

RECORD OF ORAL HEARING
U.S. PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

DISH NETWORK LLC, Petitioner

v.

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

IPR2024-00373 (Patent No. 7,594,249 B2)
IPR2024-00393 (Patent No. 7,295,518 B1)

Oral Hearing Held: May 12, 2025

Before JON M. JURGOVAN, SCOTT B. HOWARD, and
AARON W. MOORE, Administrative Patent Judges.

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The above-entitled matter came on for hearing Monday,
May 12, 2025, commencing at 8:58 a.m. CDT, at the U.S. Patent
and Trademark Office Southwest Regional Office, 207 S. Houston
St, Dallas, TX.

P-R-O-C-E-E-D-I-N-G-S

8:58 a.m.

JUDGE JURGOVAN: Okay. We'll go on the record now. And this is the consolidated trial hearing for the following cases, IPR 2024-00373 concerning US Patent No. 7,494,249 B2 and IPR 2024-00393 concerning US Patent No. 7,295,518 B1.

The date is May 12, 2025. It's approximately 10:00 a.m. Eastern. On the panel today are Judges Scott Howard and Aaron Moore, and myself, Jon Jurgovan.

Would the parties please enter their appearances starting with the Petitioner?

MR. SHARTZER: Good morning, Your Honors. Adam Schartzter today on behalf of the Petitioner, Dish Network, LLC.

With me today is my partner Chris Marchese, my colleague Alyaman Amer. He is our LEAP advocate today. Also, my partner Aly -- Aaron Pirouznia may address some issues later in the proceedings as well.

And then with us from Dish Network is Joseph Ale (Phonetic), our corporate representative. Thank you.

JUDGE JURGOVAN: Thank you.

Patent Owner please?

MR. HALVERSON: Good morning, Your Honor. Eric Halverson from K&L Gates on behalf of Entropic, Patent Owner. With me today at Counsel table, Josh Andrews our LEAP

1 representative. And then also in attendance is our lead Counsel, Jason
2 Hale.

3 JUDGE JURGOVAN: Okay. Thank you. Okay. As the
4 hearing order stated, each party will have up to 60 minutes to present
5 their arguments for both cases. In this case, the Patent Owner
6 submitted LEAP requests in both cases which were granted. So
7 Patent Owner gets an additional 30 minutes for its argument, in other
8 words 90 minutes total.

9 But Petitioner bears the burden of proving its case by
10 preponderance of the evidence. So Petitioner will begin with its
11 argument followed by the Patent Owner. Each party may reserve time
12 for rebuttal. That is limited to the opposing parties presentation.

13 You may share your demonstratives so that we can see
14 them on our screens. Or if you prefer, you may refer to the record,
15 and we will follow along with your presentation.

16 When referring to the demonstratives or exhibits, please
17 remember to cite to the paper, the exhibit number, the page number,
18 column number, et cetera, as appropriate so that the record will be
19 clear what you're referring to in your presentations.

20 Please identify yourselves as you begin speaking so that
21 the court reporter will know who you are. And then after the hearing
22 please remain in the room in case the court reporter has any questions
23 to ask you in terms of things that may not have been understood
24 during the hearing.

1 This is a public hearing. So third parties may be listening
2 on the public line. None of the information in the files has been
3 designated as confidential in this case, but if for some reason you need
4 to discuss confidential information, please let us know in advance so
5 we can address the matter.

6 Petitioner filed a motion to exclude in the 393 case. The
7 parties may use some of their time to argue that motion, but it's
8 unlikely that we'll decide it today. And then if you -- I guess I will
9 leave it there.

10 Do the parties have any questions before we begin?

11 MR. HALVERSON: Briefly, Your Honor, I think the
12 LEAP request, there was one for Patent Owner and one for Petitioner.
13 So while I would love 90 minutes, I don't think we're entitled to 90
14 minutes.

15 JUDGE JURGOVAN: Okay. I misunderstood that. So
16 it's 75 minutes a side.

17 MR. HALVERSON: I believe that's correct.

18 MR. MARCHESE: That's correct, Your Honor.

19 JUDGE JURGOVAN: Okay. Good. And then the other
20 thing is how much time would you each like to reserve for rebuttal?

21 MR. MARCHESE: Well from the Petitioner's side, Your
22 Honor. Chris Marchese from Fish and Richardson, we would like to
23 reserve 35. We may end up using somewhere, a little less than 40 in
24 our opening remarks, or maybe a little bit more, but we're roughly at
25 40 I think.

1 JUDGE JURGOVAN: So you'd like to reserve 35
2 minutes.

3 MR. MARCHESE: Yes, Your Honor.

4 JUDGE JURGOVAN: Okay. Patent Owner, how much
5 time would you like to reserve for rebuttal?

6 MR. HALVERSON: And we would like to reserve 10
7 minutes for rebuttal please.

8 JUDGE JURGOVAN: Ten minutes. Okay. Okay. With
9 that, Petitioner when you're ready.

10 MR. AMER: Good morning, Your Honors. Alyaman
11 Amer from Fish and Richardson on behalf of Petitioner. Thank you
12 for this opportunity. Slide 2.

13 Just as a quick road map, I'll start off with the state of the
14 art. Then myself and my colleague, Mr. Marchese will discuss the
15 '518 Patent, and then Mr. Shartzter will discuss the '249 Patent. Slide
16 3, please.

17 So here, just to set the state for our discussion today,
18 we've provided a brief overview of the technological landscape before
19 the priority date of both patents. At that time there were two types of
20 copper wiring that were commonly used, twisted pair, and coaxial
21 cables, or coax for short.

22 Twisted pair consists of two copper insulated wires that
23 are twisted together, hence the name twisted pair. And it can be
24 shielded or unshielded twisted pair.

1 Coax consists of a single copper wire that's surrounded
2 by shielding and insulation. As shown on the left side Figure from
3 Ovadia, initially coax and twisted pair were used for complimentary
4 solutions. Twisted pair for telephone networks and coax for broadcast
5 television.

6 Later on however, as shown in the figure, they both
7 converged to create broadband, or to support broadband networks
8 which are high speed, high capacity networks that provide video, data,
9 and audio.

10 This development of broadband networks created the
11 demand for in-home networks that can distribute broadband data
12 within the home. As shown on the right, from the two citations from
13 Amit, POSITA's looked to existing wiring within the home to develop
14 those in-home networks. That includes both twisted pair and coax.
15 Slide 4 please.

16 But twisted pair and coax weren't just being considered
17 for the same solutions. They were often used within the same
18 network. As shown on the figure on the left from Amit which
19 illustrates Amit's system, both coax and twisted pair are used in the
20 same network.

21 In fact, Petitioner's expert, Dr. Williams testified that he
22 built his own network in the year 2000 that used both twisted pair and
23 coax in his home. Dr. Williams also explained that twisted pair and
24 coax can be used in the same topologies, point-to-point and point-to-
25 multi-point.

1 Dr. Williams also explained in his second declaration that
2 twisted pair and coax can support the same network protocols.
3 Specifically, he explains that ethernet was initially developed on
4 coax's 10 base 2, and later on was implemented on ethernet at 10 base
5 T.

6 Finally, as we'll discuss in detail today, both twisted pair
7 and coax experience the same impairments. That includes
8 interference, signal attenuation, and reflections. Slide 7 please.

9 Turning to the '518 Patent, it's about a data
10 communication network that's implemented on existed wiring
11 infrastructure. This can be seen by comparing Figure 1, which is the
12 existing wiring infrastructure, and Figure 2, which is the data
13 communication network.

14 The '518 Patent introduces network devices shown in
15 yellow that can communicate over the existing wiring. Slide 11
16 please.

17 Turning to claim 1 of the '518 Patent. In addition to
18 reciting the existing wiring --

19 JUDGE HOWARD: I'm sorry to interrupt. I've lost
20 Judge Moore. Can everyone stand by for a moment.

21 JUDGE JURGOVAN: We'll just pause for a minute
22 while they bring back Judge Moore.

23 MR. AMER: No problem, Your Honor.

24 (Whereupon, the above-entitled matter went off the
25 record at 9:09 a.m. and resumed at 9:18 a.m.)

1 JUDGE JURGOVAN: Okay. I think we can proceed
2 again. Apologies for the interruption. And I think we're all back so
3 please continue.

4 MR. AMER: Thank you, Your Honor. Unless Your
5 Honor's would like otherwise, I will continue with Slide 11.

6 So Slide 11 describes the -- claim 1 of the '518 Patent. In
7 addition to reciting the existing network wiring in claim 1, the claim
8 also recites a number of concepts. Multi-carrier modulation, bit-
9 loading, RF-conversion circuitry, and probe messaging for channel
10 characterization.

11 As the patent -- excuse me -- as the petition explains, the
12 patent admits that each of these concepts was known in the art.
13 Therefore it's no surprise that there are no disputed limitations
14 between the parties in the '518 Patent proceeding. And before I hand
15 it over to Mr. Marchese to talk about today's disputes, I want to note
16 to Your Honors that Patent Owner's arguments, or many of Patent
17 Owner's arguments improperly import limitations into claim 1.

18 For example, Patent Owner explains claim 1 by the '518
19 Patent is being directed to an in-home mesh network. But as you can
20 see, claim 1 does not require an in-home or local requirement, and
21 includes at least two network devices. Thank you.

22 MR. MARCHESE: Good morning. Chris Marchese
23 from Fish and Richardson on behalf of the Petitioner Dish. I have
24 extra copies of the slides. Would Your Honor like to have a copy?

1 JUDGE JURGOVAN: We're able to -- we have access
2 to the record, and we can follow along with your slides here.

3 MR. MARCHESE: Okay. Thank you. Can we have
4 Slide 12?

5 So we just heard from Mr. Amer that there are a number
6 of items that are not in dispute. So what are the disputes here and
7 what will I address?

8 First, is analogous art. The question of whether the
9 Isaksson reference is analogous art. And we will address that in our
10 opening remarks.

11 Second is the motivation to combine. Would a POSITA
12 be motivated to combine Isaksson with the other references? In my
13 opening remarks I will address ground 2 only which is the
14 combination of Amit, Jacobsen, and Isaksson.

15 And last is the issue of how a POSITA would combine
16 Isaksson with the other networks, other references to achieve the
17 articulated improvements. And this was kind of a specific issue. It's
18 whether Isaksson, which discloses a dedicated control channel for
19 transmitting control messages precludes Isaksson from being
20 combined with the other references. And we will reserve any
21 argument on that to the rebuttal.

22 All right. So if I could have Slide 30 please. I'd like to
23 start first by discussing ground 2, the combination of Amit, Jacobsen,
24 and Isaksson.

1 UNIDENTIFIED SPEAKER: Excuse me. We lost one
2 of the Judges.

3 JUDGE JURGOVAN: All right. Let's pause again.
4 (Whereupon, the above-entitled matter went off the
5 record at 9:21 a.m. and resumed at 9:27 a.m.)

6 JUDGE JURGOVAN: Okay. It' looks like we're back.
7 Judge Howard, can you hear me?

8 JUDGE HOWARD: Yes, I can.

9 JUDGE JURGOVAN: Judge Moore, can you hear me?

10 JUDGE MOORE: Yes, I can.

11 JUDGE JURGOVAN: Okay. Great. All right. Let's
12 continue. Apologies for the interruption.

13 MR. MARCHESE: Thank you, Your Honor.

14 And back on Slide 30. Here we see Figure 2 from the
15 Amit Patent. It discloses a network that enables device, and device
16 communication over a splitter which is shown in red, and coaxial
17 cables which are shown in blue.

18 Amit also introduces a -- network devices highlighted in
19 yellow that used single-carrier modulation, which we'll come back to
20 repeatedly, to send signals across the tap ports of the splitter. Slide 31
21 please.

22 Now as to motivation to combine, the federal circuit
23 made clear in the Intel v. PACT case, which we cited on the left-hand
24 part of the slide, that there's no need for the prior art to expressly
25 identify a problem.

1 The Court said, universal motivation's known in the field
2 such as in this case, addressing signal impairments are sufficient. And
3 in Dr. William's second declaration which we don't have on this slide,
4 he explained that such impairments were well known in all wired
5 networks. That is paragraphs 23 through 29 in the second declaration.

6 And he also said that a POSITA would have recognized
7 that similar impairments could arise in a mixed coaxial network. And
8 here we have more than what the Intel case requires.

9 As you can see on the right-hand side, Dr. Williams
10 explained his first declaration that Amit acknowledges the potential
11 four problems of reflections, and varying channel conditions. In other
12 words, Amit discloses specific problems in its system. Slide 32.

13 So once a POSITA recognizes that signal impairments
14 exist in a mixed coaxial network, the next question becomes, what
15 were the known solutions. And that's where Jacobsen comes in.

16 Jacobsen addressed the single impairments on coaxial
17 networks. And you can see on the bottom left, problems like
18 reflections, distortions, and channel degradation. Jacobsen also does
19 an in-depth analysis, comparing single-carrier modulation which is
20 used in Amit, which I mentioned earlier, and multi-carrier modulation
21 with bit-loading.

22 And what's bit-loading? It's a technique used in multi-
23 carrier modulation systems to assign a varying number of bits to a
24 particular sub-carrier, or sub-channel within the system according to
25 the signal-to-noise ratio.

1 And Jacobsen concludes the analysis and determines that
2 multi-carrier modulation is both more computationally efficient and
3 better equipped to handle signal impairments than single-carrier
4 modulation, which is in Amit. And given these findings, a POSITA
5 would have seen Jacobsen as a natural fit for improving Amit's
6 network. Slide 40.

7 So let's see how Isaksson fits into the picture. Isaksson
8 teaches a wider broadband network that uses multi-carrier modulation
9 and bit-loading just like Jacobsen. Isaksson adds a discussion of how
10 bit-loading can be implemented in a wired network.

11 In particular, Isaksson discloses using something called
12 base sync frames to detect channel characteristics in the various sub-
13 channels such as in determining the signal-to-noise ratio and thereby
14 uses that information to select bit-loading for each sub-channel.

15 And what they do is, they say that the higher the signal to
16 noise ratio, the more bits you can use on that sub-channel. And
17 conversely if it's a lot of noise, you send fewer bits.

18 Isaksson also introduces the concept to synchronization
19 which ensures network stability. Slide 42.

20 As Dr. Williams explained, a POSITA would have
21 combined into the Amit-Jacobsen system, Isaksson's base sync
22 frames, used for determining bit-loading. And in conclusion, the
23 combination of Amit, Jacobsen, and Isaksson renders claims 1 and 3,
24 which are at issue here, obvious.

1 Now I'd like to turn to another subject and talk about
2 analogous art. Because the Patent Owner, Entropic in this case has
3 challenged Isaksson as being non-analogous.

4 And the argument centers around Entropic's assertion
5 that Isaksson is limited to twisted pair wires. And what they're trying
6 to do is kind of create a divide between twisted pair on the one side
7 and coaxial on the other. And as we'll see, this attempted distinction
8 fails. Could we go to Slide 14?

9 So let's turn to the analogous art issue. And as I've said
10 already, this issue only applies to Isaksson. It is not applicable,
11 Entropic has not made this argument for other references. Slide 15.

12 The Netflix case, which we've cited here on the left from
13 the Federal Circuit, lays out the two tests that define the scope of
14 analogous prior art. First, whether the art is from the same field of
15 endeavor regardless of the problem addressed and if the prior art is not
16 within the same field of endeavor, whether the art is still reasonably
17 pertinent to the problem being addressed by the inventor.

