

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

UNITED PATENTS, LLC

Petitioner

- v. -

VL COLLECTIVE IP LLC

Patent Owner

IPR2022-01086

U.S. Patent 8,605,794

Deposition of IMMANUEL FREEDMAN, PH.D.

Conducted Remotely

Wednesday, July 19, 2023

10:03 a.m.

Reported by: Matthew Goldstein, RMR, CRR

DIGITAL EVIDENCE GROUP

1730 M Street, NW, Suite 812

Washington, D.C. 20036

(202) 232-0646

VL COLLECTIVE IP LLC

IPR2022-01086

EX2014

UNIFIED PATENTS, LLC v.

VL COLLECTIVE IP LLC

1 Deposition of IMMANUEL FREEDMAN, PH.D.,

2 conducted remotely:

3

4

5

6

7

8

9 Pursuant to Notice, before Matthew Goldstein,

10 RMR, CRR, Notary Public in and for the State of

11 Maryland.

12

13

14

15

16

17

18

19

20

21

22

1 A P P E A R A N C E S

2 ON BEHALF OF THE PETITIONER:

3 JONATHAN BOWSER, ESQUIRE

4 HAYES & BOONE, LLP

5 800 17th Street NW

6 Suite 500

7 Washington, D.C. 20006

8 202.654.4503

9

10 ON BEHALF OF THE PATENT OWNER:

11 JAIME F. CARDENAS-NAVIA, ESQUIRE

12 REICHMAN JORGENSEN, LLP

13 750 Third Avenue

14 Suite 2400

15 New York, New York 10017

16 646.921.1474

17

18

19

20

21

22

1

C O N T E N T S

2

EXAMINATION OF IMMANUEL FREEDMAN, PH.D.

PAGE

3

By MR. CARDENAS-NAVIA

5

4

5

E X H I B I T S

6

(Retained by Counsel)

7

DEPOSITION EXHIBIT

PAGE

8

9

Exhibit 1001 United States Patent No.

7

10

8,605,794 B2

11

Exhibit 1016 Supplemental Declaration of Dr.

7

12

Immanuel Freedman in Support of

13

Petitioner's Reply

14

15

16

17

18

19

20

21

22

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

2 Whereupon,

3 IMMANUEL FREEDMAN, PH.D.,

4 being first duly sworn or affirmed to testify to

5 the truth, the whole truth, and nothing but the

6 truth, was examined and testified as follows:

7 EXAMINATION BY COUNSEL FOR THE PATENT OWNER

8 BY MR. CARDENAS-NAVIA:

9 Q. Good morning, Dr. Freedman.

10 A. Good morning.

11 Q. Do you have any materials around you,
12 any papers or anything like that related to this
13 IPR proceeding?

14 A. Nothing at all. I'm very careful about
15 such things.

16 Q. Okay. And do you have any files open on
17 your computer or any applications running other
18 than this Zoom proceeding we're on?

19 A. I have my time-logging software so I can
20 log the time for this deposition.

21 Q. Okay. And anything else?

22 A. Nothing, nothing at all.

1 Q. Okay. Thank you.

2 And in case we need it, this is more
3 just an administrative thing, would it be easier
4 for me to drop, you know, exhibits from the
5 deposition -- or from the IPR into the chat box or
6 do you have access, could you access your
7 declaration if you needed to?

8 A. I believe that the correct and best
9 procedure is that you drop the documents into the
10 chat box so I can be absolutely certain we are
11 both looking at the same document.

12 Q. Okay. I'll be sure to do that then.

13 And you understand that you're
14 testifying under oath here today?

15 A. Indeed I do.

16 Q. And you understand that means that you
17 need to provide testimony that is truthful and
18 complete?

19 A. Yes.

20 Q. Is there any reason why you cannot
21 provide testimony today that is truthful and
22 complete?

1 A. No.

2 Q. Okay. Great.

3 I will go ahead and drop Exhibit 1016,
4 which is your supplemental declaration, into the
5 chat.

6 (Deposition Exhibit 1016 previously
7 marked for identification and retained by
8 counsel.)

9 THE WITNESS: Okay.

10 BY MR. CARDENAS-NAVIA:

11 Q. And so that you have it handy, I will
12 also drop Exhibit 1001, the '794 patent, into the
13 chat, as well.

14 (Deposition Exhibit 1001 previously
15 marked for identification and retained by
16 counsel.)

17 BY MR. CARDENAS-NAVIA:

18 Q. And can you let me know when you've had
19 a chance to download those and open them on your
20 computer?

21 A. Sure. I'm trying to do so right now.
22 The response is a little bit sluggish. Please

1 stand by while I try to access this.

2 Q. Sure.

3 A. I have Exhibit 1016 open, please stand
4 by while I try and access the other one.

5 Q. Sure.

6 A. Yeah, I'm having some challenge with the
7 computer here. It doesn't seem to be behaving
8 properly. I have 1016 open, but I don't -- and
9 your image appears to be frozen.

10 Q. Well, why don't we do this. Let's go
11 ahead and proceed with 1016, and if we need 1001
12 for some reason, we can either address the
13 computer issue at that time or I can also share my
14 screen with Exhibit 1001 and direct you to the
15 pertinent place.

16 So can we go ahead and proceed,
17 Dr. Freedman?

18 A. Hold on one minute while I try and see
19 what has happened here. For some reason the
20 screen appears to be going black, and I do not
21 know why. I have not seen this before.

22 I'm getting it connecting and

1 disconnecting almost at random, and I can't see
2 what is taking place. The screen is going black.
3 It says the display is connecting and
4 disconnecting at random.

5 Q. Why don't we take a break then and --

6 A. Take a break. Let's say ten minutes.
7 I'll reboot the computer, and let's see if that's
8 what the issue is. I've never encountered this
9 before. So it's unknown territory for me.
10 Ten minutes, let's say.

11 Q. Okay.

12 MR. CARDENAS-NAVIA: Can we go ahead and
13 go off the record?

14 MR. BOWSER: Yes.

15 (Recess from the record.)

16 BY MR. CARDENAS-NAVIA:

17 Q. Welcome back, Dr. Freedman.

18 A. Okay.

19 Q. And before the break, I had dropped
20 Exhibit 1001, which is the '794 patent, and
21 Exhibit 1016, which is your supplemental
22 declaration, into the chat box.

1 Do you have access to those exhibits, or
2 should I provide them again?

3 A. I do have access to those exhibits, and
4 I have them open in another window.

5 Q. Okay. Great.

6 Could you please then look at your
7 supplemental declaration, Exhibit 1016?

8 A. Yes.

9 Q. And please turn to paragraph 1.

10 Are you there?

11 A. Yeah, I'm scrolling. It unfortunately
12 takes a little while to do the scroll.

13 Q. Okay. Please let me know when you have
14 paragraph 1 of your supplemental declaration in
15 front of you.

16 A. Yes, it's in front of me now.

17 Q. And I'm going to read starting at the
18 end of the third line. It says, "I am being
19 compensated at my usual and customary rate for the
20 time I spend in connection with this IPR."

21 Do you see that?

22 A. Yes, I do.

1 Q. And we discussed this -- a similar
2 sentence at your deposition last time.

3 Do you recall that?

4 A. Yes, I do.

5 Q. Okay. And you do not have a usual and
6 customary rate; correct?

7 A. I have a usual and customary rate for
8 various clients. My usual and customary rate for
9 matters that stem from Unified is currently about
10 \$270 per hour. I would have to check to make
11 sure. There are times in which I'm engaged by
12 other counsel in other types of cases, and I tend
13 to charge a different rate, typically the median
14 rate for such -- for such experts in those cases,
15 if I'm negotiating it directly.

16 Q. Okay. And so when you're hired as an
17 expert by Unified, you have a rate that's about
18 \$270 per hour; is that correct?

19 A. That's correct. And this matter stems,
20 I believe, from Unified.

21 Q. And when you're hired by companies other
22 than Unified, you have a higher rate; is that

1 correct?

2 A. I typically base my rate on the median
3 rate for expert witnesses in video technology as
4 defined by the SEAK, S-E-A-K, an expert witness
5 survey. That number is currently for most cases
6 about \$400 an hour.

7 Should I be hired through an external
8 agency, I may receive the order of 400 to \$450 an
9 hour. However, retaining counsel may have to pay
10 an additional fee, a surcharge, to that expert
11 witness agency to retain my services.

12 Q. I see.

13 So you worked through an agency, and so
14 you were compensated when you're hired by
15 companies other than Unified around 400 to \$450 an
16 hour; is that correct?

17 A. I sometimes work directly with law
18 firms, I sometimes work through agencies, and I
19 sometimes work directly and indirectly with
20 Unified and its external counsel. So now you see
21 the full picture.

22 If I'm working with Unified right now,

1 the number is about 270 an hour for matters that
2 stem from Unified. If I'm directly negotiating a
3 retention agreement with a law firm and I'm
4 directly negotiating that with retaining counsel,
5 the number will be typically in the order of 400
6 to \$450 an hour as of this time.

7 And should I be working through an
8 expert witness agency, of which there are -- I
9 have worked through a number of them, I would then
10 still seek to receive 400 to \$450 an hour, and
11 retaining counsel would have to pay that agency a
12 markup, whatever that agency charges.

13 Q. Okay. Understood.

14 And so this sentence where it says, "I
15 am being compensated at my usual and customary
16 rate," it should add when working for Unified
17 Patents, and then that would make it correct?

18 A. That would make it explicit. It's
19 correct as it stands, but it would make it
20 explicit.

21 Q. Well, you have multiple usual and
22 customary rates -- or you have multiple rates;

1 right?

2 A. I'm being compensated at my usual and
3 customary rate for the time I spend in connection
4 with this IPR. The time I spend in connection
5 with this IPR is in support of Unified, and,
6 therefore, I'm compensated at my usual and
7 customary rate for Unified. We are discussing the
8 best use of language. The statement is correct on
9 its face, but it can be made more explicit.

