

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

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

v.

APEX BEAM TECHNOLOGIES LLC,
Patent Owner.

IPR2023-00598
Patent 10,462,767 B2

Record of Oral Hearing
Held: June 18, 2024

Before JOHN D. HAMANN, SEAN P. O'HANLON, and
SCOTT RAEVSKY, *Administrative Patent Judges*.

IPR2023-00598
Patent 10,462,767 B2

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The above-entitled matter came on for hearing at 1:00 P.M. EDT on
Tuesday, June 18, 2024 at the U.S. Patent and Trademark Office via Video
Conference.

P R O C E E D I N G S

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JUDGE O'HANLON: Good afternoon, everyone. I am Judge O'Hanlon, and I'm joined by Judge Hamann and Judge Raevsky. This is a hearing on IPR2023-00598, Samsung Electronics Company Limited and Samsung Electronics America Incorporated versus Apex Beam Technologies, LLC. And this concerns US Patent number 10,462,767. I'd like to begin by having the parties, counsel for the parties introduce yourselves for the record, beginning with Petitioner, please.

MR. GOLDBERG: Good afternoon. This is Joshua Goldberg for Petitioner Samsung.

JUDGE O'HANLON: Thank you, Mr. Goldberg. And for Patent Owner, please. You may be muted. I don't hear anything.

MR. ITURRALDE: Excuse me. Sorry, Your Honor. This is Enrique Iturralde from Fabricant LLP. On behalf of Patent Owner Apex Beam.

JUDGE O'HANLON: Thank you, Mr., was it Iturralde?

MR. ITURRALDE: Iturralde.

JUDGE O'HANLON: Thank you.

MR. GOLDBERG: Yes, Your Honor. Thank you.

JUDGE O'HANLON: All right, well, I apologize in advance if I mispronounce your name, but I'll do my best. Iturralde. So thank you both. A few housekeeping items before we begin. First of all, it's our primary goal to hear you, to hear your arguments. If at any time during the proceeding you encounter technical or other difficulties, please let us know immediately by contacting the team members who provide you with the connection information for today's hearing.

1 When speaking, please ensure your microphone is positioned close to
2 you. We could hear both of you fine, so that seems to be fine. And when
3 not speaking, please mute yourselves.

4 When referencing your demonstratives, papers or exhibits, please state
5 the slide or document number so that we may follow along more easily and
6 for clarity of the record.

7 Per our hearing order, each side will have 45 minutes of total time to
8 argue. Petitioner will go first, followed by Patent Owner. Both sides may
9 reserve time for rebuttal.

10 I will be keeping time during your presentations, but please keep track
11 of your time yourselves. There's not a timer for these virtual hearings, we
12 have to keep track of our times ourselves. If you run over during your
13 argument-in-chief, I'll let you continue going, eating into your rebuttal time.
14 I'll endeavor to let you know when that happens, but again, please keep
15 track of your own time.

16 As usual, speaking objections are not allowed. If you have anything
17 to note, you may do so during your time to argue.

18 Does anybody have any questions before we begin the presentations
19 today? Hearing none, I invite Mr. Goldberg to begin. Mr. Goldberg, would
20 you like to reserve any time for rebuttal?

21 MR. GOLDBERG: Yes, Your Honor. I will reserve ten minutes for
22 rebuttal.

23 JUDGE O'HANLON: Ten minutes. Okay, thank you. You may
24 begin when you're ready.

25 MR. GOLDBERG: Thank you. I think I'd start with slide four,
26 Sam -- we have several claims at issue. There are several sets of claims I

1 should say on a couple of different grounds, but based on the arguments
2 between the parties and the papers, I'm really just going to be focusing on
3 claims one and four today. I think everything else will stand in full with
4 those. And also primarily be focusing on the first ground view of Liu, given
5 that Patent Owner's arguments about the ground, including Mallick, seem to
6 really be relying upon whether it shows deficiencies in the Liu ground or
7 not, which we didn't have any arguments for. If we go to slide seven, I want
8 to spend just a few minutes before I get to the big disputes between the
9 parties, talking about the state of the art and talking about the grounds that
10 Samsung actually proposed. Because I think there's been a little bit of
11 confusion about that in the arguments between the parties.

12 So starting with 4G/LTE, I think both parties agree that 4G/LTE has a
13 fixed frame structure, and also the subframes are fixed. So you've got a
14 frame that has ten subframes within it, and then each subframe has two slots
15 within that, and then each slot has either six or seven symbols within that,
16 and that's all fixed. And it's fixed because in 4G, there's only one
17 numerology. There are not multiple numerologies existing. If we go to slide
18 eight, once we get to 5G, in fact, the development of 5G, which is really the
19 state of the art at the time of the '767 patent, 5G was not yet a completed
20 standard. It was still in development. The framing structure, the subframe
21 structure, that's still the same as 4G, doesn't change. What changes is we
22 have multiple numerologies, and what the numerologies do, and they affect
23 the subcarrier spacing, which affects the length of the symbols and the
24 lengths of the slots. So if we see on the right-hand side in the figure, at a
25 15 khz subspacing, we have a particular length of symbol and slot. And then
26 if we go down at the bottom in 60 khz, both the symbol length and the slot

1 lengths shrink. So that's really a big change that's happening. That's on the
2 cusp in the future that's being addressed by both the '767 patent and the
3 references.

4 So if we go to slide ten, we can see here claim one of the '767 patent.
5 And as Your Honor has noted in the institution decision, they're supporting
6 You for every single one of these limitations until we get to the very last
7 limitation, which starts to try to solve this future 5G issue that's coming up
8 with the numerologies we have these X time intervals that are being
9 monitored. And because those are something that was set up at the frame
10 level in 4G, now that we start introducing different numerologies, we open
11 up the possibility of using a little bit different time intervals. And the '767
12 patent seems to be trying to solve the problem of having these multiple
13 numerologies by figuring out where the X time intervals are based on those
14 numerologies. So effectively, it's just recognizing numerologies are an
15 issue. Let's factor them in when we look at these X time intervals to figure
16 out where the opportunities for paging are going to be.

17 If we go to slide twelve, this is actually something that was obvious
18 starting with You, and I want to really focus. This is a patent reference.
19 When we get to Liu, that's also going to be a patent reference proposing the
20 4G standard and the 5G standard somehow be combined. We're combining
21 a couple of patent references, and in You reference, which is 4G that you've
22 got a UE that it is looking for, is M-PDCCH monitoring for paging, message
23 scheduling. And it looks for them in CSS monitoring opportunities. Those
24 CSS monitoring opportunities are like the X time intervals. They're the
25 areas where you look for stuff. If we go to slide 13 again, this is really
26 important to recognize. 5G was not a completed standard at the time of

1 You, at the time of Liu, or at the time of the '767 patent. On the bottom
2 right-hand side here, we've got some discussion from You talking about in
3 the NR network, that's 5G. Different numerologies will coexist. Talking
4 about the future, '767 patent, the top claiming priority back to 2017. In the
5 related art discussion it's talking about, especially 5G, NR will support
6 various numerologies because 5G is not a completed standard at the time the
7 '767 patent either.

