

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

DISH NETWORK LLC,
Petitioner,

- vs -

Case No. IPR2024-00373

US Patent No. 7,594,249

ENTROPIC COMMUNICATIONS, LLC,
Patent Owner.

DEPOSITION OF SCOTT ACTON, Ph.D.

9:08 a.m. to 11:03 a.m.

March 4, 2025

Charlottesville, Virginia

Job No. 7181892

REPORTED BY: Rhonda D. Tuck, RPR, CRR

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ENTROPIC EXHIBIT 2019

DISH v. Entropic

IPR2024-00373

1 Deposition of SCOTT ACTON, Ph.D., taken and
2 transcribed on behalf of the Patent Owner, by and
3 before Rhonda D. Tuck, RPR, CRR, Notary Public in
4 and for the Commonwealth of Virginia at large,
5 commencing at 9:08 a.m., March 4, 2025, 415 4th
6 Street NE, Suite 4, Charlottesville, Virginia.
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I N D E X

TESTIMONY OF: SCOTT ACTON, Ph.D.

Examination by Attorney Halverson.....5

PREVIOUSLY MARKED EXHIBITS REFERENCED:

EXHIBIT NUMBER	PAGE
Exhibit Number 1030	6
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REPORTER'S NOTE: All quotations from exhibits are reflected in the manner in which they were read into the record and do not necessarily indicate an exact quote from the document.

* * * * *

1 (9:08 a.m., March 4, 2025)

2 (Witness sworn.)

3
4 SCOTT ACTON, Ph.D.,

5 having been duly sworn, testified as follows:

6 E X A M I N A T I O N

7 BY ATTORNEY HALVERSON:

8 Q. Good morning, Dr. Acton. How are you
9 today?

10 A. Good morning, Mr. Halverson. I am doing
11 well.

12 Q. Wonderful. Welcome back. In front of
13 you, you have a collection of exhibits. Feel free
14 to look at any of them, none of them, or all of
15 them. But for the greatest hits of the proceeding,
16 we've got the patent, your two declarations, the
17 main references, a couple of other things that were
18 submitted with your first declaration, and then I
19 believe all but one of the exhibits that were
20 submitted with the second declaration. One of them
21 was 1,100 pages long, and we did not print that one.
22 If you need it, let me know. We can find a way, but
23 to save trees, we don't have it today.

24 So with all of that in front of you, all
25 I ask is if you're looking at something, let me know

1 what it is so that the record is clear. Everything
2 should be tabbed based on the exhibit number, just
3 missing the first two or three digits. So Tab 1 is
4 Exhibit 1001. Tab 30 is Exhibit 1030, et cetera.

5 Does that all make sense?

6 A. Yes, sir.

7 Q. So same ground rules as last time. I
8 will do my best to not start asking my next question
9 until you've finished answering my question. If you
10 can do your best to wait for me to finish asking my
11 question before you start answering my question. Is
12 that fair?

13 A. It is, and I will.

14 Q. If you need a break at any point in
15 time, just ask. My one caveat to that is if there
16 is an outstanding question, can you answer that
17 question before we go on break?

18 A. Sounds good.

19 Q. Is there any reason why you can't give
20 truthful and accurate testimony today?

21 A. There is not.

22 Q. All right. So if you could flip to
23 Tab 30, which is your second declaration. Do you
24 recognize your signature on Page 1 of Exhibit 1030?

25 A. I do.

1 Q. Do you have any changes or anything else
2 that you would like to make to your second
3 declaration today before we get started?

4 A. Not at this point. No.

5 Q. Did you review your declaration in
6 preparation for today's deposition?

7 A. Yes, sir.

8 Q. And then your first declaration is
9 Exhibit 1003, behind Tab 3 in that binder, and you
10 don't need to flip to it. You're welcome to. But
11 is it your intent with anything in your second
12 declaration to alter or change any of the opinions
13 that you have in your first declaration?

14 ATTORNEY SHARTZER: Objection to the
15 form.

16 THE WITNESS: Well, the second
17 declaration is already written.

18 BY ATTORNEY HALVERSON:

19 Q. Correct. So is your intent with
20 anything in your second declaration to alter the
21 content of your first declaration?

22 ATTORNEY SHARTZER: Objection to form.

23 THE WITNESS: Are you asking me if it
24 was my intent, in the past tense, to alter
25 something in the first declaration?

1 BY ATTORNEY HALVERSON:

2 Q. Did I say "is"? Is that where the
3 hang-up is?

4 A. Yes.

5 Q. I see. I'll ask a better question.

6 Was it your intent when you signed your
7 second declaration to have your second declaration
8 alter any of the opinions that you offered in your
9 first declaration?

10 ATTORNEY SHARTZER: Objection to form.

11 THE WITNESS: My main intent was to
12 respond to the declaration of Mr. Regis
13 Bates. Continuing, I suppose the opinions in
14 my second declaration, hopefully, helped to
15 clarify points in my first declaration.

16 BY ATTORNEY HALVERSON:

17 Q. So supplement or clarify but not change
18 in a different direction. Is that fair?

19 ATTORNEY SHARTZER: Objection to form.

20 THE WITNESS: I think that's fair. I
21 don't think there's anything in the first
22 declaration that I'm reversing, so to speak.

23 BY ATTORNEY HALVERSON:

24 Q. Can you do me a favor and go to
25 Paragraph 6 of Exhibit 1030, your second

1 declaration, on Page 7.

2 A. Yes.

3 Q. That second sentence there discusses
4 weighing benefits lost and gained. Do you see that?

5 A. Indeed.

6 Q. What benefits did you weigh that were
7 lost in your second declaration?

8 ATTORNEY SHARTZER: Objection to form.

9 THE WITNESS: Do you want to point me to

10 a --

11 BY ATTORNEY HALVERSON:

12 Q. I --

13 A. -- particular argument or a particular
14 point in the declaration?

15 Q. Pardon me. I'm already breaking my
16 rules. Sorry.

17 I'm not aware of any instance where you
18 did weigh a benefit that was lost, and I'm curious
19 to get your understanding of what, in your mind, you
20 contend is a benefit that was lost as part of your
21 analysis.