10 Q. Okay. Well, I think we have some
11 context to assess that at least. Thank you.

12 Could you please turn to page 15 of your
13 declaration, the page with paragraph 26 on it.

14 A. Okay. Hold on one moment.

15 Yes, I see paragraph 26.

16 Q. And do you see paragraph 26 has Footnote
17 No. 3 as part of it?

18 A. Yes.

19 Q. Okay. And figure -- and Footnote 3
20 says, "FIG. 1 shows a device performing the method
21 according to an embodiment of the invention."
22 Then there's a cite to the patent, to the

1 '794 patent.

2 A. Yes.

3 Q. Then it goes on to say, "I note that the
4 '794 Patent does not describe any device other
5 than the device in Figure 1."

6 Do you see that?

7 A. Yes, I do.

8 Q. In your view, what is the device in
9 Figure 1?

10 A. The device in Figure 1 is a device for
11 fragmenting a -- what is likely a video data file
12 and an audio data file, according to fragmentation
13 rules governed by a bit stream syntax description
14 file and producing segments that corresponds to
15 those fragments.

16 Q. Is the device in Figure 1, is it
17 software, hardware, a combination of the two?

18 MR. BOWSER: Objection; form.

19 THE WITNESS: Are you asking me what did
20 it say in the patent or whether I discuss this in
21 the declaration, or are you asking my general
22 opinion as to how this may be implemented?

1 BY MR. CARDENAS-NAVIA:

2 Q. I'm asking you for what your opinion of
3 the device is in Figure 1 of the '794 patent, if
4 you have one.

5 A. Well, I don't think I opined on that in
6 my declaration as such. And I don't recall the
7 patent being explicit about how it can be
8 implemented. From general knowledge, such systems
9 can be implemented sometimes in software,
10 sometimes in firmware, and, if necessary, at very
11 high -- for very high-speed applications, they can
12 be implemented in special purpose hardware.

13 Q. Why did you note in this Footnote 3 that
14 in your view the '794 patent does not describe any
15 device other than the device in Figure 1?

16 A. Because so far as I can see, there's no
17 other -- there's no other explicit description, no
18 other embodiment that has been described in the
19 patent, in the specification of the patent other
20 than that device. I would have to check to be
21 specific, and perhaps I should indeed look at the
22 patent, Column 3 at lines 46 to 47, so I can be

1 sure that we are literally on the same page.

2 Q. And my question was directed at whether
3 this statement impacts the other parts of your
4 analyses in your declaration?

5 A. Well, let's first make sure that we're
6 both speaking about the same --

7 Q. What are you --

8 A. Figure 1 shows a device for performing
9 the method according to an embodiment of the
10 invention.

11 Figure 2 shows the contents of the
12 description file and so on.

13 The impact on the opinions is really in
14 terms of how the fragmentation takes place, what
15 is the source of the first and second data
16 segments and what is the output of this
17 fragmentation operation. So this indirectly
18 parlays into my understanding of first and second
19 files and content-related data segments.

20 Q. Could you turn to paragraph 27 of your
21 supplemental declaration? Let me know when you're
22 there.

1 A. Yeah, I'm trying to. Hold on.

2 Okay. I see paragraph 27.

3 Q. I'm going to start reading from the
4 second sentence. It says, "Patent Owner's
5 proposed construction suggests that the
6 content-related data segments themselves dictate
7 how they will be ordered 'when rendered
8 sequentially' because the data segments are
9 'ordered in a file' so that 'the file's contents'
10 [will be] in their intended presentation order
11 when rendered sequentially."

12 Do you see that?

13 A. Yes, I do.

14 Q. What do you mean when you say that --
15 when you suggested it's patent owner's view that
16 the content-related data segments themselves
17 dictate how they will be ordered?

18 A. So according to one of patent owner's
19 filed documents, it may have been the reply or
20 contingent motion to amend, I cannot recall
21 offhand, patent owner appears to favor a
22 construction in which the order of the segments is

1 determined directly from the order of the
2 information in the file.

3 In other words, the patent owner's
4 proposed construction is that the content-related
5 first and second data segments are alternate files
6 such that they will present the file's contents in
7 their intended presentation order when rendered
8 sequentially.

9 Q. Right. And so what I want to understand
10 is what you mean when you say the data segments
11 themselves dictate the order. I don't know what
12 that means. And I'll offer something as maybe a
13 way to give you a sense of what I wonder if you
14 might mean. And that could be maybe if you think
15 that the construction requires that the data
16 segments themselves have metadata about their
17 order or how it is that you believe the data
18 segments would themselves dictate their order?

19 MR. BOWSER: Objection; form.

20 THE WITNESS: I believe that patent
21 owner's proposed construction suggests that the
22 order of the content-related data segments

1 perceived as a sequence of content-related data
2 segments precisely corresponds to the order in
3 which those segments should be rendered.

4 BY MR. CARDENAS-NAVIA:

5 Q. So it's your view that -- it's your view
6 that the ordering is set by how the segments are
7 ordered within the data file?

8 A. No, it is my view that that is the
9 patent own- -- that is the meaning of the patent
10 owner's proposed construction.

11 Q. Okay. Is it your view that patent
12 owner's construction required that the data
13 segments have metadata that indicates their order
14 within a data file?

15 A. I did not read it that way. I read it
16 that patent owner's construction seems on its face
17 to say that because -- or imply that because the
18 data segments themselves have an order of storage
19 in a file, that the order in which they're stored
20 in the file corresponds directly to the order --
21 to the sequential order in which they should be
22 rendered.

1 Q. Okay. I just wanted to make sure I
2 understood you on that.

3 Could you turn to page 34 of your
4 supplemental declaration -- or sorry, paragraph 34
5 of your supplemental declaration?

6 A. Okay.

7 Q. It's on page 21.

8 Please let me know when you're there.

9 A. Yeah, there's a little bit of an
10 overshoot here. For some reason it's being a
11 little hard to control.

12 This is proving difficult to control.
13 Hold on one moment, please. I want to try and
14 avoid the overlay between the video of the Zoom
15 and the Acrobat.

16 I'm not certain -- oh, there we go.
17 Okay. I've got page 21 up.

18 Q. Okay. And I'm going to direct you to
19 the last sentence of paragraph 34. It says, "A
20 POSITA would understand the meaning of the term
21 'syntactical meaning,' as used in the definition
22 of content-related' in Exhibit 1001" -- which is

1 the '794 patent.

2 A. Correct.

3 Q. -- "such that it is unnecessary to
4 further define what the term 'syntactic meaning'
5 would mean."

6 Do you see that?

7 A. Yes, I do.

8 Q. What do you understand "syntactical
9 meaning" to mean?

10 A. Well, "syntactical meaning" has a
11 meaning in the context of this art as being in
12 accordance with defined syntactical rules. So
13 there are two levels which are particularly
14 relevant for this patent. Excuse me.

15 One is the syntax of the underlying
16 video codec -- excuse me -- things like NAL
17 blocks, network access layer blocks, which
18 determine the allowed syntax of data elements such
19 as bytes or blocks or macroblocks that are encoded
20 in the video codec.

21 And the syntactic meaning, that is
22 defined by the XML according to the bit stream

1 syntax description which provides the rules that
2 the fragmentation module applies to select the
3 audio and video data segments from the video
4 and -- from the video file and the audio file.

5 Q. Anything else?

6 A. Well, we need to keep within the context
7 of the patents. As far as I can understand, these
8 are the only statements about "syntax" and
9 "syntactical meaning" that are explicitly made in
10 the patent. I would have to search to make sure
11 that those are -- that this is the only meaning
12 that is implied or explicitly discussed in the
13 '794 patent.

14 Q. Well, one of the syntax -- syntactical
15 meanings you identified was the syntax that is
16 defined by the XML; correct?

17 A. It's defined by an XML script, yes.

18 Q. And this XML script would include
19 information about the ordering of segments that
20 are part of a data stream; correct?

21 A. It can do -- it can do so. At the time
22 that the bit stream description syntax was being

1 developed, there were related and ancillary
2 concepts in MPEG-7 and MPEG-21 that related
3 directly to this. But I think that the -- that
4 the choice of segments from the video and data
5 files, the fragmentation is made by the
6 fragmentation module, but the order in which the
7 segments are to be rendered is the results of the
8 application of the assignment rule, which matches
9 identifying numbers.

10 So my understanding of how '794 is
11 intended to work is that the fragmentation module
12 provides information about which of the segments
13 are to be extracted from the video file and the
14 audio file, and the assignment rule matches
15 identifying numbers in order to decide what the
16 sequential order is in which they should be
17 rendered.

18 Q. And what is the relationship between the
19 fragmentation module and the XML script?

20 A. I believe that the XML script provides
21 the rules or instructions on which the
22 fragmentation module implements. To make an

1 analogy with reading a book, the fragmentation
2 module could say -- rules could say, I want to
3 read Chapters 1, 6, 19, and 31.

4 But the assignment rule will say, Well,
5 actually, I'd like to read Chapter 31 first, then
6 Chapter 6, then Chapter 19, then Chapter 1, if
7 that analogy makes it somewhat clearer.

8 Q. In your view, does the assignment rule
9 determine the order in which the data segments are
10 sequentially output?

11 A. Yes, I do.

12 Q. The segments are required to be output
13 in chronological order; correct?

14 A. If that is what is claimed in the
15 patent. One has to be careful about that because
16 chronological has a number of meanings. So it
17 would be entirely possible that -- let's consider
18 a video file. Perhaps one scene was captured in
19 2001, another scene was filmed in 2011, another
20 scene was filmed in 2023. They may have been
21 stored in the order in which they were captured,
22 but that does not mean that that is the order in

1 which they should be output. Perhaps the 2023
2 scene is -- should come first, and maybe the 2001
3 and the other scene should be presented in a
4 different order. So one should be very careful
5 about the concept of chronology here. Sequence
6 and chronology are not the same.

7 Q. And to make sure I understand, in your
8 view, the -- in your view, part of the syntax is
9 an XML script and the XML script has an order for
10 the data segments, but the assignment rule can
11 dictate that the data segments are output in a
12 different order than specified by the XML script;
13 is that correct?

