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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN JOSE DIVISION

WITHROW NETWORKS, INC., :
Plaintiff, :
v. : Civil Action No.
GOOGLE LLC and YOUTUBE, : 5:24-CV-03203-PCP
LLC, :
Defendants. :

_____X

Remote Videotaped Deposition of
MATTHEW S. GOLDMAN
Monday, July 21, 2025
10:10 a.m. ET

Job No.: 7365817
Pages: 1 - 133
Reported By: DEBRA BOLLMAN FARFAN, RDR, CRR, CRC
CA CSR No. 11648

1 Videoconference Deposition of MATTHEW S. 2 GOLDMAN, held remotely: 3 4 5 Witness Location: 6 Framingham, Massachusetts 7 8 9 10 11 Pursuant to notice, before Debra Bollman 12 Farfan, Registered Diplomate Reporter, Registered 13 Merit Reporter, Certified Realtime Reporter, 14 Certified Realtime Captioner, and Certified 15 Shorthand Reporter No. 11648, in and for the State 16 of California. 17 18 19 20 21 22 23 24 25 Page 2	1 A P P E A R A N C E S C O N T I N U E D 2 3 ALSO PRESENT: 4 JEFREE ANDERSON, VIDEOGRAPHER 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Page 4
1 A P P E A R A N C E S 2 ON BEHALF OF THE PLAINTIFF WITHROW NETWORKS, 3 INC.: 4 CALFEE, HALTER & GRISWOLD LLP 5 BY: MICHAEL GLENNON, ESQUIRE 6 MARK MCDOUGALL, ESQUIRE 7 JOSH FRIEDMAN, ESQUIRE 8 255 East Fifth Street 9 Cincinnati, Ohio 45202-4728 10 513.618.4494 11 Mglennon@calfee.com 12 13 ON BEHALF OF THE DEFENDANTS GOOGLE LLC AND 14 YOUTUBE, LLC: 15 KWUN BHANSALI LAZARUS LLP 16 BY: Asim M. Bhansali, ESQUIRE 17 Elizabeth H. Dinh, ESQUIRE 18 555 Montgomery Street, Suite 750 19 San Francisco, CA 94111 20 Tel: (415) 630-2350 21 Abhansali@kblfirm.com 22 Edinh@kblfirm.com 23 24 25 Page 3	1 2 I N D E X 3 WITNESS PAGE 4 MATTHEW S. GOLDMAN 5 EXAMINATION BY MR. BHANSALI 7 6 7 8 I N D E X O F E X H I B I T S 9 (EXHIBITS ARE ATTACHED TO THE TRANSCRIPT.) 10 DESCRIPTION PAGE 11 EXHIBIT 1 EXPERT REPORT OF MATTHEW GOLDMAN 9 12 EXHIBIT 2 10,771,849 PATENT 9 13 EXHIBIT 3 ARTICLE - SOCIETY OF CABLE 93 14 TELECOMMUNICATION ENGINEERS, 15 ANNUAL TRADE SHOW 16 CABLE-TEC EXPO IN 2013 17 18 19 20 21 22 23 24 25 Page 5

1 PROCEEDINGS 2 ***** 06:56:49 3 THE VIDEOGRAPHER: Good morning. We are 10:10:11 4 going on the record at 10:10 a.m. Eastern Time on 10:10:31 5 July 21st, 2025. 10:10:37 6 Please note that this deposition is being 10:10:40 7 conducted virtually. Audio and video recording 10:10:42 8 will continue to take place unless all parties 10:10:46 9 agree to go off the record. 10:10:48 10 This is Media Unit 1 of the video recorded 10:10:51 11 deposition of Matthew Goldman, taken by counsel 10:10:54 12 for the defendant in the matter of Withrow 10:10:56 13 Networks, Incorporated vs. Google, LLC, filed in 10:11:00 14 the United States District Court, Northern 10:11:05 15 District of California, San Jose Division. Case 10:11:07 16 number is 524-cv-03203-PCP. 10:11:12 17 My name is Jefree Anderson, representing 10:11:18 18 Veritext, and I am the videographer. 10:11:23 19 Counsel will now state their appearances 10:11:25 20 and affiliations for the record, beginning with 10:11:27 21 the noticing attorney. 10:11:29 22 MR. BHANSALI: Asim Bhansali and Elizabeth 10:11:30 23 Dinh of Kwun Bhansali Lazarus for defendants. 10:11:35 24 MR. GLENNON: Michael Glennon and Mark 10:11:38 25 McDougall for Calfee, Halter & Griswold for the 10:11:41 Page 6	1 A. I am in Framingham, Massachusetts. 10:12:24 2 Q. Okay. And is there anybody else there in 10:12:27 3 the room with you? 10:12:31 4 A. Yes, my 91-year-old mother. 10:12:32 5 Q. Okay. And -- 10:12:37 6 A. And just for the record, I am visiting her 10:12:42 7 this week, which I readily do in the summertime, 10:12:45 8 since I'm domiciled in Florida. 10:12:48 9 Q. Sure. But that's fine. But is she like 10:12:51 10 in the actual room that you're in? 10:12:54 11 A. Yes. But her -- her state is such that 10:12:57 12 she'll have no impact on the case. 10:13:04 13 Q. That's fine. It's not a problem. I just 10:13:06 14 wanted to make sure I understand. 10:13:08 15 A. Yeah. 10:13:09 16 Q. Thank you for letting me know that. 10:13:10 17 A. It will be more difficult for me to try to 10:13:13 18 make other arrangements, if you understand what I 10:13:16 19 mean. 10:13:18 20 Q. Sure, understood. That's fine. 10:13:19 21 And are you on your computer there? You 10:13:21 22 said you're on a laptop? 10:13:25 23 A. Yes, I'm on my laptop, yes. 10:13:26 24 Q. Do you have -- obviously, you have this 10:13:28 25 window open for the deposition. Do you have any 10:13:30 Page 8
1 plaintiffs. 10:11:46 2 THE VIDEOGRAPHER: Thank you. Would the 10:11:46 3 court reporter please introduce yourself, 10:11:48 4 administer the oath to the witness, and counsel 10:11:49 5 may proceed. 10:11:51 6 10:12:10 7 [COURT REPORTER, DEBRA B. FARFAN, CSR 07:06:01 8 NUMBER 11648, INTRODUCTION PURSUANT TO 9 CALIFORNIA BUSINESS AND PROFESSIONS CODE 10 SECTION 8016(b)(1).] 11 12 Whereupon, 13 14 MATTHEW S. GOLDMAN, 15 called as a witness, was duly sworn and testified 16 under penalty of perjury as follows: 17 10:12:13 18 EXAMINATION 10:12:13 19 BY MR. BHANSALI: 10:12:13 20 Q. Good morning, Mr. Goldman. We met off the 10:12:14 21 record a couple minutes ago. 10:12:16 22 Could you please state your full name for 10:12:18 23 the record. 10:12:20 24 A. Yes. It is Matthew S. Goldman. 10:12:20 25 Q. Okay. And where are you today? 10:12:22 Page 7	1 other windows open? 10:13:33 2 A. The only other window I have open is 10:13:35 3 Microsoft Edge, which I can't see, which has 10:13:37 4 the -- what is it called? Vartos? 10:13:41 5 Q. Veritext? 10:13:45 6 A. The Veritext windows on that I used to log 10:13:46 7 in to this meeting. 10:13:49 8 Q. Okay. And at some point we may get help 10:13:50 9 and you may have the Exhibit Share available. 10:13:53 10 A. Okay. 10:13:55 11 Q. Okay. And then do you have a copy of your 10:13:56 12 report there with you? 10:13:58 13 A. I do. I have a printed copy of my report. 10:14:00 14 Q. And do you also have a copy of the '849 10:14:02 15 patent there with you? 10:14:05 16 A. I do. 10:14:06 17 (Deposition Exhibit No. 1 was marked for 10:14:06 18 identification and attached hereto.) 10:14:36 19 (Deposition Exhibit No. 2 was marked for 10:14:36 20 identification and attached hereto.) 10:14:07 21 Q. Okay. I've gone ahead and marked your 10:14:07 22 report as Exhibit 1 and the '849 patent as 10:14:10 23 Exhibit 2, for the record. 10:14:15 24 And so if you just -- we can agree if I'm 10:14:19 25 referring to Exhibit 1, that's your report, and 10:14:23 Page 9

1 Exhibit 2 is the '849 patent? 10:14:25	1 MR. GLENNON: Objection as to form. 10:17:10
2 A. Is it okay with you if I make a notation 10:14:29	2 BY MR. BHANSALI: 10:17:15
3 on each to kind of remind me which is what? 10:14:32	3 Q. You can answer. 10:17:16
4 Q. Yes, that's fine. 10:14:36	4 A. Oh, I can answer? Okay. 10:17:17
5 A. Okay. Bear with me. 10:14:38	5 I'm not sure I really understand the 10:17:19
6 Q. And if any point you can't remember, just 10:14:39	6 question. Could you rephrase it? 10:17:23
7 ask. 10:14:42	7 Q. Yeah. Let me -- by the way, when your 10:17:25
8 A. All right. So my report is 1, right? 10:14:42	8 counsel objects, unless they instruct you not to 10:17:28
9 Exhibit 1. 10:14:46	9 answer, you can go ahead and answer the question. 10:17:31
10 Q. Yes. 10:14:46	10 Just so you know. 10:17:33
11 A. And the '849 is -- got it. 10:14:48	11 A. Thank you for that clarification. 10:17:34
12 Q. Okay. Thank you. Okay. 10:14:57	12 Q. Yeah. 10:17:36
13 So if you have your report, could you turn 10:15:00	13 Let me ask you this. Let me ask you a 10:17:37
14 to page 9, please. 10:15:05	14 different question. 10:17:39
15 A. I am ready. 10:15:16	15 So you say -- if you turn to paragraph 28, 10:17:40
16 Q. Okay. And there's a definition there, 10:15:17	16 which is on page 11. 10:17:42
17 plaintiff's proposed construction for optimized 10:15:23	17 A. Yes. 10:17:52
18 decoding processes. 10:15:26	18 Q. Okay. You say: At the very least, a 10:17:52
19 Do you see that? 10:15:27	19 construction of "complexity reducing" is 10:17:55
20 A. I do. 10:15:28	20 sufficiently reasonable such that the term is not 10:17:58
21 Q. Okay. And what is plaintiff's proposed 10:15:29	21 indefinite. 10:18:01
22 construction? 10:15:32	22 Do you see that? 10:18:01
23 A. Complexity reducing decoding processes. 10:15:34	23 A. I do. 10:18:03
24 Q. Okay. And do you agree that complexity 10:15:37	24 Q. Okay. What did you intend to convey here 10:18:03
25 reducing decoding processes is how a POSA would 10:15:43	25 when you say "At the very least"? 10:18:06
Page 10	Page 12
1 understand the term "optimized decoding 10:15:48	1 A. What I'm trying to give notice of is all 10:18:13
2 processes"? 10:15:51	2 the information, when you read the body of the 10:18:15
3 A. In context to '849, yes. 10:15:54	3 patent, when it talks about these optimized 10:18:18
4 Q. And what do you mean when you say "In 10:15:57	4 decoding processes, is that the function of every 10:18:21
5 context to '849"? 10:16:02	5 one of these things is to reduce complexity. 10:18:24
6 A. Optimized decoding process is a phrase. 10:16:07	6 And it's quite obvious, from the reading 10:18:27
7 It has a very specific meaning in how it's used in 10:16:09	7 of the body of the patent, that that's what is 10:18:29
8 '849. 10:16:12	8 meant. 10:18:31
9 Q. And do you have an understanding of what 10:16:13	9 Q. And is that your understanding of what 10:18:32
10 that phrase would mean outside of the context of 10:16:15	10 "optimized" means in the field of the '849 patent, 10:18:39
11 the '849 patent? 10:16:18	11 separate and apart from how it's used in the 10:18:42
12 MR. GLENNON: Objection. Outside the 10:16:19	12 patent? 10:18:44
13 scope. 10:16:20	13 MR. GLENNON: Objection as to form. 10:18:46
14 BY MR. BHANSALI: 10:16:22	14 THE WITNESS: I never considered the word 10:18:48
15 Q. You can answer. 10:16:23	15 "optimized" separate from "optimized decoding 10:18:52
16 A. I haven't really looked at what it would 10:16:24	16 processes" when I reviewed the patent. It doesn't 10:18:55
17 mean in every case. Any -- the way the claims are 10:16:28	17 really use the word "optimized" separately. It 10:19:02
18 written in '849 is quite obvious that the grouping 10:16:32	18 uses it always as "optimized decoding processes," 10:19:06
19 of words and phrases is very important to the 10:16:38	19 which I took together as a phrase to refer to -- 10:19:10
20 meaning of the patent itself. 10:16:40	20 in the industry, and this is going back even to 10:19:14
21 Q. Are you informing your understanding of 10:16:42	21 2005, for a POSA or a POSITA. 10:19:19
22 how that term is used in the '849 patent? Are you 10:16:53	22 By the way, I may sometimes use the word 10:19:24
23 applying any understandings that a POSA would have 10:16:58	23 "POSITA" instead of "POSA," which is the term that 10:19:27
24 as to the meanings of any of the words in the 10:17:04	24 was used in formation here, because that's the 10:19:31
25 phrase "optimized decoding processes"? 10:17:07	25 common term I'm used to. So I'm probably going to 10:19:34
Page 11	Page 13