18 And now it's notable that these are alternative tests.
19 Isaksson is analogous if either test is met. I'm going to start with the
20 reasonable pertinence test. And why am I doing that? Because it's
21 broader. We don't need to address the dispute over the field of
22 endeavor because the reasonable pertinence test is easily satisfied.
23 Can we go to Slide 21?

24 At the top of the slide we see --

1 JUDGE JURGOVAN: Counsel, pause for a second
2 there.

3 MR. MARCHESE: Sure.

4 JUDGE JURGOVAN: So you're saying, ignore what the
5 field of endeavor is, you're just relying on reasonable pertinence of the
6 problem?

7 MR. MARCHESE: No Your Honor, actually we're
8 saying that each test is satisfied, but I want to start with reasonable
9 pertinence because it's broader than field of endeavor.

10 JUDGE JURGOVAN: Okay. But I'd like to know what
11 specifically you're claiming as the field of the endeavor here for this
12 patent.

13 MR. MARCHESE: Yes. Thank you. It is wired
14 networking systems.

15 JUDGE JURGOVAN: Thank you.

16 MR. MARCHESE: So on Slide 21 we see the Donner
17 case. And it holds that under the reasonable pertinence test the
18 problem being examined must not be defined so narrowly as to
19 collapse the field of endeavor and reasonable pertinence inquiries into
20 one.

21 But that's exactly what Entropic has done here. If you
22 see the table at the bottom of the slide, it has the parties' competing
23 definitions for the problem. On the left you see the Petitioner's
24 definition, wired network signal impairments. And we submit that's
25 correct. Because the problems identified by the '518 Patent are

1 experienced in nearly all wired networks. Not just coaxial, but also
2 twisted pair.

3 In the middle we see the Entropic definition of the
4 problem for the reasonable pertinence test. It's narrowly defined. It's
5 limited to local coaxial networks with splitters. And on the right we
6 see the field endeavor that is submitted by Entropic. It's essentially
7 same as the reasonable pertinence test.

8 And so this means that the Patent Owner has done what
9 Donner tells us you cannot to, collapsed reasonable pertinence into the
10 field of endeavor. And we submit therefore that the Petitioner's
11 definition of the problem is correct. Regardless, even if you accept
12 the definition from Entropic, Isaksson is analogous.

13 So let's delve a little deeper into the Donner case. If we
14 can go to Slide 22.

15 In its sur-reply the Patent Owner argues that Isaksson's
16 twisted pair system is not reasonably pertinent because there are
17 technical differences from coaxial systems. In particular, the Patent
18 Owner argued that splitters in a twisted pair network have nothing in
19 common with coaxial splitters, and also point to other alleged
20 differences, other alleged technical differences.

21 First it's important to note that these differences are
22 actually red herrings. We, Dish, are only using Isaksson to supply the
23 claim limitation of using probe signals to determine bit-loading. Not
24 for splitters, not for other elements of the claim.

1 Regardless, these alleged differences do not overcome
2 the pertinence of Isaksson. And the Donner case is instructive. As we
3 see here on the slide, it says that a reference can be analogous art to a
4 patent even if there are significant differences between the two.

5 And Donner summed it up. Stated, "There will
6 frequently be significant differences with a reference from a different
7 field of endeavor." And they concluded, but that alone does not
8 defeat the reasonable pertinence test.

9 Despite the alleged differences called out by the Patent
10 Owner, Isaksson is still reasonably pertinent according to Donner. As
11 my colleague Mr. Amer explained twisted pair and coaxial networks
12 are closely aligned. They come from the same area. They were used
13 in homes together to deliver information. They share a development
14 history. They use the same protocols. They're even used together in
15 networks as Amit disclosed.

16 JUDGE JURGOVAN: Can I ask a question here?

17 MR. MARCHESE: Sure.

18 JUDGE JURGOVAN: And that is, is there -- do you
19 agree with Patent Owner that there's a difference between a splitter
20 use in a coaxial network and a splitter used in a twisted pair network?

21 MR. MARCHESE: We do Your Honor. Yes. We're not
22 disputing that difference.

23 JUDGE JURGOVAN: Thank you.

24 MR. MARCHESE: But our position is it's not relevant
25 here to this test.

1 JUDGE JURGOVAN: Understood. Thank you.

2 MR. MARCHESE: Now if we go to Slide 25, the '518
3 Patent itself proves that Isaksson is analogous. Here we see a passage
4 from the '518 Patent that introduces bit-loading which is claimed.
5 And in it, in the highlight, the '518 inventor cited to a patent, we'll call
6 it the '174, the last three digits, and cited it as an example of bit-
7 loading.

8 And the '174 Patent shares inventors with the Isaksson
9 reference, including Mr. Isaksson. And both claim the same priority
10 date. And here, the '518 inventors are expressly acknowledging that
11 the '174 Patent relates to twisted pair wiring.

12 And so it's clear that the inventors of the '518 Patent
13 themselves considered Isaksson's bit-loading to be reasonably
14 pertinent to the problem they were addressing. In fact, it's notable,
15 they even incorporated the '174 Patent by reference into the '518
16 Patent.

17 So we submit that this is objective evidence that the
18 inventors themselves considered Isaksson and it's bit-loading
19 discussion to be analogous art. Slide 23.

20 As further evidence, the DSL textbook, which we've
21 quoted here, explains that the same problems occur in twisted pair and
22 coax systems. On Slide 24, both experts on each side agree that the
23 same problems occur in twisted pair and coax networks. They are not
24 so different as Entropic would have the Board believe.

1 If we move to Slide 27, we're not going to dwell on this,
2 there's a lot of information here. In short, it shows that the same kind
3 of signal impairments occur in the '518 Patent and Isaksson as they're
4 compared side by side here.

5 In sum, Isaksson is reasonably pertinent prior art and is
6 analogous. And as we'll see now, it's also in the same field of
7 endeavor. Can we go to Slide 16?

8 We've cited the Netflix case in the upper-right. And it
9 identifies three situations that are not limitations on the field of
10 endeavor. And the second one is particularly relevant.

11 It states, "The narrowest possible conception of the field
12 is not a limitation." Now let's look just beneath that block in the upper
13 right, and we see this excerpt from the '518 Patent. Technical Field is
14 the title.

15 And just below, it defines the technical field. And it
16 begins with a broader field. It says broadband communication
17 networks. And then it's narrowed specifically to communications
18 using coaxial cable which is what Entropic would like to be the field
19 of endeavor, and even narrower actually.

20 And so according to Netflix, the narrower statement
21 requiring coaxial cable should not limit the field of endeavor. It really
22 should be the broader statement.

23 And just below is another excerpt from the patent that
24 backs this up. And it's from the background of the invention. And

1 here, the '518 inventor is reciting a series of wired networking
2 references.

3 And the introductory sentence, as we say here, when they
4 introduce each of these references, they use the broad statement.
5 Broadband networks. Same as the technical field.

6 Now the table on the left is the field of endeavor
7 definitions. And the Petitioner's field of endeavor is consistent with
8 the technical field. It doesn't require coax, it doesn't require splitters.
9 It's wired networking systems.

10 In contrast, the Patent Owner is proposing a field of
11 endeavor that's even narrower than that narrower statement in the
12 technical field. They're requiring not just coaxial cable, but if you
13 look here, we see a local cable network, and then splitters in their tap
14 ports.

15 And one point that I think is important to note here, why
16 we have two rows for the Patent Owner, Entropic, in this table. It's
17 because they're statement for the field of endeavor changed as the
18 briefing progressed.

19 In their Patent Owner response they called it wire
20 networking systems using coaxial cables in a local network context.
21 Then we get to the sur-reply, it's narrower, adding splitters and their
22 tap ports.

23 JUDGE JURGOVAN: Does the term wired networking
24 systems appear anywhere in the '518 Patent?

1 MR. MARCHESE: I think it is not exactly those words,
2 but we submit it is consistent with broadband networks.

3 JUDGE JURGOVAN: It says the technical field is
4 broadband communication networks, why not just go with that?

5 MR. MARCHESE: I mean, we could go with that. It --
6 we wanted to get the wired piece of it in there because I think it's fair
7 to say that these references are all wired.

8 JUDGE JURGOVAN: Okay. Thank you.

9 MR. MARCHESE: I'd like to just briefly preview an
10 issue that we're likely to hear from Entropic in their presentation. We
11 think they're going to argue that Dr. Williams, Dish's expert, admitted
12 in his first deposition that the field of endeavor is limited to wired
13 coaxial networks.

14 But that's not accurate. And if that's argued by Entropic
15 in their presentation, we'll address it in rebuttal as to why it's not
16 accurate. Just wanted to sensitize Your Honors to that.

17 Now back to the bottom right of the Slide 15 -- excuse
18 me, Slide 16. There's a paragraph right after the one that we're
19 quoting here that I'd like to show you next which is Slide 17.

20 And here, the inventors are summarizing each of the
21 broadband references that were referenced previously. And notably
22 the patent states that this Rubenstein patent which we highlighted,
23 discloses a method of transporting ethernet over twisted pair wires,
24 not coax. So the inventors themselves we submit, believed that the
25 field of endeavor is broader than coax.

1 On the right you see more references cited in the
2 specification. These are related to bit-loading. One of them we've
3 seen before. That's the Isaksson '174 Patent., twisted pair. Beneath
4 that, the '967 Patent, twisted pair.

5 So when the inventors were talking about bit-loading
6 which is in the claims, they were talking about twisted pair references,
7 and they incorporated them by reference. Quite clearly, twisted pair is
8 in the same field of endeavor as the '518 Patent.

9 If we go to Slide 18, and we submit Isaksson is
10 analogous under either field, whether you take their narrow field or
11 the broader field that we've defined. First let's look at our field which
12 is wired communication networks.

13 Isaksson is directed to this field of endeavor, and
14 Isaksson is not limited to twisted pair. If we look at the example text
15 that is highlighted at the top it states, from Isaksson, "It should be
16 emphasized that the present invention can be used with other multi-
17 carrier systems employing dynamic bit-loading." Nothing about
18 twisted pair.

19 Slide 19. Even under the Patent Owner's, Entropic's
20 narrow field of endeavor which requires coaxial network, a local
21 network with splitters, Isaksson meets this definition. We see on the
22 left Isaksson addresses a multi-carrier system which may be digital
23 multi-tone, also abbreviated as DMT. Which may either ADSL or
24 VDSL standardized protocols.

1 And then Isaksson mentions at the bottom of the
2 paragraph which we've highlighted, that the use of VDSL can be done
3 with something called DAVIC. It's another industry standard.

4 And Isaksson discloses that the DAVIC specification
5 enables premises, premises is local just like the Entropic definition,
6 distribution of VDSL signals over coaxial cable systems. Isaksson
7 explicitly acknowledges the use of the invention in that context.

8 And on the right, Dr. Williams agrees. So in sum
9 Isaksson is analogous art under either test. And I will stop my
10 presentation and turn it over to Mr. Shartzler. Thank you.

11 JUDGE JURGOVAN: Thank you.

12 MR. SHARTZER: I'm going to start with Slide 59.
13 Good morning, Your Honors. Adam Shartzler with Fish and
14 Richardson here on behalf of Dish.

15 I'll address the '249 Patent this morning. There are four
16 grounds in the '249 Patent petition. I just want to correct one thing
17 with respect to this slide. Ground 3 include claims 16 and 17. And
18 then Ground 4 should be listed there as including claims 2 through 3,
19 7, 9 through 13, 15, and 17. And in the petition we have an accurate
20 depiction of the grounds chart.

21 Why don't we go to Slide 58 now. And we'll start with
22 '249 Patent. The '249 Patent, it's purported novelty is the addition of a
23 filter at the point of entry of the building wiring. And this filter, what
24 it does is that it reflects transmitted signals back down to the network

1 so that the terminal devices on the network can communicate using
2 the reflected signals that were reflected down.

3 Turning to Slide 60, I'm going to turn to the '249 Patent.
4 The issues are fairly narrow in the '249 Patent. Most of the paper is
5 spent by Entropic arguing whether or not the art is analogous or
6 whether there is a motivation to combine. But when it comes to actual
7 disputes as to the disclosures of the prior art references, the issues
8 remaining are fairly narrow. So for claim 1, Entropic disputes
9 whether the prior art discloses one of the terminal devices providing
10 frequency bins.

11 Turning to Slide 61, Entropic has the same argument
12 with respect to claim 5. And then turning to Slide 62, Entropic has a
13 similar argument with respect to terminal devices. But their concern
14 there is that, Entropic argues that terminal devices are not disclosed as
15 performing equalization. So we'll touch on those issues.

16 And then there are some questions that Entropic has
17 raised regarding prior art disclosure as to claims 2, 9, and 17.
18 Otherwise, Entropic's arguments essentially boil down to motivations
19 to combine and analogous art arguments.

20 Let's turn to Slide 63.

21 JUDGE JURGOVAN: Counsel, can I ask a question
22 here? These terminal devices that have, they operate at multiple
23 frequencies, were those in the prior art at the time of these patents?

24 MR. SHARTZER: Yes, Your Honor, they were.

25 JUDGE JURGOVAN: Thank you.

1 MR. SHARTZER: So even Amit, for example that we
2 start with, discloses a home networking cable modem that operates at
3 multiple frequencies. So -- and then the additional art that we will
4 discuss, ADSL and Jacobsen also give us the teachings of devices that
5 are performing multi-carrier modulation.

6 JUDGE JURGOVAN: Were they commercially
7 available at the time? Do you know?

8 MR. SHARTZER: You know, Your Honor I wouldn't be
9 able to say for certain if they were. I do know that OFDM was
10 introduced into cable systems --

11 JUDGE JURGOVAN: Sure.

12 MR. SHARTZER: -- before it was introduced into DLS.

13 JUDGE JURGOVAN: Sure.

14 MR. SHARTZER: So my understanding is that they
15 were available at some level.

16 JUDGE JURGOVAN: In terminal devices for use in a
17 home.

18 MR. SHARTZER: Oh, in terminal devices for use in a
19 home. Your Honor, that's not something the parties have briefed.

20 JUDGE JURGOVAN: Okay. Thank you.

21 MR. SHARTZER: All right. So turning to slide -- let's
22 start with Slide 64, going into the analogous art arguments. Entropic
23 argues that the references that are cited in the specification of the '249
24 Patent are not analogous prior art.

1 The '249 Patent, just before it goes into the claims, it
2 talks about OFDM systems. And it says if you, the interested public,
3 want to learn more about how to implement OFDM systems and
4 engineer them, refer to these DSL references which describe OFDM.
5 Or in other parlance, DMT, discrete multi-tone.

6 Entropic's not cited any case law for the proposition that
7 if you the inventor point the public to certain disclosures and say, look
8 at these disclosures to understand how aspects that we have claimed
9 operate. OFDM for example. They've cited no case law to suggest
10 that in that type of situation the cited prior art in the specification is
11 not analogous.

12 Now we'll turn to Slide 65. We asked Entropic's expert
13 Mr. Bates. We said, at the time of the '249 Patent what are some
14 examples of the extrinsic evidence that one would look to. And he
15 cited OFDM modulation. And what he told us is, if you want to know
16 about that you go to the books that the patent cites. And these are the
17 books, the DSL books that are published. And that's the type of
18 extrinsic evidence that a POSITA would go to at the time of the '249
19 Patent.

20 Turning now, skipping ahead a bit to Slide 69. I
21 mentioned the ADSL reference. There are differing, competing fields
22 of endeavor. But under either parties' proposed field of endeavor, the
23 ADSL reference falls within the field of endeavor.