8 Mr. Jones, Apex's expert, also recognizes this. He says at the top left,
9 some of the documents were released around 2018. So that's a year after the
10 priority date for the '767 patent. And then at the bottom left, many of the
11 documents were published after the priority date of the '767 patent. So,
12 we're not combining again, we're not combining the standards, we're
13 combining patent references You and Liu. And if we go to slide 14, we can
14 see here Liu is recognizing the exact same problem, the exact same issues
15 that the '767 patent was claiming to recognize and (inaudible). On the right
16 hand side, in that network, different numerologies will coexist in the same
17 carrier, this is Liu recognizing this, the prior art, and then at the bottom right,
18 Liu saying that with the current DCI monitoring solution in LTE. So that's
19 in 4G. The stuff that's discussed in You, it cannot support the PCI
20 monitoring occasion change due to numerology and schedule and unit size.
21 These are the exact problems that the '767 patent was recognizing. On the
22 left hand side, the different numerologies, the change in basic scheduling
23 units under 5G.

24 And if we go to slide 15, Liu actually had the exact same solution
25 that's claimed in the '767 patent. It just did it before the '767 patent. Look
26 on the right hand side in the proposed solution, a DCI configuration

1 parameter, which we know if we look at the bottom right for something that
2 includes numerology, can be first transmitted to the terminal device, that's
3 the UE. And then the DCI is transmitted to the terminal device. Thus, the
4 terminal device may monitor the DCI based on received DCI configuration
5 parameter. So, it's looking at the numerology to figure out where it should
6 monitor for the DCI. That's where it should monitor for the X plane
7 intervals. The exact same thing. '767 patent saying determine transmission
8 opportunity of paging according to numerology, we just did it first. We go
9 to slide 16. We can see here a combination. There's been some discussion
10 by Apex about how somehow, maybe we are progressing from 5G to 4G.
11 That is not what is happening here. Our combination is you start with Liu,
12 the 4G reference. Liu teaches there's some problems in 4G when we go to
13 the 5G transition and how do we fix them. So to modify You based on that
14 testimony from Dr. Boone on the right hand side, it would have been
15 obvious to adapt, You's sub train level monitoring for Liu's slot-level
16 monitoring. This is progressing from 4G to 5G, not the other way around.
17 We go to slide 24.

18 JUDGE HAMANN: Counsel?

19 MR. GOLDBERG: Yes?

20 JUDGE HAMANN: This is Judge Hamann. To make sure that I'm
21 following the figure here. Slide 16, figure two that you've annotated.
22 Obviously, I'm going to call it the X-axis for now, but it says subcarrier
23 equals 15 khz. Is that really just -- I assume this axis is the time domain,
24 because it breaks slots apart. But that's just sort of the, whatever the math
25 does for the equivalent, for the times, the equivalent amount of the time
26 domain. Is that what the 15 khz refers to?

1 MR. GOLDBERG: Yes. So the top figure and the bottom figures in
2 figure two. So the 15 khz and the 60 khz, those are specifying at this
3 particular subcarrier spacing. And as Your Honor recognizes, that's
4 something that goes on the vertical axis. But when you're in the 15 khz
5 subcarrier spacing, this is what the time axis left right would look like. So,
6 when you're at 15 khz, you can see that in a single subframe there are two
7 slots. But when you go up to a 60 khz subspacing, sorry, 60 khz sub carrier
8 spacing, the slots and the symbols shrink. So, you end up being able to fit
9 eight slots in a subframe instead of just two slots.

10 JUDGE HAMANN: So, what is the time, amount of time for
11 subframe for both is what, a millisecond?

12 MR. GOLDBERG: Yes, it would be one millisecond for the
13 subframe in both.

14 JUDGE HAMANN: Thank you.

15 MR. GOLDBERG: Okay, so again, going to slide 24. There's
16 several disputes between the parties. I want to focus mainly today on the
17 motivation to combine and the X time intervals issue. But just briefly, there
18 is a dispute too, on whether the frequency of the X time intervals are
19 monitored to be in You's figure 6B, subband. I'll get to that if I have time.
20 And also, a dispute about how Samsung's combination teaches the second
21 radio signal in claim four. That's another one where I think that Apex is just
22 misreading what the combination is. And then finally, just if there was some
23 time at the end, I'll go over a little bit an issue about whether Apex's expert,
24 Mr. Gomez, is qualified to opine on the matters in this case. Given that, the
25 parties agree that a person of ordinary skill in the art needs a master's degree
26 and five years of work experience in the wireless area. But Mr. Gomez only

1 has a bachelor's degree, and it doesn't look like he's got five years of
2 experience in the wireless area. If you look at his actual experience in his
3 CV. I go to slide 26.

4 JUDGE RAEVSKY: Mr. Goldberg, am I right in remembering that in
5 the Petition that you have, you don't just specify the level of ordinary skill as
6 a master's degree, but that work experience of some sort could make up for
7 deficiency in education or vice versa.

8 MR. GOLDBERG: Yes, we do. So in theory, Mr. Gomez is only
9 having a bachelor's instead of a master's could be made up by work
10 experience, but in particular his work experience, he doesn't have the five
11 years that would be needed by the base definition, much less the additional
12 years that would be required to compensate for him only having a bachelor's
13 degree instead of a master's degree. Since you asked, I'll just go to that
14 briefly right now.

15 JUDGE RAEVSKY: I seem to recall that he had over 30 years of
16 experience. So it's interesting to hear that you think he doesn't have the
17 sufficient five years of experience. I don't want to spend a lot of time on
18 this issue. I just wanted a quick response.

19 MR. GOLDBERG: I can gratefully address it. So, yes, he has been
20 practicing engineering for more than 30 years. The issue is that his
21 experience, and this comes right from his deposition, and it's on our slide 65
22 at paragraph four, he says that his experiences in integrated circuit design,
23 storage, power conversion, telephony, and telecommunications. We asked
24 during one of his depositions what was his engineering experience, and he
25 pointed to only two places. Engineering experience that was dealing with
26 the wireless technology that's on slide 66, the ActSolar and the Philips

1 Semiconductor experience. He said those are not with 4G or 5G, which is
2 what's at issue here. But even if you add up the complete years in those
3 two, you only get the five years. So you don't have the more than five that
4 would be required to get the level of skill, given that he only has a
5 bachelor's instead of a master's.

6 But going back to, again, the disputed issues and slide –

7 JUDGE O'HANLON: Let me follow up on that, Mr. Goldberg, is
8 there a requirement that an expert witness be a person of ordinary skill in the
9 art, or is it rather that the witness is qualified in the pertinent art?

10 MR. GOLDBERG: So that is actually something that Apex raised in
11 Sur-reply. They looked at the Trial Practice Guide from 2019, which I think
12 maybe suggested you didn't have to meet the level of skill in the art. But
13 since then, the Federal Circuit in 2022 in the Kyocera versus International
14 Trade Commission. This is at 22 F.4th 1369 at pages 1376-1377, and cited
15 in reply at 25 and 26 to offer expert testimony from the perspective of a
16 skilled artisan. In a patent case like for claim construction validity, which is
17 at issue here, for infringement, the witness must have at least have ordinary
18 skill in the art. Without that skill, the witness's opinions are neither relevant
19 nor reliable.

