhury, the BSS
6 color field is not used or merely that
7 the contents of the color field are not
8 used to perform an operation?
9 A. Choudhury disclosing
10 that the color field may contain a BSS
11 color, so a field is understood by a
12 POSITA to be an element of something and
13 that something here is a message and it
14 has a field and that field is the color
15 field which contains the BSS -- or may
16 contain, I guess -- Choudhury's explicit
17 language is -- contained a BSS color.
18 So if it contains a BSS color, that's
19 the ID of the base station which is, to
20 a POSITA, based on the value in that
21 field which are a bunch of bits.
22 Q. Okay. That's helpful.
23 Okay. So looking at the
24 table following paragraph 167 of your
25 declaration, does this table refer to

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1 messages received from another station
2 or from an access point or from either?
3 A. This table is presented in
4 Choudhury in paragraph 29 or following
5 paragraph 29 and says: The following
6 table shows the functionality of the
7 combined COLOR bit and low power
8 indicator.
9 And so that follows
10 Choudhury's disclosures of both
11 preceding that, and it discusses
12 receiving communications from the access
13 point neighboring base stations. And it
14 would be contemplated also -- or I am
15 sure -- yeah, in whether its stations
16 can use higher CCA thresholds. So it's
17 also receiving transmissions from other
18 stations that could be, for example,
19 neighboring stations.
20 Q. Okay. Could you please turn
21 to page 104 of your declaration.
22 A. Yes, sir.
23 Q. And this is the beginning of
24 your Ground 2C analysis regarding
25 Choudhury and Zhou.

1 Do you see that?
2 A. Yes, I do.
3 Q. Okay. And then going onto
4 the next page, partway through paragraph
5 226, towards the top of page 105, you
6 say: Zhou addresses this deficiency of
7 teaching a method of detecting BSS color
8 collisions and reporting them to an AP.
9 And my question is, does
10 Zhou disclose that the AP determines
11 that BSS color operation should be
12 disabled or does the station that
13 detected the color collision determine
14 that BSS color operation should be
15 disabled?
16 A. Based on my analysis of both
17 the references and the disclosures, that
18 my proposed combination is that when the
19 CZD detects such a collision, indicating
20 that multiple BSSs are using the same
21 color code, it transmits a one-bit
22 collision report to the access point.
23 In response, either the access point or
24 the CZD itself sets color to 0000 in
25 transmitted frames, thereby signaling to

1 other stations that BSS color-based
2 operations, for example, spatial reuse,
3 NAV updates, and power save mode, are
4 disallowed. The result is a more robust
5 system that can dynamically suppress
6 unreliable BSS color usage in response
7 to realtime collision detection.
8 So it could be either the
9 access point or the device itself in the
10 contemplated combined system.
11 Q. Okay. And the reason that
12 either the access point or the device
13 itself would set the color value to 0000
14 is because a color collision was
15 detected, correct?
16 A. Correct.
17 Q. Does Choudhury disclose
18 disabling use of color operations in
19 response to the detection of a color
20 collision?
21 A. I state in my summary of
22 Choudhury in paragraph 82 that Choudhury
23 discloses or explains that the device
24 uses the color field to determine
25 whether an ongoing transmission is an

1 intra-BSS transmission. If the
2 transmission is an intra-BSS
3 transmission, the station will not reuse
4 the channel. However, if the
5 transmission is from an overlapping BSS,
6 a device may be able to use the channel,
7 for example, performing CCA with a
8 higher threshold, and that Choudhury
9 further describes a device can signal
10 that it is experiencing high
11 interference such that other stations
12 should not reuse the channel.
13 So specifically, it does --
14 Choudhury does contemplate limiting
15 spatial reuse based upon the collision.
16 Q. Okay. And is it your
17 opinion that the high interference state
18 is the same as recognizing that a
19 collision has occurred?
20 A. A general collision, yes.
21 That's one way to try -- that's actually
22 kind of a legacy way of trying to
23 determine the collision is happening
24 because you are sensing a lot of energy
25 in the environment which probably means

there is packets being transmitted.

Now, it could be from a device in your set or it can be a device outside of your set. It's just a generic metric.

Q. Okay. So it's possible to have a high interference state where no color collision has occurred?

A. It's certainly possible to have high energy, yes, at your receiver and it could be from a non-colliding -- non-colliding packets, for example.

Q. Okay. Is it possible for a color collision to occur but yet there -- for there to be no high interference state?

A. Yeah, I guess what I meant to -- I think I was imprecise in my previous answer, is that you could have -- when you are sensing a high interference environment, it could be from multiple packets that have the same BSS color or different BSS colors, is really what I was trying to say.