14 A. The XML script can specify many things.
15 It depends what the script is and what it is bound
16 to. Although there is a more fundamental XML
17 syntax, the -- whoever uses the syntax or defines
18 the rules can define a set of elements. The set
19 of elements are not necessarily stored in a
20 particular order, but they can be retrieved and
21 they can be accessed. And the order in which
22 they're rendered, that is the order in which

1 they're sequentially output, is determined by an
2 assignment rule.

3 There's not necessarily, and I would
4 emphasize "necessarily," there is not necessarily
5 an intrinsic order to the way these elements are
6 stored.

7 To bring in another analogy, html, which
8 many people are familiar with, on a page -- on an
9 html page, there are many links. The links may be
10 defined, and the order in which they are rendered
11 can also be defined, but it doesn't mean that the
12 contents to which those links link -- content to
13 which they point is necessarily stored in
14 sequential regions of storage.

15 Q. Are you aware of any examples in the
16 '794 patent where the syntax does not include an
17 order?

18 A. Let me look at the patent. There are a
19 couple of figures that explicitly -- I think
20 Figure 2 is one of them that explicitly show the
21 syntax.

22 Okay. So I'm looking at Figure 2. So,

1 for instance, the header is a syntactic label.
2 MV4:V0, V0 else, where it starts, what its length
3 is, gBSD unit starts, where it starts from, what
4 the marker is. VOP, where it starts, how much --
5 how much data from that starting position. And
6 for P_VOP starting at 2903 length equals 64.

7 So I believe that there is no formal
8 requirement for these gBSD units in syntactical
9 labels to be formally stated in the order of their
10 starting addresses. They really could, in my
11 view, be in any order at all.

12 Q. My question was whether there's any
13 embodiments in the '794 patent in which the syntax
14 does not have an order?

15 A. My understanding is that the assignment
16 rule dictates the order in which the
17 content-related data segments are rendered.
18 The -- as I repeatedly tried to state, the XML
19 dictates what is being retrieved, but the
20 assignment rule decides what order it should be
21 rendered in.

22 Q. Dr. Freedman, I'm going to ask my

1 question one more time.

2 Are there any embodiments in the
3 '794 patent you can point me to in which the
4 syntax does not have an order?

5 MR. BOWSER: I'm going to object; asked
6 and answered.

7 THE WITNESS: Yeah, I believe that I've
8 answered this. If we looked at the BSD files, I
9 do not see a requirement for there to be an order
10 of the starting addresses. I see that in
11 Figure 2, it was convenient to list them in the
12 order of their starting addresses. But to the
13 best of my knowledge, I'm reading the paper by
14 Panis to which this relates, I do not see a formal
15 requirement for that order in the BSD
16 fragmentation file to be enforced.

17 BY MR. CARDENAS-NAVIA:

18 Q. Okay. And, Dr. Freedman, I don't
19 believe you have directly answered my question. I
20 do believe you've indirectly answered it by not
21 identifying any embodiments in which the syntax
22 does not have an order, but unless you have

1 anything further to add, I'm going to go ahead and
2 move on.

3 A. No, I have nothing to add to that.

4 Q. Okay. You can turn to page 24 of your
5 declaration -- of your supplemental declaration,
6 it's paragraph 37.

7 Please let me know when you're there.

8 A. It's a little difficult to control this
9 Adobe for some reason.

10 Okay. I've seen it. I've got it.

11 Q. Are you there?

12 A. Yes, I'm there.

13 Q. The first sentence says, "Second, Patent
14 Owner's proposed negative limitation renders
15 Claims 1 and 9 indefinite because it uses the
16 relative and undefined term 'exact timing
17 information.'"

18 A. Correct.

19 Q. Do you see that?

20 What don't you understand about the
21 words "exact timing information"?

22 A. Okay. So "exact timing information" is

1 a somewhat nebulous concept. And I can point out
2 its indefiniteness from a couple of angles. The
3 first angle, though, is very simply exact timing
4 information is impossible; that is, it is actually
5 impossible to take -- dictate a 100 percent
6 precise exact time at which anything is rendered.
7 The laws of physics do not allow you to specify
8 time with infinite precision.

9 And the second part of that is that I do
10 not see any requirement for exact timing
11 information or even less exact timing information,
12 such as a timestamp with a finite precision to
13 be -- to be implemented if the assignment rule can
14 dictate the order.

15 In other words, such a timestamp is
16 really superfluous. It's really not absolutely
17 necessary if you have an assignment rule. It
18 doesn't matter how long the segments are. So if
19 you have Segment 1, let's say a normal length,
20 5 second segment, to a normal length, 20 seconds,
21 73 of normal length one hour, the assignment rule
22 can determine the order in which they're output

1 without there being necessarily any imprecise, of
2 course, timestamp information or any exact timing
3 information, a concept which is actually
4 physically impossible to implement.

5 Q. Okay. So in your view, exact timing
6 information just does not exist?

7 A. Exact timing information as such is a
8 concept that does not exist and is superfluous to
9 the claims and to the patent if the assignment
10 rule is implemented.

11 Q. Okay. But certainly you would agree
12 that some times are more exact -- are more
13 precise -- some timing infor- -- let me ask that
14 again.

15 Certainly you agree that some timing
16 information is more precise than other timing
17 information; right?

18 A. In situations where timing information
19 is provided or must be provided, and I don't think
20 it's the case here, then there are -- then time
21 can sometimes be presented to more or less -- and
22 superfluously rendered to more or less precision.

1 Q. And in the context of aligning video,
2 audio, or metadata data segments together, a
3 certain amount of timing precision is expected;
4 correct?

5 A. However, the assignment rule can do this
6 very nicely. So if you, for example, have an
7 audio segment that corresponds -- Segment 1 that
8 corresponds directly to a video segment,
9 Segment 1, you do not need to know the precise
10 timing information so long as you know that they
11 correspond to each other and should be
12 sequentially rendered in a synchronized manner.
13 Very often, especially historically, the video
14 actually started a little bit before the audio
15 because of latency of rendering and transmission.

16 Q. I'm glad to hear you're a fan of the
17 patent and the assignment rule. So you sort of
18 got at my question. I guess my question is: You
19 know, historically and at the time of the
20 invention, people working in this field of
21 synchronizing audio and video had a sense of what
22 timing accuracy was needed for consumers; right?

1 A. Yes. Yes, they did. And it was very
2 relevant to development of video codecs at that
3 time. So a rule of thumb would be that you really
4 should synchronize video to the order of a video
5 frame. You've got to get the frame right. And
6 that the audio, I seem to recall that a canonical
7 rule of thumb was about a quarter of a second. If
8 you were half a second behind, that latency was
9 far too long.

10 But that was roughly where one was in
11 terms of audio/video synchronization at that time.
12 And I recall that much work was done by
13 manufacturers to reduce those latencies.

14 Q. And at the time of the invention of the
15 '794 patent, timestamps were used for
16 synchronizing an audio and video; correct?

17 A. The concept of timestamps and the
18 extended concept of normal playtime came in, if I
19 remember, from DAVIC, the Digital Audio Video
20 Council, and was subsumed into the various MPEG
21 standards. So timestamps existed, but my reading
22 of this patent appears to suggest that they are

1 superfluous as such provided an assignment rule
2 can match up the audio and the video, which piece
3 of audio goes -- which data segments of the audio
4 go with which data segments of the video.

5 Provided they've been matched up in some
6 way, whether it is through formal timestamps or
7 application, normal playtime or assembled by hand,
8 you know, in a studio one segment at a time, the
9 assignment rule determines how they match each
10 other and the order in which -- so far as I can
11 see, the order in which they must be rendered.

12 Q. You don't view the word "timestamp" as
13 indefinite; do you?

14 A. I'm sorry, I didn't hear what you said.
15 Speak louder.

16 Q. Do you believe the word "timestamp" is
17 indefinite?

18 A. No, that's a really good question. If I
19 was to make it precise, I would say "timestamp" in
20 the context of the systems layer of MPEG or
21 something like that, I'm thinking of things like
22 the packetized elementary stream, "timestamp"

1 is -- "timestamp" can be defined and be a definite
2 concept.

3 Exact timing information, on the other
4 hand, is something that just doesn't exist, and
5 the -- I perceive no need for such precision of
6 timing information to implement this patent if an
7 assignment rule can be provided.

8 So, for example, let's -- for example,
9 one might consider a sequence of audio segments
10 and a sequence of video segments. And let's say
11 an individual in an editing system literally
12 matches them up segment for segment. No formal
13 timestamps will be needed to do that.

14 You know, even deeper, historically
15 recording information on a film, the audio track
16 and the video track would have been aligned
17 literally by cutting, using the scissors to cut
18 the film into the segments.

19 So while timestamps are convenient and
20 useful and widely implemented, it's the matching
21 up of the segments by the assignment rule that
22 really ultimately dictates the order. And I

1 perceive timestamps as being superfluous to the
2 main claims, the independent claims of this
3 patent.

4 Q. Can you turn to page 29 of your
5 supplemental declaration?

6 A. Yes.

7 Q. Please let me know when you're there.

8 A. Sure.

9 Q. I'll blow my nose real fast.

10 A. I'm on page 29 now.

11 Q. Could you look at paragraph 43?

12 A. Yes, I am.

13 Q. And I'm going to direct you to the last
14 sentence of paragraph 43. It says, "The fact is
15 that the bodies of Claims 1 and 9 do not require
16 the first and second data files."

17 Do you see that?

18 A. Yes, I do.

19 Q. Okay. The body of Claims 1 and 9 do
20 have the term "content-related first data
21 segments"; correct?

22 A. I recall that that's correct, but I

1 should check it by looking at the patent.

2 Okay. I'm looking at Claim 1 here. The
3 bodies recite content-related first data segments
4 and content-related second data segments.

5 Q. Okay. And the term "content-related
6 data segments" is defined in the specification of
7 the '794 patent; correct?

8 And let me do something to help a little
9 bit. Let me go ahead and share my screen, and I'm
10 going to be showing Exhibit 1001, which is the
11 '794 patent.

12 A. Okay. Very good. I see it.

13 Q. Okay. And I'm going to direct you to
14 Column 4, starting at line 14. Do you see what
15 I've highlighted there?

16 A. Yes. Oh, I see, yes.

17 "The term 'content-related' is
18 understood to mean that first and second data
19 segments have a syntactical meaning within the
20 respective data file..."