1 go back and forth between POSA and POSITA. 10:19:36 2 And for the purposes, they mean the same 10:19:40 3 thing, a person of ordinary skill in the art. 10:19:43 4 So a person of ordinary skill in the art 10:19:45 5 would know, and I say that referring to their 10:19:47 6 video- and audio-processing knowledge, that the 10:19:49 7 "optimized decoding processes" refers to the 10:19:55 8 algorithm toolkit that's described in the patent. 10:19:59 9 BY MR. BHANSALI: 10:20:03 10 Q. So is it your view that "optimized 10:20:03 11 decoding processes" is limited to the algorithm 10:20:05 12 toolkit that's described in the patent? 10:20:08 13 A. In general, that's what it's referring to 10:20:15 14 in the patent. I didn't really opine on whether 10:20:17 15 or not I believe it's only that. 10:20:21 16 But in the construction of the claims, 10:20:22 17 when I read those words, I took them to mean that, 10:20:26 18 as I was reading the words, that it was referring 10:20:32 19 to the body of the patent. 10:20:34 20 Q. Well, what else -- what else, besides the 10:20:35 21 set of toolkits described in the patent, would be 10:20:39 22 included within the scope of an optimized decoding 10:20:44 23 process? 10:20:47 24 MR. GLENNON: Objection. Beyond the 10:20:48 25 scope. 10:20:49 Page 14	1 first tool starts at column 11 and line 28. 10:23:39 2 Hopefully I didn't miss one. 10:23:49 3 Q. Okay. 10:23:51 4 A. A novel approach taken to decode VLCs by 10:23:51 5 the video decoding process operating on the 10:23:55 6 multimedia object players as illustrated in 10:23:57 7 Figure 7 can be precisely described as follows, in 10:24:01 8 which case the tool is described in the following 10:24:05 9 part of that text. 10:24:07 10 I believe that is the first occurrence of 10:24:08 11 it. However, since I'm scanning this during the 10:24:10 12 call, I might have missed that, if there's one 10:24:13 13 before it. 10:24:15 14 Q. Okay. 10:24:15 15 A. Then it would continue on from here. So 10:24:16 16 that's figure, referring to figure 7. 10:24:21 17 Figure 8 then continues with more 10:24:25 18 description, more tools described there. 10:24:28 19 Figure 9 talks about a faster motion 10:24:41 20 compensation without bilinear interpolation. 10:24:44 21 Figure 10, illustrating a novel 10:24:47 22 optimization for the dequantization step. 10:24:50 23 Figure 11 is a flow diagram illustrating a 10:24:55 24 novel use of Chen's algorithm. 10:24:58 25 Figure 12 is a flow diagram showing video 10:25:04 Page 16
1 THE WITNESS: So -- so the patent itself 10:20:49 2 has an algorithm set of tools, and it also has an 10:20:56 3 explanation about how the tools work and how they 10:21:01 4 function or what they could provide. 10:21:08 5 BY MR. BHANSALI: 10:21:12 6 Q. Okay. And where -- where -- let's take 10:21:13 7 that apart for a second. Where are the tools 10:21:16 8 themselves described in the patent? 10:21:19 9 A. Is it all right for me to open up the 10:21:22 10 patent, sort of go down the pages to find the 10:21:26 11 tools? 10:21:28 12 Q. Yes, yes. And I'll repeat the question, 10:21:29 13 just so the record it clean. 10:21:39 14 So if you look at Exhibit 2, which is the 10:21:40 15 '849 patent, can you tell me where the algorithm 10:21:44 16 set of tools, as you've described them, that 10:21:48 17 correspond to optimized decoding processes are 10:21:53 18 disclosed? 10:21:57 19 A. Okay. May I ask a clarifying question? 10:21:59 20 Are you looking for the algorithm tools themselves 10:22:02 21 or the description that are about the tools? 10:22:05 22 Q. First I was looking for the tools. 10:22:06 23 A. Okay. I am flipping through the pages 10:22:09 24 because this is a lot of words. 10:22:26 25 I might have missed it, but I believe the 10:23:36 Page 15	1 decoding of YUV or RGB step and goes and explains 10:25:07 2 a mechanism for how to optimize that and 10:25:12 3 optimizing, meaning using the tool itself. 10:25:17 4 Figure 13, flow diagram somewhere in the 10:25:25 5 shortcut optimization processing. And this is 10:25:27 6 where it discusses having multiple -- defining 10:25:32 7 multiple video levels at each of six steps and 10:25:37 8 having an overall quality rating of it as the 10:25:40 9 highest step, then maintaining state in which, 10:25:43 10 based on the state that you need to accomplish 10:25:46 11 here, apply the tools overall. 10:25:49 12 Figure 15 is referring to -- oh, just so 10:25:55 13 the previous tools were related to video. 10:26:10 14 Starting at Figure 15, they're tools that are 10:26:13 15 related to audio. So simplifying the audio 10:26:16 16 processor, reducing complexity of the audio 10:26:20 17 processing. 10:26:25 18 When I say that, so that will be the 10:26:26 19 optimized decoding processes. So Figure 15 is the 10:26:28 20 first one, decoding of a single VLC value in a 10:26:35 21 single array lookup. And the novel approach is 10:26:42 22 described there. 10:26:45 23 Figure 16 illustrates the next step for 10:26:46 24 doing an inverse DCT. And that covers you 10:26:55 25 through -- what was that? Yeah, Figure 16 is a 10:27:11 Page 17

1 whole page of description. 10:27:14	1 BY MR. BHANSALI: 10:29:55
2 Figure 17 illustrates simplified input 10:27:21	2 Q. Well, so you said that you would consider 10:29:55
3 shortcut processes that are specific to AAC -- oh, 10:27:24	3 the description of the tool or tools in addition 10:29:59
4 advanced audio coding -- low complexity is the 10:27:29	4 to the tools themselves in understanding the 10:30:07
5 full name. I used the acronym. 10:27:32	5 definition of optimized decoding process, right? 10:30:11
6 And Figure 19 is a further one from IMDCT 10:27:41	6 A. I might have to clarify what I said 10:30:17
7 short window processing. 10:27:47	7 because when I said description of the tools, is 10:30:21
8 And that looks like that's the series of 10:27:50	8 it's description of -- it's the description of the 10:30:24
9 tools that are described. 10:27:53	9 tool refers to the, you know, both information 10:30:26
10 Again, each of these tools in the toolkit 10:27:55	10 about the tool itself and how one would benefit by 10:30:29
11 is for the purposes of complexity reducing in 10:27:58	11 using the tool. 10:30:33
12 order to be able to process the video in such a 10:28:03	12 Q. Okay. 10:30:34
13 way as to maintain quality. And it's described 10:28:06	13 A. So, so I guess -- I'm still not really 10:30:35
14 through fluidity, or smoothness of the video, in 10:28:11	14 understanding what you're asking me, then, to 10:30:40
15 order to do that. You would apply these tools. 10:28:14	15 describe further. Because a POSA would understand 10:30:42
16 Q. Okay. Now, earlier, you -- I think you 10:28:17	16 the tool itself. And a POSA would understand when 10:30:47
17 said there is the algorithm tools and the 10:28:20	17 information is given by a tool, that it would be 10:30:53
18 descriptions that are about the tools. Do you 10:28:23	18 helpful in understanding how to use it. 10:30:56
19 recall that testimony? 10:28:26	19 Q. Got it. Okay. That's helpful. 10:30:59
20 A. I do. 10:28:27	20 What I'm just trying to understand is 10:31:01
21 Q. And so what are the descriptions as 10:28:27	21 optimized decoding processes in the '849 patent, 10:31:04
22 distinguished from the tools themselves? 10:28:31	22 does that include anything other than the 10:31:08
23 A. In general or specifically? 10:28:36	23 particular tools that are described in the patent 10:31:12
24 Q. First, in general. 10:28:38	24 that you just provided a list for a few moments 10:31:17
25 A. So, in general, when you're walking 10:28:39	25 ago. 10:31:20
Page 18	Page 20
1 through the tool itself and explaining it, the 10:28:43	1 MR. GLENNON: Objection. Beyond the 10:31:20
2 actual parts of the tool either referring to the 10:28:46	2 scope. 10:31:22
3 figure itself or the text within it, that's the 10:28:50	3 10:31:22
4 actual algorithm tool. 10:28:52	4 [Josh Friedman joined the Zoom 10:31:23
5 There are wording -- there's words that 10:28:54	5 Deposition.] 10:31:23
6 surround that that mention some of the benefits of 10:28:56	6 10:31:26
7 the tool when the tool is applied. Or, in 10:28:59	7 THE WITNESS: So I didn't look to see -- 10:31:27
8 general, earlier on it explains how you apply the 10:29:02	8 when I reviewed the patent, I was reviewing only 10:31:30
9 tools all together to maintain video quality. 10:29:06	9 what was contained within the patent. So I was 10:31:34
10 Those would be the description around how the tool 10:29:09	10 only looking in the scope that I used to re-review 10:31:36
11 is used. 10:29:13	11 this, was looking at the optimized decoding 10:31:39
12 I apologize, I forget the exact wording I 10:29:14	12 processes and what is described in the body of the 10:31:41
13 gave earlier in testimony. 10:29:18	13 patent. 10:31:46
14 Q. And so are the -- do the descriptions of 10:29:20	14 I did not take a look at, in general in 10:31:47
15 the tools, as distinguished from the tools 10:29:26	15 the industry, whether the use of such a term might 10:31:50
16 themselves, inform the definition of optimized 10:29:28	16 mean including things that are outside the scope 10:31:53
17 decoding process? 10:29:33	17 of the patent itself. 10:31:55
18 A. Yes, you would take them together. 10:29:36	18 BY MR. BHANSALI: 10:32:00
19 Q. So is anything that fits the description 10:29:39	19 Q. So let's go back to the definition itself, 10:32:00
20 then also something that you would consider an 10:29:43	20 complexity reducing decoding processes. 10:32:04
21 optimized decoding process? 10:29:46	21 A. Yeah, what page was that on again, please? 10:32:07
22 MR. GLENNON: Objection. Beyond the 10:29:47	22 Q. Yeah, page 9 of your report. 10:32:10
23 scope. 10:29:48	23 A. I was on page 11. Now I'm back on page 9. 10:32:13
24 THE WITNESS: I'm really not sure what 10:29:49	24 Yes, go ahead. 10:32:16
25 you're asking me. 10:29:53	25 Q. Okay. Okay. So is there a baseline from 10:32:17
Page 19	Page 21