22 ATTORNEY SHARTZER: Objection. Vague.

23 THE WITNESS: So Mr. Halverson, I
24 realize you're an engineer. Engineering is
25 always a field of trade-offs. We say that

1 there is no free lunch, so to speak. This
2 paragraph eloquently mentions such
3 trade-offs, so we could talk about it in
4 general, but certainly benefits are lost when
5 some are gained.

6 BY ATTORNEY HALVERSON:

7 Q. So did you do that kind of a weighing
8 analysis in your opinions or when coming to your
9 opinions of your second declaration?

10 ATTORNEY SHARTZER: Objection. Vague.

11 THE WITNESS: I'm comfortable with
12 saying that that's always in the mind of the
13 engineer, weighing such trade-offs.

14 BY ATTORNEY HALVERSON:

15 Q. Can you go to Paragraph 21 for me.

16 A. Okay.

17 Q. In Paragraph 21, you're talking about
18 how a person of ordinary skill in the art would look
19 to equalization for the added benefits taught by
20 Jacobsen, right?

21 A. That is what the first sentence says,
22 yes.

23 Q. So that would be a benefit that you are
24 opining would be gained from that combination,
25 right?

1 ATTORNEY SHARTZER: Objection. Vague.

2 THE WITNESS: And I believe the term is
3 "added benefits," plural, as taught by
4 Jacobsen.

5 BY ATTORNEY HALVERSON:

6 Q. But that sentence, you're referring to
7 benefits that are added, not lost, right?

8 A. Those are benefits that would be added,
9 and I would have to look up Jacobsen specifically to
10 list those benefits.

11 Q. Do you have anywhere in this discussion
12 of Amit in Jacobsen where you talk about the
13 benefits that would be lost as a result of that
14 combination?

15 A. In Paragraph 21, no.

16 Q. 22?

17 ATTORNEY SHARTZER: Objection to form.
18 Is there a question pending?

19 (The court reporter read the record.)

20 ATTORNEY SHARTZER: "22" is a question?

21 ATTORNEY HALVERSON: Yep.

22 ATTORNEY SHARTZER: Objection to form.

23 THE WITNESS: Yes.

24 BY ATTORNEY HALVERSON:

25 Q. Where?

1 A. So in 22 -- and it was your question
2 directing me to 22, so I don't know if it answers
3 your original question -- they're talking about,
4 "...designing the time-domain equalizer, which uses
5 adaptation in the frequency domain and windowing in
6 the time domain in order to minimize the mean
7 squared error of the equalized response."

8 So one of skill looks at this and sees
9 that it's a trade-off between increasing the impulse
10 response length and enhancing the signal. So
11 they're arguing if they do it before modulation,
12 they can decrease the length of the impulse
13 response; whereas, if it were done after modulation,
14 it might result in a longer impulse response, which
15 one would know is an increased amount of work and
16 possibly a delay in processing due to that work
17 that's done.

18 Q. You said "they" in that answer. Who is
19 they?

20 A. We've got three authors: Chow, C-H-O-W;
21 Cioffi, C-I-O-F-F-I; and Bingham. And it's curious
22 that Cioffi is the lead author, or the senior author
23 in the Jacobsen paper and is of course the leader of
24 that communications group. And there's many Chow
25 references also within the Jacobsen paper, I believe

1 including Chow's dissertation, which is on
2 equalization, both in time domain and frequency
3 domain and both with multicarrier and
4 single-carrier.

5 Q. You said Cioffi was the lead author in
6 Jacobsen. Why do you say that?

7 A. Generally in electrical engineering, we
8 put the senior author last, and Cioffi is a
9 well-known principal investigator from Stanford, and
10 he's certainly the senior author.

11 Q. What is 10BASE5?

12 A. Good question. 10BASE5 is a standard
13 for ethernet hardware that came out in the early
14 '80s. I vaguely recall '82, but it's safe to say
15 early '80s. And 10BASE5 was coax, meaning that it
16 had a copper conductor and a shield that was
17 coaxially oriented around that copper wire. It was
18 a shielded conductor. And if you were in, say, the
19 late '80s in academia, you might use 10BASE5 for
20 ethernet, which we now know as internet.

21 Q. I want to break down what the different
22 components mean. So the number 10, the word or
23 phrase or abbreviation, Base, and the number 5, in
24 10BASE5, right?

25 A. Yes, sir.

1 Q. What's the 5 supposed to signify?

2 A. The 5 -- and thank you for asking. The
3 5 basically is the anticipated range. I mean, these
4 are all rules of thumb, so to speak, which is a
5 malign term, by the way. The 5 connotes 500 meters
6 of anticipated transport. So you don't really want
7 to go more than half of a klick, half of a
8 kilometer, with your 10BASE5 cable.

9 Q. Why is that?

10 A. Attenuation, simple laws of physics.

11 Q. So you hit too long of a length, and all
12 of a sudden -- not all of a sudden. Excuse me. Let
13 me start over.

14 You hit too long of a length, and the
15 signal gradually starts to degrade and is no longer
16 as strong or usable as it would be less than 500
17 meters?

18 ATTORNEY SHARTZER: Objection. Vague.

19 THE WITNESS: I think that's a fair
20 characterization. I mean, basically the
21 signal dies off as a factor of distance
22 squared, 1 over distance squared, and at some
23 point the signal is too weak to use.

24 BY ATTORNEY HALVERSON:

25 Q. What's the 10 signify in 10BASE5?

1 A. The 10 signifies -- and don't expect all
2 of these numbers, if you keep going, to be as
3 beautiful as 10BASE5. The 10 signifies the target
4 of 10 megabits per second.

5 Q. Well, how about the base? What's the
6 base signify?

7 A. I've never thought about it.

8 Q. Do you have an opinion about whether or
9 not it signifies baseband?

10 ATTORNEY SHARTZER: Objection. Vague.

11 THE WITNESS: That sounds reasonable,
12 but I've really never thought about it.

13 BY ATTORNEY HALVERSON:

14 Q. Have you ever read it referred to in
15 that way?

16 A. If it's true, I probably have, but I
17 can't say for sure. No.

18 Q. We talked a lot last time about
19 multicarrier modulation. Do you remember that?

20 A. Yes.

21 Q. And an example of multicarrier
22 modulation is OFDM, correct?

23 A. Correct.

24 Q. For the record, what is OFDM?

25 A. So my first rule from last time, I

1 guess, is out the window, which was I didn't want to
2 play the acronym guessing game, but I will play the
3 acronym guessing game. OFDM is orthogonal frequency
4 domain modulation.