20 COURT REPORTER: Mr. Goldberg, can you come a little closer to
21 your screen, please, so we can hear you better.

22 MR. GOLDBERG: I'm sorry, say it again.

23 COURT REPORTER: Could you slide a little closer to your screen
24 so we can hear you better, sir, please.

25 MR. GOLDBERG: Is that better?

26 COURT REPORTER: Yes, sir. Thank you.

1 MR. GOLDBERG: Okay, was there any other questions before I go
2 back to the dispute issues?

3 JUDGE O'HANLON: Okay, you can move on. Thank you.

4 MR. GOLDBERG: Okay, so let's go to slide 26. Then, starting with
5 the motivation, and as we said in our Reply, and I'm going to say it again
6 here, Apex doesn't really confront Samsung's rationale for its combination
7 because it doesn't really confront the combination. There's a little bit of a
8 ships passing in the night feel here. I'll try to highlight a few of the
9 meaningful points. There are actually some where the parties agree. For
10 example, starting on this slide, both parties agree that 4G differs from 5G
11 because in 5G you have the different numerologies which lead to the
12 different slot sizes and the different symbol sizes. Where the parties
13 disagree is what happens because of that. If we go to slide 27, this is exactly
14 what Liu is addressing. If we look at the right hand side here in print of the
15 system with the current DCI monitoring solution, or LTE, it cannot support
16 the DCI monitoring occasion change due to numerology and scheduling unit
17 size. And therefore Liu proposes the solution, a DCI transmission and
18 receiving solution. And Dr. Bims, he doesn't say we have Liu and we're
19 going to regress and we're going to go back and we're going to start
20 pointing 4G stuff. What he says is that a person of ordinary skill in the art
21 would have been motivated to apply Liu's teachings. So that's the 5G
22 problem and how do we fix it, teachings, to modify You to 4G reference to
23 modify You's M-PDCCH DCI monitoring scheme so that it can support
24 communications among massive number of machines and massive number
25 of machines is really one of the things that 5G was developed to support.

1 Apex, they say that this difference between 4G and 5G is what means
2 there's no motivation. But that really can't be the case when Liu is
3 recognizing the difference and saying that is motivation. That's why we're
4 going to fix the stuff. We go to slide 29. Motivation exists because of the
5 progression of technology. Apex agrees. 5G is a progression of 4G. Dr.
6 Bims talking about the evolution of 3GPP systems. That's evolution from
7 4G to 5G. And he says as part of the natural transition to 5G for You's
8 MCC, a person would have been prompted by Liu's teachings to modify use
9 techniques to meet the requirements of the emerging 5G NR system. Instead
10 of confronting this, Apex, they mischaracterizes the combination. We can
11 see on the left hand side they say a person of ordinary skill in the art would
12 not make the changes alleged by Petitioner, which include regression to
13 4G/LTE. Again, there is no regression in our proposed combination. It's
14 simply following the progression from 4G to 5G.

15 And if we go to slide 31, we can see that at Apex, they repeat this in
16 their Sur-reply and they repeat this characterization. They say we're
17 incorporating elements from 4G/LTE prior art to achieve the proposed
18 combination that would change the principle of operation of 5G prior art
19 Liu. We're not changing anything in Liu, we're modifying You to include
20 the teachings of Liu, and we can see that again by giving the actual
21 combination. It's a simple substitution of Liu's DCI configuration
22 parameter for You's CSS paging configuration parameters that would yield
23 the slot-level M-PDCCH monitoring occasion within a paging occasion.
24 And such difference does not require any modifications of UE's
25 fundamental design. Rather, Liu teaches that there is no fundamental

1 difference between subframe-level monitoring and Liu's monitoring at slot-
2 level, multi-slot level or symbol level.

3 Go to slide 34 turning to the time intervals dispute between the
4 parties. Apex has argued since its Patent Owner response that time intervals
5 means variable ranges of time, but there has been, I think, a little bit of a
6 change in what that means to them. Mr. Gomez, he said during his
7 deposition that variable means changing over time, and it seems like that
8 was the approach that Apex was taking in its Patent Owner Response. And
9 as I'll show in a moment, that just cannot be a valid construction given the
10 embodiment in the specification. Apex seems to have changed in its Sur-
11 reply to be more focusing on its variable, just in the sense that when you're
12 at different subcarrier spacing, you have different time intervals. And of
13 course that's what the claim itself requires. So that is what we showed in
14 our Petition, and I'll walk Your Honors through that again. But starting with
15 the claim construction itself, if we go to slide 35 Apex has said since the
16 beginning that their construction is based on lexicography, they pointed to
17 four embodiments in the Patent Owner response and said that those
18 embodiments mandate this construction. That's just simply not possible
19 given the disclosures of the embodiment themselves. And there's a lot, all
20 of them are in the eply. But I'll touch on a couple of them if we look at the
21 top embodiment here. This is one of the four that Apex cited, says in one
22 embodiment, any two of the X time intervals have an equal time length. So
23 it can't be the case they have to vary all the time because the specification
24 explicitly discloses that they can have equal time length.

25 We go to the next slide, slide 36. The patent itself also says that any
26 one of the X time intervals is due to a slot. Now, Apex says, if we look at

1 the bottom right, that slots are fixed ranges of time which cannot be X time
2 intervals, that simply cannot be the case because it is directly contradicting
3 the recognition by the patent itself that an X time interval can be a slot. We
4 go to the next slide, slide 37. Here's the testimony I was referring to before
5 Mr. Gomez, Apex's expert, saying that variable means that it changes over
6 time. So variable ranges of time, meaning that the ranges can change over
7 time. That's all it means. But he also admitted that the patent doesn't
8 specify whether or not X time intervals are the same or different. If we go to
9 slide 38 on the right hand side here, more testimony from Mr. Gomez. So
10 there's nothing in claim one that excludes the ability for the X time intervals
11 to all be the same timeline. I don't think there is. It doesn't specify one way
12 or the other right? Nowhere in the patent says it. The X time intervals could
13 be different lengths or they could be the same length. He has to do that
14 because if we go back to slide 37, we can see on the top left here, any two of
15 the X time intervals have an equal time length and the time length of each
16 one of the X intervals is correlated to the subcarrier spacing. We can see
17 that in the figure on the bottom left at subcarrier spacing one the X time
18 intervals, those are highlighted in green. They are all the same length. Same
19 thing if we go to subcarrier space in two, both of them are the same length.

20 Go to slide 39. Even setting aside the fact that this claim construction
21 should be rejected because it's contradicting the patent itself all over the
22 place, it's also irrelevant to the outcome of the case because even Apex in its
23 Patent Owner Response recognized that the construction is just optional. It
24 doesn't always have to be they are same length. Top left, the X time
25 intervals can be equal in time, bottom left, each time interval need not be
26 equally spaced. Top right, time intervals are not necessarily equal. Bottom

1 right, the X time intervals could be variable because it's just optional. It's
2 not something that would be required by the claims even if the construction
3 is adopted. And therefore for that reason, again, it's irrelevant to the
4 outcome of the case.