1 which a POSA could determine whether a decoding 10:32:26 2 process was one that is a complexity-reducing 10:32:32 3 decoding process? 10:32:36 4 A. So the way that the patent is written, it 10:32:41 5 talks about maintaining quality. So it's not a 10:32:46 6 baseline against an absolute value amount. It's a 10:32:50 7 baseline of what can be done in relationship to a 10:32:54 8 few points that are very clearly defined in the 10:32:59 9 patent. It is the network bandwidth and is the 10:33:02 10 processing power and memory capabilities of the 10:33:06 11 device. 10:33:10 12 So the baseline is really against -- if 10:33:13 13 you take the stream as is, you will not be -- 10:33:16 14 depending on the -- I shouldn't say you will not 10:33:21 15 because it really depends on the network bandwidth 10:33:23 16 and the capability of the mobile device, which is 10:33:26 17 how it's described in this case, and then saying 10:33:29 18 how do I keep that stream being fluid or fluid. 10:33:35 19 How do I maintain the fluidity and a certain 10:33:38 20 quality level for that. 10:33:42 21 So the complexity reducing is you're 10:33:44 22 simplifying the equation so that you can actually 10:33:47 23 do the calculations in time to keep fluidity 10:33:50 24 moving, with the understanding that a POSA would 10:33:53 25 have, is that if you didn't apply these and you 10:33:57 Page 22	1 in order to account for, again, bandwidth of the 10:35:32 2 network and the differences in the devices that 10:35:36 3 are available out there, their memory capabilities 10:35:42 4 and their processing power, that you may or may 10:35:46 5 have to apply multiple tools and not just one. 10:35:51 6 And you may have to apply, you know, more 10:35:55 7 deep -- some of the tools allow different settings 10:36:00 8 in the tools to provide a more significant 10:36:03 9 complexity reducing. When it does that, as is 10:36:08 10 mentioned in that, you're reducing certain aspects 10:36:12 11 of the quality, but you're maintaining fluidity. 10:36:16 12 BY MR. BHANSALI: 10:36:33 13 Q. Let's go to Exhibit 2, which is the 10:36:34 14 patent. 10:36:36 15 And I want to turn your attention to 10:36:44 16 column 19, around lines 38 and 39, which is part 10:36:46 17 of claim 1. 10:36:55 18 A. Column 19? 10:37:00 19 Q. Yes. 10:37:02 20 A. 39? 10:37:03 21 Q. 38 and 39. 10:37:04 22 A. 38 and 39. Okay. So I have that as 10:37:05 23 "utilizing optimized decoding processes to 10:37:11 24 maintain quality playback." 10:37:13 25 Q. Correct. 10:37:15 Page 24
1 had bandwidth restrictions or the capability of 10:34:01 2 the device is such that it didn't have the 10:34:05 3 processing power or memory capability to do the 10:34:07 4 functions as described in the stream, that it 10:34:11 5 would not be able to maintain fluidity and 10:34:14 6 audio/video quality. 10:34:18 7 So I know that's a complex answer, but 10:34:19 8 that's how you would describe the baseline. 10:34:22 9 Q. So can -- can a decoding process be a 10:34:24 10 complexity-reducing decoding process even if it 10:34:34 11 doesn't reduce the number of calculations that are 10:34:38 12 done? 10:34:43 13 MR. GLENNON: Objection as to form. 10:34:46 14 THE WITNESS: I didn't really consider 10:34:48 15 that when I looked at it because I took each of 10:34:54 16 these tools as a novel approach, with the stated 10:34:57 17 value of I read the patent and I am at least a 10:35:01 18 POSA of this information, back in, you know -- my 10:35:08 19 level back in 2005. 10:35:14 20 And that's how I was reviewing this. And 10:35:16 21 I took it that each one of these actually were 10:35:19 22 complexity reducing. So, in other words, if you 10:35:22 23 applied the tool, you would be reducing 10:35:24 24 complexity. 10:35:27 25 Now, there are multiple tools here. And 10:35:28 Page 23	1 A. Okay. 10:37:16 2 Q. Okay. So a few moments ago you said when 10:37:18 3 it does that, as mentioned, you're reducing 10:37:23 4 certain aspects of the quality, but you're 10:37:27 5 maintaining fluidity. That was your testimony. 10:37:29 6 So my question to you is if you were 10:37:32 7 reducing certain aspects of quality but are 10:37:35 8 maintaining fluidity, would that satisfy this 10:37:39 9 claim element which refers to "utilizing optimized 10:37:45 10 decoding processes to maintain quality playback"? 10:37:52 11 A. Yes. 10:37:57 12 Q. How so? 10:37:57 13 A. Again, it's different -- you need to read 10:38:01 14 the words in context. 10:38:05 15 So referring to quality against -- 10:38:06 16 "maintaining quality" together in the use of the 10:38:15 17 tools to get fluidity, you're changing the quality 10:38:20 18 of the video or the audio. 10:38:24 19 But in this case it's referring to 10:38:26 20 maintaining quality playback, which has been 10:38:28 21 stated that quality playback, the primary element 10:38:31 22 of that is fluidity first and then -- and then 10:38:36 23 what would be either the oral or the visual 10:38:41 24 quality of the stream. 10:38:45 25 In other words, the human oral system, or 10:38:46 Page 25

1 audio system, and human visual system is more 10:38:49 2 sensitive to the smoothness of the stream itself 10:38:52 3 than it is to some of the other aspects. 10:38:55 4 And a POSA would know that. So there's 10:38:57 5 multiple different -- the word "quality" here is 10:39:05 6 quality playback as opposed to video or audio 10:39:08 7 quality. 10:39:12 8 Q. Okay. And so do you consider quality 10:39:12 9 playback to mean fluidity, then? 10:39:17 10 A. I consider fluidity to be an element of 10:39:18 11 quality playback, yes. 10:39:21 12 Q. What are the other elements of quality 10:39:22 13 playback? 10:39:24 14 A. The audio and video quality itself. All 10:39:25 15 three of those factors are overall part of the 10:39:28 16 quality of the stream. 10:39:32 17 Q. And so does the spec provide any guidance 10:39:33 18 as to how much audio and video quality could be 10:39:36 19 sacrificed while still maintaining quality 10:39:42 20 playback? 10:39:46 21 A. It -- the spec itself describes that an 10:39:53 22 important factor is to maintain quality playback 10:40:00 23 and to maintain -- also to maintain fluidity in 10:40:04 24 that. And when I read the patent itself, as well 10:40:09 25 as the prosecution history, it was made clear that 10:40:12 Page 26	1 This is not just about mentioning quality that's 10:41:24 2 unbounded. It's bounded by the processing power 10:41:27 3 and the memory capabilities of the device. 10:41:31 4 Q. And does the spec provide any guidance as 10:41:34 5 to particular processing power or memory 10:41:38 6 capabilities that correspond to any particular 10:41:45 7 metrics of fluidity or audiovisual quality? 10:41:49 8 A. The spec, it's really hard to explain. 10:41:56 9 You have to be a POSA to understand how to use the 10:42:04 10 spec. It's not for someone off the street who has 10:42:07 11 no experience in video or audio processing. 10:42:10 12 But if you do have that experience in 10:42:13 13 video/audio processing that a POSA would have, 10:42:16 14 then you can use the information that is provided 10:42:19 15 in there. It is sufficient to be able to make 10:42:22 16 that determination of what is fluid and the 10:42:25 17 quality for that. 10:42:29 18 Clearly, if you don't understand video and 10:42:30 19 audio processing, there's not enough information. 10:42:32 20 But there is enough for a POSA. 10:42:36 21 Q. And did you identify anywhere in your 10:42:37 22 report what you describe here as the portion of 10:42:40 23 the spec that's sufficient to be able to make the 10:42:50 24 determination of what is fluid and the quality for 10:42:52 25 that? 10:42:55 Page 28
1 smoothness of the stream was the highest priority. 10:40:17 2 So I don't know if "priority" is the right 10:40:23 3 word, but you -- basically the patent describes 10:40:25 4 that there's a high quality level, a mid quality 10:40:28 5 level, and a low quality level in order to 10:40:30 6 maintain quality playback. 10:40:33 7 And you are limited on that based on the 10:40:35 8 capability of the device. Which, you know, a 10:40:37 9 device can only do what a device can do. And the 10:40:39 10 idea behind this patent is to maintain the best 10:40:43 11 quality you can, given the limitations of the 10:40:45 12 devices. 10:40:48 13 So, yes, a POSA, from reading the patent 10:40:49 14 itself and understanding what the tool -- each 10:40:52 15 tool does and is understanding that the goal is to 10:40:54 16 have -- is to maintain quality playback, would 10:40:58 17 come to the same conclusion that the fluidity is 10:41:01 18 the more important factor, and it would sacrifice 10:41:04 19 some of the other elements to do that. 10:41:08 20 Again, it's not an absolute quality that's 10:41:10 21 being measured here. It's to maintain the best 10:41:12 22 quality you can, given network bandwidth and other 10:41:15 23 network impairments and the capability of the 10:41:19 24 device itself. 10:41:21 25 And you have to take them in context. 10:41:22 Page 27	1 MR. GLENNON: Objection as to form. 10:42:57 2 THE WITNESS: I believe I did. I would 10:42:58 3 need to refer to my report. 10:43:03 4 BY MR. BHANSALI: 10:43:06 5 Q. Sure, if you -- 10:43:06 6 A. But I do believe that I did. 10:43:07 7 Q. If you refer to -- if you go ahead and 10:43:09 8 just -- you have your report there? 10:43:15 9 A. I do. 10:43:16 10 Q. If you can point me to any part of the 10:43:17 11 discussion of the term "optimized decoding 10:43:19 12 processes" that would allow a POSA to make the 10:43:24 13 determination you just described. 10:43:29 14 A. I'm reviewing it now. 10:43:32 15 (Court Reporter Clarification.) 10:44:00 16 A. Are you asking me to only look at the 10:44:28 17 section that starts on page -- starts with "B." on 10:44:56 18 page 9, construction of "optimized decoding 10:45:05 19 processes"? 10:45:07 20 Q. Yes. For this question, yes. 10:45:08 21 A. Yes. So it says on page 10, and this is 10:45:46 22 paragraph 27: As used in the specification, the 10:45:52 23 optimizations -- in quotes -- taught therein all 10:46:07 24 seek to reduce the complexity of -- that is, 10:46:13 25 simplify -- the decoding processes, to maintain a 10:46:19 Page 29

1 smooth video stream, that otherwise could not be 10:46:22 2 completed in time using unabridged computations. 10:46:25 3 And then I refer to Figure -- parts of the 10:46:31 4 patent itself, column 12, lines 42 to 47. 10:46:37 5 And I quote: Figure 10 is a flow diagram 10:46:44 6 illustrating novel optimization for the 10:46:49 7 dequantization step of digital video decoding in 10:46:55 8 the multimedia object players 10 and 11. 10:46:59 9 And I'm going to stop for a second. 10:47:03 10 Ms. Farfan, am I reading it slow enough? 10:47:07 11 (Court Reporter Clarification.) 10:47:13 12 A. Okay. And I will continue: The novel 10:47:13 13 optimization requires the reduction in pixel 10:47:18 14 accuracy but allows values outside the range [0, 10:47:22 15 255] to be represented without an overflow -- here 10:47:30 16 it says: [which avoids complex and time consuming 10:47:32 17 clipping and modification processes]. 10:47:36 18 So that contains some instruction there. 10:47:39 19 Then also I refer to column 13, line 60, 10:47:44 20 to column 14, line 5: (Hence, Figure 13 is a flow 10:47:51 21 diagram summarizing the short-cut optimization 10:47:58 22 processing by the video decoding process used in 10:48:02 23 the multimedia objects players 10 and 11. State 10:48:06 24 information is maintained about the quality levels 10:48:11 25 with which the current video stream is processed. 10:48:14 Page 30	1 A. Yes. 10:49:55 2 Q. -- where you cite that part of the patent? 10:49:56 3 A. Yes. 10:50:00 4 Q. So that refers to the novel optimization 10:50:00 5 requires a reduction in pixel accuracy, right? 10:50:03 6 MR. GLENNON: Objection as to form. 10:50:09 7 THE WITNESS: That is part of what -- that 10:50:10 8 is part of what the dequantization step, what the 10:50:19 9 tool does, yes. 10:50:23 10 BY MR. BHANSALI: 10:50:24 11 Q. Okay. Is there any particular limit on 10:50:24 12 the reduction in pixel accuracy that would be 10:50:28 13 permitted while still maintaining quality 10:50:33 14 playback? 10:50:37 15 A. As I mentioned before, it depends on the 10:50:39 16 network bandwidth available and the processing 10:50:45 17 power and memory capabilities of the device. 10:50:49 18 So there is no absolute level depending on 10:50:52 19 it. If you have a device that has very little 10:50:56 20 processing power, you might have to use this tool 10:50:58 21 to reduce the pixel accuracy more for one type of 10:51:05 22 device in order to maintain quality playback than 10:51:11 23 you would for a different device that had more 10:51:14 24 capabilities. 10:51:16 25 So it's very difficult to put a -- well, 10:51:17 Page 32
1 On very limited devices, shortcuts in the decoding 10:48:19 2 process must be made to allow the device to 10:48:23 3 maintain synchronicity between the audio and video 10:48:26 4 playback. These shortcuts are specifically 10:48:30 5 designed to drastically reduce the number of 10:48:33 6 computations necessary at certain critical steps 10:48:36 7 in the video decoding process at the cost of video 10:48:40 8 output quality. This mechanism allows video 10:48:44 9 decoding to scale in complexity based on the 10:48:49 10 processing power of the device being used.) 10:48:51 11 What I didn't say here, but if you read 10:49:01 12 Figure 13 in the flow diagram and the section that 10:49:05 13 I refer to, it actually gives a list -- a set of 10:49:09 14 the -- when I said "certain critical steps" when I 10:49:15 15 read that from the patent, it actually describes 10:49:18 16 those critical steps specifically in the patent 10:49:21 17 itself. 10:49:23 18 Q. Okay. So let's look at both of those, 10:49:26 19 starting with the first one, the one where you 10:49:29 20 cite column 12, lines 42 to 47, and Figures 10 and 10:49:34 21 11. 10:49:42 22 Do you see that? 10:49:43 23 I'm not directing you to that -- 10:49:50 24 A. Oh, I'm sorry. 10:49:52 25 Q. Do you see in your report where -- 10:49:53 Page 31	1 it's not only that it's difficult. I should 10:51:20 2 restate that. 10:51:22 3 A POSA would understand that the level of 10:51:23 4 application of a tool is dependent on the 10:51:29 5 capabilities of the device. So it might do -- 10:51:34 6 what a POSA would implement might be different for 10:51:40 7 one device versus a different device. And that's 10:51:43 8 part of maintaining the state information that's 10:51:46 9 described in here. 10:51:48 10 And I selected a set of references to 10:51:50 11 prove the point, but these references I made were 10:51:54 12 not exhaustive of everything that's described in 10:51:57 13 the patent. They were examples used, that I felt 10:51:59 14 were sufficient, in order to describe complexity 10:52:03 15 reducing. 10:52:07 16 Q. And does the patent provide any kind of 10:52:08 17 guidance -- apart from what a POSA might 10:52:13 18 understand, does the patent provide any guidance 10:52:16 19 as to what reductions in pixel accuracy might be 10:52:21 20 appropriate for any particular device capability? 10:52:26 21 MR. GLENNON: Objection. Asked and 10:52:31 22 answered. 10:52:31 23 THE WITNESS: So the patent describes 10:52:32 24 overall -- there's a section in the patent that 10:52:40 25 describes how to apply all the tools in order to 10:52:42 Page 33