Q. No. Understood. And so

1 what I am trying to understand is, if a
2 device is signaling a high interference
3 state, can you infer based off that
4 device signaling the high interference
5 state that a color collision has
6 occurred?
7 A. Not necessarily -- no, you
8 can't. That's why in Choudhury in that
9 table after paragraph 29, it does have
10 the states where you have stations in
11 either the same or different BSSs and
12 whether it's high interference or not.
13 And it's the high interference in that
14 case that's determining whether you can
15 transmit or not because you would be
16 transmitting into a lot of other energy
17 in the system which could be
18 problematic.
19 Q. Okay. And it's been a while
20 since I took a logic course, but I want
21 to ask now what I think is the converse
22 of the previous question.
23 If a device has detected a
24 color collision, does that necessarily
25 mean that that device is experiencing a

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high interference state?

A. No. You can receive two packets which are low energy packets essentially because of your position with respect to the two transmitting interferers and it would not rise to the determination -- again, another power measurement threshold -- of saying, yeah, this is high interference or not.

Q. And in the Zhou reference that you rely on in your combination with Choudhury, does Zhou disclose that the stations themselves will inform other stations that operations based on BSS color are not allowed if a collision is detected?

A. Well, I do say based on my analysis that the combined device would signal via the color field, for example, set to a predetermined value, that -- signaling to the other stations that BSS color-based operations are disallowed. So yes, that is contemplated within the combined system.

Q. Okay. So that's helpful.

1 So I understand that in the
2 combined system, that's how you propose
3 the system would operate. So now I want
4 to ask about Zhou itself.
5 Does Zhou teach that
6 stations themselves will inform other
7 stations that operations based on BSS
8 color are not allowed after a collision
9 is detected?
10 A. Your question is with
11 respect to Zhou, right?
12 Q. Correct.
13 A. I guess I would have to say
14 I would have to go through and reread
15 Zhou carefully to make sure. But
16 certainly, Zhou does disclose a context
17 of where neighboring stations are on
18 their service set edges and the reduced
19 BSS IDs, for example, signaling, is
20 being received by a neighboring station
21 from a station in a different BSS. So
22 it certainly contemplates that context.
23 Q. Okay. So I know that you
24 have access to it. I am just posting it
25 in the chat for the benefit of the

1 reporter.
2 But can you point me to a
3 disclosure in Zhou that relates to a
4 station detecting a collision and then
5 directly informing another station
6 rather than an access point about the
7 collision?
8 A. Yeah. I am specifically --
9 I just am trying to refresh my memory
10 here, that the context disclosed in
11 figure 5 illustrates an example of a
12 wireless communication subsystem that
13 supports detection and resolution of a
14 reduced version BSS ID collision in
15 accordance with various aspects of the
16 present disclosure.
17 And as I said, I would have
18 to go back and reread carefully --
19 remind me, but I would have to go back
20 and find exactly where that's amplified
21 and discussed further in Zhou.
22 Q. Okay. So if you could
23 please turn to paragraph 81 of your
24 declaration.
25 A. 81?

1 Q. Yeah, it's on page 39. And
2 just for reference, feel free to orient
3 yourself once you get there, but it's
4 part of your overview of the Zhou
5 reference.
6 A. Okay. All right. I am on
7 page 81.
8 Q. Oh, sorry. Page 39. I am
9 sorry.
10 A. I am sorry. Page 39,
11 overview of Zhou. Okay.
12 Q. And so paragraph 81, you are
13 summarizing Zhou, in my understanding,
14 in this paragraph of your declaration,
15 and you state that Zhou further
16 describes that the device may report the
17 detected color collision to an AP in the
18 form of a collision report.
19 Do you see that?
20 A. Yes.
21 Q. Are you aware of any
22 teaching in Zhou that the device may
23 report the detected color to --
24 collision to another station in the form
25 of a collision report?