5 Q. Have you ever heard it referred to as
6 orthogonal frequency division multiplexing?

7 A. That's better. Yeah. So I knew this
8 game was going to end up awry.

9 Q. That's fair.

10 A. And I passed the game during the first.

11 Q. Last time, you did.

12 A. Yeah.

13 Q. So today -- let's start over.

14 You have a radio in your car, right?

15 A. I do.

16 Q. And your car receives a variety of
17 signals on different channels, depending on which
18 station you want to listen to, right?

19 A. That's correct.

20 Q. And each of those channels is a
21 single-carrier, right?

22 A. Are you referring to a particular type
23 of modulation?

24 Q. I'm just trying to establish the
25 difference between single-carrier modulation and

1 multicarrier modulation, just so we're all on the
2 same page.

3 A. Sure.

4 Q. So one channel, 92.7 is a
5 single-carrier, right? There's not multiple
6 carriers in that channel conveying data to your
7 vehicle?

8 A. So that would be a frequency modulation
9 channel, an FM channel, and I would agree to that,
10 in that instance. Yes.

11 Q. And so the presence of two different
12 channels doesn't mean that multicarrier modulation
13 is occurring, right?

14 A. The existence of multiple channels may
15 or may not lead to a multicarrier modulation.

16 Q. Can you go to Tab 7 for me? It's
17 Exhibit 1007, which is the Jacobsen Cioffi paper.
18 Does that look familiar?

19 A. It does.

20 Q. And if you flip to Page 8, after all of
21 the precursor events in the paper, we see the first
22 page of the paper, right?

23 A. That's correct.

24 Q. I think last time, we talked about
25 Figure 2, which is two pages in. You can take a

1 peek at -- that one, right there, with your thumb.

2 Take a peek at that for me.

3 A. Yes, sir.

4 Q. So Figure 2 is depicting regional cable
5 network delivering cable from Vi, which is a source
6 of that information or data, right? To a variety of
7 houses, through a tree structure of cabling; is that
8 right?

9 ATTORNEY SHARTZER: Objection to form.

10 THE WITNESS: That sounds fine. Yes.

11 BY ATTORNEY HALVERSON:

12 Q. So we've got four split points,
13 splitters, where the cable is divided to go into a
14 variety of different paths in a downstream
15 direction; is that right?

16 A. That appears to be correct.

17 Q. Now, part of what Jacobsen's paper,
18 Exhibit 1007, was doing was comparing the
19 feasibility of a single-carrier cable distribution
20 network as compared to a multicarrier cable
21 distribution network; is that right?

22 ATTORNEY SHARTZER: Objection to form.

23 THE WITNESS: I believe those variables
24 were on the table. Yes.

25

1 BY ATTORNEY HALVERSON:

2 Q. If we go to the abstract, which is on
3 the first page of this, not just on the table, but
4 that's exactly what Jacobsen describes when she
5 says, "We present a comparison between the
6 performances of a single-carrier modulation with
7 equalization and multicarrier modulation on
8 simulated cable television (CATV) channels."

9 Right?

10 A. That is the first sentence.

11 Q. If you go to the last page of Jacobsen,
12 Page 15, we see her conclusion on this, right?

13 A. We do.

14 Q. And that conclusion was the results of
15 her simulations indicated, "...that discrete
16 multitone modulation is more computationally
17 efficient than single-carrier modulation with
18 equalization for the transmission of digital data
19 over CATV channels with rippled passbands."

20 Right?

21 A. That is the first sentence of the
22 conclusion. Yes.

23 Q. What is discrete multitone modulation?

24 A. What we talked about in the first
25 deposition, basically we loosely allow it to be

1 synonymous with OFDM.

2 Q. And here, she's referring to DMT, but we
3 discussed last time that DMT and OFDM have kind of
4 evolved today to be synonyms, right?

5 A. I'm with that. I agree.

6 Q. If you can flip back to your second
7 declaration, which was Exhibit 1030, specifically
8 Paragraph 21, where you were talking about the added
9 benefits of Jacobsen. What are those added benefits
10 of Jacobsen?

11 A. Well, one added benefit of Jacobsen, the
12 conference paper, is computational efficiency. And
13 another is signal quality measured by SNR.

14 Q. Which is?

15 A. Signal-to-noise ratio.

16 Q. Can you go back to your declaration, to
17 Paragraph 24 for me, please.

18 A. I'm there.

19 Q. So here, you're talking about your
20 opinion that Jacobsen teaches equalization as
21 performed in a terminal device, right?

22 A. Correct.

23 Q. What is the terminal device of Jacobsen
24 that's performing that equalization?

25 A. Well, for one, Jacobsen mentions the

1 receiver.

2 Q. Where?

3 A. So on your Page 8, the second column, at
4 the bottom. The page reads 305, from the
5 conference, the NCTA. Let me read.

6 Q. Just for the record, so we're all in the
7 same spot, which column, or which side of the page
8 are you on?

9 A. Column 2, Page 8, bottom.

10 Q. Okay.

11 A. She explains intersymbol and
12 interference and then says, "Without some scheme to
13 combat ISI" -- that is intersymbol interference --
14 "a receiver would make detection errors."

15 So talking about a scheme within the
16 receiver, which, to one of skill, would of course be
17 equalization.

18 And I think there's a couple other
19 places where she mentions the receiver. I don't
20 know how much time you want to spend on this.

21 Q. So you said, which of course would be
22 equalization. She's evaluating two different
23 schemes, right? One of which was equalization?

24 ATTORNEY SHARTZER: Objection to form.

25 THE WITNESS: I suppose, going back to

1 our earlier conversation, Mr. Halverson,
2 she's investigating single-carrier with
3 equalization and multicarrier without.

4 And then we read in footnote 4, which
5 occurs on Page 12, Column 2, at the bottom,
6 we read that, hey, you could also throw in
7 some time-domain equalization along with
8 multicarrier, and that might be what you want
9 to go with.

10 BY ATTORNEY HALVERSON:

11 Q. Would you go to Page 14 for me.

12 A. I am on Page 14.

13 Q. The bottom right corner of the page,
14 that last sentence. Do you see that?

15 A. I do.

16 Q. What does it mean, "a prohibitive number
17 of taps"?

18 A. So taps is a term of art that we use,
19 and it goes way back to the '50s and '60s when
20 filter coefficients were actually physical entities.