24 ADLS specifically discloses coax networks. That coax
25 networks can handle high bandwidths. Entropic tries to narrow the

1 field of endeavor to just local area networks operating with coaxial
2 wiring, but even if that narrower definition were accepted, ADSL falls
3 within that field of endeavor.

4 Next slide, we'll move to Slide 73. You heard my
5 colleague, Mr. Marchese talk at great length about the Donner case
6 and reasonably pertinent and how that's another aspect of the test for
7 analogous art.

8 Certainly, under this broader reasonable pertinence test
9 ADSL also is analogous art. ADSL for example, it addresses the '249
10 Patent's problem of providing a suitable path for terminal-to-terminal
11 communications.

12 And ADSL specifically recognizes, here we show this on
13 the right-hand side, it recognizes that channel conditions will change
14 over time. And it teaches using techniques like equalization
15 performed at the transmitter, at the receiver, or at both the transmitter
16 and receiver. So certainly, ADSL is discussing equalization
17 performed at terminal devices.

18 Now I want to shift over to ground 2. We'll move to
19 Slide 75. And then I think we can actually just go ahead and move on
20 to Slide 76. Your Honors, ground 2 wasn't addressed by the
21 institution decision. So that's why I want to spend a little bit of time
22 this morning on ground 2.

23 At least a year before the '249 Patent Amit, the primary
24 reference here, disclosed the exact problem and solution to the
25 problem that the '249 Patent purports to solve. Amit knew that there

1 were problems with signals and communications and a network, and
2 Amit came up with a solution to allow terminal devices to
3 communicate with each other downstream of a splitter or a notch filter
4 as Amit describes it.

5 And it's the same solution. Reflect signals back down
6 from the notch filter, and then all of the terminal devices can
7 communicate to each other on those reflective signals.

8 Turning to page, or Slide 77. Here we see Figure 2 of
9 Amit. Amit discloses that a signal comes in from the cable TV
10 network. It goes through the notch filter, and then the RF splitter.
11 And it's using coax wiring over that feed.

12 And then it ends up at terminal devices in the network.
13 The first spot that that signal ends up from the cable TV provider is,
14 I'll turn Your Honor's attention to unit 206 there in Figure 2. That's
15 the home networking cable modem. That's the device that allows
16 signals to pass between the cable TV network and the home network
17 as well.

18 So from that home networking cable modem, signals are
19 then further passed along an ethernet wire to a PC. And then twisted
20 pair wiring to a phone.

21 So what Amit describes is a network system that's using
22 many different types of wiring. Coax wiring, ethernet wiring, and
23 twisted pair wiring just to name a few.

24 Let's turn to Slide 78.

1 JUDGE JURGOVAN: Can we say there for just a
2 second?

3 MR. SHARTZER: Yes.

4 JUDGE JURGOVAN: The question is, so this notch
5 filter is optional. And Amit, correct me if I'm wrong, appears to use
6 this notch filter when you're using a single frequency. But then has
7 another embodiment where if you're using multiple frequencies you
8 don't need the notch filter.

9 And I think Patent Owner grabbed a hold of that and says
10 that well, that's a reason why you know, you wouldn't combine Amit
11 with these other references. How do you respond to that?

12 MR. SHARTZER: Well, let me respond to that by --
13 let's, why don't we move to the next slide just ahead of me, Judge
14 Jurgovan.

15 JUDGE JURGOVAN: Oh, I apologize.

16 MR. SHARTZER: No, that's fine. Please, it's great. So
17 jump to Slide 79. You mentioned different embodiments.

18 Actually, let's go back to Slide 78 if you don't mind.
19 Slide 78 actually describes two different modes. Right. So Amit
20 describes single home operation mode and connected home operation
21 mode.

22 Now Entropic tries to argue that those are two separate
23 embodiments that are mutually exclusive of each other. But when you
24 do a holistic read of Amit, what we understand, and let's now move to

1 Slide 79, is that that notch filter, it can be optional but there's still a
2 connection in that network to the home networking cable modem.

3 And what Amit describes for us is that that home
4 networking cable modem, it bridges messages between the home
5 interface to the cable channels and vice versa. So we're able to
6 communicate seamlessly between both the home network and the
7 cable TV network.

8 And so I think a holistic read of all of Amit's disclosures
9 leads the POSITA to understand that there's not a mutually exclusive
10 network that is the home network, by itself, disconnected from the
11 cable network at all times.

12 So why don't we then move to Slide 82. Because Amit
13 addresses this issue of communications going between the cable TV
14 network and the home network as well. But Amit also recognizes that
15 there were certain challenges in building out this network.

16 Amit describes that different modulation methods needed
17 to be used based upon channel conditions at the time. So in Amit's era
18 you would use QPSK or QAM at different levels, 16, 64, 256.

19 Amit also recognizes that cable and frequency resources
20 are limited. And that reflections, while they can be helpful, they can
21 also create problems in a system. And so problems in network
22 communication occur when we have high levels of reflection for
23 example.

1 And then Amit also recognizes the need to have highly
2 scalable bandwidth across networks. A hundred kilo-bits per second
3 on up to a ten mega-bit per second need.

4 So what would a POSITA look to if they were looking at
5 Amit and thinking about improving on Amit's network? Let's go to
6 Slide 81 where we introduce again ADSL. And ADSL, as we
7 discussed, it describes coax modems and using coax to handle high
8 bandwidths.

9 We'll jump to Slide 83 and dig a little further into
10 ADSL's disclosures. A POSITA would recognize that ADSL teaches
11 solutions to Amit's motivations to provide networks with higher bit-
12 rates. And how does ADSL address that?

13 Well, ADSL says, look to equalization and you can
14 perform equalization to optimize the channel and account for noise
15 and channel impairments as you're communicating. But ADSL
16 doesn't stop there. ADSL also describes DMT.

17 And what it tells the POSITA is that discrete multi-tone,
18 or otherwise known as OFDM. Discrete multi-tone builds on the
19 ideas of QAM. And we saw Amit's disclosures earlier of QAM
20 modulation at 16, 64, and 256.

21 Now I want to move to Slide 84. And Dr. Acton's
22 declaration brings it together. He says, a POSITA would have known
23 to use the ADSL teachings, building upon QAM and combining Amit
24 to create a combined system.

1 And in this combination modulation is performed by
2 terminal devices. Again, Amit discloses home networking devices
3 that are performing modulation. And these are the terminal devices
4 that are claimed by claims 1 and 5.

5 And they're not shown here on the slide. I do want to
6 note for the record that ADSL, which is Dish 1006, at pages 171 and
7 172, they specifically disclose that a POSITA can improve upon Amit
8 by using DMT where the frequency bins that have better signal to
9 noise ratios, those are the frequency bins that are used to transmit
10 more bits. And that discloses again, the sort of disputed limitations of
11 claims 1, and 5.

12 Let's turn to Slide 85. Again, there are some disputes
13 about whether or not equalization is performed by terminal devices.
14 But again, we see Amit's disclosure here of modems which are the
15 terminal devices in Amit's network. And we see that, here on the left-
16 hand side of Slide 85, that Amit describes modems being used to
17 perform equalization. And so the combination of those renders
18 obvious, certainly claim 10 of the '249 Patent.

19 Let's move to Slide 86 where again we see this home
20 networking cable modem. Again, a modem, it's a terminal device
21 under the '249 Patent parlance. And again, ADSL teaches us that
22 equalization can be performed by modems.

23 Turning to Slide 88, we asked Mr. Bates about the types
24 of things that you would consider when designing a network, and you
25 had to deal with issues of reflections. And what he told us is that

1 when you're dealing with reflection, he couldn't come up with a
2 reason why a system designer would not look to equalization to
3 address the negative impacts of high reflections in a network.

4 Now I want to address a couple of other claims. We'll
5 turn to Slide 89. Claim 17 is cited here on the slide, but there's similar
6 claim language for dependent claims 2, and 9.

7 Those claims require TDD which is time division duplex.
8 Whether time division duplex is accomplished by synchronizing the
9 time that different network devices will communicate. And those are
10 synchronized in the '249 Patent by what is called a beacon message.

11 Well ADSL teaches beacon message. What ADSL
12 teaches us, is -- they use a slightly different term, it's pilot tones. But
13 pilot tones perform the same exact function as beacon messages in the
14 '249 Patent. Pilot tones are used to synchronize time and ensure that
15 the devices are communicating in the proper time slots in a TDD
16 implementation.

17 JUDGE JURGOVAN: Is there a distinction between a
18 tone and a message? A tone to me sounds like some fixed frequency
19 that's being used as something you lock on to. Whereas, a message
20 seems like something that's sent from one device to another.

21 MR. SCHARTZER: In both cases, they're both signals
22 Your Honor. A pilot tone gets reserved its own sub-channel, so to
23 communicate in a multi-carrier frequency situation. But it's
24 essentially a signal being sent in order to synchronize all the terminal

1 devices on the network that would be communicating in that DTT
2 situation.

3 JUDGE JURGOVAN: Do you know why it's called a
4 tone?

5 MR. SHARTZER: I don't know why it's called a tone,
6 Your Honor. I didn't really see that honestly described.

7 But let's look to -- I'm going to move to Slide 90 because
8 I want to focus the Board on what the '249 Patent teaches us. The
9 '249 Patent doesn't limit beacon messages to excluding tones, for
10 example.

11 It's just two sentences in the '249 Patent that describe
12 beacon messages. And they're described as being used to synchronize
13 user messages by providing a common time reference. And Your
14 Honor's, that's exactly what the pilot tone of ADSL does.

15 Okay. All right. So let's move to Slide 92.

16 JUDGE JURGOVAN: Counsel, you're into your rebuttal
17 time, just so you know.

18 MR. SHARTZER: Thank you, Your Honor. Yes. We'll
19 wrap shortly. Just a couple of slides on ground 3.

20 So ground 3 is the combination of Amit and Jacobsen.
21 You heard a lot from Mr. Marchese about the motivations to combine
22 the Amit and Jacobson references.

23 And so turning to Slide 95. As the ID recognized,
24 reflections in a network can be beneficial, but they can also be

1 detrimental. So a POSTIA would have looked to different techniques,
2 and specifically the techniques of Jacobsen to manage reflections.

3 Now I want to move to Slide 96. Entropic argues that the
4 Jacobsen reference is silent regarding terminal devices providing
5 frequency bins for claims 1 and 5. But Jacobsen teaches this.

6 It's at page 307 of the Jacobsen reference. And it teaches
7 that the receiver and the transmitter participate in providing frequency
8 bins, and that the receiver, ultimately the receiver and the terminal --
9 the transmitter are in fact terminal devices. At page 307 Jacobsen also
10 teaches us that you would load more bits onto the channels that have
11 the higher or better signal to noise ratios.

12 Let's turn to Slide 97. I just have two more slides, Your
13 Honor. With Slide 97 I wanted to address the institution decision
14 which found that the POSITA, adding Jacobsen's multi-carrier
15 modulation to Amit's network would not utilize equalization because
16 Jacobsen compares single carrier modulation with equalization and
17 compares that to multi-carrier modulation and bit loading. And it
18 determines, Jacobsen determines ultimately that multi-carrier
19 modulation with bit loading is more efficient.

20 But Your Honors, nothing in Jacobsen suggests that you
21 would never perform equalization on a multi-carrier signal. So I want
22 to direct the Board's attention to footnote 4. And we cited this in the
23 petition at page 70.

1 But footnote 4 is important in Jacobsen. Because
2 Jacobsen provides us a specific example of when you would consider
3 using equalization with multi-carrier modulation.

4 Jacobsen describes that you can do multi-carrier
5 modulation, but if you want to use smaller FFT sizes, which is less
6 costly, less complex, you may -- that may come at the cost of
7 increasing the cyclic prefix size. And if you increase the cyclic prefix
8 size you don't have as much room to send data.

9 And so what Jacobsen proposes is that in order to address
10 the cyclic prefix size when you want to have smaller FFT sizes, you
11 would perform equalization on a multi-carrier signal. And so
12 Jacobsen gives us the reasons and the motivations and the problems
13 and the solutions to the problems for why we would use equalization
14 with multi-carrier modulation.

15 And so turning to Slide 98. Your Honors, Jacobsen
16 simply concluded that discrete multi-tone modulation is more
17 computationally efficient than single-carrier modulation with
18 equalization for transmitting cable -- data over cable TV channels
19 with rippled passbands.

20 But importantly, what Jacobsen did not conclude is that
21 multi-carrier modulation without equalization is somehow preferable
22 over multi-carrier modulation with equalization. And so we would
23 just respectfully request that the Board simply take another look at
24 Jacobsen, the arguments that were made in the papers, and particularly
25 footnote 4. I think it's important for that ground.

1 Thank you, Your Honors.

2 JUDGE JURGOVAN: Thank you.

3 Petitioner, when you're ready. I'm sorry. Patent Owner,
4 when you're ready.

5 MR. SHARTZER: Your Honor, we addressed this. The
6 clock at 90. It should start at 75.

7 JUDGE JURGOVAN: Oh, I'm sorry. Yes. You're right.

8 MR. SHARTZER: No, it's okay. I just want -- thank
9 you.

10 JUDGE JURGOVAN: Yeah. Thank you. When you're
11 ready.

12 MR. HALVERSON: I don't have that much to say. I
13 couldn't have gotten to 90 if I wanted to.

14 Good morning, Your Honors. Eric Halverson with K&L
15 Gates on behalf of Patent Owner, Entropic. And I want to start today
16 with the '249 Patent. So we're going to go in reverse order from
17 Petitioner's challenge. But before we dive in to responding to
18 Petitioner's challenge, I want to highlight a couple of points that are
19 essential to understand about the '249 Patent.

20 The first is the '249 is a coaxial reference. And as we're
21 going to talk about in a little bit, the medium of the network is
22 incredibly important. It cannot be disregarded.

23 The second is the bulk of the Petitioner's challenge relies
24 on non-analogous art in the form of two DSL textbooks that are
25 seemingly relied upon solely because they're referred to in the

1 background -- or excuse me -- in the specification of the '249 Patent
2 itself. You see that in column 8, approximately line 55 of Exhibit
3 1001.

4 Now this non-analogous art should not allowed to be part
5 of the obviousness challenge simply because the inventors identified a
6 potential solution. And we'll get some case law on this in a second.
7 But the hindsight view through the Petitioner analyzes the art it relies
8 upon is improper.

9 Now the '249 Patent claims a specific network, specific
10 components on that network that perform certain functionality. In the
11 petition, based significantly on expert testimony, combines local
12 coaxial networks in the form Amit with out of home wide area
13 networks, and ignores the differences between those networks in order
14 to cherry pick certain functionality from one reference to another
15 reference without regard to what's actually being described, analyzed
16 and concluded in those references.

17 Now we've heard a lot from Petitioner about what their
18 challenge is, and a lot of it boiled down to well, this was known. This
19 was a known concept. Well known concepts is not obviousness.
20 That's not what the obviousness inquiry is.

21 The obviousness inquiry centers around what would a
22 person of ordinary skill in the art have done, and why would they have
23 done that. And the petition, and it's overreliance on expert testimony,
24 which under the current guidance from the Board appears to be

1 disfavored now, further confirms the overreach that is the Petitioner's
2 challenge.

3 Now, Mr. Shartzter seemed to suggest that the only
4 disputes were motivation to combine or analogous art. These disputes
5 are foundational disputes to an obviousness challenge. Those have to
6 be met before you can even look at whether or not the prior art teaches
7 certain claim elements.