1 A. Well, it does disclose in
2 paragraph 71 regarding the collision
3 report, and it says -- it's
4 three-quarters of the way through the
5 paragraph, and it says -- I guess it's
6 the last sentence -- next-to-last
7 sentence: In some cases, the collision
8 report or the change request may be
9 relayed to an access point via a station
10 or access point.
11 So a relay would be
12 understood to be using another station
13 to send the message. So it's certainly
14 sending it to another station --
15 Q. Okay.
16 A. -- at a minimum.
17 Q. And in your opinion, does
18 this disclosure in Zhou mean that the
19 station that's helping with the relay
20 would then immediately stop using color
21 capabilities when it is relaying that
22 collision report to the access point?
23 MS. HUANG: Objection, form.
24 THE WITNESS: I do not
25 specifically recall Zhou discussing

1 actions of a relay station
2 associated with that. It's -- I am
3 not saying it's not contemplated
4 within Zhou because from a POSITA's
5 perspective, it may make sense,
6 too, for example, knowing that a
7 station close to you to which you
8 are relaying the message -- or from
9 which you are relaying the message
10 is experiencing interference or
11 collision, you may be also. But
12 that's not what -- I don't see a
13 specific disclosure discussing that
14 other than what I have pointed to
15 in paragraph 29, figure 5, and the
16 related paragraph that I mentioned
17 about the relaying in Zhou.
18 BY MR. MILKEY:
19 Q. Okay. And then still in
20 your paragraph 81 of your declaration --
21 I am going to paraphrase slightly, but
22 feel free to correct me if I am wrong.
23 I am not trying to put words into your
24 mouth.
25 A. Okay.

1 Q. But at a high level, you
2 summarize what happens in response to
3 the collision report that is sent to the
4 AP, and that the AP may transmit a color
5 change announcement that includes a
6 scheduled change time and it can also
7 indicate whether the associated STAs are
8 allowed to transmit before the scheduled
9 change time.
10 And so my question is, is
11 there any teaching in Zhou that a
12 station rather than the access point
13 would indicate whether STAs are allowed
14 to transmit before a scheduled change
15 time?
16 MS. HUANG: Objection, form.
17 THE WITNESS: I would have
18 to go back and review Zhou again to
19 see if I can point to anything. I
20 guess outside of my declaration and
21 my opinion expressed there, I have
22 to -- again, I would have to
23 contemplate that question in the
24 context of rereading Zhou and that
25 question to be able to give you a

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1 fulsome answer. I did not
2 elaborate on that in my
3 declaration, and certainly I think
4 I would have to have some time to
5 be able to go back and look at
6 that.
7 BY MR. MILKEY:
8 Q. Okay. So I want to turn
9 back to your analysis of Lee again, just
10 closing out a few issues.
11 And so turning to paragraph
12 88 of your declaration and let me know
13 when you are there.
14 A. 88. Okay.
15 Q. And do you see that at the
16 beginning of paragraph 88, you state:
17 Lee further explains that the STA
18 performs a CCA level change based on the
19 coloring bit in the received frame?
20 A. Yes.
21 Q. And we discussed earlier
22 that one -- strike that.
23 We discussed earlier that
24 the change of the CCA level is
25 essentially updating a threshold value

1 within the station; is that correct?
2 A. That would be the general
3 understanding of what a CCA level is,
4 yes.
5 Q. Okay. And this could be --
6 it doesn't have to be exclusively, but
7 this could be done, for example, by
8 updating a memory location within the
9 station, such as a register value,
10 correct?
11 A. There is multiple ways you
12 can do it. I am sure you can even
13 contemplate other ways, such as a
14 qualitative measurement, restrict
15 threshold. But a POSITA would think of
16 a specific value being changed, and that
17 value would be sitting somewhere in
18 memory typically. You are not going to
19 rewrite code on the fly, for example,
20 and recompile it and then -- but either
21 way, it's going to end up in memory
22 somewhere as it's being utilized. So
23 it's reasonable to say that that is
24 contained and saved somewhere that's
25 going to be updated.

1 Q. Okay. And is it possible to
2 change the CCA level even when the
3 device is not actively accessing or
4 reusing a channel?
5 A. So two things: Number one,
6 I was just thinking you can also have
7 index values to a predetermined set of
8 levels and you just change it at X
9 value. So you wouldn't be changing the
10 value itself; you would be changing the
11 index to the value.
12 But beyond that, in terms of
13 determining channel access to a POSITA,
14 your -- and thresholding operations
15 associated with that, that's going to be
16 during or when you are trying to access
17 the channel. So it certainly can be
18 done in between accesses, but if you are
19 idle for a long time and you are
20 constantly changing the CCA level or any
21 level associated with the channel -- I
22 guess the question is broad enough to
23 contemplate many exceptions to that
24 where you are dozing or in power save
25 states or -- long transmission times