21 So you could think of today, from your
22 education as an engineer, you could think of taps as
23 being the number of coefficients with which you have
24 to multiply a signal. And if there were to be N, as
25 in Nevada, taps, you would have to do N multiplies,

1 and then, conservatively, N-1 adds to get an answer.

2 Q. When you say "to get an answer," what do
3 you mean to get an answer? To what?

4 A. Good question. So an equalizer, it
5 sounds really esoteric and special, but really it's
6 just a filter. And we if implement it as a finite
7 impulse response filter -- we call that FIR -- the
8 output of that filter is a series of multiplies
9 which corresponds to the number of taps and then a
10 series of adds to get the answer. And so that
11 filter might smooth out your signal appropriately.

12 In this case, the filter tries to do the
13 inverse of what the channel did to it in distortion
14 and basically gives a better, less distorted signal
15 at the receiver.

16 Q. The sentence before the sentence you
17 just read, the one that begins, "Equalizers with a
18 reasonable number of taps," do you see that?

19 A. I do.

20 Q. Where she refers to them as so-called
21 dead-zones, what is a dead-zone?

22 A. So roughly speaking, we think in the
23 frequency domain, and a dead-zone is a band of
24 frequencies that are highly attenuated, almost dead.

25 Q. Can you go to Tab 32, which is

1 Exhibit 1032, for me.

2 A. I can.

3 Q. Do you know how to pronounce this guy's
4 last name?

5 A. I'm going to go with Czyllwik, but I have
6 no idea.

7 Q. I'm good with Czyllwik. For the record,
8 Czyllwik is spelled C-Z-Y-L-W-I-K.

9 You reviewed Czyllwik as part of the
10 preparation of your second declaration, right?

11 A. Correct. It's a reference in my second
12 declaration.

13 Q. Had you read Czyllwik before the
14 preparation of your second declaration?

15 A. I can't recall.

16 Q. Czyllwik is also doing a comparison
17 between single-carrier and multicarrier modulation,
18 right?

19 A. I suppose I can agree to you that those
20 elements are in there, but I would say the main
21 driving force of Czyllwik is describing the
22 synchronization of the single-carrier modulation
23 with what he calls FDE, frequency domain
24 equalization.

25 Q. And he does this in the cellular domain,

1 right?

2 A. He calls it broadband mobile radio
3 applications.

4 Q. That would be wireless?

5 A. That would be wireless.

6 Q. And what did Czyllwik conclude?

7 A. So as I mentioned a few minutes ago,
8 Czyllwik cared about synchronization, which one could
9 say is relevant to the '249 discussion.

10 And in looking in synchronization,
11 Czyllwik found that one could use a similar
12 synchronization method for single-carrier systems
13 with FDE, frequency domain equalization, as compared
14 to what already existed, and that one could also use
15 this for OFDM systems, which we've recently been
16 discussing.

17 Q. So on the first page, right side, top of
18 the first partial paragraph, the last sentence
19 begins, "Therefore." Do you see that?

20 A. Yes.

21 Q. And Czyllwik says, "Single-carrier
22 modulation with FDE," frequency domain equalization,
23 "and OFDM," orthogonal frequency division
24 multicarrier, exhibit approximately the same
25 complexity."

1 Right?

2 A. Right.

3 Q. So what do you think about the
4 inconsistencies as far as complexity between Czylik
5 and Jacobsen?

6 ATTORNEY SHARTZER: Objection to form.

7 THE WITNESS: I wouldn't characterize it
8 as such, but I would also say that you're
9 talking about two conference papers out of a
10 body of thousands of such papers, and there's
11 so many different scenarios and so many
12 different setups. Of course we could get
13 into the weeds and figure out what's
14 different about Jacobsen and what's different
15 about Czylik, but it's not surprising that
16 those two could have the same complexity in a
17 given scenario.

18 BY ATTORNEY HALVERSON:

19 Q. And Jacobsen found that in her study,
20 the single carrier with equalization was more
21 complex than the multicarrier without equalization,
22 right?

23 A. I think that's correct. And Czylik
24 also, as well as Jacobsen, but Czylik probably in
25 more detail, include the ability to do equalization

1 in the OFDM scheme.

2 Q. Go back to Tab 7 for me, which is
3 Jacobsen.

4 A. Mr. Halverson, what's our time on the
5 clock right now?

6 Q. About 45 minutes. Do you want a break?

7 A. Let's go a little bit more.

8 Q. Tab 7, Jacobsen. We were talking about
9 terminal devices a little bit ago. Do you remember
10 that? And Jacobsen, you said, the receivers?

11 A. Correct.

12 Q. Jacobsen, we talked about, has
13 communications from a cable source, in Figure 2, to
14 a variety of houses at the end of those fingers of
15 that cable network, right?

16 A. Right. Those little local area networks
17 at the end of the, I guess you're calling them,
18 fingers.

19 Q. Yeah. I don't have a great word for it.
20 Do you have a better one?

21 A. Branches.

22 Q. We can use branches.

23 Does Jacobsen describe a time division
24 system or a frequency division system or some other
25 form of division?

1 A. I don't understand your question.

2 Q. So somehow there's got to be an
3 allocation of time or frequency to the different
4 houses so that the signals don't interfere with each
5 other; is that right?

6 ATTORNEY SHARTZER: Objection. Vague.

7 THE WITNESS: Not necessarily, but I
8 know where you're going.

9 BY ATTORNEY HALVERSON:

10 Q. We'll get to where I'm going in a
11 second.

12 Why not?

13 A. They all could be receiving the same
14 content.

15 Q. Is it your understanding of Jacobsen
16 that it is a unidirectional network, in that there
17 is only data going from Vi to the different
18 endpoints and nothing coming back?

19 ATTORNEY SHARTZER: Objection.

20 Incomplete hypothetical.

21 THE WITNESS: It is not.

22 BY ATTORNEY HALVERSON:

23 Q. Why?

24 A. For one citation, and I could keep
25 looking, on Page 8, Column 1, Introduction, the

1 first paragraph, she speaks of, "...the CATV network
2 is a potential supplier of these interactive data
3 services."

4 So interaction would involve an uplink
5 as well as a downlink. Oh. And then it goes on and
6 discusses upstream frequencies for interactive
7 transmission.