1 maintain fluidity. 10:52:46 2 And what the patent suggests, or actually 10:52:48 3 I shouldn't say suggests -- the patent states is 10:52:50 4 that you want to make a state table of all the 10:52:55 5 different tools, of which this one tool would be 10:52:57 6 part of that, where you would implement the tool 10:52:59 7 that would cause the least degradation in the 10:53:04 8 quality in order to maintain quality playback. 10:53:07 9 Let me restate that because I'm using 10:53:11 10 "quality" two different ways in this sentence. 10:53:14 11 You would want the degradation of the video or 10:53:16 12 audio quality to be the least impactful to being 10:53:18 13 able to maintain fluidity. That's the tool you 10:53:25 14 would apply or the level of the tool you would 10:53:28 15 apply. And if there was another tool that would 10:53:31 16 give -- that would be satisfactory to maintain 10:53:35 17 quality playback, then that's the tool you would 10:53:39 18 apply first. 10:53:41 19 The patent absolutely does describe that 10:53:42 20 as part of its instruction to the POSA. 10:53:46 21 BY MR. BHANSALI: 10:53:49 22 Q. And by a "tool that would be satisfactory 10:53:49 23 to maintain quality playback," do you mean a tool 10:53:54 24 that would be satisfactory to maintain fluidity, 10:53:57 25 then? 10:53:59 Page 34	1 THE WITNESS: Are we referring to a tool 10:55:23 2 that's -- an algorithmic tool that's not described 10:55:27 3 in the patent in that question? Maybe you could 10:55:30 4 ask me it again. 10:55:33 5 BY MR. BHANSALI: 10:55:34 6 Q. It's just a general question. 10:55:34 7 Is it your position that any tool that 10:55:35 8 reduces audio or video quality while maintaining 10:55:37 9 fluidity meets the definition of an optimized 10:55:41 10 decoding process? 10:55:44 11 MR. GLENNON: Objection as to form. 10:55:45 12 THE WITNESS: It's hard to generalize on 10:55:46 13 that. It's not what I looked at. I looked at 10:55:55 14 only what was within the patent. But, in general, 10:55:58 15 if you're trying to achieve the same goal as the 10:56:01 16 patent, which is to have -- to maintain quality 10:56:04 17 playback, so maintain fluidity, audio and video 10:56:10 18 quality to maintain quality playback, taken 10:56:13 19 together, then, yes. 10:56:16 20 These tools can be applied -- or any tool 10:56:19 21 can be applied that would achieve that goal, 10:56:21 22 because that's the point -- that's the whole point 10:56:28 23 of the patent. You want to maintain quality the 10:56:30 24 best you can based on the capabilities of the 10:56:33 25 network and the device itself. 10:56:36 Page 36
1 A. Yes. Fluidity -- fluidity, audio and 10:54:01 2 video quality are all taken together in order to 10:54:04 3 maintain quality playback, correct. 10:54:06 4 Q. But would the tool then prioritize one or 10:54:09 5 the other there or -- 10:54:17 6 A. No. That's not how audio and video tools 10:54:19 7 work. They apply an algorithm that adds an end 10:54:22 8 result. And depending on the end result and how 10:54:26 9 some of the tools, but not all of the tools, have 10:54:31 10 different levels that you can apply, obviously the 10:54:34 11 more complexity reducing you use in order to keep 10:54:38 12 a fluid playback, the more potential impact on the 10:54:42 13 audio or video quality that could occur in order 10:54:47 14 to maintain fluidity. 10:54:50 15 Q. So in your position -- sorry. Go ahead. 10:54:52 16 I didn't realize -- I thought you were finished. 10:54:56 17 Go ahead. 10:54:58 18 A. I'm sorry, I lost my train of thought. Go 10:54:59 19 ahead. 10:55:02 20 Q. Yeah, okay. 10:55:02 21 Is it your position that any tool that 10:55:03 22 reduces audio or video quality while maintaining 10:55:10 23 fluidity meets the definition of an optimized 10:55:14 24 decoding process? 10:55:18 25 MR. GLENNON: Objection as to form. 10:55:21 Page 35	1 BY MR. BHANSALI: 10:56:39 2 Q. But isn't it the case that to meet the 10:56:46 3 definition of optimized decoding process, you 10:56:51 4 actually have to degrade some amount of audio and 10:56:55 5 video quality to reduce the complexity of the 10:56:58 6 calculations or the number of the calculations? 10:57:03 7 A. Well, yes. That's exactly what the patent 10:57:08 8 described, and it states that explicitly. 10:57:11 9 Q. Okay. 10:57:14 10 A. Again, the point behind this patent is if 10:57:14 11 you didn't do any of these things, if you just 10:57:17 12 played the stream as received using the standard 10:57:21 13 codecs that were available back in 2005, and at 10:57:25 14 the time the example that were being used back in 10:57:29 15 2005 at the time of the application of this 10:57:33 16 patent, then the latest and greatest at that time 10:57:40 17 was MPEG-4 Advanced Simple Profile. 10:57:42 18 Or actually it was just Simple Profile, 10:57:45 19 which is one that's used here. Not Advanced 10:57:47 20 Simple Profile. It was Simple Profile and AAC, 10:57:49 21 which is Advanced Audio Coding. 10:57:53 22 And what the patent is describing is if 10:57:55 23 you just played those on the devices that were 10:57:57 24 available back in 2005, if you didn't make any of 10:57:59 25 these optimizations that are -- these novel 10:58:03 Page 37

1 optimizations that are described -- when I say 10:58:07 2 "novel," novel optimized decoding processes that 10:58:09 3 are described in the patent, then you wouldn't 10:58:14 4 have fluidity at all. It would completely break 10:58:20 5 up on some of these devices. 10:58:24 6 So the purpose of the patent is to provide 10:58:27 7 a set of tools, or algorithmic, you know, 10:58:29 8 mechanisms through which you can reduce 10:58:35 9 complexity, and therefore maintain fluidity so the 10:58:39 10 end result to a non-POSA, to a man on the street, 10:58:42 11 would be that the video quality is better 10:58:46 12 maintained. 10:58:49 13 Because it wouldn't even play -- it 10:58:51 14 wouldn't even, in the case of it -- it's basically 10:58:53 15 the presumption of the whole background of the 10:58:56 16 patent is if you played it as is, without using 10:58:58 17 any of these, then some devices that were 10:59:02 18 available would not be able to play it back at 10:59:04 19 all. 10:59:06 20 When I say "at all," with any quality, 10:59:06 21 what you'd consider even to the layman as being 10:59:09 22 not a quality playback. 10:59:12 23 Q. Does the patent give any guidance as to 10:59:15 24 the amount of audio and video quality that can be 10:59:18 25 degraded in order to maintain fluidity while still 10:59:22 Page 38	1 because this is what engineers do every day. This 11:00:39 2 is what I do every day -- design a system where I 11:00:42 3 would go through the state list as the patent 11:00:47 4 describes, and I would apply these tools. 11:00:49 5 Now, when you first read the patent, the 11:00:52 6 tools or description in here, the first thing a 11:00:54 7 POSA would do is to implement the tool and run it 11:00:56 8 to see what the tool does. 11:01:01 9 So, again, the metric that's being used -- 11:01:03 10 I'm using your term "metric" -- would be that by 11:01:07 11 using this complexity reducing tool, I reduce it 11:01:10 12 enough that I still -- I reduce the video and 11:01:15 13 audio quality enough so I still have fluidity. 11:01:19 14 And that is better than the result of not applying 11:01:21 15 the tool, because the complex calculations can't 11:01:25 16 be completed in time, and there will be drastic 11:01:28 17 degradation if you don't apply the tool. 11:01:33 18 So I don't know how to explain it any more 11:01:37 19 clearly than that. A POSA would know exactly what 11:01:39 20 to do in order to implement a viable product. I 11:01:41 21 mean, that's what a design engineer does. 11:01:45 22 BY MR. BHANSALI: 11:01:47 23 Q. And when you say "the state list," is 11:01:53 24 that -- are those the different aspects of quality 11:01:56 25 that are described in column 14, starting at line 11:02:07 Page 40
1 maintaining quality playback? 10:59:27 2 MR. GLENNON: Objection. Asked and 10:59:29 3 answered. 10:59:30 4 THE WITNESS: I do believe I have 10:59:32 5 described that several times. I mean, I'm happy 10:59:35 6 to repeat my same explanation again. 10:59:38 7 BY MR. BHANSALI: 10:59:41 8 Q. Well, my question is specific to the 10:59:41 9 patent, which is does the patent give you any 10:59:47 10 metrics on the amount of permissible audio and 10:59:51 11 video quality degradation that would still be 10:59:56 12 considered maintaining quality playback? 10:59:59 13 MR. GLENNON: Objection. Asked and 11:00:02 14 answered. And objection as to form. 11:00:03 15 THE WITNESS: So the term "metric" that 11:00:05 16 you use, a metric is a comparison of a difference, 11:00:07 17 and that is exactly what a POSA would do in order 11:00:11 18 to know that the quality was maintained. 11:00:14 19 There would be a reference stream that the 11:00:17 20 POSA would see what the quality was like. And, 11:00:21 21 presumably, if we follow the lines of the patent, 11:00:26 22 the device that's under test and the network 11:00:28 23 bandwidth chosen, there would be degradation in 11:00:32 24 the stream that would be unacceptable. 11:00:34 25 So then the POSA would design a system -- 11:00:36 Page 39	1 30? 11:02:11 2 Feel free to refer to the patent. 11:02:11 3 A. You said column 14, line 30? 11:02:23 4 Q. Yes. 11:02:26 5 A. Yes. The description starts at line 25, 11:02:35 6 but the six of the state information is those six 11:02:38 7 elements that are there. 11:02:43 8 Now, there's probably additional things on 11:02:44 9 top of all of that that are referred to elsewhere. 11:02:47 10 Because I know it does describe that there's 11:02:49 11 other -- I forget what the term is they used with 11:02:53 12 it, but there's other data that accompanies the 11:02:56 13 streams as well that it uses in order to do this. 11:02:58 14 But, yes, this is the six steps that are 11:03:01 15 described. And you provide a -- let me count 11:03:04 16 them. One, two, three, four, five, six. Yep. 11:03:13 17 In addition to that, there is also an 11:03:15 18 overall rating, if you follow further on down 11:03:18 19 below, line 43 in column 14, where it talks about 11:03:21 20 an overall high, medium, and low that you would 11:03:26 21 establish based on what the device -- the device 11:03:30 22 can handle. 11:03:35 23 In other words, you would set these up 11:03:36 24 based on the capabilities of the device. 11:03:40 25 Q. So how does a POSA know which, if any, of 11:03:45 Page 41