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1 between intervals of access and things
2 like that. So it really depends on the
3 context of whether it would be expected
4 to be performed at a given point in
5 time.
6 Q. Okay. So it sounds like
7 it's context-dependent whether a CCA
8 level can be changed even when a device
9 is not actively accessing or reusing a
10 channel?
11 A. Well, I am saying that you
12 could -- you could code your device to
13 do it various ways. There is -- the
14 standard doesn't say you must do it
15 within a certain period of time of
16 trying to do channel access or not that
17 I can recall, certainly.
18 So I guess -- yeah, my
19 answer is that I would leave it at your
20 -- based on what's disclosed in the --
21 in the art and relate it to the
22 operation or prevention of an operation
23 occurring, the times at which -- again,
24 you would have to look at the
25 implementation aspects and see how it

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1 maps to that to say when or where or how
2 that would be performed. But to a
3 POSITA, it certainly indicates that a
4 level change is going to -- is happening
5 for a given reason, which is typically
6 to access and transmit.
7 Q. Updating a value in memory
8 within a device doesn't require actively
9 using a channel, correct?
10 MS. HUANG: Objection, form.
11 THE WITNESS: So out of
12 context, you are just saying that
13 you have some memory that you are
14 accessing -- like, you know, my
15 phone is currently doing whatever
16 it's doing in the background and
17 it's accessing the memory it has
18 for whatever the purpose is -- it
19 may not -- you know, in airplane
20 mode or whatever, it may not be
21 transmitting. I am not sure if
22 that's the context you are talking
23 about or if you are talking about
24 something specific in my
25 declaration.

1 Well, within paragraph 88, I
2 guess, if you are talking about
3 that, you would have to kind of
4 focus me in a little more.
5 BY MR. MILKEY:
6 Q. Yeah. No, I think that is
7 in line with what we are talking about.
8 So, for example, if Lee's --
9 if Lee wanted to issue a CCA level
10 change or, rather, implement a CCA level
11 change by writing an updated CCA value,
12 either to a register or updating an
13 index value in memory, Lee's device
14 doesn't have to be actively accessing
15 the channel in order to update that
16 memory value, right?
17 MS. HUANG: Objection, form.
18 THE WITNESS: I don't recall
19 Lee discussing that specifically,
20 and I would leave it at my analysis
21 based on the disclosures in Lee are
22 from a POSITA's perspective of
23 whether Lee by itself or in
24 combination discloses as part of
25 the prior art, the aspects of a

1 '163 claim elements or claims.
2 I didn't do that analysis,
3 and I guess I would have to look
4 back at Lee and reread it for that
5 purpose. I don't recall expressing
6 that opinion in my -- in my report.
7 And, again, I would have to go back
8 and formulate an opinion based on
9 that question.
10 BY MR. MILKEY:
11 Q. Okay. Please turn to page
12 107 of your declaration. Let me know
13 when you are there.
14 A. Okay. I am there.
15 Q. And do you see at the bottom
16 of page 107 that this is the beginning
17 of your analysis of limitation 4.1 with
18 respect to the Choudhury and Zhou
19 combination?
20 A. Yes.
21 Q. Okay. And limitation 4.1
22 recites that -- in part, it recites that
23 the processor is configured to signal
24 that the operation based on the BSS
25 color is not allowed when the wireless

1 communication terminal recognizes that a
2 BSS color collision has occurred.
3 Do you see that?
4 A. Yes.
5 Q. And my question is, what are
6 you mapping to the action of signaling
7 that the operation based on the BSS
8 color is not allowed in your analysis of
9 limitation 4.1 with respect to Choudhury
10 and Zhou combination?
11 A. Well, here, specifically, I
12 am incorporating my discussion from
13 Section XII.B and XII.D, and I say that
14 Choudhury's access points transmit the
15 all zero bits in high interference
16 scenarios signaling BSS color-based
17 operations are disallowed.
18 So it's the fact that
19 they -- all zero conditions is set and
20 that the processor therefore is
21 configured to signal that the operation
22 based on the BSS color is not allowed
23 when the terminal has recognized that a
24 color collision has occurred.
25 Q. Okay. So is it your opinion

1 that the access point's transmission of
2 the 0000 value in high interference
3 scenarios is the claim signaling that
4 the operation based on the BSS color is
5 not allowed?
6 A. Yes, I am pointing to the
7 access points here of acting as managing
8 or in managing the stations associated
9 with it and that the POSITA would have
10 understood that combination device
11 teaches signaling information
12 transmitted from a base -- from a base
13 wireless communication terminal.
14 MR. MILKEY: Okay. I will
15 pass the witness.
16 MS. HUANG: I have no
17 questions.
18 MR. MILKEY: All right.
19 Let's go off the record.
20 - - -
21 (Off the record at this
22 time.)
23 - - -
24 (Witness excused.)
25 - - -