5 If you go to the next slide, slide 40, turn to the substance. How the art
6 actually discloses the variance when you change the numerology, X time
7 intervals vary. That's something that we have back to our petition. We
8 didn't introduce any new arguments in our reply. If I said we did, I just
9 want to note that to the extent somehow any of our arguments in the Reply
10 were interpreted to be new. That has been expressly reviewed by the
11 Federal Circuit. Federal Circuit held in the Axonics case, 75 F.4th 1374,
12 that where a Patent Owner in IPR first proposes a claim construction in
13 Patent Owner Response, a petitioner must be given the opportunity in its
14 Reply to argue and present evidence of anticipation or obviousness under the
15 new construction, at least where it relies on the same embodiment for each
16 invalidity ground as were relied on in the petition. And we definitely do
17 that. Go to slide 41.

18 Just a reminder here, Apex, in it's sur reply tries to morph things here.
19 It just needs to vary in the sense of this figure. If you're at subcarrier
20 spacing one, we've got X time intervals that are one subcarrier spacing, if
21 you go to a different subcarrier spacing, then the X time interval is a little
22 bit. Go to slide 42 is what the 4G situation was, In 4Gg You did something
23 called blind decoding. What that meant is that on the vertical axis here they
24 have to look everywhere. In 4G it is defined more clearly on the X-axis time
25 that we need to look. In this example here, you just look in the first three
26 symbols. So you need to look in the first three columns, but you have to

1 look everywhere, up and down. So that's a little bit of a hit to batteries. It
2 requires power because you've got to do blind decoding. You have to look
3 everywhere on the vertical axis, but at least it's known on the horizontal
4 axis.

5 JUDGE HAMANN: Counsel?

6 MR. GOLDBERG: Yes?

7 JUDGE HAMANN: This is Judge Hamann, sorry. I don't understand
8 what you're saying. You have to look everywhere on the vertical axis. I'm
9 trying to understand that. Are you basically saying you have to look across
10 the entirety of the subcarriers or the broad portion of the frequency
11 spectrum?

12 MR. GOLDBERG: Yes. So just to make this, I guess, a more
13 specific example on it. If you are, say, you look at unit number one, we can
14 see in the legend on the figure unit number one where they're actually going
15 to get a PDCCH that is directed to them because it has their identification in
16 it. They will look everywhere in the first three columns. They will look
17 from the very bottom of the frequency spectrum shown here all the way up
18 to the top. They're going to look in every box, whether it's labeled clear,
19 yellow, or red. They're going to look in all the boxes to see if there's any
20 green ones for them. And here, You and Liu doesn't have any green ones.
21 There's nothing for them. So then they're going to just wait and they're
22 going to look at the next time there's a subframe that has a control space in
23 it, they'll look at it again. In contrast, if you're two, so you have yellow
24 boxes that identify You, they've got your identifier. You're going to look
25 again all the way up and down on these first three columns, but you're going
26 to find some that are actually for you. So every UE is going to do that.

1 Every UE is going to have to look all the way from the bottom all the way
2 up to the top to see if there's any PDCCHs that are for it, any GCIs that are
3 for it. They only have to look, in time-wise, they only have to look in those
4 first three columns. They don't have to look everywhere.

5 We go to slide 45. The issue becomes if you look at the right-hand
6 side here, this is that same figure two that we saw earlier. When you start
7 messing with the numerologies in 5G, now, you don't just look at those two
8 symbols on the far left and the 15 khz spacing, because there's also a 60 khz
9 spacing. So rather than just looking at the first two, which is corresponding
10 to time, you have to look all over the place. Because depending on which
11 numerology you're in, you might have your DCIs occurring right at the
12 beginning. You might have your DCIs occurring somewhat later, like when
13 tuning 60 khz. We have DCI monitoring occasion occurring at slot two. We
14 have it again occurring at slot four. So now if you were operating in 4G,
15 you would have to be looking not just up and down, but you would be
16 having to work everywhere left and right to figure out where your occasion
17 is that you need it. And that's what Liu is solving. So Liu discloses that a
18 subcarrier spacing change from 15 khz to 60 khz. We caused the scheduling
19 size to the slot size to change, and this causes the M-PDCCH DCI
20 monitoring occasion to change. However, with the traditional blind
21 decoding. So that's what we were looking at on the previous slide. The UE
22 does not know when the subcarrier spacing and or the scheduling unit size
23 would change. Thus the UE would have to search M-PDCCH DCI
24 monitoring occasions corresponding to all the supported subcarrier spacings.
25 So that's 15 and 60 here. There could be other subcarrier spacings as well
26 that the UE would have to look for.

1 If we go to the next slide. Again, this is what Liu is recognizing is a
2 problem on the top left here. None of the prior art can support the DCI
3 monitoring occasion change due to numerology and scheduling unit size. In
4 a prepared solution, a DCI configuration parameter can be first transmitted
5 to the terminal device. Thus, the terminal device may monitor the DCI
6 based on the received DCI configuration parameter, which means a flexible
7 DCI monitoring solution and thus can support the DCI monitoring change
8 due to numerology and scheduling unit size. If we look at the bottom left
9 here, with the DCI configuration parameter the terminal device may learn
10 the time frequency resource for the DCI from the DCI configuration
11 parameter and monitor the DCI at any time frequency resource. So this is
12 what's making it so that if we look at slide 45 again now UE only has to
13 look at the relevant DCI monitoring occasion, because it mirrors it for 15
14 khz. We only have to look at that first and second symbol in slot zero. But
15 if we're in 60 khz now, we need to start looking at in slot zero, in slot two, in
16 slot four and slot six.

17 If we go to slide 48, again, Liu discloses that the UE uses the DCI
18 configuration parameter to determine the time frequency resources for
19 monitoring the DCI. Go to slide 49. A person of ordinary skill in the art
20 would have expected the resulting combination to work well in a 5G/NR
21 system, because by using this method we can determine time-domain
22 locations, durations, and number of the M-PDCCH DCI monitoring
23 occasions at the slot level. Despite the duration of the slot and the number
24 of the slots in the subframe changing with the subcarrier spacing. So, we go
25 to slide 50. Apex has made a lot of arguments about what X being positive
26 integer means. Does it need to be more than one unit to one? I'm not sure

1 why they think this is relevant to the IPR, given that in the IPR we've
2 mapped everything to the rule and numeral that occur in both You and Liu,
3 and in this discussion we're always talking about one or more DCI
4 monitoring occasions. We saw that in figure two where at 15 khz there was
5 one DCI monitoring occasion, and at 60 khz there was four. So it doesn't
6 seem relevant to the outcome here.