8 Q. So those upstream -- pardon me. Were
9 you finished?

10 A. Yes. Thank you.

11 Q. So those upstream frequencies have to be
12 allocated in some shape or form or subdivided in a
13 time domain in some shape or form to ensure that the
14 interactive content from the house to the head end
15 of one house doesn't interfere with the interactive
16 content of a different house, right?

17 ATTORNEY SHARTZER: Objection. Assumes
18 facts not in the record.

19 THE WITNESS: Wrong.

20 BY ATTORNEY HALVERSON:

21 Q. Why?

22 A. So I'm taking your question sort of out
23 of the blue, and one way that we could transmit and
24 receive is using CDMA, code division multiple
25 access, although maybe I'll be corrected on that one

1 as well. In such a modulation scheme, CDMA
2 basically uses a random, what we call a pseudorandom
3 number, to modulate a signal using the exact same
4 frequency up and down.

5 Q. Now, we've already established that
6 Jacobsen uses DMT, right?

7 ATTORNEY SHARTZER: Objection. Form.
8 BY ATTORNEY HALVERSON:

9 Q. If you go to the last page, the
10 conclusion.

11 A. DMT and single-carrier modulation,
12 right?

13 Q. Well, for her multicarrier analysis,
14 she's using DMT, right?

15 A. Agreed.

16 Q. Can the system employ DMT and CDMA at
17 the same time?

18 A. I like the question. Probably. Yes.

19 Q. In a DMT system, would you have to
20 allocate different tones to different houses, or
21 could the different houses use the same tone to
22 communicate?

23 A. I think I get where your question is
24 going. If one were to use the same set of tones at
25 the same time instance, it would have to be the same

1 message.

2 Q. Otherwise, what would happen?

3 A. Otherwise, there would be degradation
4 from interference.

5 Q. Does Jacobsen describe the allocation of
6 tones to houses?

7 A. Well, for one, the citation that I just
8 mentioned, which is on Page 8, Column 2, at the top,
9 where she mentions using 50 to 550 megahertz for
10 downstream and 5 to 40 megahertz for upstream.

11 Q. And what about that do you understand to
12 be Jacobsen describing the allocation of different
13 tones to different houses?

14 A. At least in that paragraph,
15 Mr. Halverson, it doesn't go into such detail.

16 Q. Are you aware of it anywhere else?

17 A. I think I understand the question, but
18 can I have it read back?

19 (The court reporter read the record.)

20 THE WITNESS: No, and I don't believe
21 that's the intent of the Jacobsen and Cioffi
22 article.

23 ATTORNEY HALVERSON: Now might be a good
24 time for a break, if you want one.

25 THE WITNESS: Perfect.

1 (Break in proceedings.)

2 BY ATTORNEY HALVERSON:

3 Q. Welcome back, Dr. Acton.

4 A. Thank you.

5 Q. Go to Paragraph 11 of your declaration
6 for me, the second declaration, 30.

7 A. Yes.

8 Q. You use the word "exclusively" a couple
9 of times in this paragraph. Do you see that?

10 A. Yes.

11 Q. Why?

12 A. So the two statements are, number one,
13 "Engineers do not exclusively work on broadband
14 networks." That's statement one. And that
15 statement is true.

16 The second statement is, two, "Engineers
17 do not exclusively work on coaxial cable networks."
18 And that is also true.

19 Q. Maybe I'm missing something there. My
20 question was, why do you use the word "exclusively"
21 there, and in response you said that they are true
22 statements, and perhaps I'm missing something, but
23 with the understanding that it's your opinion that
24 those are true statements, what are you conveying
25 with the word "exclusive" in those two sentences?

1 A. Okay. So exclusively is an adverb, and
2 it's modifying the verb "work," and one could say
3 engineers trained in this area, that we could call
4 digital communications, work on a variety of
5 networks. So they don't exclusively work on
6 broadband networks. Likewise, engineers work on a
7 lot of media.

8 We've already talked about today air as
9 a medium, when you mentioned wireless. We talked
10 about cable, at least coaxial cable. Certainly in
11 this matter we've talked about twisted pair. Think
12 of the old telephone network. And we could talk
13 about others, like fiber or gold wire, but the
14 engineer is not exclusively working on any one of
15 these media.

16 Q. You would agree that somebody could meet
17 your definition of skill in the art without having
18 ever worked on coaxial cable networks, right?

19 ATTORNEY SHARTZER: Objection. Vague.

20 BY ATTORNEY HALVERSON:

21 Q. Paragraph 9.

22 A. I'm sorry?

23 Q. Paragraph 9.

24 A. Let me go to Paragraph 9, which is
25 allegedly my definition.

1 So as to your hypothetical, it certainly
2 could be true, but basically for 31 years, I've been
3 teaching engineers in electrical engineering, and I
4 would seriously doubt that someone with a bachelor's
5 degree in electrical engineering would not have an
6 understanding of coaxial cable, but I don't know if
7 that answers your question.

8 Q. I think it does. I think the beginning
9 part. So the question was, somebody could -- a
10 hypothetical person could meet your definition of
11 skill in the art, in Paragraph 9, and not have any
12 experience with coaxial cable networks, right?

13 A. Do you want to nail down "experience"
14 any further?

15 Q. Professional or educational.

16 A. It's possible. Maybe unlikely but
17 possible. I'll have to give you that.

18 Q. And so your second part of your answer
19 to that question was, and I don't mean to put words
20 in your mouth, so by all means correct me if I do
21 this wrong, but effectively, in your experience
22 somebody who had this level of skill in the art
23 would necessarily have had some exposure to coaxial
24 networks, based on your time teaching?

25 A. I agree with that.

1 Q. So if that's the case, what is it about
2 Mr. Bates's definition that's a problem?

3 A. Great question. The problem is that
4 he's trying to limit the person of ordinary skill in
5 the art to one particular technology, with one
6 particular method of deployment, and I think that's
7 improper.

8 Q. So why do you think that he is trying to
9 exclude other experiences, based on the language
10 that he has provided, as far as what that level of
11 skill would have?

12 A. I can't really speak to his motivation.
13 It seems that the documents from the patent owner's
14 side want to go more towards the technician
15 definition of the person of ordinary skill and away
16 from an engineer definition of the person of
17 ordinary skill. And I don't understand that, but I
18 was just pushing back in Paragraph 11 on narrowing
19 to broadband networks and narrowing to coaxial
20 cable.