1 these six aspects of quality to prioritize in 11:03:48	1 what you would apply it to. 11:06:49
2 determining how much quality degradation is 11:03:58	2 Are you talking about the application of 11:06:52
3 acceptable? 11:04:00	3 this patent to some future technology? 11:06:53
4 MR. GLENNON: Objection as to form. 11:04:02	4 Q. My question is just does an optimized 11:06:59
5 THE WITNESS: I've described a POSA as 11:04:04	5 decoding process have to be applied to a codec? 11:07:03
6 someone who has a bachelor's degree in a related 11:04:10	6 MR. GLENNON: Objection as to form. 11:07:06
7 field here, so electrical engineering, computer 11:04:14	7 THE WITNESS: Well, I don't know what else 11:07:08
8 science, computer engineering or similar, and has 11:04:17	8 it could be applied to. I'd have to think about 11:07:17
9 several years of -- oh, by the way, in the areas 11:04:20	9 that. I didn't really look into that. 11:07:20
10 of networking and in video and audio processing. 11:04:24	10 But the whole point behind this is you 11:07:23
11 And it's very key that you have to have 11:04:28	11 have to -- let me give an example. 11:07:25
12 experience in video/audio processing through 11:04:31	12 If we had infinite bandwidth, then we 11:07:30
13 degree and through several years of practical 11:04:35	13 wouldn't be using a codec at all. We'd just send 11:07:34
14 experience. 11:04:38	14 uncompressed video down the line. And I think 11:07:37
15 So it's through that that a POSA knows how 11:04:38	15 even laymen now in today's date, maybe not back -- 11:07:40
16 to do this, how to review the tools that are in 11:04:40	16 would be a POSA back in 2005, would understand 11:07:44
17 here, how to understand what each tool does, and 11:04:45	17 that we don't have unlimited bandwidth. Everyone 11:07:47
18 then how to apply them, with the end goal of 11:04:48	18 talks about bandwidth constraints and limits. 11:07:49
19 maintaining quality. 11:04:50	19 There's also limiting processing power and memory, 11:07:52
20 BY MR. BHANSALI: 11:04:52	20 obviously much more in 2005 than you have today. 11:07:56
21 Q. You said earlier that the optimized 11:04:58	21 So, in other words, it would be impossible 11:07:59
22 decoding processes are applied back in 2005 to the 11:05:01	22 to even consider this functionality unless it 11:08:01
23 then existing codecs. Am I accurately describing 11:05:07	23 was -- unless the signal itself was compressed, 11:08:09
24 your testimony? 11:05:12	24 based on the capability of devices and networks 11:08:13
25 A. Well, I'm basing this on what was 11:05:12	25 back in 2005. 11:08:15
Page 42	Page 44
1 available back in 2005 and what a POSA would know 11:05:15	1 So I don't know anything else you could 11:08:17
2 at that time, yes. 11:05:18	2 apply it to other than a compressed stream again 11:08:20
3 Q. Okay. And so does the optimized decoding 11:05:19	3 based on that. In other words, the construction 11:08:28
4 process have to be applied to an existing codec? 11:05:24	4 of the hypothesis, I don't know what else you 11:08:30
5 MR. GLENNON: Objection as to form. 11:05:30	5 could apply it to, but I haven't really researched 11:08:31
6 THE WITNESS: The patent says it does not 11:05:31	6 it either. 11:08:34
7 have to be. It obvious -- the patent does give 11:05:39	7 BY MR. BHANSALI: 11:08:35
8 some very specific things that based on knowing 11:05:44	8 Q. Well, let's go to Exhibit 2, the '849 11:08:35
9 what the codec is that have what the -- what the 11:05:49	9 patent, and go to column 12, line 60 -- well, at 11:08:39
10 applicant believes are better tools to use. And 11:05:53	10 the very end of line 63. 11:08:49
11 he mentions that in the text of the patent. 11:05:59	11 A. Column 12? 11:08:52
12 But it also -- it was state-of-the-art at 11:06:04	12 Q. Yeah. 11:08:54
13 the time. There were only certain types of codecs 11:06:06	13 You and I have the same issue, we have to 11:08:56
14 that were available, and anything of a general 11:06:09	14 lower our glasses and push them back up. 11:08:59
15 type for that, these tools would apply to. It 11:06:11	15 A. I apologize. I have highly expensive 11:09:01
16 didn't have to be these exact -- it didn't have to 11:06:14	16 progressive lenses, and I'm still adjusting. 11:09:05
17 be MPEG-4 Simple Profile or Advanced Audio Coding. 11:06:17	17 Q. No, that's what I said. I share your 11:09:07
18 It could be other codecs that are related that 11:06:20	18 pain. So, sorry. 11:09:09
19 were available or generally understood to be 11:06:26	19 Go ahead, yes. 11:09:10
20 available at that time. 11:06:28	20 A. At least you know what I'm doing there. 11:09:13
21 BY MR. BHANSALI: 11:06:29	21 Let's see. So you want me to look at 60? 11:09:15
22 Q. But the -- but the optimization has to be 11:06:30	22 Q. Column 12. If you just -- I'll direct 11:09:21
23 applied to a available codec; is that right? 11:06:35	23 you, but why don't you go column 12. I think it's 11:09:24
24 A. Well, I'm not sure I understand the 11:06:44	24 line 63, the very end of line 63, where it says -- 11:09:28
25 question. If it's not available, I don't know 11:06:47	25 and then it goes on -- 11:09:32
Page 43	Page 45

1 A. The "Chen's IDCT algorithm"? 11:09:34 2 Q. Yes. 11:09:37 3 A. Okay. Do you want me to read that? 11:09:38 4 Q. Yeah. Go ahead and just read that until 11:09:40 5 the end of the column there, and then I'll ask you 11:09:43 6 a question. 11:09:45 7 A. Okay. "The Chen's IDCT" -- 11:09:46 8 Q. You don't need to read it out loud. I 11:09:48 9 just meant you can read it to yourself. 11:09:51 10 A. Oh, okay. 11:09:53 11 Q. Yeah. 11:09:54 12 A. Yes. What would you like to ask me? 11:10:01 13 Q. Okay. So what do you understand the 11:10:03 14 patent to be saying there when it says "The Chen's 11:10:07 15 IDC algorithm is optimized"? 11:10:10 16 A. It's referring to the fact that in and of 11:10:16 17 itself, when you're doing an inverse modified 11:10:19 18 discrete cosine transform, there's many 11:10:25 19 calculations that need to be done to do that. 11:10:26 20 In this particular case, the Chen 11:10:28 21 algorithm itself has already done optimizations on 11:10:30 22 that to try to reduce the complexity of doing an 11:10:33 23 inverse modified discrete cosine transform, which 11:10:38 24 you may not know is a set of floating point 11:10:43 25 calculations. It could be quite intense in order 11:10:45 Page 46	1 algorithm, which was Chen's IDCT which was the 11:12:11 2 standard algorithm that was available at the time, 11:12:15 3 was not sufficient in order to have quality 11:12:16 4 playback. So, hence, this tool is a novel 11:12:19 5 approach to be able to address this issue instead 11:12:22 6 of using the standard Chen's IDCT. 11:12:27 7 Q. So if a codec includes the standard Chen's 11:12:30 8 IDCT algorithm, would that codec be considered to 11:12:34 9 have an optimized decoding process? 11:12:40 10 MR. GLENNON: Objection as to form. 11:12:42 11 THE WITNESS: I'm not sure how -- I looked 11:12:44 12 at the word "optimized decoding processes" 11:12:50 13 together as they were used in the patent itself. 11:12:53 14 I didn't look to see why the applicant wrote that 11:12:59 15 Chen's IDCT algorithm is already optimized. I 11:13:05 16 didn't look into that. 11:13:09 17 BY MR. BHANSALI: 11:13:10 18 Q. So you can't say, then, whether or not a 11:13:13 19 codec with the Chen's IDCT algorithm would itself 11:13:16 20 be an optimized decoding process? 11:13:20 21 MR. GLENNON: Objection as to form. 11:13:22 22 THE WITNESS: Again, in my -- how I opined 11:13:24 23 on the terminology is I used only what was in the 11:13:33 24 intrinsic information in the patent, in the 11:13:37 25 record. I didn't look at any outside source of 11:13:41 Page 48
1 to process that. 11:10:48 2 So that's how I took that to mean. But 11:10:49 3 it's saying that. 11:10:51 4 And there's obviously a typo in the patent 11:10:52 5 here. It's t-o-o, "too great for real-time 11:10:55 6 decoding on limited devices." Saying that even 11:11:01 7 though the Chen IDCT algorithm is optimized, it's 11:11:03 8 still not enough to be able to do realtime 11:11:07 9 decoding on limited devices. 11:11:10 10 What I take that to mean is that you're 11:11:12 11 not going to have a quality playback with using 11:11:15 12 Chen's IDC algorithm, even though it's optimized 11:11:20 13 in and of itself, and whatever Chen is defining 11:11:24 14 the term "optimized" to mean, on a device that 11:11:27 15 doesn't have the -- on some devices that don't 11:11:34 16 have the processing power or memory bandwidth in 11:11:36 17 order to be able to do that. 11:11:39 18 So instead there is a novel tool that is 11:11:42 19 being introduced in Figure 11, which is a 11:11:44 20 simplified version of Chen's algorithm. 11:11:48 21 Now, I didn't go and study why, if there's 11:11:54 22 a simplified version of Chen's algorithm, was it 11:11:57 23 known before. I didn't study that. 11:12:01 24 But the claim here is that, because the 11:12:03 25 algorithm that's available, the standard 11:12:09 Page 47	1 whether or not Chen's IDCT could be considered an 11:13:46 2 optimized decoding processes as referred to in the 11:13:51 3 patent. 11:13:56 4 However, that being said, it's clearly 11:13:56 5 being stated here that it's not optimized enough, 11:14:01 6 even if it's optimized, because an alternative is 11:14:04 7 provided that reduces complexity further. And to 11:14:08 8 work around the limitations where if you applied 11:14:12 9 the Chen's IDCT by itself, it would not -- it 11:14:15 10 would not achieve quality playback. 11:14:19 11 BY MR. BHANSALI: 11:14:25 12 Q. And how much reduction of the complexity 11:14:25 13 of Chen's IDCT is required in order to meet the 11:14:29 14 patent's claim language of optimized decoding 11:14:35 15 process? 11:14:40 16 MR. GLENNON: Objection as to form. 11:14:40 17 Objection beyond the scope. 11:14:42 18 THE WITNESS: Again, I didn't evaluate 11:14:44 19 Chen's IDCT. So I can't opine about what would be 11:14:46 20 needed to be done to Chen's IDCT in order to make 11:14:52 21 it part of the optimized decoding processes. 11:14:57 22 What I can state is that the applicant has 11:15:00 23 provided an alternative to Chen's that the 11:15:06 24 applicant is describing as optimized decoding -- 11:15:11 25 as one of the tools in the toolkit for optimized 11:15:16 Page 49

1 decoding processes. 11:15:19 2 BY MR. BHANSALI: 11:15:20 3 Q. How would a POSA determine whether a 11:15:20 4 modification or an alternative to Chen is a 11:15:26 5 complexity reducing decoding process, which is the 11:15:32 6 way you've said that optimized decoding processes 11:15:37 7 is defined? 11:15:41 8 MR. GLENNON: Objection as to scope. 11:15:42 9 THE WITNESS: So as a, you know -- 11:15:44 10 speaking in terms of a POSA in 2005, I'm reading 11:15:53 11 this patent. I know I'm going to run it using 11:15:58 12 Chen's -- I'm going to have a certain device under 11:16:03 13 test to prove it out, is this patent even worth 11:16:06 14 looking at, right? That's the thing you first do 11:16:10 15 as an engineer: Is this patent even worth looking 11:16:13 16 at? 11:16:16 17 And you have a device under test. You 11:16:17 18 pick one of these devices that presumably has 11:16:19 19 insufficient processing power or memory access 11:16:22 20 bandwidth, separate even from discussing what the 11:16:27 21 network bandwidth does, just focusing solely on 11:16:31 22 the device, even though the patent covers both. 11:16:34 23 And you'd run Chen's tool on it, and you would see 11:16:36 24 that you're not having quality playback. That's 11:16:41 25 the presumption of what this whole part of the 11:16:44 Page 50	1 quality. We're measuring maintaining quality. So 11:18:09 2 we would look to see if something looked better or 11:18:11 3 not. Now, that can be measured -- differences can 11:18:16 4 be measured through something known as DMOS 11:18:20 5 scoring, which is the difference between the 11:18:22 6 original stream and the other ones, so you can 11:18:25 7 quantify it. 11:18:27 8 But to be honest with you, a POSA at that 11:18:28 9 time, through experience and training, can visibly 11:18:31 10 see that one looks better than the other, even 11:18:38 11 without putting a quantize, you know, a 11:18:42 12 differential factor on it. 11:18:47 13 You could use the instrument to do that, 11:18:48 14 if you want. 11:18:51 15 (Court Reporter Clarification.) 11:19:12 16 A. Okay. So you could measure what the 11:19:15 17 difference will be while you're using the tool in 11:19:23 18 order to check that you're maintaining quality. 11:19:28 19 In this case, the quality presumably would go up 11:19:30 20 because you're using the complexity reduced tool. 11:19:33 21 But that's really not what a POSA would do 11:19:36 22 back then, in general. A POSA, through his or her 11:19:38 23 own experience and knowledge, would be able to 11:19:43 24 visibly see or orally hear that it sounds better 11:19:46 25 or looks better, and therefore would know that the 11:19:52 Page 52
1 patent is saying. 11:16:46 2 Then as a POSA, you would then run the 11:16:47 3 reduced -- let me use the exact wording that's 11:16:50 4 used here -- the simplified. I didn't mean to say 11:16:55 5 reduced. I apologize. 11:16:57 6 "Here several different" -- I'm reading 11:16:59 7 from column 13, line 1: Here several different 11:17:01 8 simplified versions of Chen's algorithm be 11:17:04 9 implemented, based on the energy or distribution 11:17:10 10 of input DC and AC coefficients. 11:17:12 11 So I would execute these algorithms as 11:17:15 12 described in the patent and I would look at the 11:17:18 13 result, and therefore I would see that the 11:17:20 14 image -- the quality playback is better than not 11:17:26 15 running this, and therefore I would know that the 11:17:31 16 complexity has been reduced. 11:17:33 17 Again, this is very standard design 11:17:38 18 engineering processes that a video or audio 11:17:41 19 engineer would do. 11:17:43 20 BY MR. BHANSALI: 11:17:44 21 Q. And how would that video or audio engineer 11:17:44 22 decide whether quality playback has been achieved? 11:17:49 23 MR. GLENNON: Objection as to form. 11:17:57 24 THE WITNESS: So a POSA can do it by two 11:17:58 25 ways. Again, we're not measuring absolute 11:18:05 Page 51	1 application of this tool has been complexity 11:19:55 2 reducing because the results are better. 11:19:58 3 Again, the point behind this patent isn't 11:20:00 4 to achieve some quality -- particular quality 11:20:03 5 level. It is to maintain a quality level that is 11:20:08 6 not achievable if you don't use one or more of the 11:20:11 7 shortcuts described in the patent. 11:20:14 8 Q. Hold on for one second. So would you 11:20:16 9 agree with me, then, that what constitutes 11:20:40 10 acceptable picture quality is literally in the 11:20:44 11 eyes of the beholder? 11:20:48 12 MR. GLENNON: Objection as to form. 11:20:50 13 Objection, beyond the scope. 11:20:51 14 BY MR. BHANSALI: 11:20:53 15 Q. In the context of -- let me ask the 11:20:53 16 question again. 11:20:55 17 In the context of what you just described 11:20:56 18 is the process that the POSA would undertake, 11:20:59 19 would you agree with me that what constitutes 11:21:01 20 acceptable picture quality is literally in the 11:21:04 21 eyes of the beholder? 11:21:06 22 MR. GLENNON: Objection as to form. 11:21:08 23 Objection. Beyond the scope. 11:21:09 24 THE WITNESS: That's a complex question to 11:21:12 25 answer. But, in general -- in general, no. 11:21:17 Page 53