7 We go to slide 52. Just briefly talking about the first subband. I think
8 it's important to recognize that the dispute that existed pre-institution no
9 longer exists. Apex agrees that the Board on this record, it agrees that the
10 ordinary and customary meaning of subband, as used in the '767 patent, is a
11 subset of the available frequency band. If we go to slide 53, their argument
12 is now that Petitioner only relies on You, and specifically figure six of You
13 for this limitation. But the specification of figure six only makes clear
14 allegedly disclosed subband correspondence to a singular subband. Now
15 that statement about You, the figure six, as having subband that only
16 corresponds to a singular subband, that's wrong. I'll get to that in a minute.
17 I think this is also irrelevant if we go to slide 56, the non -- sorry 55. If we
18 look at the combination that Samsung has proposed, the slot level
19 monitoring can be done in a single subframe. In figure two, everything is
20 occurring in a single subframe, whether it's one VCR monitoring occasion
21 or whether it's four. In the case of 60 khz, it's all happening within one
22 subframe. So the fact that they think the subband in figure six only relates to
23 one subframe doesn't matter because our combination only needs one
24 subframe. But in fact, if we go to slide 56 now, we can see You actually
25 says that the subband for operating the MTC UE always be located at the
26 center. For example, six center PRBs of a cell as shown in figure 6A. So

1 there's always at the center and it's going to be at the center for the first
2 subframe, the second subframe, and any subframes that are later. So again,
3 I'm not clear why that really matters.

4 JUDGE O'HANLON: I just want to let you know that you're at your
5 ten minute mark.

6 MR. GOLDBERG: Thank you, Your Honor. And I'll finish up real
7 quick here. Looking at slide 59. Again, I think here there's a little bit of
8 confusion about what our combination actually is. In fact takes the position
9 the Petitioner only relies on use SIB to disclose the second radio signal. But
10 if we look at the right-hand side, Samsung's actual position You in view of
11 Liu teaches claim one and this limitation, Liu discloses that the UE can
12 receive information from reconfiguring the time frequency resources for
13 monitoring DCI because Liu discloses that the numerology can change.
14 Person of ordinary skill in the art would have understood that the DCI
15 configuration parameter is transmitted in real time to reconfigure the DCI
16 monitoring occasion upon a change of numerology. And finally slide 60. It
17 would have been obvious to modify You's SIB message for reconfiguring
18 CSS paging to include Liu's DCI configuration parameter. Just like the '767
19 patent, Liu's SIB message constitutes the claim second radio signal and I'll
20 reserve the rest of my time. Thank you.

21 JUDGE O'HANLON: Thank you Mr. Goldberg, Mr. Iturralde we
22 will now hear from you. Do you wish to reserve any time for rebuttal?

23 MR. ITURRALDE: Yes, Your Honor, I'd like to reserve ten
24 minutes.

25 JUDGE O'HANLON: Ten minutes. Okay. Thank you. You may
26 begin when you're ready.

1 MR. ITURRALDE: So my presentation will avoid repeating the
2 briefing verbatim. I think the briefing identifies sufficient explanation
3 regarding, for example, Mr. Gomez's experience in response to Petitioner's
4 challenge to his credentials. Instead, what I'll do is I'll provide a brief
5 overview of the parties' disagreement over the X time intervals, those
6 limitations, and then I will move on to the incompatibility of the You and
7 Liu references and the lack of motivation to combine, lack of reason to
8 combine of the You and Liu references, particularly in light of opposing
9 counsel's comments in his presentation.

10 The prior art fails to disclose the X time intervals and more
11 specifically, determining the X time intervals. This is apparent in claim one,
12 which recites two relevant limitations, monitoring of first signaling in X
13 time intervals and at least one of location of the first subband in the
14 frequency domain. Subcarrier spacing of subcarriers included in the first
15 subband is used for determining the X time intervals. Taking the first
16 limitation, monitoring a first signaling in X time intervals we understand that
17 Petitioner intends to map X time intervals generally to use a fixed 4G system
18 and in particular use subframes because Petitioner contends that the
19 subframes represent numerous potential X time intervals, which may belong
20 to a time window or subframe in the time domain. This arbitrary
21 identification of potential time ranges within a subframe does not hold up
22 when those specific time intervals need to be determined as required by the
23 limitation determining the X time intervals.

24 The You reference cannot teach such determinations because the You
25 reference is a 4G reference that does not determine X time intervals. As a
26 matter of the standard, the You reference and 4G in general do not teach

1 determining time intervals or determining X time intervals because You's
2 subframes are fixed. You teaches that base stations and user equipment
3 transmit data and data and control information on a quote, prescribed time
4 unit basis, which is a subframe basis. This means that data and control
5 information are transmitted on an assigned or fixed basis. It's not
6 determined, it's not variable.

7 JUDGE O'HANLON: Mr. Iturralde, doesn't Petitioner rely on Liu to
8 teach this limitation, the determining limitation?

9 MR. ITURRALDE: Yes, Your Honor, I did see that in the Reply, and
10 I am going to address that with the motivation to combine arguments. So, I
11 will get to that shortly in about a minute, if that's okay with you, Your
12 Honor.

13 JUDGE O'HANLON: Thank you.

14 MR. ITURRALDE: So the You reference teaches a configured search
15 space for a control channel, and this configured search space is fixed. It's
16 already configured. There's no need to make any determinations. And You
17 the user equipment assumes the configured search space is fixed and until
18 it's updated with another fixed space, and that's shown in Exhibit 1005,
19 page three, paragraphs eight and ten. You's monitoring only occurs as to
20 known fixed search spaces. This is because You describes 4G technology,
21 as I stated earlier, and it's not dynamic, it's not teaching variable ranges of
22 time. Now getting to Your Honor's question. In an attempt to cure these
23 deficiencies, Petitioner attempts to combine You's 4G system with a 5G
24 reference called Liu. We disagree with this attempt because the teachings of
25 the references are incompatible, and there is no motivation to combine those
26 teachings. Now just from common knowledge, 5G represents a giant leap

1 over 4G/LTE technology. We experience these advancements every day.
2 When you're on the metro or driving out of the DC area, your phone's going
3 to switch from 5G to 4G service, and a drop in transmission quality is
4 noticeable and impactful. Sometimes the change to 4G renders our browsers
5 and our apps on our phones and tablets useless because the service is not
6 enough to handle such large amounts of data.

7 5G is designed to efficiently handle heavy data usage between
8 smartphones, tablets, and servers. 5G addresses the need for constant
9 exchange of large amounts of data, listening to music and podcasts,
10 exchanging information, location and maps, multiple applications running in
11 the background of our phones and tablets, exchanging loads of data with
12 remote servers. That's what 5G is designed for. But please recall that
13 Petitioner maps a specific special use case of the You reference. The
14 Petitioner skips over the first 170 paragraphs of the You disclosure to rely on
15 a specific use case which addresses a whole different kind of communication
16 for a very different purpose. Petitioner and You refer to this specific use
17 case as the machine type communication or MTC embodiment. The purpose
18 of this specific use case is to address the need for transmission of very, very
19 small amounts of data. For example, the paragraph 173 of Exhibit 1005,
20 which is the You reference, You states that the MTC may be used for data
21 communication for measurement sensing reporting such as meter rating,
22 excuse me, meter reading, water level measurement, use of surveillance
23 camera, inventory reporting, and reporting of a vending machine, and
24 automatic firmware updates. In that same paragraph, You goes on to say
25 that in MTC, the amount of transmission data is small and the uplink, the
26 UL/DL transmission or reception occurs occasionally. That's once in a

1 while. It's not constant communication that's needed for use in smartphones
2 and tablets. You goes on to explain in the same paragraphs 173, since the
3 MTC user equipment has low mobility the channel environment thereof
4 remains substantially the same. The MTC user equipment is very likely to
5 be located in a place such as basement, warehouse, et cetera.