21 Q. And you agree that this is defining the
22 term "content-related data segment"; correct?

1 A. That the applicant is defining the term
2 "content-related," specifically.

3 Q. Okay. And this definition includes a
4 reference to the "respective data file" of data
5 segments; correct?

6 A. To the respective data file. However,
7 this is -- this is related to the fragmentation of
8 the input video file and the input audio file.
9 And my understanding of syntactical meaning in
10 this context, as we've discussed already in
11 questions you've asked and which I have answered,
12 relates to the operation of the fragmentation
13 module according to the definitions in the bit
14 stream syntax definition files.

15 Q. Dr. Freedman, my question was: Does the
16 patent's definition of "content-related" include a
17 reference to a data file?

18 A. It states a syntactical meaning within
19 the respective data file.

20 Q. So I'm going to now scroll to Claim 1.
21 And the body of Claim 1 references
22 "content-related first data segments" and

1 "content-related second data segments"; correct?

2 A. Oh, I see what statement you're saying.

3 The term "content-related data segment" as such

4 was never defined. It was the term

5 "content-related" that was defined as having a

6 syntactical meaning with respect to the -- with

7 regard to the respective file.

8 Q. Well, you seem to be drawing a

9 distinction between the term "content-related"

10 versus "content-related data segments," but let me

11 put that to the side for a moment.

12 You do agree that the term "content" --

13 well, I should say in your view, the term

14 "content-related" is defined to have a reference

15 to a "data file"; correct?

16 MR. BOWSER: Objection; form.

17 BY MR. CARDENAS-NAVIA:

18 Q. I --

19 A. So I see -- I understand what question

20 you're asking, and I'm thinking about this very

21 carefully.

22 Q. Well, my question, Dr. Freedman, to be

1 clear, was just to confirm, which I believe you've
2 already testified to, that in your view the
3 patentee's definition of "content-related"
4 includes a reference to "data file."

5 Do you agree with that?

6 A. It does seem to use the term
7 "content-related" to refer to segments of a data
8 file from which it comes.

9 Q. And so by using the term
10 "content-related" in Claim 1, it is incorporating
11 that definition and incorporating the reference to
12 "data file"; correct?

13 A. Only if we -- only if we believe --
14 okay. Only if we believe that the applicant has
15 acted as his own lexicographer and has defined
16 that term clearly and explicitly. If we believe
17 that that term has been defined clearly and
18 explicitly, then the term "content-related" refers
19 to a file.

20 But if we don't believe that that is so,
21 then in this claim the first and second data file
22 are irrelevant because the body of the claim can

1 be fully understood in terms of the reference to
2 the content-related data segments. That is the
3 first and second data file as such recited in the
4 preamble are irrelevant. And, thus, the preamble
5 is, to the best of my understanding and to the
6 best information that retaining counsel has given
7 me, does not make the preamble limiting.

8 Q. Well, I'm not quite sure why you jumped
9 to the preamble there, but I'm going to pull up --
10 I'm going to direct you to paragraph 28 of your
11 supplemental declaration, Exhibit 1016.

12 Do you see my screen here?

13 A. Yes.

14 Q. And do you say that, "In my opinion, if
15 the 'content-related...data segments' terms are to
16 be construed, they should be construed to include
17 only the explanation of 'content-related' in the
18 specification of the '794 Patent. The '794 Patent
19 explained that the term 'content-related' mean[s]
20 that first and second data segments have a
21 syntactical meaning within the respective data
22 file."

1 A. Correct. Yeah.

2 Q. "Thus, if the terms
3 'content-related...data segments' are to be
4 construed, they should be construed to mean 'that
5 first and second data segments have a syntactical
6 meaning within the respective data file.'"

7 A. Correct.

8 Q. Do you see that?

9 A. Yeah. Yes, I do see that.

10 Q. Do you have an opinion, one way or
11 another, on whether the term "content-related data
12 segments" should be construed?

13 A. I really should not offer any opinion,
14 but as I've stated here, the district court judge
15 construed that phrase to mean segments of content
16 data that have a syntactical meaning within the
17 respective data file, and that to me certainly
18 seems to be a reasonable construction.

19 Q. Okay. I'll stop sharing my screen.

20 If you'd turn to page 36 of your
21 supplemental declaration.

22 Let me know when you're there.

1 A. Page 36. I'm on page 36 now.

2 Q. And I'm going to direct you to
3 paragraph 52. Please go ahead and read
4 paragraph 52, and let me know when you're done.

5 A. Yeah, I'm trying to scroll down to it.
6 I'm not sure why the scrolling is so sluggish.

7 Okay. I've read it.

8 Q. And in paragraph 52 of your supplemental
9 declaration, you're describing what you believe to
10 be is the syntax of the data file 1 in Sonohara --

11 A. Correct.

12 Q. -- is that correct?

13 A. Yes.

14 Q. And what is that syntax?

15 A. This file is -- results from the -- is
16 produced from two separate files, an image file 11
17 and a sound file 12.

18 Q. And my question is: What is the syntax
19 of data file 1 in Sonohara?

20 A. Well, to understand this, we really
21 should look at Sonohara and the diagram in
22 Sonohara. I think it's Figure 4 on the next page.

1 And this -- the corresponding operation to
2 fragmentation here appears -- seem to be -- result
3 from a system that reads the file header in
4 Element 16, analyzes data in Element 17, and there
5 is an image and sound data formation and renewal
6 section, Element 13, with two components, a track
7 identifying section and a data identifying
8 section, 2 and 3, and, likewise, another one
9 in 14.

10 And the whole system essentially
11 compiles, I think, segments or sections from the
12 image and sound files to yield a file containing
13 what I believe corresponding to the first and to
14 the second content-related data segments.

15 Q. Okay. And, Dr. Freedman, feel free to,
16 you know, look at the proceeding and -- well, feel
17 free to look at portions of your supplemental
18 declaration if you need to kind of refresh
19 yourself on Sonohara and what you contend is the
20 syntax of the single data file 1, but I want to --
21 I want to understand what you contend is the
22 syntax of single -- of data file 1 in Sonohara.

1 A. Okay. So we've discussed what
2 syntactical meaning is, and in the concept of
3 extracting video and audio data segments from
4 video and audio -- from video and audio files or,
5 here in Figure 4, image file and sound file. So
6 the process -- so the process with the sequence of
7 elements here that takes information from the
8 header, possibly some external data, identifies,
9 tracks, and, in my view, selects segments from the
10 sound file and the image file and places them into
11 a motion picture file that contains video and
12 audio content-related data segments.

13 So the syntax here is very probably
14 being -- probably relates to the external data in
15 Sonohara or possibly some data or metadata in a
16 file header in Sonohara.

17 Q. Anything else in Sonohara that you
18 contend is the syntax for the data file No. 1?

19 A. I do not recall that Sonohara makes any
20 explicit disclosure of precisely how this activity
21 is carried out. Sonohara does not use this
22 XML-based bit stream description syntax, but it

1 doesn't mean that Sonohara can't use information
2 in a file header or some external data to decide
3 which content-related data segments to extract
4 from the image file and the sound file.

5 Q. To the previous question I asked, you
6 said, "So the syntax here is very probably
7 being -- probably relates to the external data in
8 Sonohara or possibly some data or metadata in a
9 file header in Sonohara."

10 What did you mean when you said
11 "external data in Sonohara"?

12 A. Actually, looking more closely, I would
13 like to walk back from that -- that statement.
14 Because I do see in Sonohara that the data
15 analyzer acts on information from the file reader
16 and does not appear on the surface to operate on
17 the basis of information provided externally.

18 I thought for a moment that the arrow
19 led to some external source of information, but
20 looking more closely at Figure 4, it doesn't. It
21 only relates to information derived from the image
22 and sound files and not to an external source of

1 information.

2 Q. So thank you for that clarification.

3 I'll just tell you from my reading of your
4 supplemental declaration, it seems that you
5 identify the header and track identification
6 numbers as the syntax in Sonohara.

7 Do you agree with that?

8 A. They're both elements of syntax, yes.

9 Q. Is there anything else that you identify
10 as the syntax in data file 1 in Sonohara?

11 A. I don't immediately see anything.

12 Q. Okay. I did not either, for what that's
13 worth.

14 MR. BOWSER: Objection. Is there a
15 question?

16 MR. CARDENAS-NAVIA: No, I was checking
17 my notes to see my next question.

18 I have no further questions.

19 MR. BOWSER: Give me five minutes. Let
20 me just look over my notes, and we can come back
21 on. So at 3:20 Eastern.

22 MR. CARDENAS-NAVIA: Sounds good.

1 THE WITNESS: And that's fine for me, as
2 well.

3 (Recess from the record.)

4 MR. BOWSER: Counsel, I don't have any
5 reason questions for Dr. Freedman.

6 MR. CARDENAS-NAVIA: I believe we're all
7 set then.

8 MR. BOWSER: Okay.

9 (Off the record at 3:22 p.m.)

10

11

12

13

14

15

16

17

18

19

20

21

22

1 STATE OF MARYLAND)

2 ss:

3 COUNTY OF MONTGOMERY)

4

5 I, Matthew Goldstein, Notary Public
6 within and for the State of Maryland, do hereby
7 certify:

8

9 That I reported the proceedings in the
10 within entitled matter, and that the within
11 transcript is a true record of said proceedings.

12

13 I further certify that I am not related
14 to any of the parties to the action by blood or
15 marriage, and that I am in no way interested in
16 the outcome of this matter.

17

18 IN WITNESS WHEREOF, I have hereunto set
19 my hand this 23rd day of July, 2023.

20

21

22


Matthew Goldstein, RPR

1 Immanuel Freedman, Ph.D., c/o

HAYES AND BOONE, LLP

2 800 17th Street NW, Suite 500

Washington, DC 20006

3

4 Case: Unified Patents, LLC v. VL Collective IP LLC

Date of deposition: July 19, 2023

5 Deponent: Immanuel Freedman, Ph.D.

6

7 Please be advised that the transcript in the above
8 referenced matter is now complete and ready for signature.

9 The deponent may come to this office to sign the transcript,
10 a copy may be purchased for the witness to review and sign,
11 or the deponent and/or counsel may waive the option of
12 signing. Please advise us of the option selected.