1 That's what a POSA uses during the design. But 11:21:22 2 obviously once the system is designed, a POSA 11:21:26 3 would probably use, to use your term earlier, 11:21:30 4 metrics, objective metrics, in order to be able to 11:21:35 5 describe that further. 11:21:38 6 But a POSA in everyday operations as an 11:21:41 7 engineer, as a first approximation would use his 11:21:45 8 or her own eyes and ears. That's the standard 11:21:51 9 practice. But if you're developing a product for 11:21:54 10 this, and you want to do -- you know, maintain 11:21:57 11 quality level, you could do a, you know -- one of 11:22:01 12 several objective measurements that were available 11:22:06 13 back in 2005. 11:22:09 14 BY MR. BHANSALI: 11:22:11 15 Q. And are those objective measurements 11:22:12 16 described in the patent? 11:22:13 17 A. No. And it need not be. It's common 11:22:17 18 practice at that time to a video and audio 11:22:21 19 engineer to do this. 11:22:22 20 Q. You mentioned -- I think it was DMOS. 11:22:23 21 A. Differential Mean Opinion Score. 11:22:28 22 Q. And what is that? 11:22:30 23 A. That is a way to take one stream and 11:22:33 24 compare it against another stream and look at what 11:22:37 25 the differences are between them. 11:22:40 Page 54	1 been degraded versus something else. Even if you 11:23:59 2 disagree with the absolute number that they give. 11:24:03 3 I guess that's one of the things I really 11:24:10 4 wanted to say was the point behind this patent is 11:24:12 5 to maintain quality the best that you can, given 11:24:15 6 the network quality that's out there, which is 11:24:19 7 bandwidth and other degradation factors that can 11:24:23 8 happen in the network, as well as the capabilities 11:24:27 9 of the device. It's not the absolute quality. 11:24:29 10 It's to maintain a quality. 11:24:32 11 Q. The optimized decoding processes, are 11:24:43 12 those -- are those present in software? 11:24:47 13 A. They could be implemented in software 11:24:56 14 depending on -- I mean, software or hardware is a 11:25:00 15 matter of degree. These could be implemented in 11:25:03 16 software. 11:25:06 17 I did not study the state-of-art in 2005, 11:25:07 18 what the capabilities are and whether or not these 11:25:13 19 particular -- all of these particular tools could 11:25:16 20 be implemented in software. However, as described 11:25:18 21 in the patent, it talks about doing these in terms 11:25:22 22 of a Java applet, which, of course, is software. 11:25:26 23 And actually, I need to change a little 11:25:30 24 bit of what I just said there because actually, 11:25:33 25 even though I didn't look at this, it's quite 11:25:35 Page 56
1 Q. Okay. And what is -- how is a 11:22:41 2 Differential Mean Opinion Score calculated? 11:22:45 3 A. Well, it depends. In the beginning, 11:22:49 4 because this concept of doing this is well known 11:22:52 5 to those in the industry for over 100 years, it's 11:22:55 6 just a noticeable different way of doing it. 11:23:00 7 And they used to use humans. You'd get 11:23:03 8 people -- really bring a test together, bring a 11:23:06 9 bunch of people and have them look at something, 11:23:09 10 and you get enough of them putting together, and 11:23:11 11 you take the mean of that. That would give you a 11:23:14 12 good example of it. 11:23:17 13 It's back in 2005, there were testers that 11:23:18 14 would actually implement this by taking one of 11:23:23 15 several different ways of looking at something. 11:23:27 16 There were PQA meters at the time, picture quality 11:23:31 17 assessment meters at the time, that you could use 11:23:34 18 to do this. 11:23:38 19 The issue with those, if you were going to 11:23:38 20 compare one to another in absolute quality, there 11:23:40 21 were different measurements. But that's not the 11:23:43 22 point of this patent. The point of this patent is 11:23:45 23 to maintain -- and this is very important -- is to 11:23:47 24 maintain quality. And so they are very good at 11:23:50 25 looking at -- of measuring whether something has 11:23:55 Page 55	1 obvious from the reading of the patent that these 11:25:37 2 can be implemented in software because it talks 11:25:40 3 about device-independent Java applet. And if 11:25:42 4 you're device independent, that means you're not 11:25:48 5 relying -- by definition, you're not relying on 11:25:50 6 any hardware optimizations that could be available 11:25:53 7 in a certain chip at that point in time. It was 11:25:56 8 independent from that. 11:25:59 9 So, yes, to answer that based on what the 11:26:00 10 patent describes, it's implementable in software. 11:26:04 11 Q. And, in fact, the patent doesn't disclose 11:26:07 12 any hardware implementation, right? 11:26:11 13 A. Correct. I guess because -- as a design 11:26:14 14 engineer myself, the trade-off between hardware 11:26:22 15 and software all depends on the particular 11:26:24 16 application you're working on at the moment and 11:26:27 17 what problem you're trying to solve. 11:26:29 18 In other words, if you have a different 11:26:31 19 application, but in the same area, you might 11:26:33 20 choose to use hardware, firmware, or software to 11:26:36 21 do your solution. The choice of that really is 11:26:39 22 very application specific. 11:26:42 23 You know, I've been designing -- I 11:26:44 24 design -- well, I don't do it anymore. I have 11:26:48 25 people. But I used to design products for many, 11:26:51 Page 57

1 many years. So that is a typical trade-off that 11:26:55 2 an engineer would have to make is how do you want 11:26:59 3 to implement this based on the technology that's 11:27:01 4 available and the end result you're trying to 11:27:03 5 achieve. 11:27:05 6 Q. In 2005 -- 11:27:11 7 A. Are you asking me a question? 11:27:20 8 Q. Yeah. My question is in 2005 would an 11:27:22 9 engineer -- well, actually, I'll strike that. 11:27:31 10 Let's go to -- actually, let me ask you 11:27:41 11 this. We've been going for a little while. I'm 11:27:46 12 happy to keep going. If you want to take a break, 11:27:48 13 we can take a break; otherwise, we can keep going. 11:27:50 14 A. I'm okay with continuing. At some point 11:27:53 15 in time, I'm going to want to eat lunch, but -- 11:27:55 16 Q. Let me ask you this -- why don't we go off 11:27:59 17 the record for one second. 11:28:02 18 THE VIDEOGRAPHER: Going off the record. 11:28:03 19 The time is 11:28. 11:28:05 20 (Recess ensued from 11:28 a.m. 11:40:45 21 to 11:44 a.m.) 11:44:10 22 THE VIDEOGRAPHER: We're back on the 11:44:21 23 record. The time is 11:44 a.m. 11:44:22 24 BY MR. BHANSALI: 11:44:25 25 Q. I'm going to turn your attention to the 11:44:26 Page 58	1 BY MR. BHANSALI: 11:53:25 2 Q. Okay. Let me repeat the last question. 11:53:26 3 In reference to column 4, line 9, my 11:53:30 4 question is what is the expert assessment process 11:53:33 5 that's described there? 11:53:36 6 A. So an expert assessment process would be 11:53:39 7 an algorithm that would be implemented to actually 11:53:42 8 figure out or deliver -- let me back up a second 11:53:48 9 here. Sorry, but I got out of sync from our 11:53:56 10 previous time asking it. 11:54:00 11 So starting at the beginning again. 11:54:02 12 So an expert assessment process, what it's 11:54:05 13 going to do is it's going to evaluate the material 11:54:08 14 that's been sent to it. So you have the video 11:54:10 15 objects themselves. You have information that 11:54:13 16 goes along with those video objects, such as the 11:54:17 17 network bandwidth that's available. You have the 11:54:19 18 type of device that is being used and the 11:54:23 19 capabilities of said device. 11:54:26 20 It will take that, it will take the 11:54:28 21 information of the different toolkits that's in 11:54:31 22 the organized list that's described in the patent, 11:54:34 23 and it will then decide what quality level based 11:54:39 24 against the device type it is and then run through 11:54:43 25 the sequence to determine which tools to turn on 11:54:47 Page 60
1 patent again and go to column 4, around line 9. 11:44:29 2 A. Yes, I'm there. 11:44:54 3 Q. And do you see where it refers to an 11:44:55 4 expert assessment process? 11:44:58 5 A. Yes. 11:45:00 6 Q. What is the expert assessment process 11:45:01 7 that's described there? 11:45:03 8 A. So expert assessment process would be an 11:45:06 9 algorithm that an engineer would write in order to 11:45:12 10 look, basically, at the data that's been sent down 11:45:17 11 either with the video itself or the different 11:45:23 12 described in here -- I forget what the exact 11:45:34 13 terminology is, but we were discussing just a few 11:45:36 14 minutes ago with different levels of stuff. And 11:45:39 15 there -- 11:45:42 16 MR. BHANSALI: Why don't we go off the 11:46:07 17 record. 11:46:09 18 THE VIDEOGRAPHER: Going off the record at 11:46:10 19 11:46. 11:46:11 20 (Recess ensued from 11:46 a.m. 11:53:06 21 to 11:53 a.m.) 11:53:06 22 11:53:09 23 THE VIDEOGRAPHER: We're back on the 11:53:21 24 record. The time is 11:53 a.m. 11:53:22 25 /// Page 59	1 and not use or the settings of them as described 11:54:51 2 in the patent. 11:54:55 3 Q. And so it's an algorithm that's -- that an 11:54:55 4 engineer would design, then? 11:55:02 5 A. That's how I took it to be, yes. 11:55:05 6 Q. And is that algorithm part of an optimized 11:55:07 7 decoding process? 11:55:12 8 A. Well, that algorithm would use the 11:55:15 9 optimized decoding processes. I wouldn't 11:55:17 10 necessarily say it's part of them, but it would 11:55:20 11 use them. 11:55:23 12 Q. Well, is the algorithm necessary to 11:55:26 13 implement an optimized decoding process? 11:55:28 14 A. The algorithm -- an algorithm of some 11:55:33 15 sort, like a program or like anything else you 11:55:35 16 have to give instruction to, is how you would 11:55:38 17 implement the -- or apply the optimized decoding 11:55:40 18 processes defined in the patent. 11:55:46 19 Q. And so this expert assessment process, 11:55:48 20 would it actually increase the number of 11:55:54 21 calculations as an initial matter beyond those 11:55:57 22 that are included in the codec to which it is 11:56:02 23 applied? 11:56:06 24 MR. GLENNON: Objection as to scope. 11:56:08 25 THE WITNESS: It's -- it's actually 11:56:10 Page 61