6 JUDGE O'HANLON: I'm going to interrupt you here. You spent
7 several minutes talking about the MTC environment. I don't recall seeing
8 that in your briefs. Can you tell me where any argument regarding You's
9 reliance? Petitioner's reliance on an MTC embodiment is addressed in your
10 briefs?

11 MR. ITURRALDE: Well, yes, Your Honor, it's just the motivation to
12 combine section of our briefing describes the differences between the
13 references. This is just going into further explanation about those
14 differences.

15 JUDGE O'HANLON: I only recall you, in the Response in the
16 combining section, basically saying you would not combine 4G and a 5G
17 system. I don't recall any discussion whatsoever about the MTC
18 embodiment of the You reference.

19 MR. ITURRALDE: Well, the MTC embodiment is what Petitioner
20 relies on as the only embodiment in its description, you know, in its
21 description and its Petition. And so our attack on the motivation to combine
22 was addressing Petitioner's proposal to combine those portions of You with
23 Liu.

24 JUDGE O'HANLON: I don't recall any discussion of the MTC, just
25 4G versus 5G in general.

1 MR. ITURRALDE: Okay, if you don't mind, Your Honor, I'll take a
2 look at that briefing and point that out before the ending of this call.

3 JUDGE O'HANLON: Please do.

4 MR. ITURRALDE: Thank you, Your Honor. So going back to this
5 MTC embodiment that's proposed in the Petition, the user equipment is not
6 the same type of equipment that is proposed in the 5G reference of Liu. The
7 MTC embodiment directly contradicts Petitioner's misleading statement. If
8 you look at page 22 of the Petition, it says that the MTC user equipment can
9 be a smartphone and a tablet PC. But the MTC embodiment and its related
10 teachings are not designed for a smartphone or tablet PC because it involves
11 only a transmission of very small amounts of data. Meanwhile, we know
12 that smartphones and tablets transmit high volumes of data, so much that 4G
13 can barely keep up with those smartphones.

14 So, to recap here, Petitioner relies on a 4G special use case that is
15 purposely designed and limited to low data exchange. But Liu's 5G
16 disclosure serves a very different purpose. Liu itself teaches that 5G is
17 directed to large scale deployment requirements, such as an enhanced mobile
18 broadband, instead of the low data meters that are described in Your's MTC
19 embodiment. Lui's 5G is directed to massive machine type communications
20 involving terminal devices, and those terminal devices are not limited to the
21 special use case of the transmission of very small amounts of data. And
22 you'd see that.

23 JUDGE RAEVSKY: Mr. Iturralde, this is Judge Raevsky. How do
24 you respond to Petitioner's argument, which is based on slide 27 of
25 Petitioner's slides, that Liu itself provides a motivation to combine because

1 Liu explains the disadvantages of LTE and then explains how to improve
2 upon them using 5G?

3 MR. ITURRALDE: Sorry, Your Honor, I didn't get that last portion
4 of your question.

5 JUDGE RAEVSKY: I think I was asking how do you address the
6 disclosure in Liu, that Liu explicitly describes the disadvantages of LTE and
7 then explains how to address them using 5G, and therefore, how do you
8 address that potential explicit motivation to combine the references?

9 MR. ITURRALDE: Thank you, Your Honor. So, addressing that, I
10 guess there are two portions to address there. First is the Petitioner, during
11 his presentation, described tried to back away from showing a progression
12 between 4G and 5G. And Petitioner disregarded during his presentation that
13 he was relying on this special use case of 4G. Right. That's something that
14 hasn't been adequately explained in the Petition. We have just a special
15 case, special use case that just addresses a small slice of the types of
16 communications that would have been seen. And so, Liu's 5G disclosure
17 serves a very different purpose. Liu expressly states in its 5G user
18 equipment that's recited in the reference refers to, quote, a terminal, a
19 mobile terminal, MT, and a subscriber station, a portable subscriber station,
20 a mobile station, or an access terminal. And this is on Liu exhibit 1006,
21 page seven, paragraph 39. Because Liu's disclosure addresses high volume
22 devices with requirements for high volume data communications devices, a
23 skilled artisan would not have had reason to combine You's special use case
24 for low data with Liu's 5G case. And in an attempt to bridge that clear
25 incompatibility between the two teachings, Petitioner misrepresented the

1 scope of You's disclosure on MTC user equipment to inject user equipment
2 that You had not contemplated for that special use case embodiment.

3 So when we go back to the Petition at 22, Petitioner expressly stated
4 that, I'm sorry, the You MTC user equipment devices included smartphones
5 and tablets. They do not. And You never contemplated that for that special
6 use case. So additionally, I'm going to note that Petitioner's reliance on this
7 special use case as a starting point cuts against their arguments about natural
8 progression from the general disclosure of 4G. What we're really seeing
9 here is reliance on impermissible hindsight. You and Liu are incompatible.
10 And there would be --

11 JUDGE O'HANLON: I'm going to interrupt you again, Mr. Iturralde.
12 I don't know that you addressed Judge Raevsky's question. Liu explicitly
13 discloses the benefit of improving on the 4G system. Based on the explicit
14 teachings of Liu, how can that be hindsight?

15 MR. ITURRALDE: That refers to the general discussion of 4G.
16 Your Honor, that does not refer at all to this special use case scenario that
17 starts around paragraph 173. Petitioner should not be permitted to rely on
18 improvements concerning embodiments that are not actually part of this
19 special use case embodiment. And so, the mixing and matching of relying
20 on picking out benefits from a normal 4G system and applying them to this
21 special use case that is meant to address very low amounts of data as
22 opposed to what were at the time, higher amounts of data, should not be
23 permitted.

24 JUDGE O'HANLON: Why should that not be permitted? Is there
25 anything in, for example, claim one that specifies any amount of data that is
26 transmitted?

1 MR. ITURRALDE: You did. This is a specific embodiment that
2 they're relying on, and there's no combination, there's no proposed
3 combination between the other embodiments and this specific embodiment.

4 JUDGE O'HANLON: But that doesn't address my question. Does
5 claim one or any of the claims require a certain amount of data to be
6 transmitted?

7 MR. ITURRALDE: I wouldn't say that there's a specific requirement
8 of an amount of data, but we're not looking at whether or not this meets a
9 claim limitation for the purposes of disclosure. We're looking at the
10 compatibility of the references for the purpose of combining them. And so,
11 these arguments apply to the rationale for combining references.