21 Q. You don't see the word "exclusively" in
22 Mr. Bates's definition of a person of ordinary skill
23 in the art, do you?

24 A. No, but look at what precedes it. "At
25 least two or three years of experience relating to

1 the design and development of broadband networks
2 over coaxial cables."

3 That, to me, is unbelievably narrowing,
4 and I believe the definition I gave was unbelievably
5 broad, even accepting on-the-job experience as a
6 substitute for some formal education. That's my
7 opinion.

8 Q. Can you go to the patent, which is the
9 first page, the first document.

10 A. Yes. The patent, the '249 patent.

11 Q. Exhibit 1001, right?

12 A. Precisely.

13 Q. The top left corner of this front cover
14 of Exhibit 1001, we see five inventors. Do you see
15 that?

16 A. I do.

17 Q. Do you know any of them?

18 A. I don't. Were they Qualcomm?

19 Q. I think they were Entropic, if you look
20 just below.

21 A. Okay.

22 Q. Are you aware of whether or not they had
23 specific coaxial experience?

24 A. I'm not.

25 Q. Do you know what Entropic was doing in

1 2001?

2 A. Operating as a company.

3 Q. Do you know what kind of company?

4 A. A communications company.

5 Q. Where did that come from?

6 A. The name.

7 Q. Do you know what kind of communications
8 they were providing technology for?

9 A. I'm not really familiar with the history
10 of Entropic or whether it's practicing in 2025.

11 Q. To be clear, I'm not asking about today.
12 I'm asking about in 2001, when the provisional for
13 the '249 was filed.

14 A. Agreed.

15 Q. Okay. So with that understanding, not
16 whether or not they are practicing today, but
17 specifically about what they were doing in 2001,
18 does that change your answer?

19 A. I don't think it changes my answer,
20 which was, to clarify, that I'm not familiar with
21 the history of this company.

22 Q. Can you go back to your second
23 declaration for me, Tab 30.

24 A. Yes.

25 Q. Paragraph 25, please, which is on

1 Page 15.

2 A. Yes.

3 Q. What is the HomeCN of Amit? And full
4 disclosure, Amit is Tab 5.

5 I may be able to short-circuit this a
6 little bit if you go to Column 2, Line 56.

7 A. Thank you. It is the home cable network
8 of Amit.

9 Q. So that would be the local network of
10 Amit, right?

11 ATTORNEY SHARTZER: Objection to form.

12 THE WITNESS: That would be a local
13 network mode of Amit.

14 BY ATTORNEY HALVERSON:

15 Q. So in Paragraph 25, and I would keep
16 your hand there because we're going to go back to
17 that spot in Amit, but in Paragraph 25 where you say
18 you don't agree that Amit's notch filter disconnects
19 the home from the regional cable network, what is it
20 that you disagree with?

21 A. That it disconnects the home from the
22 regional cable network.

23 Q. So the next sentence here says that,
24 Amit states the HomeCN is disconnected from the
25 regional cable network, right?

1 A. Correct.

2 Q. And the HomeCN is the home cable
3 network, right?

4 A. I think you more precisely described it
5 as the local area network.

6 Q. And so what is incorrect about the
7 disconnection of the home from the regional cable
8 network?

9 A. Well, the home isn't disconnected.

10 Q. What do you mean by that?

11 A. The cable company could still be feeding
12 the signal downstream into the home and would be.

13 Q. So when Amit says the HomeCN is
14 disconnected, do you disagree with Amit's statement,
15 or what am I missing here?

16 A. I disagree with your and Dr. or
17 Mr. Bates interpretation of that statement.

18 Q. So what is your understanding of my
19 interpretation of that statement?

20 A. And maybe I'm wrong -- correct me --
21 that you think the entire home is disconnected from
22 the network when the notch filter is in place.

23 Q. When you say "the entire home," what is
24 the line that you're drawing between the entire home
25 and the HomeCN, or are those the same?

1 A. The line I'm drawing is that -- say you
2 were watching CNN in your bedroom. When the notch
3 filter exists, you can still watch CNN in your
4 bedroom. Now, the point-to-point communications
5 within your house -- maybe your friend is watching
6 ESPN in another room. Those communications between
7 the two of you, should they exist, will be notched
8 out.

9 Q. I see. So what you're saying is it is
10 not a disconnect in the sense that no cable signals
11 are allowed to enter the home?

12 A. Yes.

13 Q. But you agree that it is a disconnect in
14 the sense that the LAN signals are severed from the
15 regional cable network?

16 A. I can agree to that. Yes.

17 Q. Go to Paragraph 32.

18 A. Okay.

19 Q. So 32, you're setting forth two factual
20 characterizations of different disclosures of Amit,
21 right?

22 A. Two factual disclosures. I guess I
23 don't understand your question. Sorry,
24 Mr. Halverson.

25 Q. So I'm trying to figure out what 32 is

1 saying, and the way that I read 32, there is an
2 opinion sentence, is the first sentence, right, your
3 conclusion of this paragraph?

4 A. Yes.

5 Q. And then you have two different -- two
6 other sentences in this paragraph, one related to
7 two-frequency mode and the other related to notch
8 filter reflection, right?

9 A. Yep.

10 Q. And I think what you're saying is for
11 the notch filter reflection, there are teachings in
12 Amit that say the reflection off of a notch filter
13 is used as the communication signal, the main
14 signal, and that's the thing -- that's the last
15 sentence of the paragraph, where you're citing to
16 Column 13 and 14. Is that right?

17 A. That's accurate.

18 Q. In first one, you're describing
19 two-frequency mode, which is a teaching in Amit of
20 using a transponder to frequency shift to avoid an
21 echo signal, right?

22 A. Correct.

23 Q. You then draw a conclusion, in the next
24 paragraph, where you say, "A POSITA implementing
25 Amit's beneficial reflection would not look to

1 Amit's two-frequency mode, as it addresses the
2 reflection in a completely different way."

3 Right?

4 A. That is a great point.

5 Q. You made that point, right?

6 A. Yes.

7 Q. What do you mean, "a completely
8 different way"?

9 A. It's a completely different way in the
10 sense that, let's call it, the reflection approach
11 off of a notch filter, which is basically using the
12 reflection off of a passive component, which is
13 rather brilliant.