8 Now the reliance on these textbooks, which themselves
9 are simply an overview of technologies, is underscoring the difficulty
10 of trying to use those in an obviousness challenge. Because the
11 textbooks don't explain why you're doing something. The textbooks
12 simply identify discreet teachings of certain functionality.

13 Now this morning I'd like to focus primarily on claim 10
14 of the '249 Patent. Claim 10, there are some specific limitations here
15 about what these terminal devices do. And as we'll talk about in just a
16 second, is not present in the prior art.

17 So what is claim 10? Claim 10 requires coaxial, local
18 area network, coax cable inside of the building. A filter at the point of
19 entry. A splitter which based on what's in the claim is a coaxial
20 splitter, not just any generic splitter. And then terminal devices that
21 are required to perform equalization.

22 Now briefly on this last element, terminal devices
23 element, as was talked about a little bit in the pre-institution papers,
24 there was a re-examination filed by Unified against this same patent
25 using this same Amit reference.

1 And there, the Patent Office concluded that this terminal
2 device performing equalization of the received signal wasn't taught.
3 Now there are also some arguments that we may get to depending on
4 time regarding the notch filter and other things about the SNR
5 binning.

6 But our focus this morning, I really want to be on claim
7 10.

8 JUDGE JURGOVAN: Can I interrupt for a second?

9 MR. HALVERSON: Of course.

10 JUDGE JURGOVAN: So this preamble, is that limiting?
11 The preamble of claim 10.

12 MR. HALVERSON: It breathes life into the claims,
13 Your Honor. It's not limiting in the sense of a -- or it's not limiting
14 because it provides antecedent basis, but it does give color as to what
15 it is, what the patent is directed toward, and what it is --

16 JUDGE JURGOVAN: So your position is that it is
17 limiting.

18 MR. HALVERSON: At least in so far as the coaxial
19 elements are part of the splitter limitation. Yes, Your Honor.

20 JUDGE JURGOVAN: Thank you.

21 MR. HALVERSON: So what is the '249 Patent? '249
22 Patent came to be because the inventors, who at the time were
23 working for Entropic, specifically on coaxial networking technology,
24 identified a problem associated with using home cable wiring for
25 LAN-based communications.

1 Specifically they identified a problem tied to the splitters
2 because the tap ports, which is the output port of a coaxial splitter, has
3 significant isolations between those tap ports. Now for normal splitter
4 operation that makes perfect sense.

5 You're sending a TV signal in, you want to make sure
6 that the TV that's upstairs viewing one channel, isn't mirroring down
7 on a different channel. And when those communications come back
8 from the TV, you don't want to have those reflections inadvertently
9 causing distortion to the signal on the downstairs TV when you're
10 upstairs, or changing the channel on the downstairs TV.

11 So this isolation, is something that was intentionally built
12 into these splitters. But when you shift from a primarily downstream
13 one-directional with a little bit of control information coming back to
14 a home networking solution, this bidirectional communication
15 becomes essential.

16 And this port-to-port isolation problem can lead to signal
17 distortion, inter-signal interference, or ISI, and signal ghosting. So
18 what does the prior art do?

19 Petitioner's primary reference is Amit, 1005, and it's used
20 in all grounds. Now undeniably Amit has terminal devices. But also
21 undeniably, Amit's terminal devices do not perform any equalization.
22 And as we saw in claim 10, it's an essential element of what claim 10
23 is.

1 There's also no disclosure in Amit of any SNR binning,
2 excuse me, which is the assignment of different bit loading onto
3 different channels, or different carriers based on channel conditions.

4 Instead, what is Amit? Amit is a low-cost, single-carrier
5 network. Now, it's not exactly the model of clarity, but it is crystal
6 clear with regards to two things. One, it's a low cost, simple solution
7 which must allow for easy solution.

8 We see that in the call out on the right of Slide 6, where it
9 explains from 18:24 to 44, what it is that this network must be.
10 Simple to install and use. Low cost to allow mass market to enjoy the
11 benefits of home networking. Grow as user applications without
12 obsoleting existing devices. Must not be accessible to neighbors or
13 anyone outside of the home. You've got to seal off your network so
14 that your neighbor's network doesn't somehow impact yours.

15 And if we quickly hop ahead to Slide 37, there was some
16 discussion earlier about the notch filter and what it is and how it was
17 set up. And we submit that Amit is clear. A notch filter is a filter at
18 the entrance to the home. And if this notch filter exists in the home
19 network, the home network is disconnected from the regional cable
20 network.

21 We see that on Slide 37 which is a call out from
22 1005:7:12 to 35. And so we also see similar disclosures -- pardon me.

23 We see similar disclosures, still in column 7, a little bit
24 further down at approximately line 39. One way that this notch filter

1 can be detected is to figure out or to answer a query, is notch filter
2 exist. Or in slightly better English, does the notch filter exist.

3 The sentence goes on, and the next sentence goes on to
4 say, this query can be used by the HCNP to verify the type of
5 operating mode that should be handled if the components supplied the
6 two modes. This query, the response to this query, is notch filter
7 exist, determines what operation mode we're operating in.

8 And we see further up, and it's confirmed at column 7
9 line 12 where it says, the HomeCN operation modes are determined
10 according to the existence or non-existence of the notch filter at the
11 home entrance.

12 And then we also see up at the very bottom of column 7,
13 into the top of column 8, beginning at line 66 through line 3. There's
14 a discussion about how certain components don't support frequency
15 selection capability when those components are working in Single
16 Home operation. And Mr. Andrews will get to that in a little bit about
17 what the frequency selection capability is and where that comes from.

18 But it's determined by the presence and absence of a
19 notch filter. Amit is not set up as broadly as Petitioner would have
20 everybody believe.

21 Now this matters because Petitioner relies on certain
22 disclosures from the connected home embodiment and other
23 disclosures from the single home embodiment, ignoring the fact that
24 these are two not only separate, but distinct, operationally distinct
25 embodiments.

1 Can we go back to Slide 7 there? So in ground 3, the
2 Petitioner addresses terminal device equalization in its petition from
3 page 69 through 71. Not once in that section does the petition even
4 allege that there's a terminal device that performs the claimed
5 equalization.

6 As Mr. Bates explains, there's no teaching of how any of
7 those terminal devices in Jacobsen would perform such equalization
8 because Jacobsen is entirely directed towards an out-of-home
9 network. The way that Jacobsen's equalization is done, is that it's all
10 done at the CMTS, cable modem termination system, which is
11 effectively something that is put in the neighborhood, distributes cable
12 signals from the CMTS out to the home. That's not a terminal device,
13 it's an in-line device.

14 Now this is problematic for the proposed ground because
15 in the embodiment necessary for the claimed filter that we saw when
16 we had claim 10 up, that filter cuts off all communications from the
17 CMTS. That's the whole purpose. There is no back and forth network
18 ability, network communication back to the CMTS in Amit when the
19 notch filter is present.

20 Now Mr. Shartzer cited some disclosures in Jacobsen
21 saying that there was a communication between a receiver and a
22 transmitter, and as a result these terminal devices were doing
23 equalization.

24 And I would direct Your Honor's back to that slide. I did
25 not write it down, I apologize. But if you look at what that section of

1 Jacobsen actually says, it is the transmitter, the CMTS, that is
2 performing the equalization. It is the receiver, which is the cable
3 modem in the home, that is sending information back to the CMTS.

4 Now what the '249 Patent improved upon was actually
5 doing this in the terminal devices. Taking that functionality that
6 would otherwise would have been out in the network, and
7 incorporating it into terminal devices in the home.

8 Now the mere existence of equalization in a network is
9 not enough to render obvious the claimed equalization being
10 performed in the terminal devices. For example, we see in the
11 ADSL/VDSL book that equalization can be either transmitter-based or
12 receiver-based.

13 And so in Exhibit 1006 at 55, it's talking about receiver-
14 based equalization and identifies some problems associated with that.

15 And then at 60 it talks about transmitter-based equalization. This is
16 acknowledged by the Petitioner at page 32 where it cites to Exhibit
17 1006 at 187, that's 187 up at the top. It corresponds to page 48 of the
18 Exhibit down at the bottom.

19 So this acknowledgement of this broad-reaching
20 equalization is exactly what the problem is with the Petitioner's
21 challenge. It amounts to simply concepts were known, but known
22 concepts does not render obvious specific claims.

23 Moreover, the introduction of this complexity to Amit to
24 perform this equalization in these terminal devices is contrary to the

1 simple teachings of Amit. Excuse me, the teaching of Amit regarding
2 simplicity and ease of use.

3 And more importantly, contrary to the actual teachings of
4 Jacobsen, as the Board noted in the institution decision Jacobsen's
5 clear. It analyzed two things and it came to a conclusion.

6 Now Petitioner again would say well look, Jacobsen says
7 that certain things are known in footnote 4, certain things are known
8 in other references, certain things were known because they were
9 analyzed. But that's not the obviousness inquiry.

10 The obviousness inquiry requires reading the entirety of
11 Jacobsen and coming to a conclusion based on what Jacobsen's
12 teachings are, not just what individual discreet portions of Jacobsen
13 say.

14 Now Jacobsen itself is also clear. It says it's too
15 complicated. It's going to increase the complexity of a system by at
16 least two-fold. Exhibit 1007 at 13. Adds unnecessary processing
17 delays, and in fact part of the equalization discussion explains that
18 doing so would add a prohibitive number of tap ports to its system.
19 That's Jacobsen at 14.

20 Jacobsen is clear that multi-carrier modulation is better
21 equipped to handle the network conditions. And that's at Jacobsen at
22 10 -- or excuse me, at 15.

23 Now on to Slide 10. Amit, as we see on the left, is all
24 about home networking. Amit describes connections between
25 existing consumer hardware, devices that are communicating over

1 Amit's network within the home. Conversely DSL is technology that
2 worked outside the home provided by and installed by the telephone
3 operators.

4 Recall when you first had DSL installed in your house?
5 You call up AT&T or whoever your phone operator was at the time.
6 Have them come out and install hardware in your house in order to do
7 this.

8 Now this is exactly the complexity that Amit says we
9 don't want to do. We don't want to incorporate that because Amit is
10 looking for a simple, user-installable solution.

11 Now a person of ordinary skill in the art would not have
12 modified Amit in view of ADSL or VDSL, or the DSL textbook, or
13 any of the DSL references. Because contrary to what the petition
14 says, DSL at the time was a backwards technology.

15 The coax references in these proceedings are far more
16 advanced technology-wise at the time than DSL was. Amit's capable
17 of providing very high data rates in each direction, up to 40 mega-bits
18 per second. Conversely, DSL at best was half that. And at worst was
19 approximately one-fortieth of that.

20 There's absolutely no testimony in the record about why
21 a person of ordinary skill in the art would have looked at a slower,
22 less efficient, lower throughput type network in order to improve upon
23 what was described as an excellent communication medium that has
24 high bandwidth and is shielded to avoid noise.

1 And that's a quote from Dr. Acton, Petitioner's expert at
2 paragraph 105 of his opening declaration. Nobody at the time of the
3 '249 Patent would have looked backwards to non-analogous DSL
4 references to try to improve upon coaxial networks.

5 Now as I mentioned a little bit ago, the medium matters.
6 So what is twisted pair? Twisted pair telephone lines are unshielded
7 lines, two copper wires braided together. Down one wire you send
8 one signal, down the other wire you send the inverse signal. And
9 when that communication is received they're combined and that
10 boosts the level of the signal, helps eliminate interference, and it's
11 technically a fundamentally a different way of operating a network
12 than coax.

13 And we see coax on the left of the slide here, which is
14 just a copper core with a shielding around it, and then another shieling
15 layer around that. Now coax cables, they're constructed in a way that
16 makes them much more expensive. And as a result you get much
17 more performance, or you got much more performance through them.

18 JUDGE JURGOVAN: Counsel, is there something
19 called a shielded twisted pair?

20 MR. HALVERSON: Is there shielded twisted pair?

21 JUDGE JURGOVAN: Yeah.

22 MR. HALVERSON: Yes, there is.

23 JUDGE JURGOVAN: Okay. So they're not -- twisted
24 pair is not always unshielded.

1 MR. HALVERSON: Twisted pair over the telephone
2 lines was primarily unshielded. But shielded twisted pair did exist in
3 the prior art.

4 JUDGE JURGOVAN: And one other question, with
5 terminal devices, at the time of the '249 and '518, were there
6 commercially available versions that would communicate multi-tone
7 on the up-link direction?

8 MR. HALVERSON: I don't believe so. So DOCSIS 3.1
9 came out in -- the date escapes me, but it was after priority. I think it
10 was 2013. And DOCSIS 3.1 was the introduction of OFDM into coax
11 communications in the home. Before that it was single carrier.

12 JUDGE JURGOVAN: You said DOCSIS 3.1?

13 MR. HALVERSON: Correct. And that was an argument
14 that was raised in our Patent Owner response at page 54. The date is
15 in there, I just don't have it off the top of my head.

16 JUDGE JURGOVAN: Thank you.

17 MR. HALVERSON: And then the second DSL
18 reference, DSL book, similarly, no identified teaching of any terminal
19 device performing equalization. So in neither ADSL, VDSL or the
20 DSL book does the Petitioner identify terminal devices performing
21 equalization.

22 And so what they say here, and this is the petition at 82
23 on Slide 13. DSL explains that channel distortion could cause inter-
24 signal interference, ISI. And that ISI can be minimized by selecting a
25 lower baud rate, or channel equalization.

1 That sentence has a lot of wishy-washiness in it. There's
2 a lot of lack of direction. None of that says, put equalization into a
3 terminal device. And so at its core this challenge really gets to what
4 could a person of ordinary skill in the art have done, not what would a
5 person of ordinary skill in the art have done?

6 And so for claim 10, where it specifically claims the
7 plurality of terminal devices, wherein the terminal devices perform
8 equalization on the received signal, respectfully, there's simply no
9 teaching in the record of any devices capable of doing that.

10 I want to make sure I give Mr. Andrews his time. I will
11 be back when he's finished, but he's going to talk about claims 17, 9,
12 and 2.

13 JUDGE JURGOVAN: Thank you, Mr. Halverson.

14 MR. ANDERSON: Good morning, Your Honors. So as
15 my co-counsel said I will be discussing primarily claims 17, 9, and 2
16 with respect to all four grounds.

17 And turning to -- so regarding claim 17, it claims using a
18 time division duplex protocol and synchronizing the time division
19 duplex protocol with a beacon message on the network. And as
20 identified in the specification of the patent, a beacon message
21 provides a common time reference to users on the network, and can
22 also provide other network management information.

23 And none of the references cited in grounds 1, 2, 3, or 4
24 reference use of a beacon message. Just as you mentioned during the
25 Petitioner's argument, a beacon tone is not a message. A beacon tone

1 is used as a sub-carrier only for the purposes of timing recovery. This
2 can be shown on Slide 52 in the DSL book where, as you can see at
3 the bottom, a pilot tone is a sub-carrier. This is a DMT sub-carrier,
4 not a message used over time division duplex.

5 And likewise, similar disclosure is found on Slide 54
6 relating to ADSL/VDSL. In this reference you can see it's a DMT
7 tone, which in the tone is provided on specific frequencies rather than
8 a message used that can be broadcast on the network.

9 JUDGE JURGOVAN: Does the pilot tone relate to the
10 synchronization frame?

11 MR. ANDREWS: Yes. So a pilot tone has, is used
12 primarily for the uses of time recovery and synchronization.
13 However, it's a different protocol than a beacon message.