13 Please forward the errata sheet and the original signed
14 signature page to counsel noticing the deposition, noting the
15 applicable time period allowed for such by the governing
16 Rules of Procedure. If you have any questions, please do
17 not hesitate to call our office at (202)-232-0646.

18

19

20 Sincerely,

Digital Evidence Group

21 Copyright 2023 Digital Evidence Group

22 Copying is forbidden, including electronically, absent
express written consent.

1 Digital Evidence Group, L.L.C.
1730 M Street, NW, Suite 812
2 Washington, D.C. 20036
(202) 232-0646

3

4 SIGNATURE PAGE

Case: Unified Patents, LLC v. VL Collective IP LLC
5 Witness Name: Immanuel Freedman, Ph.D.
Deposition Date: July 19, 2023

6

7 I do hereby acknowledge that I have read
and examined the foregoing pages
8 of the transcript of my deposition and that:

9

10 (Check appropriate box):

() The same is a true, correct and
11 complete transcription of the answers given by
me to the questions therein recorded.

12 () Except for the changes noted in the
attached Errata Sheet, the same is a true,
13 correct and complete transcription of the
answers given by me to the questions therein
14 recorded.

15

16

17

DATE

WITNESS SIGNATURE

18

19

20

21

22

DATE

NOTARY

1 Digital Evidence Group, LLC
2 1730 M Street, NW, Suite 812
3 Washington, D.C. 20036
4 (202) 232-0646

5

6 ERRATA SHEET

7

8 Case: Unified Patents, LLC v. VL Collective IP LLC

9 Witness Name: Immanuel Freedman, Ph.D.

10 Deposition Date: July 19, 2023

11 Page No. Line No. Change

12

13

14

15

16

17

18

19

20

21

22

Signature

Date

A	27:7	39:8 46:3,4,4 46:12	box 6:5,10 9:22 52:10	checking 48:16
a.m 1:17	analyses 17:4	audio/video 34:11	break 9:5,6,19	choice 24:4
absent 51:21	analyzer 47:15	Avenue 3:13	bring 27:7	chronological 25:13,16
absolutely 6:10 31:16	analyzes 45:4	avoid 21:14	BSD 29:8,15	chronology 26:5 26:6
access 6:6,6 8:1,4 10:1,3 22:17	ancillary 24:1	aware 27:15	bytes 22:19	cite 14:22
accessed 26:21	and/or 51:11		C	claim 38:2 39:20 39:21 41:10,21 41:22
accuracy 33:22	angle 31:3	B	C 3:1 4:1 5:1	claimed 25:14
acknowledge 52:7	angles 31:2	B 4:5	c/o 51:1	claims 30:15 32:9 37:2,2,15,19
Acrobat 21:15	answered 29:6,8 29:19,20 39:11	B2 4:10	call 51:17	clarification 48:2
acted 41:15	answers 52:11,13	back 9:17 47:13 48:20	canonical 34:6	clear 41:1
action 50:14	APPEAL 1:2	base 12:2	captured 25:18 25:21	clearer 25:7
activity 46:20	appear 47:16	basis 47:17	CARDENAS-... 3:11 4:3 5:8 7:10,17 9:12,16 16:1 20:4 29:17 40:17 48:16,22 49:6	clearly 41:16,17
acts 47:15	appears 8:9,20 18:21 34:22 45:2	BEHALF 3:2,10	careful 5:14 25:15 26:4	clients 11:8
add 13:16 30:1,3	applicable 51:15	behaving 8:7	carefully 40:21	closely 47:12,20
additional 12:10	applicant 39:1 41:14	believe 6:8 11:20 19:17,20 24:20 28:7 29:7,19,20 35:16 41:1,13 41:14,16,20 44:9 45:13 49:6	carried 46:21	codec 22:16,20
address 8:12	application 24:8 35:7	best 6:8 14:8 29:13 42:5,6	case 6:2 32:20 51:4 52:4 53:8	codecs 34:2
addresses 28:10 29:10,12	applications 5:17 16:11	bit 7:22 15:13 21:9 22:22 23:22 33:14 38:9 39:13 46:22	cases 11:12,14 12:5	Collective 1:7 51:4 52:4 53:8
administrative 6:3	applies 23:2	black 8:20 9:2	certain 6:10 21:16 33:3	Column 16:22 38:14
Adobe 30:9	appropriate 52:10	blocks 22:17,17 22:19	certainly 32:11 32:15 43:17	combination 15:17
advise 51:12	arrow 47:18	blood 50:14	certify 50:7,13	come 26:2 48:20 51:9
advised 51:7	art 22:11	blow 37:9	challenge 8:6	comes 41:8
affirmed 5:4	asked 29:5 39:11 47:5	BOARD 1:2	chance 7:19	companies 11:21 12:15
agencies 12:18	asking 15:19,21 16:2 40:20	bodies 37:15 38:3	Change 53:11	compensated 10:19 12:14 13:15 14:2,6
agency 12:8,11 12:13 13:8,11 13:12	assess 14:11	body 37:19 39:21 41:22	changes 52:12	compiles 45:11
agree 32:11,15 38:21 40:12 41:5 48:7	assignment 24:8 24:14 25:4,8 26:10 27:2 28:15,20 31:13 31:17,21 32:9 33:5,17 35:1,9 36:7,21	book 25:1	Chapter 25:5,6,6 25:6	complete 6:18,22 51:8 52:11,13
agreement 13:3	attached 52:12	BOONE 3:4 51:1	Chapters 25:3	components 45:6
ahead 7:3 8:11 8:16 9:12 30:1 38:9 44:3	audio 15:12 23:3 23:4 24:14 33:2 33:7,14,21 34:6 34:16,19 35:2,3 35:3 36:9,15	bound 26:15	charge 11:13	computer 5:17 7:20 8:7,13 9:7
aligned 36:16		BOWSER 3:3 9:14 15:18 19:19 29:5 40:16 48:14,19 49:4,8	charges 13:12	concept 26:5 31:1 32:3,8 34:17,18 36:2 46:2
aligning 33:1			chat 6:5,10 7:5 7:13 9:22	concepts 24:2
allow 31:7			check 11:10 16:20 38:1 52:10	conducted 1:15
allowed 22:18 51:15				
alternate 19:5				
amend 18:20				
amount 33:3				
analogy 25:1,7				

2:2 confirm 41:1 connecting 8:22 9:3 connection 10:20 14:3,4 consent 51:22 consider 25:17 36:9 construction 18:5,22 19:4,15 19:21 20:10,12 20:16 43:18 construed 42:16 42:16 43:4,4,12 43:15 consumers 33:22 containing 45:12 contains 46:11 contend 45:19,21 46:18 content 27:12 40:12 43:15 content-related 17:19 18:6,16 19:4,22 20:1 28:17 37:20 38:3,4,5,22 39:2,16,22 40:1 40:3,5,9,10,14 41:3,7,10,18 42:2,15 43:3,11 45:14 46:12 47:3 content-related' 21:22 38:17 42:17,19 contents 17:11 19:6 27:12 contents' 18:9 context 14:11 22:11 23:6 33:1 35:20 39:10 contingent 18:20 control 21:11,12 30:8 convenient 29:11	36:19 copy 51:10 Copying 51:21 Copyright 51:21 correct 6:8 11:6 11:18,19 12:1 12:16 13:17,19 14:8 22:2 23:16 23:20 25:13 26:13 30:18 33:4 34:16 37:21,22 38:7 38:22 39:5 40:1 40:15 41:12 43:1,7 44:11,12 52:10,13 correspond 33:11 corresponding 45:1,13 corresponds 15:14 20:2,20 33:7,8 Council 34:20 counsel 4:6 5:7 7:8,16 11:12 12:9,20 13:4,11 42:6 49:4 51:11 51:14 COUNTY 50:3 couple 27:19 31:2 course 32:2 court 43:14 CRR 1:19 2:10 50:22 currently 11:9 12:5 customary 10:19 11:6,7,8 13:15 13:22 14:3,7 cut 36:17 cutting 36:17 <hr/> D <hr/> D 5:1 D.C 1:21 3:7 52:2	53:3 data 15:11,12 17:15,19 18:6,8 18:16 19:5,10 19:15,17,22 20:1,7,12,14,18 22:18 23:3,20 24:4 25:9 26:10 26:11 28:5,17 33:2 35:3,4 37:16,20 38:3,4 38:6,18,20,22 39:4,4,6,17,19 39:22 40:1,3,10 40:15 41:4,7,12 41:21 42:2,3,15 42:20,21 43:3,5 43:6,11,16,17 44:10,19 45:4,5 45:7,14,20,22 46:3,8,12,14,15 46:18 47:2,3,7 47:8,11,14 48:10 Date 51:4 52:5,17 52:22 53:10,22 DAVIC 34:19 day 50:19 DC 51:2 decide 24:15 47:2 decides 28:20 declaration 4:11 6:7 7:4 9:22 10:7,14 14:13 15:21 16:6 17:4 17:21 21:4,5 30:5,5 37:5 42:11 43:21 44:9 45:18 48:4 deeper 36:14 define 22:4 26:18 defined 12:4 22:12,22 23:16 23:17 27:10,11 36:1 38:6 40:4 40:5,14 41:15 41:17	defines 26:17 defining 38:21 39:1 definite 36:1 definition 21:21 39:3,14,16 41:3 41:11 definitions 39:13 depends 26:15 deponent 51:5,9 51:11 deposition 1:14 2:1 4:7 5:20 6:5 7:6,14 11:2 51:4,14 52:5,8 53:10 derived 47:21 describe 15:4 16:14 described 16:18 describing 44:9 description 15:13 16:17 17:12 23:1,22 46:22 determine 22:18 25:9 31:22 determined 19:1 27:1 determines 35:9 developed 24:1 development 34:2 device 14:20 15:4 15:5,8,10,10,16 16:3,15,15,20 17:8 diagram 44:21 dictate 18:6,17 19:11,18 26:11 31:5,14 dictates 28:16,19 36:22 different 11:13 26:4,12 difficult 21:12 30:8 Digital 1:20	34:19 51:20,21 52:1 53:1 direct 8:14 21:18 37:13 38:13 42:10 44:2 directed 17:2 directly 11:15 12:17,19 13:2,4 19:1 20:20 24:3 29:19 33:8 disclosure 46:20 disconnecting 9:1,4 discuss 15:20 discussed 11:1 23:12 39:10 46:1 discussing 14:7 display 9:3 distinction 40:9 district 43:14 document 6:11 documents 6:9 18:19 download 7:19 Dr 4:11 5:9 8:17 9:17 28:22 29:18 39:15 40:22 45:15 49:5 drawing 40:8 drop 6:4,9 7:3,12 dropped 9:19 duly 5:4 <hr/> E <hr/> E 3:1,1 4:1,5 5:1 5:1 easier 6:3 Eastern 48:21 editing 36:11 either 8:12 48:12 electronically 51:21 Element 45:4,4,6 elementary 35:22 elements 22:18
----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