1 independent from it. So I would say, again, I 11:56:15 2 didn't study the details of -- I took it for 11:56:22 3 granted that an engineer would have to write this. 11:56:26 4 I didn't look into the details of what it would 11:56:28 5 be. 11:56:28 6 But given that the algorithms that are 11:56:31 7 being described for decoding are complex 11:56:32 8 calculations, and the point behind this is to 11:56:36 9 simplify those calculations by using the optimized 11:56:41 10 decoding processes, or what I call the algorithmic 11:56:45 11 toolkit -- just, again, this is without doing any 11:56:48 12 advanced research, and if I did this research, my 11:56:53 13 answer might change -- but I would say the level 11:56:56 14 of processing power that's needed to do the 11:56:58 15 expert -- what do they call it? -- the expert 11:57:01 16 assessment process is orders of magnitude less 11:57:03 17 computationally complex than the actual 11:57:07 18 toolkits -- the tools themselves. 11:57:12 19 BY MR. BHANSALI: 11:57:17 20 Q. But it does add some number of 11:57:17 21 calculations beyond what are required by the 11:57:22 22 codec, by the standard codec? 11:57:26 23 MR. GLENNON: Objection as to scope. 11:57:29 24 THE WITNESS: If you were blindly just 11:57:30 25 running the codec as is, without doing any other 11:57:36 Page 62	1 tools to apply to maintain quality, is orders of 11:58:55 2 magnitude less complex than the actual tools 11:58:58 3 themselves. And you would know that because 11:59:01 4 that's what a POSA who is an audio or video expert 11:59:04 5 would know. 11:59:09 6 Q. So let's go to column 14 of the patent. 11:59:10 7 A. Column 14. 11:59:13 8 Q. And let's go to line -- starting at 11:59:16 9 line 7. 11:59:19 10 A. And by the way, I just realized I just 11:59:20 11 said something that I'd like to modify a little 11:59:22 12 bit. 11:59:24 13 I said "that's what a POSA who is an audio 11:59:25 14 or video expert." I didn't mean to imply that the 11:59:28 15 a POSA would need to have more knowledge than what 11:59:30 16 a POSA would have. I'm sorry. I used the word 11:59:33 17 "expert" when I should have said "engineer." 11:59:36 18 Q. Sure, that's fine. 11:59:38 19 Let me just direct you again to 11:59:39 20 column 14 -- 11:59:41 21 A. Column 14. 11:59:44 22 Q. -- line 7. 11:59:43 23 A. Line 7. 11:59:45 24 Yes, I'm there. 11:59:51 25 Q. There is a sentence there that says "The 11:59:52 Page 64
1 process running in the client, then, by 11:57:39 2 definition, you would be correct. 11:57:44 3 But there's so many things that happen in 11:57:46 4 a client that are running in the background. Like 11:57:50 5 in this case, the media player, right? There are 11:57:53 6 so many things that are running in the background, 11:57:55 7 this would just be one more task. 11:57:58 8 And I don't -- I don't think it -- I mean, 11:58:00 9 if you're looking for an absolute difference, of 11:58:02 10 course it adds something; but if you're looking 11:58:05 11 for relative compared to what's already there, I 11:58:07 12 would say it's insignificant. 11:58:09 13 BY MR. BHANSALI: 11:58:11 14 Q. And how do you determine whether a number 11:58:15 15 of calculations is insignificant? 11:58:19 16 A. Well, as I said, I didn't study this. 11:58:23 17 This is just my conjecture, based on the fact that 11:58:25 18 codec algorithms are very computationally 11:58:31 19 intensive. Most computer instructions or programs 11:58:33 20 are relatively simple and they use simple math. 11:58:36 21 So taking the comparison, through my 11:58:39 22 experience, or a POSA in the year of 2005, you 11:58:43 23 would see that the number of complex calculations 11:58:47 24 that are needed in order to do the assessment 11:58:50 25 process itself, in order to pick and choose what 11:58:51 Page 63	1 highest quality is consistent with." 11:59:54 2 Do you see that? 11:59:57 3 A. I do. 11:59:57 4 Q. Okay. So what does it mean to say 11:59:57 5 "consistent with the video codec specification and 12:00:03 6 displays a correct image"? 12:00:06 7 MR. GLENNON: Objection. Beyond the 12:00:10 8 scope. 12:00:11 9 THE WITNESS: I took that to mean that the 12:00:11 10 highest quality, given what these tools are doing, 12:00:19 11 which are trading off quality for realtime 12:00:23 12 processing or being able to deliver a fluid 12:00:27 13 picture, due to constraints and limitations in the 12:00:31 14 client and the network. 12:00:34 15 So if we remove all said constraints and 12:00:35 16 we had no bounds on the processing power in the 12:00:39 17 client, so it was just there were no issues with 12:00:42 18 processing power or memory access or the amount of 12:00:46 19 memory or the network quality or anything like 12:00:49 20 that, and you ran the video codec specification as 12:00:52 21 is, that would give you -- this is sort of like -- 12:00:55 22 I hesitate to use this word -- it's sort of like 12:00:59 23 the upper limit of what the quality would be. 12:01:02 24 If you had infinite resources and you 12:01:05 25 execute a codec, you're going to get the best 12:01:08 Page 65

1	quality there is. And that -- and that's -- what	12:01:11
2	is defining as the highest quality is consistent	12:01:13
3	with that.	12:01:15
4	Now, it doesn't mean you need to do all	12:01:16
5	those things I just said. It's just that that's	12:01:18
6	how you would define it.	12:01:20
7	You actually could have some level of	12:01:22
8	restriction on processing power and some level of	12:01:24
9	memory access network stuff, and you'd still be	12:01:28
10	able to get the highest quality. But the point	12:01:30
11	behind the patent is what if the amount of	12:01:33
12	processing power memory bandwidth or network	12:01:36
13	bandwidth goes below this limit? Then you	12:01:39
14	wouldn't have quality of the highest quality.	12:01:43
15	I hope that made sense.	12:01:46
16	BY MR. BHANSALI:	12:01:47
17	Q. And so can the expert assessment process	12:01:48
18	that was described in column 4 lead to an output	12:01:54
19	that that's the highest quality as described here?	12:02:01
20	MR. GLENNON: Objection. Beyond the	12:02:04
21	scope.	12:02:05
22	THE WITNESS: I didn't look at that	12:02:07
23	specifically in the bounds of the patents. But I	12:02:13
24	think that's reasonable to believe; that if the	12:02:17
25	determination of the expert process is -- because,	12:02:21
		Page 66
1	according to the process, if every level, the	12:02:25
2	overall level was set to highest, and of the six	12:02:28
3	critical steps that were described, those are all	12:02:30
4	set to highest, and they're all on highest, and	12:02:32
5	that's what the expert assessor process comes up	12:02:35
6	with, then, yes, that would be obtained.	12:02:40
7	BY MR. BHANSALI:	12:02:42
8	Q. Would that still be an optimized decoding	12:02:42
9	process?	12:02:44
10	A. Yes. Because you're using the processes	12:02:45
11	in order to make that -- you're using this expert	12:02:47
12	algorithm in order to make a determination of	12:02:51
13	whether or not you need to apply these tools.	12:02:53
14	Q. Now, let's go just a little further up in	12:02:55
15	column 14. Basically to line 3, I think. You see	12:03:03
16	where it starts "This mechanism"?	12:03:14
17	A. You said column 14?	12:03:17
18	Q. Yeah, column 14, line 3, where it says	12:03:19
19	"This mechanism."	12:03:22
20	A. Oh, the end of the line. Sorry. I was	12:03:23
21	looking at the beginning of the line.	12:03:26
22	Yes, "This mechanism allows video	12:03:27
23	decoding."	12:03:30
24	Q. Do you see that?	12:03:30
25	A. Yes.	12:03:31
		Page 67
1	Q. Okay. So explain to me what is described	12:03:31
2	where it says: This mechanism allows video	12:03:33
3	decoding to scale in complexity based on the	12:03:36
4	processing power of the device being used.	12:03:38
5	MR. GLENNON: Objection. Beyond the	12:03:42
6	scope.	12:03:42
7	THE WITNESS: For me to answer that, I'd	12:03:43
8	need to read the previous paragraph. Please give	12:03:47
9	me time to do that.	12:03:50
10	BY MR. BHANSALI:	12:03:52
11	Q. Sure.	12:03:52
12	A. Okay. So what this is referring to is the	12:04:08
13	entire paragraph here that starts at column 13,	12:04:10
14	line 60.	12:04:13
15	And I read: Hence, Figure 13 is a flow	12:04:16
16	diagram summarizing the shortcut optimization	12:04:22
17	processing by the video decoding process used in	12:04:24
18	the multimedia objects players 10 and 11. State	12:04:28
19	information is maintained about the quality levels	12:04:34
20	with which the current video stream is processed.	12:04:36
21	On very limited devices, shortcuts in the decoding	12:04:40
22	process must be made to allow the device to	12:04:43
23	maintain synchronicity between the audio and video	12:04:46
24	playback. These shortcuts are specifically	12:04:50
25	designed to drastically reduce the number of	12:04:53
		Page 68
1	computations necessary at certain critical steps	12:04:56
2	in the video decoding process at the cost -- and	12:04:59
3	I'm assuming there is a word missing, "of" -- of	12:05:03
4	video output quality.	12:05:06
5	So that is what is meant by "This	12:05:08
6	mechanism."	12:05:11
7	So this mechanism --	12:05:17
8	Q. And then what happens -- what happens --	12:05:19
9	sorry. Go ahead. I didn't realize you were still	12:05:19
10	talking. Go ahead.	12:05:23
11	A. Yeah, well I didn't realize I was going to	12:05:23
12	be either. My apologies to you.	12:05:24
13	"This mechanism allows video decoding to	12:05:26
14	scale in complexity based on the processing power	12:05:29
15	of the device being used."	12:05:32
16	What that is saying is, again, that expert	12:05:33
17	evaluation process is taking a look at what are	12:05:36
18	the capabilities of the device. And based on the	12:05:38
19	capabilities of the device, I'm going to	12:05:40
20	implement -- basically execute through the flow	12:05:43
21	diagram of Figure 13 and then pick out certain	12:05:47
22	tools I need to use. And depending on the	12:05:51
23	capabilities, I'll use more tools or I'll use less	12:05:54
24	tools based on that. And that's all contained in	12:05:58
25	the state information and the quality levels.	12:06:00
		Page 69

1 As we mentioned earlier, if everything was 12:06:02 2 set high, high, high on all the levels, including 12:06:05 3 the overall rating is high, that would be the 12:06:08 4 highest level of quality. And then presumably 12:06:10 5 there is a combination of things, based on how the 12:06:13 6 patent is written, where some of those might not 12:06:15 7 be set to high based on the process. There might 12:06:17 8 be medium, or there might below. And then you 12:06:21 9 would implement the tools accordingly to how the 12:06:23 10 setup of the state information is made. 12:06:26 11 Q. Let's go to column 4 again, and this time 12:06:29 12 I want to direct you to line 38. 12:06:35 13 A. Yes. Talking about audio. 12:06:49 14 Q. Yes, okay. 12:06:51 15 So there's a description here of the 12:07:00 16 proposed invention also solving a gapping problem. 12:07:03 17 Do you see that? 12:07:09 18 A. I do. 12:07:10 19 Q. Can you describe what that's -- what that 12:07:11 20 is, the gapping problem, and the solution? 12:07:16 21 MR. GLENNON: Objection. Beyond the 12:07:18 22 scope. 12:07:19 23 THE WITNESS: So I didn't opine anything 12:07:20 24 specifically regarding the gapping problem in my 12:07:26 25 report. But I did read the patent. And what 12:07:31 Page 70	1 multimedia objects in 10. Hence, playback is then 12:09:22 2 controlled so the gap will occur during that 12:09:27 3 frame, which may be dropped, and if that frame 12:09:30 4 gets dropped, then the synchronization with video 12:09:32 5 is not lost. 12:09:35 6 So it's describing a way of moving the gap 12:09:36 7 into frames of the lowest total energy. And 12:09:40 8 that's a way of masking the gap from the ears of 12:09:43 9 the listener. 12:09:48 10 BY MR. BHANSALI: 12:09:49 11 Q. And is this moving of the gap, is that an 12:09:49 12 optimized decoding process? 12:09:53 13 A. That is one -- that is one of the tools 12:09:57 14 that is being used to be an optimized decoding 12:10:00 15 process, yes. 12:10:03 16 Q. And does that reduce the number of 12:10:03 17 calculations always that are required in the 12:10:06 18 decoding process? 12:10:11 19 A. I didn't study the details of the novel 12:10:19 20 invention for doing that. In my experience as a 12:10:21 21 POSA, I know that you do want to mask where you 12:10:24 22 think you're going to get a pop or a click or 12:10:28 23 similar type of artifact in there through that, 12:10:33 24 but I didn't study in detail this particular 12:10:37 25 optimization. 12:10:40 Page 72
1 they're referring to here is that basically, since 12:07:35 2 you have a limited amount of processing power and 12:07:40 3 a limited amount of memory in a device, it's 12:07:43 4 impossible to have a continuous stream of audio. 12:07:46 5 And a POSA in 2005 is well aware that a 12:07:49 6 break in audio, or gap in audio, could manifest 12:07:55 7 itself as a pop, a click, a muting. It's all 12:08:00 8 these undesirable side effects for doing that. 12:08:04 9 And I am aware from reading this patent 12:08:07 10 that there's a -- there is an algorithm that -- I 12:08:10 11 believe it's on the last column of the patent, 12:08:16 12 that describes a way of moving the gap to an area 12:08:18 13 that would have the least amount of impact. That 12:08:21 14 has to do with the -- I forget the exact term. 12:08:25 15 Let me go look at it. 12:08:29 16 So looking forward, I'm probably going to 12:08:31 17 be right before the claim. So it's either going 12:08:34 18 to be column 18 or column 19. Let me see. 12:08:36 19 It's column 18, line 55: "Finally, Figure 12:08:43 20 20 illustrates an interleaved detection process in 12:08:53 21 the audio decoding of received multimedia objects 12:08:57 22 25 by the multimedia object players 10 and 11. 12:09:01 23 Figure 20 illustrates the placement of gaps 26 at 12:09:06 24 detected frames of low total energy 27 and are -- 12:09:10 25 they are detected during audio decoding by the 12:09:18 Page 71	1 Optimized decoding process, I should say. 12:10:43 2 Q. And sitting here today, not having studied 12:10:46 3 it, you can't answer whether or not this 12:10:50 4 particular tool would reduce the number of 12:10:53 5 calculations required in the decoding process? 12:10:54 6 A. Correct. I would have to research that. 12:10:57 7 Q. So if you go to your report, and you go to 12:10:59 8 paragraph 27. 12:11:09 9 A. I just happen to have that to be where I 12:11:14 10 am. 12:11:17 11 Q. Right. You say here: As used in the 12:11:17 12 specification, the "optimizations" all seek to 12:11:25 13 simplify the decoding processes. 12:11:28 14 Is that right? 12:11:31 15 A. Can you point me to about where I say 12:11:36 16 that? 12:11:38 17 Q. Yeah. It's the third line. It starts the 12:11:38 18 third line in paragraph 27. 12:11:41 19 A. Ah. "As used in the specification, the 12:11:45 20 'optimizations'" -- in quotes -- taught therein 12:11:48 21 all seek to reduce the complexity of the decoding 12:11:51 22 process, to maintain a smooth video stream, that 12:11:54 23 otherwise could not be completed in time using 12:11:57 24 unabridged computations. 12:12:00 25 Q. Okay. But we just referred to one 12:12:02 Page 73