14 Likewise, as noted in the specification of the patent on
15 Slide 46, the beacon message also provides other network
16 management information and the pilot tone would be unable to do so.
17 It is just a periodic wave form transmitted over a specific sub-carrier.

18 JUDGE JURGOVAN: So does the claim actually recite
19 that this beacon message performs network management functions or
20 should we just imply that from the fact that it says beacon message?

21 MR. ANDREWS: So the -- so it recognizes that the
22 beacon message is used to synchronize the network. And as
23 recognized in the specification of the patent, a beacon message does
24 this by providing a common time reference and also providing other
25 network management functions.

1 JUDGE JURGOVAN: Is the synchronization frame a
2 message?

3 MRE. ANDREWS: So a synchronization frame can be
4 performed in different ways. The synchronization can be performed
5 in different ways however one of these ways would be using a beacon
6 message which might require using other network management
7 information to facilitate the synchronization.

8 JUDGE JURGOVAN: Thank you.

9 MR. ANDREWS: And so moving on to again, these --
10 this argument relating to a pilot tone was relied on by Petitioner on
11 their grounds 2 and 4. And on ground 1 and 3, the Petitioner
12 primarily relies on disclosures in Amit. And now Amit provides no
13 disclosure of a beacon message or any mechanism for
14 synchronization.

15 In fact, Amit recognizes that time division multiplexing
16 would not be possible in, when the notch filter is used as this system
17 would require synchronization by the CMTS. And as noted by my
18 colleague the CMTS is disconnected from the network during, when
19 the system is in the Connected Home embodiment when the notch
20 filter is present.

21 So it would be incapable of performing any kind of
22 synchronization and Jacobsen is also silent relating to any kind of
23 network synchronization using a, or use of a time division duplex
24 protocol. And the Patent Owner -- apologies.

1 The Petitioner makes reference to use in the art in the
2 '249 Patent's supposed acknowledgement of a beacon message being
3 known. However, irrespective of the Patent Owner's disclosure of use
4 of a beacon message the citations, or the references to Gibbs by the
5 Petitioner is inapplicable in an IPR proceeding based on recent federal
6 circuit precedent in Qualcomm v. Apple. Which the decision was on
7 April 23, 2025.

8 Accordingly, on all four grounds there is no specific
9 reference to a beacon message. And if there are no further questions,
10 I will return the remainder of our time to my colleague Erik
11 Halverson.

12 JUDGE JURGOVAN: Thank you, Mr. Andrews.

13 When you're ready, Mr. Halverson.

14 MR. HALVERSON: I'm going to talk about the
15 analogous art arguments for a little bit. So prior art, we're on Slide 16
16 now. Prior art can only be used if it's analogous art. Non-analogous
17 art cannot be part of an obviousness combination.

18 And as Petitioner's burden, as we see in the Schott case
19 here on Slide 16, to establish that art is analogous. And so I don't
20 think there is any dispute that there are two ways that art can be
21 deemed to be analogous. And we cite the In re Clay case at the
22 bottom Slide 16. Either the field of endeavor, or alternatively
23 reasonably pertinent to the particular problem, to the problem that the
24 inventor was trying to solve.

1 So on Slide 17, the bottom call out here, the Airbus case,
2 and the full cite is Airbus SAS v. Firepass, Corp. 931 F 3d 1374 at
3 1382. It says, you have to perform this analogous art analysis from
4 the perspective of a person of ordinary skill in the art, not with the
5 hindsight of what the inventors themselves did.

6 We can't look to what the specification says as far as
7 identification of other art. We have to put ourselves in the shoes of a
8 person of ordinary skill in the art who is not one who has already read
9 the specification of the '249. That would be textbook hindsight
10 reconstruction. And that's exactly what the Petitioner has done in its
11 reliance on both ADSL/VDSL as well as the DSL textbook.

12 And so the field of endeavor of the '249 Patent is clear. It
13 jumps off the page. The title involves coaxial cable. The abstract
14 involves coaxial cable. Specification talks about tap port-to-port
15 isolation, in a coax cable wired building.

16 Now in the face of all of this disclosure, Dr. Acton's
17 second declaration, Exhibit 1030, paragraph 35 which is on page 19
18 disagrees with all of this. He sets all of this aside and he says well,
19 the '249 Patent is not limited to coax. It's his opinion that we're going
20 to set aside the title, set aside the abstract, set aside the summary, set
21 aside the claims, and instead rely on the fact that certain patents
22 referenced in the specification and certain other textbooks referenced
23 in the specification are broader than coax.

1 And based on that we're going to say the field of
2 endeavor is broadband communication networks. That's improper.
3 That's not what the field of endeavor analysis requires.

4 JUDGE JURGOVAN: Counsel, I think the word coaxial
5 is used only in claim 10. Is that correct?

6 MR. HALVERSON: The word coaxial is also --wrong
7 slide. Great question. If we go to Slide 19. So we see coaxial in the
8 preamble of 10. We see coaxial in the preamble of 5. And we see
9 repeatedly signal splitter being used over and over and over again in
10 claim 1.

11 JUDGE JURGOVAN: So you're saying a signal splitter
12 in this context must be coaxial.

13 MR. HALVERSON: That's correct, Your Honor. And a
14 person of ordinary skill in the art, reading claim 1 in the context of the
15 specification of the '249 Patent would understand. Because it talks
16 about tap ports. And I don't have this highlighted, but the bottom
17 portion of claim 1, the last wherein clause. It's talking about tap ports
18 of a signal splitter.

19 JUDGE JURGOVAN: And tap ports are unique to
20 coaxial, and twisted pair does not use tap ports.

21 MR. HALVERSON: Correct, Your Honor. A DSL
22 splitter doesn't have a tap port. It has an ethernet port on it. A tap
23 port is unique to a coaxial environment.

1 JUDGE HOWARD: And this is Judge Howard. Just so I
2 have this clear. This is, the evidence you're relying on this is from
3 paragraph 61 of your expert's declaration.

4 MR. HALVERSON: Paragraph 61 sounds right, as well
5 as the specification and the claims and the title of the patent itself. So
6 a combination of the expert's characterization of that factual evidence
7 as well as the factual evidence itself.

8 JUDGE HOWARD: And with respect to what claim 1
9 covers, that's from, well I guess we're still looking at the -- I see the
10 point that you're making.

11 MR. HALVERSON: And I'll get back to you, Your
12 Honor with a specific citation to the declaration when I come back up.

13 JUDGE JURGOVAN: And Counsel, just for
14 clarification. I think you said that the preamble of claim 10 is limiting
15 us and you're saying the same with respect to 5.

16 MR. HALVERSON: That's correct, Your Honor.

17 JUDGE JURGOVAN: Thank you.

18 MR. HALVERSON: So the other two references, or the
19 two references that we're contending are not analogous art, are these
20 DSL textbooks. They're used in essentially the same way. Both are
21 referred to in the background of the -- or excuse me, the text of the
22 '249. But they're simply describing at a textbook level out of home,
23 wide area networks that provide signal into a user's home which then
24 must be demodulated, frequency divided, separated out the telephone

1 signal from the data signal, and then communicated to a modem or a
2 phone or internet access or for telephone access.

3 There's no coax in either of these textbooks. There's no
4 coax splitter, there's no tap port. And most importantly there's
5 absolutely no discussion of port-to-port isolation. There's no
6 discussion of what the whole crux of the '249 Patent is in the '249
7 Patent. Or excuse me, in the DSL textbooks.

8 And we see on Slide 21 some exemplary callouts of the
9 twisted pairs that are used in both of these. I don't think there's any
10 dispute that DSL has done in the textbooks over twisted pair.

11 Now we heard some testimony from Petitioner about
12 their expert's independent purported use. But that's not part of the
13 obviousness challenge that was done by the Petitioner.

14 And so that's part of the problem, with saying look, all of
15 these concepts were known. Look at all of this other evidence that we
16 submitted both with our second petitioner declaration as well as with
17 our petitioner reply.

18 The volume of additional exhibits was significant.
19 Because what they're doing is just characterizing concepts as
20 concepts. But not identifying teachings in the references, or
21 motivations from the expert, or reasons under KSR to actually make
22 the modification or make the combination that they are proposing.

23 And there's a little bit of differences between these two.
24 And we talked a little bit about how twisted pair could be shielded,
25 but primarily it's not. And how coax is always shielded, and that

1 shielding means that it's less susceptible to noise. Now coaxial cable
2 is primarily used -- we're on Slide 22 now. Apologies. Coaxial cable
3 is primarily used for shorter distances. Twisted pair is primarily used
4 for longer distances.

5 The operating frequencies are significantly different.
6 Coax operates at much higher frequencies, and twisted pair in fact,
7 filters out those higher frequencies. It operates because of its twisted
8 nature as effectively a band-pass filter. So it operates at much lower
9 frequencies.

10 Now coaxial cables, because of these tap ports and those
11 splitters, have reflections. This impedance mismatch is much more
12 significant in a coaxial network than it is in a twisted pair network.

13 And this evidence is all found in Mr. Bates' declaration,
14 at paragraphs 107, 111, 113, 114, and 115. And it's all unrebutted
15 from Dr. Acton. He doesn't disagree with any of this.

16 Now shifting gears to the other prong of analogous art,
17 what is the problem and solution of the '249 Patent? '249 Patent is
18 very clear. On Slide 23 we see the callout in column 2, lines 39 to 41.

19 Tap port isolation of splitters presents a problem to shared usage of
20 the cable for a LAN system. Could not be more clear.

21 Now '249 goes through and identifies a handful of
22 references, other networking references, and it concludes that none of
23 these references address the problem of tap port-to-port isolation.
24 And it's 3, column 3, line 4 to 7.

1 What do ADSL/VDSL, or the DSL textbook have to do
2 with that problem or the claim solution? Absolutely nothing. While
3 they are splitters, they're different types of splitters. They don't -- they
4 don't have the same problems. They don't suffer from tap port-to-tap
5 port isolation issues. And therefore the problems, or the solutions --
6 excuse me -- that are proposed in these two textbooks are not
7 reasonably pertinent to the '249 Patent's problems.

8 I'd like to pivot to the '518, but before I do are there
9 questions about anything on the '249 Patent?

10 JUDGE JURGOVAN: Yeah. How do you explain that
11 the '249 Patent is discussing the references such as DSL and ADSL
12 and so forth?

13 MR. HALVERSON: Oftentimes the invention can be a
14 byproduct of recognizing applicability that nobody else has
15 recognized before. Nobody else recognized the applicability of this,
16 of that technology to a coaxial network.

17 And so it's used in a specification simply as a way of
18 short circuiting what the inventors were thinking. But that's not to say
19 that what the inventors were thinking was obvious. That's just to say
20 that the inventors identified a problem and a solution, and were able to
21 implement that solution.

22 JUDGE JURGOVAN: But you're saying that the
23 background, for example, can discuss these references and they're still
24 -- they wouldn't be analogous?

1 MR. HALVERSON: That's correct, Your Honor. And
2 you know, as a hypothetical, you can envision a patent on a car. And
3 in the background there's a discussion of a rocket ship because the
4 inventors of this car patent thought hey, it would be really cool to put
5 a rocket ship on the back of my car.

6 That doesn't make all rocket ship art, or even that rocket
7 ship art analogous to the car. What it does, is it says, it conveys to the
8 public what the inventors thought process was. But oftentimes the
9 though process itself can be where the inventive concept lies.

10 JUDGE JURGOVAN: Thank you.

11 JUDGE HOWARD: This is Judge Howard. Before you
12 go on, looking at your arguments in your response related to the level
13 of ordinary skill in the art. You'd say those are consistent with the
14 argument that you have about the analogous art?

15 MR. HALVERSON: Let's do that real quick.

16 JUDGE HOWARD: Maybe how we can approach this
17 issue is if the level of skill in the art is limited, as you say to coaxial
18 cable, that might affect what the analogous art is. And similarly, if we
19 rejected your construction of the level of ordinary skill in the art, it
20 had afforded a communications system, that might also have an
21 impact on what is analogous art.

22 MR. HALVERSON: So I think it might have an impact,
23 to answer the latter part of your question first. But I don't know that a
24 rejection of our proposal for the level of skill in the art necessarily
25 means that the DSL books become analogous.

1 But I do think that the -- or we do think that the level of
2 skill in the art should reflect at least some familiarity with coaxial
3 cable. And so during Dr. Acton's deposition, we were discussing
4 whether or not coax was a requirement. And he seemed to think that
5 that was going to limit the scope of a person of skill in the art to just
6 experience with coaxial cables.

7 That's not the case. You could certainly have experience
8 with other communications systems. But you have to have a little bit
9 of understanding, at least two to three years of experience in a coax-
10 specific environment in order to truly understand what it is the '249
11 Patent is.

12 We look back at the inventors, the Entropic inventors.
13 They had all been working on coax cables specifically for tens of
14 years. So this has to be accounted for when we are determining both
15 what is analogous as well as what a person of ordinary skill in the art
16 would have looked to.

17 Now I also think there was also some miscommunication
18 about whether or not Dr. Acton qualifies as a person of skill in the art.

19 We're not disputing that he qualifies as a person of skill in the art,
20 we're simply contesting whether or not his opinions about the
21 combined ability of these, and the applicability of these other
22 references are appropriate.

23 And I do think that as you go through the claims, so on
24 27 we see claim 1, on 27 we see claim 10. I didn't have clam 5. We
25 see the abstract on Slide 28. And I think it becomes clear as you go

1 through what the patent is, that there is indeed a focus on the coaxial
2 environment that must be accounted for.

3 Anything else on the '249? Okay. Thank you.

4 All right. So shifting gears to the '518 Patent. IPR No.
5 2024-00393. Very similar fundamental issues exist. I think we can
6 streamline some of this discussion.

7 But again, before we get into the specifics of what we're
8 talking about today, the network topology matters. The specific claim
9 limitations matter. We can't focus on just these high-level discussions
10 of concepts. We have to dig into what the patent actually is, what the
11 prior art actually is, and what the Petitioner's proposed grounds
12 actually are, and whether or not the art in those grounds would have
13 led a person of skill in the art to the claimed invention.

14 And so in the '518 Patent there is some significant
15 additions that happened, post institution in the form of Mr. Garrett's
16 testimony. And so this testimony was not before the Board at the
17 institution decision.

18 But what he does, is he confirms the goals of Amit as a
19 simple, low-cost network. We're on Slide 3 now. This appears in his
20 declaration, Exhibit 2002 at 100 to 102. He confirms that Amit in fact
21 already solved the problems that Petitioner proports to use to motivate
22 this combination. This comes in the same exhibit, 2002, paragraphs
23 82 to 94.

24 And, in fact, Petitioner's expert, Dr. Williams confirmed
25 that he failed to consider or address, or analyze any of the drawbacks

1 associated with the combination that he was proposing. He focused
2 solely on cherry picking the good things out of prior art at the expense
3 of any other teachings in the prior art in an effort to arrive at the
4 claimed invention. This is incorrect. It's the hindsight-driven
5 perspective and infected all of Dr. Williams' analysis.

6 So if we start on Slide 4 of the '518 slides, and if I go
7 back to the '249 I'll say something. But from here on out in the
8 transcript this will be Patent Owner's demonstrative exhibits from the
9 '518 proceeding.

10 And so what is the '518? So I think there was some --
11 there might be some disagreement here about whether or not the
12 claims of the '518 are unique to a coax network. But, in fact, they are.
13 What we see, and whether or not that network is a local network.
14 And they are.