26:18,19 27:5 46:7 48:8 embodiment 14:21 16:18 17:9 embodiments 28:13 29:2,21 emphasize 27:4 encoded 22:19 encountered 9:8 enforced 29:16 engaged 11:11 entirely 25:17 entitled 50:10 equals 28:6 errata 51:13 52:12 53:6 especially 33:13 ESQUIRE 3:3,11 essentially 45:10 Evidence 1:20 51:20,21 52:1 53:1 exact 30:16,21,22 31:3,6,10,11 32:2,5,7,12 36:3 EXAMINATI... 4:2 5:7 examined 5:6 52:7 example 33:6 36:8,8 examples 27:15 excuse 22:14,16 Exhibit 4:7,9,11 7:3,6,12,14 8:3 8:14 9:20,21 10:7 21:22 38:10 42:11 exhibits 6:4 10:1 10:3 exist 32:6,8 36:4 existed 34:21 expected 33:3 expert 11:17 12:3 12:4,10 13:8	experts 11:14 explained 42:19 explanation 42:17 explicit 13:18,20 14:9 16:7,17 46:20 explicitly 23:9,12 27:19,20 41:16 41:18 express 51:22 extended 34:18 external 12:7,20 46:8,14 47:2,7 47:11,19,22 externally 47:17 extract 47:3 extracted 24:13 extracting 46:3 <hr/> F F 3:11 face 14:9 20:16 fact 37:14 familiar 27:8 fan 33:16 far 16:16 23:7 34:9 35:10 fast 37:9 favor 18:21 fee 12:10 feel 45:15,16 field 33:20 FIG 14:20 figure 14:19 15:5 15:9,10,16 16:3 16:15 17:8,11 27:20,22 29:11 44:22 46:5 47:20 figures 27:19 file 15:11,12,14 17:12 19:2 20:7 20:14,19,20 23:4,4 24:13,14 25:18 29:16 38:20 39:4,6,8	39:8,17,19 40:7 40:15 41:4,8,12 41:19,21 42:3 42:22 43:17 44:10,15,16,17 44:19 45:3,12 45:20,22 46:5,5 46:10,10,11,16 46:18 47:2,4,4 47:9,15 48:10 file' 18:9 file's 18:9 19:6 file.' 43:6 filed 18:19 files 5:16 17:19 19:5 24:5 29:8 37:16 39:14 44:16 45:12 46:4 47:22 film 36:15,18 filmed 25:19,20 fine 49:1 finite 31:12 firm 13:3 firms 12:18 firmware 16:10 first 5:4 17:5,15 17:18 19:5 25:5 26:2 30:13 31:3 37:16,20 38:3 38:18 39:22 41:21 42:3,20 43:5 45:13 five 48:19 follows 5:6 Footnote 14:16 14:19 16:13 forbidden 51:21 foregoing 52:7 form 15:18 19:19 40:16 formal 28:7 29:14 35:6 36:12 formally 28:9 formation 45:5 forward 51:13	fragmentation 15:12 17:14,17 23:2 24:5,6,11 24:19,22 25:1 29:16 39:7,12 45:2 fragmenting 15:11 fragments 15:15 frame 34:5,5 free 45:15,17 Freedman 1:14 2:1 4:2,12 5:3,9 8:17 9:17 28:22 29:18 39:15 40:22 45:15 49:5 51:1,5 52:5 53:9 front 10:15,16 frozen 8:9 full 12:21 fully 42:1 fundamental 26:16 further 22:4 30:1 48:18 50:13 <hr/> G G 5:1 gBSD 28:3,8 general 15:21 16:8 getting 8:22 give 19:13 48:19 given 42:6 52:11 52:13 glad 33:16 go 7:3 8:10,16 9:12,13 21:16 30:1 35:4 38:9 44:3 goes 15:3 35:3 going 8:20 9:2 10:17 18:3 21:18 28:22 29:5 30:1 37:13 38:10,13 39:20	42:9,10 44:2 Goldstein 1:19 2:9 50:5,22 good 5:9,10 35:18 38:12 48:22 governed 15:13 governing 51:15 Great 7:2 10:5 Group 1:20 51:20,21 52:1 53:1 guess 33:18 <hr/> H H 4:5 half 34:8 hand 35:7 36:4 50:19 handy 7:11 happened 8:19 hard 21:11 hardware 15:17 16:12 HAYES 3:4 51:1 header 28:1 45:3 46:8,16 47:2,9 48:5 hear 33:16 35:14 help 38:8 hereunto 50:18 hesitate 51:17 high 16:11 high-speed 16:11 higher 11:22 highlighted 38:15 hired 11:16,21 12:7,14 historically 33:13 33:19 36:14 Hold 8:18 14:14 18:1 21:13 hour 11:10,18 12:6,9,16 13:1 13:6,10 31:21 html 27:7,9
------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

<p>I</p> <p>identification 7:7 7:15 48:5</p> <p>identified 23:15</p> <p>identifies 46:8</p> <p>identify 48:5,9</p> <p>identifying 24:9 24:15 29:21 45:7,7</p> <p>image 8:9 44:16 45:5,12 46:5,10 47:4,21</p> <p>Immanuel 1:14 2:1 4:2,12 5:3 51:1,5 52:5 53:9</p> <p>immediately 48:11</p> <p>impact 17:13</p> <p>impacts 17:3</p> <p>implement 32:4 36:6</p> <p>implemented 15:22 16:8,9,12 31:13 32:10 36:20</p> <p>implements 24:22</p> <p>implied 23:12</p> <p>imply 20:17</p> <p>impossible 31:4,5 32:4</p> <p>imprecise 32:1</p> <p>include 23:18 27:16 39:16 42:16</p> <p>includes 39:3 41:4</p> <p>including 51:21</p> <p>incorporating 41:10,11</p> <p>indefinite 30:15 35:13,17</p> <p>indefiniteness 31:2</p> <p>independent 37:2</p> <p>indicates 20:13</p>	<p>indirectly 12:19 17:17 29:20</p> <p>individual 36:11</p> <p>infinite 31:8</p> <p>infor- 32:13</p> <p>information 19:2 23:19 24:12 30:21,22 31:4 31:11,11 32:2,3 32:6,7,16,17,18 33:10 36:3,6,15 42:6 46:7 47:1 47:15,17,19,21 48:1</p> <p>information.' 30:17</p> <p>input 39:8,8</p> <p>instance 28:1</p> <p>instructions 24:21</p> <p>intended 18:10 19:7 24:11</p> <p>interested 50:15</p> <p>intrinsic 27:5</p> <p>invention 14:21 17:10 33:20 34:14</p> <p>IP 1:7 51:4 52:4 53:8</p> <p>IPR 5:13 6:5 10:20 14:4,5</p> <p>IPR2022-01086 1:10</p> <p>irrelevant 41:22 42:4</p> <p>issue 8:13 9:8</p> <p>J</p> <p>JAIME 3:11</p> <p>JONATHAN 3:3</p> <p>JORGENSEN 3:12</p> <p>judge 43:14</p> <p>July 1:16 50:19 51:4 52:5 53:10</p> <p>jumped 42:8</p>	<p>K</p> <p>keep 23:6</p> <p>kind 45:18</p> <p>know 6:4 7:18 8:21 10:13 17:21 19:11 21:8 30:7 33:9 33:10,19 35:8 36:14 37:7 43:22 44:4 45:16</p> <p>knowledge 16:8 29:13</p> <p>L</p> <p>L.L.C 52:1</p> <p>label 28:1</p> <p>labels 28:9</p> <p>language 14:8</p> <p>latencies 34:13</p> <p>latency 33:15 34:8</p> <p>law 12:17 13:3</p> <p>laws 31:7</p> <p>layer 22:17 35:20</p> <p>led 47:19</p> <p>length 28:2,6 31:19,20,21</p> <p>let's 8:10 9:6,7,10 17:5 25:17 31:19 36:8,10</p> <p>levels 22:13</p> <p>lexicographer 41:15</p> <p>likewise 45:8</p> <p>limitation 30:14</p> <p>limiting 42:7</p> <p>line 10:18 38:14 53:11</p> <p>lines 16:22</p> <p>link 27:12</p> <p>links 27:9,9,12</p> <p>list 29:11</p> <p>literally 17:1 36:11,17</p> <p>little 7:22 10:12 21:9,11 30:8</p>	<p>33:14 38:8</p> <p>LLC 1:4,7 51:4,4 52:4,4 53:1,8,8</p> <p>LLP 3:4,12 51:1</p> <p>log 5:20</p> <p>long 31:18 33:10 34:9</p> <p>look 10:6 16:21 27:18 37:11 44:21 45:16,17 48:20</p> <p>looked 29:8</p> <p>looking 6:11 27:22 38:1,2 47:12,20</p> <p>louder 35:15</p> <p>M</p> <p>M 1:21 52:1 53:2</p> <p>macroblocks 22:19</p> <p>main 37:2</p> <p>manner 33:12</p> <p>manufacturers 34:13</p> <p>marked 7:7,15</p> <p>marker 28:4</p> <p>markup 13:12</p> <p>marriage 50:15</p> <p>Maryland 2:11 50:1,6</p> <p>match 35:2,9</p> <p>matched 35:5</p> <p>matches 24:8,14 36:12</p> <p>matching 36:20</p> <p>materials 5:11</p> <p>matter 11:19 31:18 50:10,16 51:8</p> <p>matters 11:9 13:1</p> <p>Matthew 1:19 2:9 50:5,22</p> <p>mean 18:14 19:10,14 22:5,9 25:22 27:11</p>	<p>38:18 43:4,15 47:1,10</p> <p>mean[s] 42:19</p> <p>meaning 20:9 21:20 22:9,10 22:11,21 23:9 23:11 38:19 39:9,18 40:6 42:21 43:6,16 46:2</p> <p>meaning' 22:4</p> <p>meaning,' 21:21</p> <p>meanings 23:15 25:16</p> <p>means 6:16 19:12</p> <p>median 11:13 12:2</p> <p>metadata 19:16 20:13 33:2 46:15 47:8</p> <p>method 14:20 17:9</p> <p>minute 8:18</p> <p>minutes 9:6,10 48:19</p> <p>module 23:2 24:6 24:11,19,22 25:2 39:13</p> <p>moment 14:14 21:13 40:11 47:18</p> <p>MONTGOME... 50:3</p> <p>morning 5:9,10</p> <p>motion 18:20 46:11</p> <p>move 30:2</p> <p>MPEG 34:20 35:20</p> <p>MPEG-21 24:2</p> <p>MPEG-7 24:2</p> <p>multiple 13:21 13:22</p> <p>MV4:V0 28:2</p> <p>N</p> <p>N 3:1 4:1,1 5:1</p>
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