14 Amit provides an alternative solution of
15 using this transponder, and it's not using the
16 reflection off the notch filter. It's receiving the
17 signal, changing frequency, and sending it back on a
18 different frequency. It's more of a brute force
19 approach.

20 And of course there's, as we talked
21 about earlier, there's trade-offs. One trade-off
22 might be the expense of that transponder. One
23 trade-off might be latency. Who knows. But I think
24 we're on the same page now.

25 Q. So when you say "it addresses the

1 reflection," it's your opinion that the transponder
2 disclosure that you cite in Paragraph 32 doesn't use
3 a reflection; it instead transforms the carrier
4 frequency to a different channel, right?

5 ATTORNEY SHARTZER: Objection to form.

6 THE WITNESS: It in effect transponds
7 the signal to a different frequency. Yes.

8 BY ATTORNEY HALVERSON:

9 Q. So how is that addressing the
10 reflection?

11 A. It's addressing the reflection, and I
12 don't know how deeply we want to get into the
13 reflection, because there's reflections off of all
14 of these little components. There's passive
15 splitters. There's the notch filter. There's the
16 big splitter.

17 Right now I'm looking at Figure 6 of
18 Amit, but you could look at some of the other
19 figures as well.

20 So there's all these different
21 reflections that have to be handled carefully, and
22 the patent talks about receiving these reflections.

23 The transponder way is an alternate
24 method. Instead of trying to clean up the
25 reflections and capture the dominant reflection,

1 perhaps, I'm just going to switch to a different
2 frequency and go downstream into my house, with the
3 same information but at a different frequency, and
4 perhaps I don't have to use mitigation strategies
5 like equalization, like error correction, as well,
6 and maybe a more advanced system like least mean
7 squared algorithm.

8 Q. So is it your opinion that those two
9 disclosures of Amit are incompatible?

10 A. That's a really nice question, because
11 maybe they're not. You could use Amit's reflections
12 at the same time as using a transponder, maybe if
13 latency was a key feature that you were trying to
14 minimize.

15 Q. Are you familiar with coaxial splitters?

16 A. Yes.

17 Q. We talked about them before in this
18 proceeding. How do coaxial splitters work?

19 ATTORNEY SHARTZER: Objection to form.

20 THE WITNESS: So if we take the
21 traditional passive coaxial splitter, you
22 make one coaxial connection into two, and
23 that involves a signal loss of approximately
24 half the power on either side.

25

1 BY ATTORNEY HALVERSON:

2 Q. So one signal comes in. Two identical
3 signals come out, and those two identical signals
4 have less power individually than the signal that
5 came in?

6 A. Perfect.

7 Q. You said "passive" there. You're
8 distinguishing that from an active splitter; is that
9 right?

10 A. Yes.

11 Q. And an active splitter could also be
12 referred to as a powered splitter?

13 A. I like it.

14 Q. And that would be where instead of a
15 loss of power, you could maintain approximately the
16 same power as the input signal in the two different
17 output ports, right?

18 A. Yeah, or you could even apply gain.

19 Q. Have you ever heard of a POTS splitter,
20 plain old telephone system?

21 A. I have.

22 Q. How does a POTS splitter work?

23 ATTORNEY SHARTZER: Objection to form.

24 THE WITNESS: So a plain old telephone
25 system splitter, POTS, is a twisted pair

1 technology, and we've talked about that
2 previously. It's similar, and typically in
3 the passive case, there is a two-to-one
4 wiring. And some of these twisted pair units
5 are actually quite complicated, with four or
6 five twisted pairs within one cabling, but a
7 fairly similar process.

8 BY ATTORNEY HALVERSON:

9 Q. The signal comes in, some sort of power
10 division, assuming it's a passive splitter,
11 identical signals go out. Right?

12 A. Right.

13 Q. Have you ever heard of a DSL splitter?

14 A. Sure. DSL is digital subscriber line
15 and uses most commonly twisted pair or POTS
16 technology. So that would be similar.

17 Q. And when you say "similar," what do you
18 mean by that?

19 A. That would be, similarly, splitting the
20 twisted pair wires and basically doubling the
21 output.

22 Now, the twisted pair, maybe we covered
23 this in my first deposition, is one signal that's
24 positive, one signal that's the reverse of that,
25 flipping it. I think about flipping a sine wave.

1 You transmit those both simultaneously. They're
2 both subject to the same noise. And then when you
3 subtract them at the back end, you get twice the
4 signal and, theoretically, almost zero noise, and
5 that would be part of a splitter in that case. And
6 of course a splitter would add attenuation. It
7 would probably add noise as well, if impedance
8 wasn't perfectly matched.

9 Q. Have you ever seen a DSL splitter that
10 divided data from telephone?

11 A. I don't know if I've physically seen
12 one, but that makes a lot of sense.

13 Q. Have you ever had DSL in your house?

14 A. No.

15 Q. You're, well, maybe lucky. Never mind.

16 If you were to be separating the
17 telephone spectrum from the data spectrum in a DSL
18 splitter, how would the splitter ensure that the
19 signal went to the right endpoint?

20 A. Well, in such a case, there would be
21 filters, and you might be surprised to know that the
22 low-pass filter involved in the phone portion, the
23 telephone portion of DSL, is a simple capacitor.
24 It's one discrete, passive unit, and essentially
25 low-pass would go one way, and the other portion of

1 the spectrum would go the other way, which may not
2 necessarily need to be filtered.

3 Q. And the data side of that goes onwards
4 to a modem; is that right?

5 A. Yes.

6 Q. Is a modem a terminal device?

7 A. I think it can be. Yes.

8 Q. Last time, we chatted about TDM, time
9 division multiplexing, I think. Is that right?

10 A. I'm already batting zero for one today,
11 so I'm going to agree with you. Yes.

12 Q. Do you agree that TDM is synchronized
13 using an 8-kilohertz clock?

14 A. In all cases, no, I don't agree.

15 Q. Why?

16 A. TDM is much broader than one
17 manifestation of TDM.

18 Q. In your declaration, Paragraph 55, you
19 refer to some FFTs, Fast Fourier Transformations,
20 from your experiences in the '80s. Do you recall
21 that portion of your declaration?