15 Because what we see in the claim is cable wiring. Is
16 cable wiring, the second element of claim 1, has to comprise a splitter
17 with a common port and a plurality of tap ports. So we know from
18 that, and then the subsequent in this claim element, that this is a coax-
19 specific network.

20 Now a splitter, and the -- excuse me, the claim element
21 goes on. The splitter, as described in the specification is being used in
22 home, and in buildings as having inputs and outputs. Now as the
23 claim continues, we see network devices that communicate through
24 the cable wiring. Well, through the cable wiring that was previously
25 introduced.

1 So these network devices have to transmit probe
2 messages through the splitter and a plurality of segments of coax
3 cable between the splitter tap ports and the network devices. So you
4 have a network device that sends a probe message that has to go
5 through coax, through a tap port, through a common port, back
6 through a common port, back through a tap port, to another network
7 device.

8 That only happens in the art that we've seen in the
9 proceeding as well as in the '518 itself, in a local coax network. It's
10 not something that exists in a broader coax network. So this is indeed
11 a LAN-specific claim.

12 Now nothing talks about LAN-based splitters in this
13 proceeding. Now in the petition takes certain coax LAN references --

14 JUDGE JURGOVAN: I'm sorry, why is that limited to
15 LAN?

16 MR. HALVERSON: That's how it is described in the
17 '518 Patent. I'm not saying that it's necessarily -- it's limited to LAN
18 because that's how it's described for the '518 Patent, and it's consistent
19 with everything that is discussed in the proceeding as far as how coax
20 splitters are used.

21 Nobody has identified a coax splitter outside of the
22 home. Nobody has identified a network device that transmits probe
23 messages through cable wiring in a network that is outside the home.

1 JUDGE JURGOVAN: So if a CMTS was using the
2 splitter, that would not fall within the scope of this? That are would
3 be outside the scope of this claim?

4 MR. HALVERSON: By itself?

5 JUDGE JURGOVAN: Yeah.

6 MR. HALVERSON: The hypothetical needs at least two
7 network devices, and then you have to go through a splitter --

8 JUDGE JURGOVAN: Right, so --

9 MR. HALVERSON: -- with a common port and a
10 plurality of tap ports, and through a plurality of segments of coax
11 cable.

12 JUDGE JURGOVAN: Yeah. So two terminal devices
13 on a LAN, connected to a CMTS. Where the CMTS is doing the
14 reflection. Does that fall within the scope of this claim or no?

15 MR. HALVERSON: I don't know that that challenge has
16 been put forth by the petition. I want to think through this for a
17 second if you forgive me.

18 And so in this hypothetical, the network devices that
19 you've identified are in a home. Is that right?

20 JUDGE JURGOVAN: Right.

21 MR. HALVERSON: So you've got like a device in a
22 living room, a device in a, I don't know, in a home office, and there's a
23 splitter at the point of entry. The signal goes up through the coax,
24 through the splitter, to the CMTS. Comes back through the --

1 JUDGE JURGOVAN: Yeah. So the splitter is at the
2 CMTS. So the signals are coming from one terminal device, from the
3 LAN, outside the LAN, hits the CMTS, reflects back through into the
4 network again to the second terminal device. If that makes sense.

5 MR. HALVERSON: I don't know that it does because
6 there's, the splitter in the CMTS splits on a home-by-home basis. And
7 so in your hypothetical, and we may be getting sideways, I apologize.
8 But is it one home talking to another home, or two devices in the
9 same home?

10 JUDGE JURGOVAN: Let's say two devices in the same
11 home. On the same LAN.

12 MR. HALVERSON: Then I would say no because
13 there's not a plurality of tap ports over which the probe message is
14 being transmitted.

15 JUDGE JURGOVAN: Okay. Thank you.

16 MR. HALVERSON: So moving on to Slide 5. What is
17 the '518? The '518 solves for specific impairments present in home
18 wiring that restrict high-bandwidth communications.

19 This came to be again, because of the inventor's
20 recognition of certain problems facing coax-based home networking
21 issues. Once again, tied to tap port to tap port isolation. The '518
22 Patent proposes a number of different ways of doing this. Adaptive
23 power control, bit loading, power loading, frequency coordination.

24 These are all described, but the only one that is claimed
25 is bit loading. And so the claims of the '518 Patent implement this bit

1 loading scheme based upon the use of probe messages throughout the
2 network.

3 And so we talked about that. So what does the petition
4 do? The petition takes two references, Kleiger and Amit as their base
5 references. And these are in-home coax references for sure. Neither
6 of these though use bit loading.

7 Kleiger, on the left of Slide 7, Exhibit 1007, uses a
8 constant constellation for all transmissions. We see that in figure 6 of
9 Kleiger, Exhibit 1007. So all transmissions in the entire home
10 network of Kleiger are sent using a, the same constellation regarding,
11 or excuse me.

12 Irrespective of what the channel conditions are of any
13 given hop. And so on the slide we see two different possible paths,
14 and the red path versus the yellow, or the green path on Slide 7 may
15 have different degrees of channel impairments. But in Kleiger all of
16 this is dictated by the DPU, which is I believe element 14. But it's the
17 thing at the entry point of Kleiger. And it is that central nervous
18 system, effectively of the home network of Kleiger that dictates what
19 the whole network uses as far as its modulation scheme.

20 Amit, completely silent as to bit loading. No disclosure
21 whatsoever.

22 And so none of the references that are relied on in the
23 '518 proceeding show any bit loading that is done over this coax cable
24 network. What we see is bit loading done on a single hop. And that
25 makes sense.

1 It makes a lot of sense to determine channel
2 characteristics, we're back on Slide 7 now, channel characteristics
3 between the family room and the DPU, and then use bit loading for
4 that.

5 But it doesn't make any sense based on anything that's on
6 the prior art challenge, to modify this to perform bit loading over a
7 splitter, over a coax splitter. It adds another hop. It adds another
8 introduction of complexity which is contrary to Amit. And it adds a
9 lot of unknown which is why Kleiger as a reference says look, we're
10 going to use one constellation for everything.

11 We're not going to make this dynamic, we're going to
12 make it a static system. And as the system changes you know perhaps
13 we'll update the constellation but we're not going to change it based
14 on any specific network conditions of a hop.

15 What does Isaksson do? Isaksson, the other reference,
16 the bit loading reference from the petition transmits base-sync frames
17 in a point-to-point architecture without anything in the middle. So
18 device A to device B, right across a twisted pair wire. There's nothing
19 else in between that needs to be analyzed.

20 And so in Isaksson, the analysis that's done to determine
21 the channel characteristics is relatively straightforward. There's not a
22 lot of computation that has to happen. There's not a lot of ambiguity
23 that goes into that process.

24 And as a result Isaksson doesn't inform a person of
25 ordinary skill in the art to take these teachings and put them into a

1 network that is a highly splitter-based network. Now Isaksson is
2 clear, we're on Slide 9 now, that it is a twisted pair reference. And
3 you saw some callouts from Petitioner's demonstratives earlier where
4 they tried to characterize it as just a multi-carrier reference.

5 But regularly, repeatedly, consistently, Isaksson goes
6 through and explains that it is a twisted pair cabling reference. Or a
7 POTS, or a UTP.

8 So if you look at Figure 4, which I don't have a screen
9 shot of. But Figure 4 of Isaksson, 1013 on the left-hand side depicts
10 POTS and UTP, plain old telephone system and unshielded twisted
11 pair.

12 Now there is undoubtedly a single reference to the
13 DAVIC standard. But what that's doing is simply in the context of
14 explaining where the frequency bands that are going to be used are.
15 So traditionally all frequency bands were handled in a -- and I conflate
16 the two, so forgive me -- but it's either upstream, below downstream,
17 or downstream below upstream. And in DAVIC they flip it.

18 DAVIC is unique because they change the way that that
19 happens. That's not to say that anything in Isaksson is intended to
20 suggest that it could be used in coax let alone over a splitter in a coax
21 network as would be required by claim 1 of the '518.

22 So I want to spend just a second talking about whether or
23 not coax experience again is necessary in the '518 Patent. And we
24 contend it is because as we see on Slide 11, the title, broadband
25 network for coax. The abstract, broadband local area data network

1 using coax. The problem solution at 1:25 to 30, specifically to
2 communications using coax cable building wiring.

3 And we talked earlier today about claim 1, and it's our
4 contention that that also implies not only coax through the splitter, but
5 also a local network through the way that it is set up.

6 And so like we were talking about with the '249 Patent
7 earlier, Amit is very focused, and here Amit is 1014. But Amit is very
8 focused on its low-cost devices. Low-cost implementation we see on
9 Slide 14. Low-cost devices. Low-cost devices again.

10 And so there's a dispute now in this proceeding about
11 how these goals would be weighed. How do we weigh Amit's goal of
12 providing a simple, low-cost home networking solution with
13 Isaksson's much more technically complex network?

14 And so we've got some evidence now in the record,
15 through the form of Mr. Garrett's declaration. It wasn't present at the
16 Institution Decision. But with Mr. Garrett's analysis, who again was
17 the only testimony on the technical drawbacks about what it is that's
18 going on in this proposed combination.

19 Mr. Garrett's testimony confirms that there are indeed
20 these drawbacks tied to costs of the hardware, costs of operation of
21 the network, and complexity. And the only reason why you disregard
22 these is if you were trying to get to the claims of the '518 Patent
23 through hindsight.

1 And so this over-reliance again of Dr. Williams and his
2 outcome driven analysis is similarly disfavored now under the new
3 Board guidance.

4 And so here we see on Slide 17, the bottom, a table
5 identifying where it is that Mr. Garrett performs this analysis and
6 where it is that Dr. Williams, excuse me, performs his analysis.

7 And so Mr. Garrett analyzed the hardware costs at
8 paragraph 100 of his declaration which is 2002. He analyzed the
9 operational costs, paragraph 101, and he analyzed the complexity,
10 paragraph 102. Dr. Williams didn't address any of these despite
11 submitting a second declaration after Mr. Garrett's declaration went
12 in.

13 So what do we see? We see on Slide 18, paragraph 100
14 from Mr. Garrett's declaration. And he's talking about all of the
15 hardware that needs to go into modifying Amit to then arrive at a
16 situation where you have the ability to do what Kleiger's devices are
17 doing.

18 On Slide 19 we see his quantification of the costs, the
19 operational costs that are added. Those are reflected in paragraph
20 101. And on Slide 20 we see his analysis of the complexity that's
21 added to that network in that proposed combination. And that's
22 reflected in Mr. Garrett's declaration at paragraph 102.

23 And then here on paragraph 21 we have Dr. Williams'
24 admission that he didn't do this. He didn't look at any of the
25 downsides of the combination. And so Mr. Garrett identified multiple

1 teachings, or excuse me, multiple technical drawbacks related to
2 hardware costs, operational costs, and complexity that only hindsight
3 would lead somebody to overlook. And Dr. Williams failed to look at
4 any of that.

5 Now there are certain problems that were identified in the
6 petition. "Problems" should be in quotes there, alleged problems in
7 the petition as it relates to Amit that would have suggested to a person
8 of ordinary skill in the art to go make some changes.

9 But as Mr. Garrett's testimony now confirms these
10 problems aren't actual problems. And so the Petitioner treats high
11 reflection as a problem. But Amit in fact already addressed high
12 reflection.

13 Petition treats this hidden node thing of Amit as a
14 problem but this problem is not only solved in Amit already because
15 it's a proposed benefit of Amit, but the combination doesn't do
16 anything to actually address this hidden node problem.

17 And finally the petition treats synchronization as a need
18 to not only, or to go from the combination of Amit and Jacobsen and
19 bring in Isaksson. But Jacobsen already has synchronization. So
20 synchronization isn't a reason to continue to go on to Isaksson.

21 So we'll start with the high reflection problems. And so
22 on Slide 25 we have the petition. And the petition is citing 1354 to
23 1401.

24 And they say Amit identifies the hidden nodes problem
25 and high reflection as some RF challenges in designing the home CN

1 components. But if you look at what Amit says, which in this
2 proceeding is Exhibit 1014 at column 13 at the bottom up into column
3 14.

4 This is a creative use of these quotations. Note where the
5 excerpts are, note what has been removed. And I think when you go
6 back and you look at this portion of Amit which I won't read and bore
7 everybody. But when you look at this portion of Amit it becomes
8 clear that this high reflection is not actually a problem.

9 Because what Amit does, is Amit says look, you can do
10 this. You can solve for this. We've proposed this solution in this
11 transponder module in its dual frequency mode. You can use this
12 transponder. And when you use that transponder you're solving for
13 these problems. So that's not a basis to then go on and look at
14 additional references.

15 You see the same thing for the hidden node problems on
16 Slide 27 in the petition. And as we go to Slide 28 there's simply no
17 discussion, and this is admittedly Mr. Garrett's declaration. But he's
18 responding to Dr. Williams' declaration which doesn't explain why it
19 is that this multi-carrier modulation would solve Amit's hidden node
20 problem.

21 And then the petition further states that there might be a
22 problem with reflection. And I cite to 20:42 to 43. We're on Slide 29
23 now. But when you look at this call out, it's a different column, I
24 apologize. But when you look at the rest of the text of Amit, Amit

1 explains that this reflection is a benefit. It's something that they're
2 looking to capitalize upon and utilize for their communications.

3 And so these problems that were identified on Slide 31 as
4 alleged reasons to make this combination don't actually propose a
5 reason to make that combination.

6 And unless there are further questions on the '518 --

7 JUDGE JURGOVAN: Thank you, Counsel.

8 So you have, back to Petitioner and you have 27 minutes,
9 30 seconds left for your rebuttal.

10 MR. MARCHESE: Thank you, Your Honor. May I just
11 have a minute to organize my material?

12 JUDGE JURGOVAN: Certainly.

13 MR. MARCHESE: Thank you. I am ready when you
14 are. May I proceed?

15 JUDGE JURGOVAN: Yes, please.

16 MR. MARCHESE: Thank you. The first thing that I
17 wanted to point out is, going back, if Your Honors will recall the
18 citation of the '518 Patent is '174 Isaksson Patent.

19 I didn't hear any rebuttal of that whatsoever, and it's very
20 important to note that if the Patent Owner is going to argue that the
21 Isaksson reference, which as we've already established is related to
22 this '174 Patent, is not analogous, that doesn't fly.

23 The inventors themselves, of the '518 Patent, who I heard
24 Counsel say had tens of years of experience in the coax field. Now he
25 was saying that with respect to the '249 Patent, but there's four

1 inventors that overlap. People with tens of years of experience in the
2 coax field. Where do they look for bit loading? They looked to
3 Isaksson, twisted pair. Where did they look with respect to the
4 background art, these broadband networks? They looked at
5 Rubenstein, twisted pair.

6 And so we submit that these are clearly analogous
7 references, these twisted pair references. In particular Isaksson
8 because Isaksson was cited, relied on, and actually incorporated by
9 reference into the '518 Patent.

10 And it wasn't distinguished. It wasn't in any way
11 tarnished by the inventors. And in fact, it can't be hindsight because
12 the inventors weren't looking back in time to their patent. They were
13 standing there in whatever year they were working on these
14 inventions. And where did they look? They looked to twisted pair.
15 They looked at Isaksson. It's not -- it is analogous.

16 JUDGE JURGOVAN: Just for purposes of argument. If
17 we say that the claims are limited to coaxial. Does that, is that
18 dispositive of this analogousness issue?

19 MR. MARCHESE: Absolutely not, Your Honor. We
20 have submitted evidence, and we heard argument from Mr. Amer that
21 they, the twisted pair and coax, are closely related. We can look to
22 Amit. Amit has coaxial on one side, twisted pair on the other in one
23 singular network. They are clearly interrelated, closely related.