NAL 22:16	offhand 18:21	23:19	patent 1:1,2,8,11	35:7
Name 52:5 53:9	office 1:1 51:9,17	original 51:13	3:10 4:9 5:7	please 7:22 8:3
nebulous 31:1	oh 21:16 38:16	outcome 50:16	7:12 9:20 14:22	10:6,9,13 14:12
necessarily 26:19	40:2	output 17:16	15:1,4,20 16:3	21:8,13 30:7
27:3,4,4,13	okay 5:16,21 6:1	25:10,12 26:1	16:7,14,19,19	37:7 44:3 51:7
32:1	6:12 7:2,9 9:11	26:11 27:1	16:22 18:4,15	51:12,13,16
necessary 16:10	9:18 10:5,13	31:22	18:18,21 19:3	point 27:13 29:3
31:17	11:5,16 13:13	overlay 21:14	19:20 20:9,9,11	31:1
need 6:2,17 8:11	14:10,14,19	overshoot 21:10	20:16 22:1,14	portions 45:17
23:6 33:9 36:5	18:2 20:11 21:1	own- 20:9	23:10,13 25:15	POSITA 21:20
45:18	21:6,17,18	owner 1:8 3:10	27:16,18 28:13	position 28:5
needed 6:7 33:22	27:22 29:18	5:7 18:21	29:3 30:13 32:9	possible 25:17
36:13	30:4,10,22 32:5	owner's 18:4,15	33:17 34:15,22	possibly 46:8,15
negative 30:14	32:11 37:19	18:18 19:3,21	36:6 37:3 38:1	47:8
negotiating 11:15	38:2,5,12,13	20:10,12,16	38:7,11 42:18	preamble 42:4,4
13:2,4	39:3 41:14	30:14	42:18	42:7,9
network 22:17	43:19 44:7		patent's 39:16	precise 31:6
never 9:8 40:4	45:15 46:1	P	patentee's 41:3	32:13,16 33:9
New 3:15,15	48:12 49:8	P 3:1,1 5:1	patents 1:4 13:17	35:19
nicely 33:6	open 5:16 7:19	p.m 49:9	23:7 51:4 52:4	precisely 20:2
normal 31:19,20	8:3,8 10:4	P_VOP 28:6	53:8	46:20
31:21 34:18	operate 47:16	packetized 35:22	pay 12:9 13:11	precision 31:8,12
35:7	operation 17:17	page 4:2,7 14:12	people 27:8	32:22 33:3 36:5
nose 37:9	39:12 45:1	14:13 17:1 21:3	33:20	present 19:6
Notary 2:10 50:5	opined 16:5	21:7,17 27:8,9	perceive 36:5	presentation
52:22	opinion 15:22	30:4 37:4,10	37:1	18:10 19:7
note 15:3 16:13	16:2 42:14	43:20 44:1,1,22	perceived 20:1	presented 26:3
noted 52:12	43:10,13	51:14 52:4	percent 31:5	32:21
notes 48:17,20	opinions 17:13	53:11	performing	previous 47:5
Notice 2:9	option 51:11,12	pages 52:7	14:20 17:8	previously 7:6,14
noticing 51:14	order 12:8 13:5	Panis 29:14	period 51:15	probably 46:13
noting 51:14	18:10,22 19:1,7	paper 29:13	pertinent 8:15	46:14 47:6,7
number 12:5	19:11,17,18,22	papers 5:12	Petitioner 1:5 3:2	procedure 6:9
13:1,5,9 25:16	20:2,13,18,19	paragraph 10:9	Petitioner's 4:13	51:16
numbers 24:9,15	20:20,21 24:6	10:14 14:13,15	Ph.D 1:14 2:1 4:2	proceed 8:11,16
48:6	24:15,16 25:9	14:16 17:20	5:3 51:1,5 52:5	proceeding 5:13
NW 1:21 3:5 51:2	25:13,21,22	18:2 21:4,19	53:9	5:18 45:16
52:1 53:2	26:4,9,12,20,21	30:6 37:11,14	phrase 43:15	proceedings 50:9
	26:22 27:5,10	42:10 44:3,4,8	physically 32:4	50:11
O	27:17 28:9,11	parlays 17:18	physics 31:7	process 46:6,6
O 4:1 5:1	28:14,16,20	part 14:17 23:20	picture 12:21	produced 44:16
oath 6:14	29:4,9,12,15,22	26:8 31:9	46:11	producing 15:14
object 29:5	31:14,22 34:4	particular 26:20	piece 35:2	properly 8:8
Objection 15:18	35:10,11 36:22	particularly	place 8:15 9:2	proposed 18:5
19:19 40:16	ordered 18:7,9	22:13	17:14	19:4,21 20:10
48:14	18:17 20:7	parties 50:14	places 46:10	30:14
offer 19:12 43:13	ordering 20:6	parts 17:3	playtime 34:18	provide 6:17,21

10:2 provided 32:19 32:19 35:1,5 36:7 47:17 provides 23:1 24:12,20 proving 21:12 Public 2:10 50:5 pull 42:9 purchased 51:10 purpose 16:12 Pursuant 2:9 put 40:11	34:3 35:18 36:22 43:13 44:20 reason 6:20 8:12 8:19 21:10 30:9 49:5 reasonable 43:18 reboot 9:7 recall 11:3 16:6 18:20 34:6,12 37:22 46:19 receive 12:8 13:10 Recess 9:15 49:3 recite 38:3 recited 42:3 record 9:13,15 49:3,9 50:11 recorded 52:11 52:14 recording 36:15 reduce 34:13 refer 41:7 reference 39:4,17 40:14 41:4,11 42:1 referenced 51:8 references 39:21 refers 41:18 refresh 45:18 regard 40:7 regions 27:14 REICHMAN 3:12 related 5:12 24:1 24:2 39:7 50:13 relates 29:14 39:12 46:14 47:7,21 relationship 24:18 relative 30:16 relevant 22:14 34:2 remember 34:19 remotely 1:15 2:2	rendered 18:7,11 19:7 20:3,22 24:7,17 26:22 27:10 28:17,21 31:6 32:22 33:12 35:11 rendering 33:15 renders 30:14 renewal 45:5 repeatedly 28:18 reply 4:13 18:19 reported 1:19 50:9 require 37:15 required 20:12 25:12 requirement 28:8 29:9,15 31:10 requires 19:15 respect 40:6 respective 38:20 39:4,6,19 40:7 42:21 43:6,17 response 7:22 result 45:2 results 24:7 44:15 retain 12:11 retained 4:6 7:7 7:15 retaining 12:9 13:4,11 42:6 retention 13:3 retrieved 26:20 28:19 review 51:10 right 7:21 12:22 14:1 19:9 32:17 33:22 34:5 RMR 1:19 2:10 50:22 roughly 34:10 rule 24:8,14 25:4 25:8 26:10 27:2 28:16,20 31:13 31:17,21 32:10	33:5,17 34:3,7 35:1,9 36:7,21 rules 15:13 22:12 23:1 24:21 25:2 26:18 51:16 running 5:17 <hr/> S <hr/> S 3:1 4:1,5 5:1 S-E-A-K 12:4 saying 40:2 says 9:3 10:18 13:14 14:20 18:4 21:19 30:13 37:14 scene 25:18,19,20 26:2,3 scissors 36:17 screen 8:14,20 9:2 38:9 42:12 43:19 script 23:17,18 24:19,20 26:9,9 26:12,14,15 scroll 10:12 39:20 44:5 scrolling 10:11 44:6 SEAK 12:4 search 23:10 second 17:15,18 18:4 19:5 30:13 31:9,20 34:7,8 37:16 38:4,18 40:1 41:21 42:3 42:20 43:5 45:14 seconds 31:20 section 45:6,7,8 sections 45:11 see 8:18 9:1,7 10:21 12:12,20 14:15,16 15:6 16:16 18:2,12 22:6 29:9,10,14 30:19 31:10 35:11 37:17	38:12,14,16 40:2,19 42:12 43:8,9 47:14 48:11,17 seek 13:10 seen 8:21 30:10 segment 31:19,20 33:7,7,8,9 35:8 36:12,12 38:22 40:3 segments 15:14 17:16,19 18:6,8 18:16,22 19:5 19:10,16,18,22 20:2,3,6,13,18 23:3,19 24:4,7 24:12 25:9,12 26:10,11 28:17 31:18 33:2 35:3 35:4 36:9,10,18 36:21 37:21 38:3,4,6,19 39:5,22 40:1,10 41:7 42:2,20 43:5,12,15 45:11,14 46:3,9 46:12 47:3 segments' 42:15 43:3 select 23:2 selected 51:12 selects 46:9 sense 19:13 33:21 sentence 11:2 13:14 18:4 21:19 30:13 37:14 separate 44:16 sequence 20:1 26:5 36:9,10 46:6 sequential 20:21 24:16 27:14 sequentially 18:11 19:8 25:10 27:1 33:12
---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