12 JUDGE O'HANLON: Does the MTC embodiment use a different
13 transmission scheme than the other embodiments? I guess I'm not
14 understanding why it wouldn't be obvious to apply the explicit teachings of
15 Liu to even this specific embodiment. You seem to be distinguishing it
16 based on the amount of data that's being transmitted. But maybe you could
17 explain that more because I'm not following your argument.

18 MR. ITURRALDE: Sure. Your Honor, let me just pull up the
19 reference. So the MTC embodiment is not a, sort of typical 4G. It's not a
20 typical 4G communications. It's something that was added as an
21 enhancement on top of 4G in order to address this issue of small amounts
22 data being transmitted. And so, it's not a -- how can I say this? It's not the
23 same disclosure, it's not the same teaching as the rest of the 4G reference.

24 JUDGE HAMANN: Counsel, this is Judge Hamann. And this
25 question, I think is in the same vein that is being asked now. Looking at
26 paragraphs 173, 174, for example, of You, and this particular MTC

1 embodiment, it seems certainly like there are instances where there are lower
2 amounts of data transmitted as metering, et cetera. So assuming that's the
3 case for this particular embodiment, let's say, why doesn't having lower
4 amounts of data still benefit from adding the limitation, the teaching from
5 Liu that Petitioner does? That's what I'm trying to understand. Maybe less
6 benefit because there's less data. You know, why would it negate a
7 motivation to combine by dealing based on the volume of data?

8 MR. ITURRALDE: Thank you, Your Honor. It's using a different
9 configuration to address that, to address the transmission of data. It is not
10 using sort of the normal configuration that's discussed in the rest of the
11 reference in which I'm looking for. Right. So the rest of the reference
12 describes You's usage of the first physical downlink control channel
13 PDCCH one to schedule random access response for the UE. This particular
14 embodiment uses a special type of control channel in order to transmit low
15 volumes of data.

16 JUDGE HAMANN: This is Judge Hamann. So are you suggesting
17 that Petitioner is mixing and matching different embodiments. And when
18 Petitioner points to the MTC embodiment that somehow it doesn't use a
19 PDCCH.

20 MR. ITURRALDE: That's correct, Your Honor. It doesn't use a
21 PDCCH. Later on in the description for that MTC embodiment, it describes
22 specific reasons why the, or specific limitations on using something other
23 than paging. And I believe that disclosure is around paragraphs 203 and
24 205.

25 JUDGE HAMANN: Let me, this is Judge Hamann, again, let me just
26 add paragraph 174 certainly does talk about maybe having coverage

1 enhancement, but it seems to certainly acknowledge that although maybe not
2 preferable, an MTC embodiment could still employ PDCCH signaling.

3 MR. ITURRALDE: Okay, let me, sorry, my computer is a little bit
4 slow, but I'm going to pull up the paragraphs for -- sorry, Your Honor, I'm
5 not able to pull up the reference on my screen right now, but I should be able
6 to in a minute. Apologize for this.

7 JUDGE HAMANN: Yeah, and this is Judge Hamann. Obviously, we
8 have the briefing and parties' papers in front of us, and we can have, and
9 continue go through those again, but to the extent that you can help further
10 clarify what's in those papers by now, that'd be great. If you can't just, it is
11 what it is.

12 MR. ITURRALDE: I'll have that by the end of the hearing, Your
13 Honor.

14 JUDGE HAMANN: Thank you.

15 MR. ITURRALDE: So that's my last point on this presentation, and
16 I'll reserve the rest of my time.

17 JUDGE RAEVSKY: Mr. Iturralde, before we go, can I just clarify? I
18 want to just kind of distill the argument a bit. So from a legal standpoint, is
19 it accurate to say that you're relying on two legal bases for your argument
20 against motivation to combine. Those being, one, that there's improper
21 hindsight, and two, that the combination of Liu would change You's
22 principle of operation. Is there anything else I'm missing to your legal
23 rationale?

24 MR. ITURRALDE: I would say that as far as our legal rationale,
25 first, there's missing elements. As our first rationale, there's a lack of

1 motivation to combine and the only way to fill it would be with
2 impermissible hindsight.

3 JUDGE RAEVSKY: Okay, so you're not relying on teaching away or
4 any other theory as far as the motivation to combine, it's really just
5 impermissible hindsight?

6 MR. ITURRALDE: No, not teaching away. That's correct, Your
7 Honor.

8 JUDGE O'HANLON: Okay, thank you. Mr. Iturralde, before we
9 move on to rebuttal, did you want to address the claim construction of time
10 intervals? Whether that necessarily must be variable.

11 MR. ITURRALDE: I have nothing further to add other than what's in
12 our papers on the claim construction issue. So we can rest on our papers on
13 that.

14 JUDGE O'HANLON: Okay. Noted. Mr. Goldberg, we'll hear your
15 reply when you're ready.

16 MR. GOLDBERG: Thank you. I'll keep it brief here. The
17 arguments that you just heard about the MTC embodiments, and all these
18 details were not in any of the papers. They were completely new arguments,
19 as I think you had recognized. But just quickly looking through our own
20 papers, I was able to find some evidence that shows those arguments don't
21 even hold up. As far as what Liu is about, as far as what 5G is about, if we
22 look at Liu, the very first page, line 19, it talks about how the NR, so that's
23 5G. I guess this is starting a few lines above, will consider frequency
24 ranging up to 100 GHz within subject a single technical framework
25 addressing all usage scenarios, requirements and deployment scenarios
26 defined in technical which include requirements such as enhanced mobile

1 broadband and massive machine type communications. So Liu is also
2 dealing with these MTCs. If that's not enough, if we look at Dr. Bims'
3 declaration. So Exhibit 1002, paragraph 66, he says that the planning stages
4 for 5G standardization and for goals that included higher density mobile
5 broadband users and supporting device-to-device ultra-reliable and massive
6 machine communications and lower battery consumption for better
7 implementation of the Internet of Things.

8 As far as I know, this was not disputed over Apex at any other papers.
9 And Dr. Bims actually is not just making this up. He cites to the You
10 reference of paragraph 21 for this. If we then look down to Dr. Bim's
11 paragraph 111, rather than something that counts motivation to combine
12 these MTC issues are actually something that Dr. Bims relied upon in
13 supporting the motivation to combine. So in paragraph 111, going down to
14 about halfway down the page. On page 75, he says that You pertains to
15 monitoring M-PDCCH/DCI used in machine type communication.
16 Relatedly, Liu discloses that 5G/NR's wide range of frequency spectrum, as
17 well as the resultant flexible neurology, is aimed at addressing requirements
18 such as massive machine type communications. Accordingly, in my
19 opinion, person of ordinary skill in the art would have been motivated to
20 apply Liu's teachings to modify You's M-PDCCH/DCI monitoring scheme
21 so it can support communications by massive number of machines.