24 Ethernet, in the development of ethernet, it was
25 developed in part in coax, in part in twisted pair. They are joined at

1 the hip. And so to say that you can just drive a gulf between the two
2 of them and say one wouldn't look to the other. It just doesn't make
3 sense, and it doesn't fit the evidence.

4 JUDGE JURGOVAN: Because they're -- well, because
5 they're not analogous or because the twisted pair teachings are part of
6 a general knowledge of the person of ordinary skill in the art that
7 supposed to be taken into account in the obviousness analysis?

8 MR. MARCHESE: I would say, Your Honor, that it's
9 both. I mean, you have people who've worked for years according to
10 Counsel in the coax environment. They're looking to twisted pair.

11 You have all the evidence that shows the
12 interrelationship between the technology, all the similarities between
13 them. And then on top of that you have the Donner case which tells
14 us that even if there are significant differences, those are not
15 dispositive.

16 JUDGE JURGOVAN: Thank you.

17 MR. MARCHESE: Thank you.

18 JUDGE HOWARD: Judge Howard. Just to follow up
19 on that point.

20 MR. MARCHESE: Yes.

21 JUDGE HOWARD: Patent Owner has argued that all
22 the claims are limited to coaxial systems. Do you agree or disagree
23 with that?

24 MR. MARCHESE: Well so I think it's different between
25 the two patents. The '518 Patent, it specifically talks about -- I've got

1 claim 1 here open in front of me -- cable wiring, tap ports and all that.
2 We're not disputing that that is a coaxial claim. What we are
3 disputing is that it's limited to local. We are arguing about that. That
4 sounded like attorney argument. It sounded like claim construction.

5 The patent, the inventors knew how to write local. They
6 wrote it in the abstract. They said a broadband local area data
7 network. That's in the abstract. You'll see it in other places in the
8 spec. When you get to the claim it doesn't say local.

9 And so this is just an effort at this point in time to import
10 a limitation into the claim that isn't there. They're trying to avoid the
11 prior art. I understand why they're doing it but it doesn't fit because
12 they didn't use the word local. They should have done something to
13 make the claim narrowed in that way.

14 JUDGE JURGOVAN: Okay.

15 JUDGE HOWARD: And what about the claims of the
16 '249 Patent? Specifically claim 1, but I guess also claims 5 and
17 independent claims 5 and 10. Do you agree or disagree with Patent
18 Owner on the scope of those claims being limited to coaxial cable
19 systems?

20 MR. MARCHESE: May I defer to my co-counsel
21 Mr. Shartzler on that Your Honor?

22 JUDGE HOWARD: Sure.

23 MR. MARCHESE: Okay. I'll leave that for him to
24 answer.

1 We heard a lot of argument about the cost, about
2 Dr. Williams did not consider drawbacks. And we saw some citation
3 to some testimony where he said I didn't consider drawbacks. And I
4 wanted to address that.

5 What happened here is, what's really important to note.
6 If we could have Slide 37.

7 The Patent Owner argues that Amit teaches a system that
8 has low-cost goals, is simple, and that the Jacobsen multi-carrier
9 modulation system would increase complexity and so there would be
10 no motivation to combine.

11 And what we would like to point out first is this Winner
12 v. Wang case in the upper left here. And it says that the fact that a
13 motivating benefit comes at the cost of another benefit should not
14 nullify the prior art to modify another reference. And you have to
15 weigh the benefits of loss and gain.

16 And we submit that the Jacobsen paper that's being
17 combined, this is Dish 101-6. It's a research paper and they compare
18 single-carrier modulation with multi-carrier modulation. They
19 consider computational complexity and distortions while achieving
20 high bit rates. And they conclude, after weighing all the costs and the
21 benefits, they vary the FFT sizes. They do all these different trade
22 offs to try to figure which of these two technologies will be better.

23 And they conclude decisively that multi-carrier
24 modulation is the way to go. And therefore, if you're sitting in the
25 Amit world and you have single-carrier modulation and you're saying

1 how can I make my network better. I'd look to Jacobsen. A POSITA
2 would look to Jacobsen and say well this is a very detailed analysis.
3 Cost benefits are all weighed and the tradeoffs, I would use multi-
4 carrier modulation.

5 And not just because it solves problems stated in Amit of
6 reflections and variations in channel conditions. But also because the
7 Jacobsen paper goes through a pretty detailed analysis to try to figure
8 out the effects on signal-to-noise ratio by varying certain conditions.
9 Also the bit rates, and then also the computational complexity.

10 If you look in that paper, I believe it's table 2. There is a
11 discussion of how many millions of instructions per second it takes to
12 perform these various computations. And they conclude that multi-
13 carrier modulation is significantly better.

14 Then we've also cited the Jacobsen 2 reference. It's Dish
15 1023, another reference paper authored by the first author of the other
16 paper. And it builds on the first Jacobsen paper. It talks about, you
17 can adjust parameters and to increase or decrease the complexity.
18 And says that each remote terminal can be configured such that
19 computational complexity can be easily handled on a single DSP chip.

20 And we've heard argument about there's hardware
21 complexity, and that that was going to be a problem with
22 incorporating Jacobsen into Amit. Jacobsen 2 tells you that you can
23 use a single chip to do this entire process. And this is back prior to
24 the filing of these patents.

1 And Dr. Williams didn't ignore these pieces of evidence,
2 contrary to what Counsel for the Patent Owner has said. Dr. Williams
3 cited and explained the Jacobsen 2 reference, this is Dish 1023. And
4 he considered, in his second declaration, the cost benefit analysis of
5 Jacobsen 2.

6 And so this excerpt of deposition testimony that you saw
7 where Dr. Jacobsen said that he didn't specifically consider
8 drawbacks, what he did do, and it's in his declaration, his second
9 declaration. He looked to Jacobsen 2 which does a cost benefit
10 analysis and he considered the holistic approach of that paper.

11 He didn't call out like drawback 1, 25 percent. Drawback
12 2, 30 percent. He did not do that. And I think that's what he was
13 saying. Because if you go further up in his testimony at page 30 of his
14 second deposition.

15 He was asked about the benefits that he weighed, both
16 lost and gained. And he said, do you recall what the outcome of that
17 exercise was. And he says it's expressed in my opinion. And he said
18 there were opinions on this that were expressed in my report.

19 And if you go to his report, his second report, and you
20 look at paragraph 70 he talks about Jacobsen 2, the 1023 exhibit. So
21 he did consider the costs and benefits. And he did determine,
22 Dr. Williams, that it would be a motivation for a POSITA to combine
23 Jacobsen with Amit.

24 I'd like to talk about another issue that Patent Owner
25 raised, and that was that Amit already solves the problems of

1 reflections. If we look at Slide 31 we're coming back to a slide that I
2 think I showed earlier with the Intel v. PACT case. And Intel says
3 you don't have to look just at specific problems if any that are called
4 out in the reference. You can look at universal motivations known in
5 a particular field to combine.

6 And there's argument that Amit solves the problems of
7 reflections. But what the Intel case tells us is that a POSITA can look
8 to other problems, universal motivations that are known more
9 generally.

10 If we go to Slide 34 Amit does identify problems even
11 beyond what intel says you have to have. Varying channel conditions
12 at column 8, lines 30 through 32, and reflections in column 14, lines 1
13 through 5.

14 And Jacobsen, which we are combining with Amit,
15 addresses reflections and additional specific signal impairments and
16 hence motivations that were well known in the art. Distortions, inter
17 signal interference, or ISI, that we've heard discussion on, and the
18 desire to reduce computational complexity.

19 So under the Intel PACT case a POSITA can still look to
20 Jacobsen for a motivation to combine. And then the Ovadia reference
21 that we see here in the bottom right further confirms this fact that a
22 POSITA would know that other problems were well known in the
23 field.

24 If we can go to Slide 38. And thus it's noted in our reply
25 brief, a POSITA would be motivated to combine Jacobsen with Amit

1 because Jacobsen would address additional problems and motivations
2 not specifically identified in Amit. Moreover, the Patent Owner's
3 expert, we see here on the right, Mr. Garrett agreed in his deposition
4 that it was known in the field to use multiple techniques to address
5 signal impairment.

6 And so we heard a lot of argument from Counsel about
7 the use in Amit of a transponder that would eliminate reflections. I
8 submit, I don't think it would eliminate. I don't think the evidence
9 shows that. But their own expert, Mr. Garrett has said you would look
10 to multiple techniques to solve problems.

11 And so a POSITA would be motivated to combine
12 Jacobsen because Jacobsen has another technique for reflections.
13 Multi-carrier modulation with bit loading.

14 And so a POSITA would have been motivated to
15 combine Jacobsen regardless of any teachings of overcoming the
16 problems of reflections in Amit.

17 And then another point of note is that Amit says that this
18 frequency transponder which addresses reflections was optional. And
19 this would give further motivation to combine the Jacobsen reference
20 with Amit because Jacobsen discloses multi-carrier modulation with
21 bit loading as being on all the time.

22 And then I'd like to show Slide 30. It was only touched
23 by -- the Patent Owner's Slide 30, excuse me. It was only touched on
24 for a minute by Counsel. But I think it's important to read this text in
25 its full context.

1 This is straight out of the Amit patent, Exhibit 1014.
2 And it says here, high reflection, the reflection from a notch filter is in
3 the power of the signal or it might be higher. Then it says this. When
4 this reflection is higher than the signal, we can use this reflection as
5 our main signal.

6 That's teaching us that when it's lower, when you go
7 lower you have a reflection problem. And you need to deal with it.
8 And you can use Jacobsen to do that.

9 And with that I think I will turn my -- I will stop my
10 argument and turn it over to my co-counsel.

11 JUDGE JURGOVAN: Thank you.

12 MR. MARCHESE: Thank you, Your Honor.

13 MR. PIROUZANIA: Thank you, Your Honors. Aaron
14 Pirouznia on behalf of Petitioner. I'm going to address the '249
15 rebuttal arguments.

16 I'd like to start with Judge Howard's question about
17 claim 1. If we can go to Slide 66 that will have the claim language.

18 But It's Petitioner's position that there's nothing -- I'm
19 sorry, maybe I've got the slide wrong. But if we look at claim 1's
20 language, Slide 60 I believe. I can't remember.

21 There's nothing in claim 1's language that explicitly
22 limits it to coaxial networks. I think the Judges hit on this point.
23 What Patent Owner has pointed to is the recitations --

24 JUDGE HOWARD: Well let me go and ask you about
25 the point that the claims clearly require a splitter. Is there any

1 evidence in the record of any type of cable besides coaxial cable that
2 uses those splitters with the tap ports?

3 MR. PIROUZANIA: Your Honor, I don't have a citation
4 to the specific spot in the record, but as far as to answer your question,
5 fiberoptics and ethernet cable also use splitters that have ports labeled
6 tap ports and common ports as well.

7 And so that kind of gets to this entire dispute. The Patent
8 Owner wants to live in a world where a POSITA would look at
9 coaxial networks versus twisted pair networks. But that's not the world
10 we live in. A POSITA who has an electrical engineering background,
11 both sides agree on that, has been taught about all of these networking
12 techniques that are in their tool belt, excuse me.

13 And those techniques apply to both coaxial networks and
14 twisted pair networks and fiber optic networks. And if we can go to
15 Slide 66, we can see that Entropic's own expert agrees that service
16 providers would use networks including all types of technology, all
17 types of cable. Coaxial cable, twisted pair cable, fiber optic cable,
18 radio-based systems.

19 You know, these networks, we see them in every single
20 reference we've discussed here whether it's the patents or the prior art
21 references. They're addressing multiple types of networks. And so I
22 think this type of argument relies on the sole premise that you're going
23 to separately consider techniques for coaxial versus twisted pair
24 networks versus wireless networks or fiber optic networks. And the
25 record just doesn't reflect that.

1 One other thing I'll touch on is the bottom part of this
2 slide. And that's Mr. Bates agreeing that even back in the '80's and
3 '90's it was common to have LANs that used both twisted pair and
4 coax. And Your Honors may have heard these before, but there's
5 devices called balloons or ballons. Ballon connections. And the
6 testimony from both experts in the record, they're cited in our briefing,
7 talking about these devices that allow you to go from coax to twisted
8 pair.

9 Mr. Bates agreed that these devices were commonly used
10 at the time of invention to save cost on coaxial cables. We heard from
11 Patent Owner's Counsel. Coaxial cable is more expensive than
12 twisted pair. So a lot of times service providers wanted to use twisted
13 pair instead. Or someone developing a LAN in their home office
14 wanted to use twisted pair instead of coax and they would do that by
15 using these ballon devices to go from coax to twisted pair. Twisted is
16 a ballons technology, coax is not.

17 And so that just further gets to our point that these two
18 types of cable can be used interchangeably, and the techniques, the
19 modulation methods, all of that really apply to both types of network.

20 I'll touch on a point Patent Owner's Counsel said,
21 Mr. Halverson, that no one else had recognized the applicability of
22 these DSL textbooks to the coaxial space. I believe that was in
23 response to your question, Judge Jurgovan, about well why are these
24 books even being addressed if they're from a completely different
25 field of art.

1 And I think to really get that in context we should go to
2 Slide 64. This is at the very end of the '249 Patent. This is when the
3 textbooks are introduced by the '249 Patent. And they're introduced
4 because the '249 applicant said that OFDM provides this mechanism
5 to overcome frequency selective channel impairments. And then they
6 said to understand OFDM look to these two textbooks. Two DSL
7 textbooks.

8 This was not in the context of the alleged inventive you
9 know, concept of the '249 Patent. It was hey, one of the ways that we
10 can solve this problem of impairments is with OFDM. If you want to
11 know more about OFDM look at these textbooks.

12 And so it really gets to the point that what Mr. Marchese
13 was saying earlier. When it came to these problems, where did the
14 inventors decide to look. They decided to look to DSL textbooks
15 because a POSITA does not live in this world where we're not going
16 to consider techniques that work on twisted pair DSL networks when
17 we're implementing our coax network.

18 Similarly we heard Patent Owner say that in neither of
19 these textbooks there's not coax addressed in either of these textbooks.
20 Once again, that's actually not correct.

21 If we look at Slide 69 we'll see that in the ADSL/VDSL
22 textbook there is a section on cable modems, right. And it talks about
23 how coax is delivered.

1 So it wasn't like even the writers of these DLS textbooks
2 were saying we don't know anything about coax, we don't know about
3 coaxial networks. They addressed it explicitly in the textbook.

4 Very similarly, if you go to the next slide, Slide 70, the
5 book talks about how it discusses networks capable of delivering
6 high-speed data to all end users. It talks about how there's these
7 common protocols found in LANs and WANs. It's not talking about
8 concepts that only exist in DSL.

9 Same for the other DSL textbook which is on Slide 72.
10 Here you see, as the book's being introduced it's being described as
11 being intended for practicing engineers working in DSL and related
12 fields. It even explicitly says, many techniques developed for DSLs
13 can be useful also for next generation communication systems.

14 So Patent Owner described this as a backwards
15 technology yet the people working in DSL themselves are saying no,
16 these techniques we're talking about that are being used in DSL are
17 also being used for future technologies in related fields.

18 And so I think that's all I want to say on the analogous art
19 point, unless Your Honors have any questions on that. And I'd like to
20 move on to the single home versus the connected home arguments.