sequentially' 18:8	specific 16:21	19:21	44:10,14,18	time 5:20 8:13
services 12:11	specifically 39:2	Suite 1:21 3:6,14	45:20,22 46:13	10:20 11:2 13:6
set 20:6 26:18,18	specification 16:19 38:6	51:2 52:1 53:2	46:18,22 47:6	14:3,4 23:21
49:7 50:18	42:18	superfluous 31:16 32:8 35:1	48:6,8,10	29:1 31:6,8
share 8:13 38:9	specified 26:12	37:1	system 36:11	32:20 33:19
sharing 43:19	specify 26:14	superfluously 32:22	45:3,10	34:3,11,14 35:8
sheet 51:13 52:12	31:7	supplemental 4:11 7:4 9:21	systems 16:8	51:15
53:6	spend 10:20 14:3	10:7,14 17:21	35:20	time-logging 5:19
show 27:20	14:4	21:4,5 30:5	T	times 11:11
showing 38:10	ss 50:2	37:5 42:11	T 4:1,1,5	32:12
shows 14:20 17:8	stand 8:1,3	43:21 44:8	take 9:5,6 31:5	timestamp 31:12
17:11	standards 34:21	45:17 48:4	takes 10:12 17:14	31:15 32:2
side 40:11	stands 13:19	support 4:12	46:7	35:12,16,19,22
sign 51:9,10	start 18:3	14:5	technology 12:3	36:1
signature 51:8,14	started 33:14	surcharge 12:10	tell 48:3	timestamps 34:15,17,21
52:4,17 53:22	starting 10:17	sure 6:12 7:21	ten 9:6,10	35:6 36:13,19
signed 51:13	28:5,6,10 29:10	8:2,5 11:11	tend 11:12	37:1
signing 51:12	29:12 38:14	17:1,5 21:1	term 21:20 22:4	timing 30:16,21
similar 11:1	starts 28:2,3,3,4	23:10 26:7 37:8	30:16 37:20	30:22 31:3,10
simply 31:3	state 2:10 28:18	42:8 44:6	38:5,17,22 39:1	31:11 32:2,5,7
Sincerely 51:20	50:1,6	surface 47:16	40:3,4,9,12,13	32:13,15,16,18
single 45:20,22	stated 28:9 43:14	survey 12:5	41:6,9,16,17,18	33:3,10,22 36:3
situations 32:18	statement 14:8	sworn 5:4	42:19 43:11	36:6
sluggish 7:22	17:3 40:2 47:13	synchronization 34:11	terms 17:14	today 6:14,21
44:6	statements 23:8	synchronize 34:4	34:11 42:1,15	track 36:15,16
software 5:19	states 1:1 4:9	synchronized 33:12	43:2	45:6 48:5
15:17 16:9	39:18	synchronizing 33:21 34:16	territory 9:9	tracks 46:9
somewhat 25:7	stem 11:9 13:2	syntactic 22:4,21	testified 5:6 41:2	TRADEMARK 1:1
31:1	stems 11:19	28:1	testify 5:4	transcript 50:11
Sonohara 44:10	stop 43:19	syntactical 21:21	testifying 6:14	51:7,9 52:8
44:19,21,22	storage 20:18	22:8,10,12 23:9	testimony 6:17	transcription 52:11,13
45:19,22 46:15	27:14	23:14 28:8	6:21	transmission 33:15
46:16,17,19,21	stored 20:19	38:19 39:9,18	thank 6:1 14:11	TRIAL 1:2
47:1,8,9,11,14	25:21 26:19	40:6 42:21 43:5	48:2	tried 28:18
48:6,10	27:6,13	43:16 46:2	thing 6:3	true 50:11 52:10
sorry 21:4 35:14	stream 15:13	22:15,18 23:1,8	things 5:15 22:16	52:12
sort 33:17	22:22 23:20,22	23:14 28:8	26:14 35:21	truth 5:5,5,6
sound 44:17 45:5	35:22 39:14	38:19 39:9,18	think 14:10 16:5	truthful 6:17,21
45:12 46:5,10	46:22	40:6 42:21 43:5	19:14 24:3	try 8:1,4,18
47:4,22	Street 1:21 3:5	27:16,21 28:13	27:19 32:19	21:13
Sounds 48:22	51:2 52:1 53:2	29:4,21 39:14	44:22 45:11	trying 7:21 18:1
source 17:15	studio 35:8		thinking 35:21	44:5
47:19,22	subsumed 34:20		40:20	
Speak 35:15	suggest 34:22		third 3:13 10:18	
speaking 17:6	suggested 18:15		thought 47:18	
special 16:12	suggests 18:5		thumb 34:3,7	

turn 10:9 14:12 17:20 21:3 30:4 37:4 43:20 two 15:17 22:13 44:16 45:6 types 11:12 typically 11:13 12:2 13:5	53:8 V0 28:2 various 11:8 34:20 versus 40:10 video 12:3 15:11 21:14 22:16,20 23:3,3,4 24:4 24:13 25:18 33:1,8,13,21 34:2,4,4,16,19 35:2,4 36:10,16 39:8 46:3,4,4 46:11 view 15:8 16:14 18:15 20:5,5,8 20:11 25:8 26:8 26:8 28:11 32:5 35:12 40:13 41:2 46:9 VL 1:7 51:4 52:4 53:8 VOP 28:4	15:19 19:20 29:7 49:1 50:18 51:10 52:5,17 53:9 witnesses 12:3 wonder 19:13 word 35:12,16 words 19:3 30:21 31:15 work 12:17,18,19 24:11 34:12 worked 12:13 13:9 working 12:22 13:7,16 33:20 worth 48:13 written 51:22	44:10,19 45:20 45:22 46:18 48:10 10:03 1:17 100 31:5 1001 4:9 7:12,14 8:11,14 9:20 21:22 38:10 10017 3:15 1016 4:11 7:3,6 8:3,8,11 9:21 10:7 42:11 11 44:16 12 44:17 13 45:6 14 38:14 45:9 15 14:12 16 45:4 17 45:4 1730 1:21 52:1 53:2 17th 3:5 51:2 19 1:16 25:3,6 51:4 52:5 53:10	23rd 50:19 24 30:4 2400 3:14 26 14:13,15,16 27 17:20 18:2 270 11:10,18 13:1 28 42:10 29 37:4,10 2903 28:6
<hr/> U <hr/> U.S 1:11 ultimately 36:22 undefined 30:16 underlying 22:15 understand 6:13 6:16 19:9 21:20 22:8 23:7 26:7 30:20 40:19 44:20 45:21 understanding 17:18 24:10 28:15 39:9 42:5 understood 13:13 21:2 38:18 42:1 unfortunately 10:11 Unified 11:9,17 11:20,22 12:15 12:20,22 13:2 13:16 14:5,7 51:4 52:4 53:8 unit 28:3 United 1:1,4 4:9 units 28:8 unknown 9:9 unnecessary 22:3 use 14:8 41:6 46:21 47:1 useful 36:20 uses 26:17 30:15 usual 10:19 11:5 11:7,8 13:15,21 14:2,6	<hr/> W <hr/> waive 51:11 walk 47:13 want 19:9 21:13 25:2 45:20,21 wanted 21:1 Washington 1:21 3:7 51:2 52:2 53:3 way 19:13 20:15 27:5 35:6 43:10 50:15 we're 5:18 17:5 49:6 we've 39:10 46:1 Wednesday 1:16 Welcome 9:17 WHEREOF 50:18 widely 36:20 window 10:4 witness 7:9 12:4 12:11 13:8	<hr/> X <hr/> X 4:5 XML 22:22 23:16,17,18 24:19,20 26:9,9 26:12,14,16 28:18 XML-based 46:22	<hr/> 2 <hr/> 2 17:11 27:20,22 29:11 45:8 20 31:20 20006 3:7 51:2 2001 25:19 26:2 20036 1:21 52:2 53:3 2011 25:19 202 1:22 52:2 202)-232-0646 51:17 202)232-0646 53:4 202.654.4503 3:8 2022 51:21 2023 1:16 25:20 26:1 50:19 51:4 52:5 53:10 21 21:7,17 232-0646 1:22 52:2	<hr/> 3 <hr/> 3 14:17,19 16:13 16:22 45:8 3:20 48:21 3:22 49:9 31 25:3,5 34 21:3,4,19 36 43:20 44:1,1 37 30:6
		<hr/> Y <hr/> Yeah 8:6 10:11 18:1 21:9 29:7 43:1,9 44:5 yield 45:12 York 3:15,15		<hr/> 4 <hr/> 4 38:14 44:22 46:5 47:20 400 12:6,8,15 13:5,10 43 37:11,14 450 12:8,15 13:6 13:10 46 16:22 47 16:22
		<hr/> Z <hr/> Zoom 5:18 21:14		<hr/> 5 <hr/> 5 4:3 31:20 500 3:6 51:2 52 44:3,4,8
		<hr/> 0 <hr/> 1		<hr/> 6 <hr/> 6 25:3,6 64 28:6 646.921.1474 3:16
<hr/> V <hr/> v 1:6 51:4 52:4		1 10:9,14 14:20 15:5,9,10,16 16:3,15 17:8 25:3,6 30:15 31:19 33:7,9 37:15,19 38:2 39:20,21 41:10		<hr/> 7 <hr/> 7 4:9,11 73 31:21 750 3:13 794 7:12 9:20 15:1,4 16:3,14

22:1 23:13 24:10 27:16 28:13 29:3 34:15 38:7,11 42:18,18 <hr/> 8 <hr/> 8,605,794 1:11 4:10 800 3:5 51:2 812 1:21 52:1 53:2 <hr/> 9 <hr/> 9 30:15 37:15,19				
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--	--	--	--