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1 THE STENOGRAPHER: Counsel,
2 does anyone need a rough draft? It
3 might be expedited?
4 MR. MILKEY: I think the
5 rough is included with realtime, if
6 I understand. So we will -- I
7 guess if that's the case, we will
8 take a rough. And then if we could
9 get a final by --
10 THE STENOGRAPHER: Five-day
11 expedite?
12 MR. MILKEY: If we could get
13 the final by the 10th, yeah, that
14 would be great.
15 MS. HUANG: Yeah, no rush
16 for us, so...
17 THE STENOGRAPHER: So normal
18 turnaround for you?
19 MS. HUANG: Yes, normal is
20 fine with us. Rough would be
21 great. Thank you.
22 - - -
23 (The proceedings concluded
24 at 3:52 p.m.)
25 - - -

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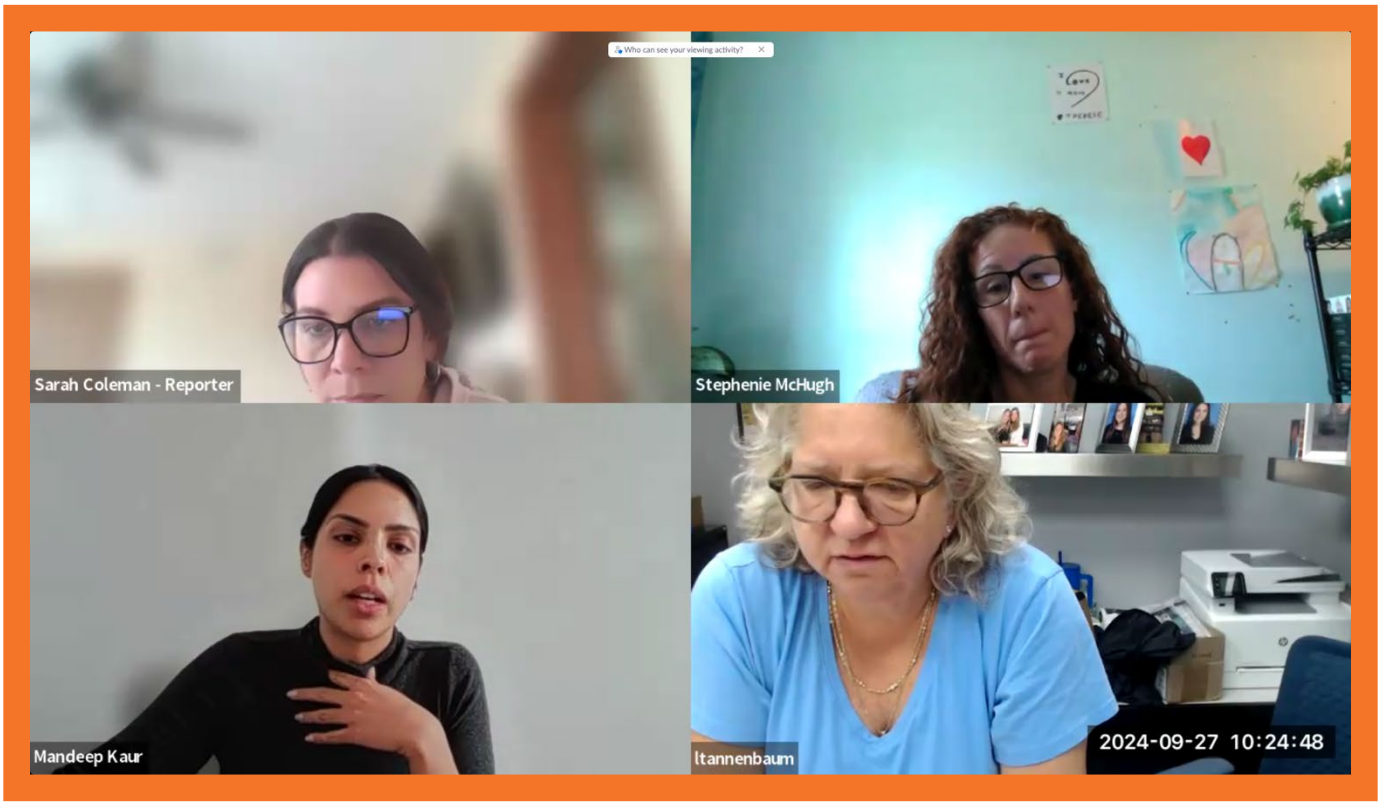

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