21 If you could go to Slide 78 please. So first I want to start
22 out with kind of dispelling this notion that these are separate
23 embodiments. Right? These are described as separate modes. And
24 very importantly you'll see at the bottom of Slide 78, it talks about

1 how the management system configures to components to the
2 appropriate mode after initialization. So what is that saying?

3 That's saying that the exact same components in
4 hardware cannot break in either of these modes and you're going to
5 configure and determine, am I going to be in Single Home mode or in
6 Connected Home mode on initialization.

7 And that's telling me that the same hardware and
8 functionality is being used for either mode, and they're not properly
9 considered as separate embodiments.

10 But even if we do consider these as separate
11 embodiments, Patent Owner's counsel said that Petitioner is mixing
12 and matching embodiments. We're relying sometimes on Single
13 Home descriptions and sometimes on Connected Home descriptions.

14 I'll represent to you that's not the case. If we actually
15 look at the record, everything that's cited is being described by Amit
16 as applicable to both of these modes. We're not relying on a
17 description that says this only applies to connected to home mode and
18 yet we're trying to use it with our notch filter teachings. That's just
19 not reflected in the record.

20 If you go to the next slide, Slide 79. Mr. Shartzter briefly
21 touched on this earlier, but the other important point is even if we do
22 consider these as separate embodiments we have this HCNM, which
23 is the home cable network modem. And it's described specifically in
24 the Amit disclosure as being able to bridge these two different
25 networks.

1 And so you might be asking, well if these aren't separate
2 embodiments, if they can all be on the same hardware, what's the
3 point of Single Home versus a Connected Home. And the point is,
4 sometimes if you have a notch filter there, you can have your home
5 networks LAN be on one frequency range and your networks LAN,
6 your neighbor's LAN can use the exact same frequency range. Right.

7 Because we have that notch filter that's keeping all of
8 your LANs traffic in your house, your neighbor can use the same
9 frequency range. So it's more efficient from a frequency re-use
10 standpoint.

11 If we don't have that notch filter there, you can imagine,
12 the frequency range in your house is going to leak out of your house,
13 right. And so communications on that frequency range would
14 therefore be able to be received by your neighbor. So in order to keep
15 everyone's traffic separate when we're in Connected Home mode we
16 would have to use different frequency ranges for the neighbor's LAN
17 versus your LAN.

18 We get the notch filter there, we're in single home mode,
19 it's much simpler because you've got the notch filter keeping your
20 LAN traffic in the house. But that does not mean that in Single Home
21 mode you're unable to connect with the outside world, right.

22 I believe in the briefing it's being represented that
23 disconnecting the home CN, disconnecting the home computer
24 network, is the same as disconnecting the home from the outside
25 world. And that's not true. And we see that with the modem

1 descriptions here. The modems bridge the connections of the internet
2 service provider traffic to your original cable network, or to your
3 CMTS with the traffic that stays in your house, the LAN traffic, the
4 home network traffic.

5 So even if we treat these as two separate embodiments,
6 that doesn't mean we're going to ignore all the teachings for stuff that
7 happens outside your home, right. For the regional network
8 teachings, for the wide area network teachings. That's just not the
9 case because we have the modem here that's bridging the connections,
10 that's keeping you connected, that makes all of this relevant.

11 I'd like to switch to the equalization topics. So if we go
12 to Slide 96 please. So Patent Owner represented that we're relying on
13 teachings in Jacobsen about what's being done at the transmitter side.
14 And they talked about a slide we presented.

15 That was this slide about frequency binning or bit
16 loading. It wasn't about equalization. Unfortunately I don't have a
17 slide on equalization but if you look at Jacobsen at 311 it specifically
18 says a receiver would need an equalizer with. So it's talking about
19 when a receiver is doing equalization.

20 It's not talking about a transmitter doing equalization as
21 was represented earlier. And so the idea that we have not provided
22 disclosure that show a receiver performing equalization with Jacobsen
23 is just not true. It's on page 311 of Jacobsen.

24 Segue into footnote 4 of Jacobsen, if we can go to Slide
25 98. We heard Counsel argue that Jacobsen says multi-carrier

1 modulation with equalization is too complicated. There was a
2 prohibited number of tap ports. Those are all disclosures talking
3 about single-carrier modulation with equalization and why you would
4 choose multi-carrier modulation over single-carrier modulation with
5 equalization.

6 When we get to multi-carrier modulation, what really
7 matters is footnote 4. And that's where Jacobsen explains that yes,
8 even though multi-carrier modulation is more computationally
9 efficient than single-carrier with equalization, then we can still build
10 even further upon that by adding the time-domain equalizer and
11 making it even more efficient.

12 And so all of the quotes that were given out earlier about
13 two complicated and prohibitive number of tap ports do not apply to
14 footnote 4 which is representing our proposed combination of adding
15 equalization to the multi-carrier system.

16 I see I'm running out of time. So I just want to touch on
17 the dependent claim about pilot tones. And so if we can go to Slide
18 90.

19 So earlier we had some questions about the differences
20 between beacon messages and pilot tones. Right. And what I
21 understood Patent Owner's argument to be is that because the
22 specification says on the left column, on the left side of Slide 90, that
23 the beacon message provides a common time reference to the users
24 and can include other network management information that we
25 should discard the pilot tones as being different as beacon messages.

1 But this is simply the specification describing what can
2 be in a beacon message. It's not limiting the claim.

3 And so what we have here is the Patent Owner reading in
4 a limitation requiring the ability to include other network management
5 information which is simply not claimed by the dependent claims at
6 issue for the TDD with beacon message limitation.

7 Instead, what the claims specifically say is that the
8 communications are synchronized by broadcasting a beacon message
9 on the network. And so all we need to do is show a broadcasting of a
10 beacon message that synchronizes the communications. And that's
11 exactly what a pilot tone does which is why we've represented that the
12 pilot tone teachings from both DSL textbooks render this claim
13 obvious.

14 And I see my time's running out. So unless you have any
15 questions, I'll sit down.

16 JUDGE JURGOVAN: None from me.

17 MR. PIROUZNIA: Thank you, Your Honors.

18 JUDGE JURGOVAN: Thank you, Counsel.

19 Let's go to rebuttal from Patent Owner. You've got 13
20 minutes left. When you're ready.

21 MR. HALVERSON: Thank you, Your Honor. Eric
22 Halverson from K&L Gates on behalf of Patent Owner.

23 Judge Howard, before I sat down, or before I transitioned
24 from the '249 to the '518 you had asked for what we were relying on
25 as far as coax specific support. And you identified paragraph 60 in

1 Mr. Bates' declaration, and I think 61 also feeds into that, as well as
2 paragraph 117 and 118 about the distinctions between splitters,
3 twisted pair, and what it is that the tap ports and what the tap ports
4 imply.

5 We heard from --

6 JUDGE HOWARD: I just want to follow up on that. In
7 Petitioner's reply they identified optical cables, optical fiber cables as
8 another type of cable which can have tap ports and splitters. Is that
9 correct?

10 MR. HALVERSON: In the '249 Your Honor?

11 JUDGE HOWARD: No. As a technical matter --

12 MR. HALVERSON: Oh.

13 JUDGE HOWARD: They said that --

14 MR. HALVERSON: Just now. At the dais.

15 JUDGE HOWARD: Just now they said that.

16 MR. HALVERSON: That's unsupported attorney
17 argument. That's not part of the petition's challenge. I don't have any
18 reason to disagree or agree with it.

19 JUDGE HOWARD: Well, looking at the argument about
20 claim construction which isn't really -- which isn't really fully set out
21 in the Patent Owner's response either. You don't ask to construe
22 claims. So, I think it's very fair that if you're talking about what claim
23 I should be construed as they're allowed to respond to that.

24 So, I'm asking you if that is an accurate statement.

1 MR. HALVERSON: I don't have a basis to agree or
2 disagree. I unfortunately --

3 JUDGE HOWARD: Thank you.

4 MR. HALVERSON: There's no evidence in the record
5 of what those optical ports would look like. And that's about all I've
6 got. I'm sorry.

7 JUDGE HOWARD: You've made a representation that a
8 -- that the only way you can go and have splitters in a tap port is
9 coaxial cable. I just want to make sure you're standing by that
10 representation.

11 MR. HALVERSON: Based on the evidence in the
12 record, yes Your Honor.

13 JUDGE HOWARD: Okay. Thank you.

14 MR. HALVERSON: There was some reliance as well on
15 the inventor's disclosure. And it would be improper to hold the
16 inventor's disclosure in the specification against them. And the use of
17 this as a motivation to make a change or to add functionality is exactly
18 why this is a hindsight-based theory.

19 Regarding the '518 Patent, there was some back and forth
20 about whether or not it was a local or a broader than local. And
21 there's no disclosure in the '518 Patent of an embodiment of a WAN, a
22 wide area network doing that functionality.

23 The only disclosure in the '518 Patent is a local network.
24 And so the claims should be limited to what it is that's described in
25 the invention. We're not saying that they're limited to an embodiment

1 in the invention. But they are -- sorry -- they are limited to what the
2 invention is and why it's different than the prior art.

3 There was some discussion about whether or not the
4 benefits were properly weighed by Dr. Williams, and there was some
5 reliance on Dr. Williams' declaration, the second declaration, as well
6 as his identification of Jacobsen 2, which is not a piece of prior art
7 accompanied, or that is part of the challenge that is set forth for the
8 '518 Patent.

9 But notably, his deposition testimony is clear. While his
10 declaration testimony said what it said, there's no denying that that
11 first paragraph, or the first sentence of that first paragraph that was
12 shown says what it said.

13 When he was asked about it during his deposition he was
14 very clear. He did not do that analysis. He was asked a couple of
15 times and his answers did not change.

16 It was not corrected on redirect. It was not addressed at
17 any point in time by either his attorney's or by himself during that
18 deposition process.

19 We also heard some testimony during the first half of
20 Petitioner's rebuttal about Jacobsen and what Jacobsen said. And I
21 wrote this down because I thought this was an interesting conclusion
22 to draw.

23 Counsel said that regarding the '518 Patent Jacobsen
24 concludes that multi-carrier is significantly better. We can go back
25 and look at the testimony, or the transcript when the hearing is over.

1 But when they're talking about Jacobsen vis-à-vis the '518, they take a
2 very different view then when they're talking about Jacobsen for the
3 '249 Patent.

4 Remember, when they're talking about the '249 Patent we
5 are hyper focused on footnote 4. Setting aside all of the other
6 conclusions, all of the other analysis that's being done. But when
7 we're talking about the '518 Patent we are very, very focused as
8 Petitioner, on what it is that the conclusion of Jacobsen is.

9 So we need to make sure that we're interpreting this prior
10 art consistently. And respectfully, the conclusion of Jacobsen is quite
11 clear. It concludes, I agree with Petitioner on this, that multi-carrier is
12 significantly better than single-carrier with equalization. Just like the
13 Board found in its institution decision for the '249 Patent.

14 There was some response saying that there was only
15 reliance by Petitioner on notch filter based embodiments of Amit.
16 And respectfully, when you go back and you look at the analysis in
17 the petition as it relates to claim 17, which is the FDM and the beacon
18 message. The beacon message driven claim, not the FDM, excuse
19 me. But the beacon message claim.

20 What they're pointing to in Amit is in part that FDM
21 disclosure. And they say FDM leads you to OFDM, and OFDM has a
22 -- is related to DSL, and because of that there are these pilot tones.
23 And so that whole chain begins because of this FDM disclosure.

24 But when you look at that chart in Amit, it's clear that
25 FDM is only applicable when it's connected to the CMTS. When the

1 notch filter is present, that notch filter cuts off the communication
2 with the CMTS. Because the CMTS is what's assigning out those
3 frequencies.

4 And so when that's notch filter's present, the CMTS can't
5 do that to the home anymore. And so respectfully, you cannot have a
6 situation where Amit is used to render obvious a claim that has a
7 notch filter and then also claim 17. And that's exactly what claim 17
8 as it relates to independent claim 10 is.

9 There was -- oh. Also some discussion about Jacobsen's
10 receiver performing equalization. Jacobsen's receiver is not a terminal
11 device. Jacobsen's receiver, when you go back and you look at what
12 Jacobsen was modeling, they were modeling the regional cable
13 network to the home.

14 Let me get the citation for it too. In Exhibit 1007, which
15 is Jacobsen, on page 10 of 1007, or 307 of the original citation, under
16 the CATV channel mode heading. About the third sentence says,
17 "The system is modeled as one-half inch copper clad coax cable
18 delivering signals through bridge taps to 14 homes."

19 That's where the modeling ends. It's not a terminal
20 device. It is the input point of the cable signal to the home.

21 And then last I believe from me pending any questions,
22 there's a lot of reliance today on second declarations. On what
23 Dr. Acton did when he came back a second time, and what
24 Dr. Williams did when he came back a second time. On what
25 additional evidence they were able to put forth with the Petitioner's

1 replies and whether or not, specifically here I want to talk about
2 whether or not we are adding in certain limitations to the beacon
3 message.

4 But respectfully the portion of the specification that
5 Mr. Andrews identified during his presentation was describing what a
6 beacon message is. When it got to the claims, we're claiming a
7 beacon message. It is a message. It's not a tone.

8 And so the specific network information, or the control
9 information that the specification is referring to that could also be part
10 of that beacon message, doesn't somehow disappear into the ether
11 because it's not claimed.

12 The claimed message has to be capable of doing the
13 embodiments that are described. And respectfully, a pilot tone is not
14 capable of doing the embodiments that are described.

15 So unless there are any further questions. Let me double
16 check one thing. Apologies.

17 JUDGE JURGOVAN: Certainly.

18 MR. HALVERSON: I had one more. Sorry.

19 So there was also some discussion today about whether
20 or not the differences in the mediums matter. And the experts, at least
21 Patent Owner's experts put forth some descriptions in their opening
22 declarations.

23 And for example, I'm looking at Mr. Bates' declaration
24 which is Exhibit 2007 in the '249 proceeding, the 373 proceeding, at
25 paragraphs roughly 110 through, it goes on to about 121 or so.

1 Where he expressly talks about why it is that these
2 mediums are set up in the way that they are, and the different
3 advantages and disadvantages that exist between twisted pair and
4 coaxial references.

5 Petitioner sets all of that aside, ignores all of that and
6 says look, copper is copper. A wire is a wire. You look at everything,
7 here's all of these concepts that were known. Because these concepts
8 are known across a whole host of references, the obviousness
9 challenge that we presented in our petitions, supported by our opening
10 declarations, our burden bearing declarations must mean that we're
11 right.

12 But that's simply not the case. The obviousness analysis
13 requires more than just an identification of known concepts. It
14 requires an explanation of not only why it claims that specific
15 elements are rendered obvious by the combination, but a reason why
16 that combination is both proper and would have been made with a
17 reasonable expectation of success.

18 Respectfully, Petitioner has not done that. We request
19 that you uphold the patentability of the claims of the '249 and the '528.

20 JUDGE JURGOVAN: Thank you very much, Counsel.
21 No questions from me.

22 Any questions from Judges Howard or Moore?

23 JUDGE HOWARD: I don't have any other questions.

1 JUDGE JURGOVAN: It doesn't appear that there are. I
2 want to thank the Counsel for their presentations. Thank everybody in
3 attendance.

4 We will -- the Judges will now leave the hearing, but
5 please stay in the room for a moment in case the Court Reporter has
6 any questions to ask you of terms that might have been used and not
7 understood.

8 And again, we appreciate your presentations and they
9 were helpful I think in resolving the issues in this case.

10 (Whereupon, the above-entitled matter was concluded at
11 11:52 a.m.)