22 A. I do.

23 Q. When you say you were executing FFTs on
24 PCs, what does that mean?

25 A. So the FFT stands for Fast Fourier

1 Transform. It's a faster version of the Fourier
2 Transform. Fourier Transform is one of the most
3 basic, if not the most basic, concept in electrical
4 engineering. I just taught it this fall in my
5 sophomore level class, that we call second year
6 class at the University of Virginia, signals and
7 systems.

8 The Fourier Transform is a method to
9 take a signal in the time domain and to convert it
10 into its frequency domain components, if you will.
11 For length and signal, it has a complexity of
12 roughly quarter N squared.

13 Now, the Fast Fourier Transform, we say
14 rediscovered in the '60s, because Gauss, G-A-U-S-S,
15 actually discovered it a long time ago, the Fast
16 Fourier Transformation has a complexity of $n \log n$,
17 N-L-O-G-N, which when N is large makes a whole heck
18 of a lot of difference.

19 So in the '80s, one way of computing a
20 Fourier Transform was through software, and I used
21 the book called Numerical Recipes to execute a Fast
22 Fourier Transform in software in, say, 1988, 1989
23 timeframe.

24 Q. And so "in software," you're referring
25 to the performance of the mathematical operation,

1 correct?

2 A. Yeah. So if there's an input of length
3 N, as in Nevada, the output is of length N of the
4 Fast Fourier Transform. The output is in a
5 different domain. It's complex numbers instead of
6 real numbers, but you get the point.

7 Q. What makes N large?

8 A. Making a signal large, like N would be
9 large for an image or a video or some sort of
10 multimedia signal.

11 Q. So if you were performing a Fast Fourier
12 Transformation on a cable video signal, you would
13 expect N to be large?

14 A. Not necessarily. Let me explain. I
15 teach this in my signal processing class.

16 Essentially, when you talk to your
17 grandmother on the phone, you have no idea how long
18 she's going to be on the phone. It could be an
19 hour. It could be two hours. It could be three
20 hours. It could be five seconds.

21 So you're not going to create a
22 frequency domain representation of her two-hour
23 conversation. What you're going to do is you're
24 going to break it up into subsignals of length L, as
25 in Louisiana, in which you can handle L

1 computationally, because probably on the receiving
2 end, you don't want to wait too long for processing.

3 Maybe you're using the Fourier Transform
4 to filter your grandmother's voice to remove noise,
5 and you can't wait a minute. That's annoying. You
6 can wait maybe 200, 300 milliseconds. So you would
7 break your cable TV signal up into segments. And
8 now they're all packetized, so the question is
9 probably moot, but each one would be processed
10 individually by the Fourier Transform.

11 Q. When you were doing it on your PC in the
12 '80s, was that generating a signal that was
13 transmitted, or was that performing the math on a
14 simulated signal?

15 A. I guess I'm not understanding your
16 question, because it's not like I did the Fourier
17 Transform once. I don't know. Is there a way to
18 reword the question?

19 Q. No. I think that's all right.

20 A couple more DSL questions for you.
21 DSL, digital subscriber -- I've heard loop and line.
22 Do you know what the right answer is?

23 A. There's some history there. Originally
24 it was a loop, but line is what everyone thinks of
25 when they say DSL.

1 Q. So the digital subscriber line describes
2 the communications from the home to the DSLAM,
3 D-S-L-A-M. Is that right?

4 ATTORNEY SHARTZER: Objection to form.

5 THE WITNESS: I think that's correct,
6 and in my first deposition we went over
7 DSLAM. Can you remind me of the antecedent?

8 BY ATTORNEY HALVERSON:

9 Q. Maybe. Digital subscriber line access
10 multiplexer. Does that sound about right?

11 A. Yes.

12 Q. And then upstream from the DSLAM, away
13 from the home, the telephone and the data signals
14 are separated again. Is that right?

15 A. That certainly makes sense. Yes.

16 ATTORNEY HALVERSON: I think I might be
17 about done. Do you want to give me a
18 three-minute break?

19 ATTORNEY SHARTZER: Sure.

20 THE WITNESS: Certainly.

21 (Break in proceedings.)

22 ATTORNEY HALVERSON: Dr. Acton, I have
23 nothing else, subject to anything from your
24 counsel.

25 ATTORNEY SHARTZER: Nothing further.

1 ATTORNEY HALVERSON: Wonderful. Thank
2 you, sir.

3 THE WITNESS: Thank you.

4 ATTORNEY HALVERSON: Can I get a
5 fast-turn final?

6 THE COURT REPORTER: Sure. You can have
7 it tomorrow. It wasn't very long.

8 ATTORNEY HALVERSON: Okay. Tomorrow
9 would be great.

10 THE COURT REPORTER: Okay. Did you want
11 a copy, sir?

12 ATTORNEY SHARTZER: Yes. Seven days.
13 (Deposition adjourned at 11:03 a.m.)

14 * * * * *

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1 COMMONWEALTH OF VIRGINIA AT LARGE, to wit:

2 I, Rhonda D. Tuck, RPR, CRR, Notary Public in
3 and for the Commonwealth of Virginia at Large, and
4 whose commission expires on May 31, 2028, do certify
5 that the aforementioned appeared before me, was
6 sworn by me, and was thereupon examined by counsel;
7 and that the foregoing is a true, correct, and full
8 transcript of the testimony adduced.

9 I further certify that I am neither related to
10 nor associated with any counsel or party to this
11 proceeding, nor otherwise interested in the event
12 thereof.

13 I further certify that prior to the close of
14 the deposition, the witness did not request to
15 review the transcript.

16 Given under my hand and notarial seal in
17 Fluvanna County, Virginia, this 5th day of March,
18 2025.

19 
20
21

22 Rhonda D. Tuck, RPR, CRR
23 Notary Public Registration No. 224847
24 Commonwealth of Virginia at Large
25 Job No. 7181892

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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THE ABOVE RULES ARE CURRENT AS OF APRIL 1, 2019. PLEASE REFER TO THE APPLICABLE FEDERAL RULES OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

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Veritext Legal Solutions represents that the foregoing transcript is a true, correct and complete transcript of the colloquies, questions and answers as submitted by the court reporter. Veritext Legal Solutions further represents that the attached exhibits, if any, are true, correct and complete documents as submitted by the court reporter and/or attorneys in relation to this deposition and that the documents were processed in accordance with our litigation support and production standards.

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