22 And then finally, if we look back at You, paragraph nine in 76, this is
23 the start of the so called MTC discussions and providing some examples.
24 Actually, I've lost my place. Give me one second to find the paragraph. So I
25 actually cut off 173. In 173 it says this is starting at the very bottom of page
26 36, "For example, MTC may be used for data communication for

1 measurement/sensing/reporting such as meter reading, water level
2 measurement, use of a surveillance camera, inventory reporting of vending
3 machine, etc.” This is all in our claims. And as we just looked at them,
4 paragraph 66, Internet of Things is one of what 5G is trying to address. So
5 the 5G is addressing exactly what’s in You. And again, just as a reminder
6 going back to the beginning, we are not combining the 4G and 5G standards.
7 That is not what Samsung proposed. We are combining pertinent references,
8 You and Liu, and Liu expressly includes the motivation for the combination.
9 There can be no hindsight because it is coming directly from Liu that there’s
10 these issues with 4G/LTE and that is what’s being fixed. And unless there’s
11 any questions, I’ll rest there.

12 JUDGE O’HANLON: I did have one question, Mr. Goldberg. You
13 were reciting from paragraph 173 of the You reference regarding the MTC.
14 Is it your argument that MTC devices do not necessarily transmit just very
15 small amounts of data as the Patent Owner’s counsel is arguing today? I
16 guess this is the other paragraph that you cited as well, paragraph 173.

17 MR. GOLDBERG: I don’t think that they necessarily only transmit
18 small amounts of data. I don’t know that this is something that has been
19 expressed, addressed in the record, because this argument was not made by
20 Patent Owner until today. But in any case, I don’t think that the amount of
21 data that’s transmitted is really relevant to the case anyway. The claims
22 don’t address how much data is transmitted. And as we just went through,
23 5G is not just about addressing more data, it’s about addressing Internet of
24 Things and these various types of machines that are talked about in You.

25 JUDGE HAMANN: Counsel, this is Judge Hamann and I recognize
26 Petitioner’s contention. This may be a new argument as some of these MTC

1 arguments, but the amount of data may be in paragraph 173 of You, but
2 paragraph 174 of You goes on to talk about maybe multiple transmissions of
3 the PDCCH and other issues for the MTC embodiment. So it seems to be
4 that that aspect, or at least that may be an aspect that Patent Owner suggests
5 would cut against the motivation to combine. Does Petitioner have a
6 response to that? And again, I recognize it may not, because it may be
7 viewed as a new issue here.

8 MR. GOLDBERG: I'm not sure why it would be relevant whether
9 there's going to be multiple PDCCHs or PDSCHs or anything like that going
10 on with these MTCs, because the fact of the matter is, this is 4G technology.
11 There is a recognized progression that's happening from 4G to 5G, and
12 there's a recognition in the Liu reference that in order to complete that
13 progression, that you're going to have to be able to deal with the multiple
14 numerologies, and therefore we need to deal with that issue regardless of
15 how many PDCCHs there are in a particular implementation in 4G.

16 JUDGE HAMANN: Thank you.

17 MR. GOLDBERG: I have nothing further. If there's any other
18 questions.

19 JUDGE O'HANLON: Thank you, Mr. Goldberg. Mr. Iturralde, we'll
20 hear your sur-rebuttal. And we spoke during your argument in chief
21 regarding where in your briefs there is any discussion of the shortcomings of
22 relying on the MTC embodiment. And I believe during the break you were
23 going to look for where those were identified in your briefs. I was
24 wondering if you found any instances?

25 MR. ITURRALDE: Yes, Your Honor. Thank you again. This is
26 Enrique. It's Iturralde for Patent Owner. And I apologize earlier for sort of

1 the technical difficulties I was having on my end. It looks like the pulling up
2 the documents with the video feed was causing my computer to run slowly.
3 But I have for you the places where we argued regarding MTC, page six and
4 page 25 of the POR, as well as pages 17 through 18. And if we didn't hash
5 out the argument as clearly as we should have for, you know, the motivation
6 to combine, I apologize for that, Your Honor. And we understand that you
7 have sort of, you can -- we understand that if the arguments weren't
8 completely fleshed out, that, you know, they might be disregarded. But we
9 believe that these arguments are sort of crucial to the combination, because
10 right up front, the only channel that is relied upon for the subframe in
11 Petitioner's Petition, and the mapping to You is the M-PDCCH of this MTC
12 embodiment. And so I think that's something that needs to be addressed.
13 And again, if we didn't properly flesh it out, I apologize for that. And I take
14 responsibility for that.

15 JUDGE O'HANLON: Let me follow up on that. You said pages 17
16 and 18. Can you show me where on page 17 or 18?

17 MR. ITURRALDE: I'm going to go to in order starting on page six.
18 In describing the alleged prior art, we explained that Petitioner relied on this
19 M-PDCCH starting at the end of page five leading into page six. Next page,
20 I believe it's 17. In 17, we explain the other 4G reference, Mallick and You.
21 And in the context of that combination, we point out that the reference
22 describes a low cost MTC.

23 JUDGE O'HANLON: That's the Mallick reference, correct?

24 MR. ITURRALDE: The Mallick reference. Correct, Your Honor.
25 And on page 25, in the description of You, we have arguments regarding
26 figure six of You and whether it corresponds to a singular subframe in which

1 M-PDCCH is monitored, as shown below. And we describe MTC there, the
2 MTC embodiment there. And that's in the context of the combination of
3 You and Liu.

4 JUDGE O'HANLON: Thank you.

5 MR. ITURRALDE: Thank you, Your Honor. So going back to Judge
6 Hamann's question earlier regarding, well, why is this important, the MTC
7 embodiment discloses, and which is the only embodiment the Petitioner
8 relies on, it discloses this M-PDCCH channel that's used to transmit control
9 information. And the control information in this case, I guess, is paging
10 messages. However, and if you look at paragraphs 208 and 209 of the You
11 reference that states that the M-PDCCH channel, the search spacing can be
12 used to transmit DCIs for other purposes. Now, there are no other purposes
13 that Petitioner relies on for transmitting other DCIs. There are no other
14 DCIs that are identified in Petitioner's briefing. And so, we're just looking
15 at paging messages here. However, if Petitioner did want to use
16 transmission of DCI to address this, there's specific limitations on here as
17 configured for this MTC embodiment. For example, M-PDCCHs can be
18 used for transmission of DCI for unicast data, for TCP, DCI for enhanced
19 interference management, traffic adaptation, enhanced PICH. If the CSS
20 is used to transmit these DCIs, then the location and decoding candidates,
21 they need to be expressly specified. It says they're at the end of end of 2009
22 or 209.

23 And so here we're looking at a system that even with the M-PDCCH,
24 which is different from the other channels describing You. We need to
25 specifically specify the location, and that location is not determined. Aside
26 from that, we have nothing further to add other than to reiterate that there's,

1 you know, given this reliance on this MTC embodiment which is expressed
2 between paragraphs 173 and 233, there's no reason to combine this specific
3 embodiment that's specifically designed for low transmission of data with
4 5G, which is designed for transmission of data on user equipment that
5 requires much higher transmission of data. And with that, we'll rest. Your
6 Honor.

7 JUDGE O'HANLON: Thank you both for your presentations today.
8 A final written decision will be issued in due course. And let's go off the
9 record, please.

10 (Whereupon, the proceedings at 2:26 p.m. were concluded.)

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