1 optimization that I think you said may not 12:12:07	1 MR. GLENNON: Objection. Asked and 12:15:22
2 necessarily reduce the number of computations, 12:12:10	2 answered. 12:15:28
3 correct? 12:12:15	3 THE WITNESS: I apologize. I didn't mean 12:15:28
4 A. That's actually not what I said. What I 12:12:15	4 to speak over you, Mr. Glennon. 12:15:30
5 said was I didn't study in particular that it did 12:12:17	5 MR. GLENNON: Objection. Asked and 12:15:32
6 that. I took it for granted, based on the patent, 12:12:22	6 answered. 12:15:32
7 because that's what the applicant said it did. 12:12:26	7 BY MR. BHANSALI: 12:15:35
8 But I have not studied it. You asked me whether I 12:12:29	8 Q. You can answer. 12:15:35
9 knew whether it did or not. 12:12:32	9 A. Yeah, so that's exactly right. I mean, I 12:15:36
10 The applicant in the patent itself claims 12:12:34	10 haven't done it. I took the reading of the patent 12:15:39
11 it did -- claims it does. 12:12:37	11 to state and/or imply that each of these tools 12:15:41
12 Q. Where did the applicant say that? 12:12:39	12 would be complexity reducing. 12:15:47
13 A. It said the applicant, in general, says 12:12:42	13 But in the case of Figure 20, when it's 12:15:49
14 that all these -- all the tools -- all the -- all 12:12:45	14 masking, I don't know the calculations that are 12:15:52
15 the optimized decoding -- I'm sorry. Getting 12:12:51	15 being used in the masking operation to do that. 12:15:55
16 tired, I guess. Bear with me. 12:12:57	16 So I can't make that assessment. That's not what 12:16:00
17 I'd have to go and take time to look for 12:13:01	17 I was asked to review, and I have not reviewed it. 12:16:02
18 it. But somewhere in the patent it says that the 12:13:13	18 I would have to take time to do that in order to 12:16:05
19 optimized decoding processes do that. 12:13:14	19 answer your question. 12:16:08
20 I do quote a section here. So maybe that 12:13:19	20 Q. Okay. And just to be clear, the statement 12:16:09
21 is where it says it. I'm reading further down. 12:13:23	21 in paragraph 27 of your report that says "As used 12:16:15
22 I know I wrote the report, but I don't 12:13:29	22 in the specification, the optimizations taught 12:16:19
23 memorize every line. I don't have an eidetic 12:13:31	23 therein all seek to reduce the complexity of 12:16:22
24 memory, unfortunately. I wish I did. 12:13:36	24 (i.e., simplify) the decoding processes," that 12:16:28
25 So the references I use to make that 12:13:52	25 statement -- that statement itself is not a quote 12:16:32
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1 statement, I've made in paragraph 27. I've 12:13:54	1 from the patent, correct? 12:16:34
2 selected some to show that. I didn't do an 12:13:58	2 A. That's my -- that's my opinion. 12:16:41
3 exhaustive inclusion of every statement in that, 12:14:01	3 Q. And that's -- 12:16:44
4 but I do believe that the premise behind all these 12:14:04	4 A. I refer -- I refer to quotes in the patent 12:16:45
5 tools that are in here is that the tools taken as 12:14:09	5 in which I made that opinion, yes. 12:16:49
6 a set are complexity reducing. 12:14:12	6 Q. Well, you're referring to descriptions -- 12:16:51
7 Q. Taken as a set. But not necessarily every 12:14:15	7 following that sentence, you're referring to 12:16:55
8 individual tool is complexity reducing? 12:14:19	8 descriptions of two specific tools, right? 12:16:57
9 A. I apologize. I did not mean to imply 12:14:21	9 A. As I believe I mentioned earlier in 12:17:02
10 that. I think -- my understanding of reading the 12:14:25	10 today's testimony, I felt that that was sufficient 12:17:04
11 patent, and I took it this way -- again, I didn't 12:14:28	11 in order to make that statement. For the time 12:17:06
12 study and do an analysis of how each tool did 12:14:31	12 we're allowed, I could do this, and it would be 12:17:12
13 that -- I took it as an analysis in here that 12:14:35	13 possible to do this for every tool, but that 12:17:16
14 every one of these tools individually is 12:14:38	14 wasn't what I was asked to do. 12:17:19
15 complexity reducing. 12:14:44	15 I felt that it was sufficient based on the 12:17:20
16 It's just that in this particular one on 12:14:47	16 plurality of tools that are in here. I mean, 12:17:23
17 Figure 20, as you noted, it's a masking operation 12:14:50	17 there are a dozen or so tools that are in here. 12:17:27
18 in order to hide a gap in the audio. So I'm 12:14:55	18 And I realize that you're looking to extract one 12:17:30
19 saying I didn't study it to see how that would be 12:15:01	19 particular tool, but if you take -- if, you 12:17:36
20 complexity reducing. 12:15:04	20 know -- the point behind all this is to improve 12:17:39
21 Q. Okay. So even -- so looking at it, you 12:15:09	21 fluidity. And in the case of Figure -- and 12:17:45
22 can't say whether or how the tool in Figure -- 12:15:10	22 maintain quality. In the case of Figure 20, it's 12:17:47
23 around Figure 20 relating to gapping is complexity 12:15:18	23 an oral one, where it masks where the gap is. 12:17:50
24 reducing? 12:15:21	24 Q. Let's go to paragraph 26 of your report. 12:17:54
25 A. Right. That's what I -- 12:15:22	25 A. I'm there. 12:18:07
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1 Q. And that paragraph talks about some 12:18:08 2 dictionary definitions, correct? 12:18:13 3 A. Correct. Dictionary definitions that the 12:18:15 4 defendants' side made. 12:18:19 5 Q. Okay. And so one of the definitions which 12:18:21 6 you reference here is from "The Authoritative 12:18:25 7 Dictionary of IEEE Standards," correct? 12:18:30 8 A. Yes, but I'm referencing what the 12:18:36 9 defendants cite here. I'm not citing it. I'm 12:18:38 10 mentioning what the defendant cites. 12:18:43 11 Q. Yeah, and maybe I didn't phrase the 12:18:45 12 question well. Let me re-ask the question. 12:18:47 13 In this paragraph 26, you refer to 12:18:49 14 defendants citing "The Authoritative Dictionary of 12:18:54 15 IEEE Standards," correct? 12:18:58 16 A. Correct. 12:19:01 17 Q. And is that a publication that you're 12:19:01 18 familiar with? 12:19:03 19 A. Not really. I know it says 12:19:04 20 "Authoritative," and I am a member of the IEEE, 12:19:09 21 but, sorry, no. 12:19:13 22 Q. Have you ever looked at it before, prior 12:19:16 23 to this proceeding, this case? 12:19:18 24 A. I have not. 12:19:23 25 Q. And what is the IEEE? 12:19:24 Page 78	1 BY MR. BHANSALI: 12:21:02 2 Q. And why not? 12:21:02 3 A. And the issue is because it's describing a 12:21:03 4 generic term "optimization," and what the patent 12:21:05 5 is specifically referring to is optimized decoding 12:21:09 6 processes. 12:21:12 7 And as I've mentioned earlier in my 12:21:13 8 testimony, you can't take these words in 12:21:15 9 isolation. You have to take them in context to 12:21:18 10 the patent itself. 12:21:20 11 It's obvious -- to me, it's obvious what 12:21:22 12 the meaning "optimized decoding processes" is 12:21:26 13 referring to when read in context of the patent. 12:21:29 14 To pull out the word "optimized" and then say it 12:21:32 15 means something -- in this case you're not even 12:21:35 16 pulling out "optimized." You're pulling out the 12:21:37 17 word "optimization," which isn't mentioned in this 12:21:40 18 phrasing. 12:21:42 19 So, whether it's true or not, I have no 12:21:45 20 reason to believe that "The Authoritative 12:21:48 21 Dictionary" of my colleagues is incorrect, but I 12:21:51 22 don't think it's applicable to this reference and 12:21:55 23 particularly the construction of optimized 12:21:58 24 decoding processes. 12:22:01 25 Q. I mean, the patent does refer to novel 12:22:02 Page 80
1 A. It's Institute of Electrical and 12:19:28 2 Electronics Engineers. 12:19:30 3 Q. Okay. And is that one of the -- and 12:19:32 4 you're a senior member of that organization; is 12:19:39 5 that right? 12:19:41 6 A. I am. 12:19:42 7 Q. And how long have you been a member? 12:19:42 8 A. Oh, geez, a long time. 40 years, maybe, 12:19:48 9 30. Long time. 12:19:57 10 Q. And what does the IEEE do? 12:19:58 11 A. The IEEE is a -- well, they do many 12:20:00 12 things. But IEEE is a trade -- it's basically a 12:20:03 13 trade association. I believe, I'm not a hundred 12:20:04 14 percent sure, it's the largest trade association 12:20:10 15 for electrical and electronics engineers. 12:20:12 16 Q. Okay. And -- 12:20:15 17 A. So it would not surprise me that they have 12:20:18 18 said dictionary. It's just I have found in my 12:20:20 19 career that I haven't had a need to reference it. 12:20:24 20 Q. Okay. And is that -- so do you agree that 12:20:26 21 this definition that you reference defendants 12:20:35 22 citing for optimization is applicable to the '849 12:20:44 23 patent? 12:20:49 24 MR. GLENNON: Objection as to form. 12:20:51 25 THE WITNESS: I don't believe it is. 12:20:53 Page 79	1 optimizations, right? 12:22:05 2 A. I'd have to double-check if it used that 12:22:07 3 exact wording. 12:22:10 4 Q. Let's look at column 4. 12:22:11 5 A. Column 4. 12:22:13 6 Q. Line 8. 12:22:15 7 A. "The invention provides novel 12:22:23 8 optimizations for digital video decoding." 12:22:25 9 Q. So it does refer to optimizations, right? 12:22:28 10 A. It does use the word there, yes. 12:22:31 11 Q. And those optimizations are part of the 12:22:32 12 description of optimized decoding processes? 12:22:35 13 A. I don't believe so. 12:22:41 14 Q. You said it's a novel optimization for 12:22:42 15 digital video decoding, right? 12:22:48 16 A. Those are the words it uses. But I don't 12:22:53 17 know how it implied specifically to an optimized 12:22:55 18 digital decoding processes, excuse me. 12:23:01 19 Q. Well, isn't this -- this is referring to 12:23:09 20 the state information list that we talked about 12:23:13 21 earlier, right? 12:23:15 22 A. I'm reading the paragraph. 12:23:21 23 Yes, in this paragraph, it does refer to 12:23:39 24 that. 12:23:42 25 Q. Yep. And that state information, this was 12:23:43 Page 81

1 part of the tool that you described as being part 12:23:46 2 of the novel optimized decoding processes? 12:23:51 3 A. Yes, it is. 12:23:56 4 Q. Okay. And, in fact, in paragraph 27 of 12:23:57 5 your report, you refer to, quote, optimizations 12:24:00 6 taught in the specification, correct? 12:24:05 7 A. I did. 12:24:08 8 Q. But you think the word -- the definition 12:24:09 9 of optimization that the IEEE has in the 12:24:15 10 dictionary here is nonetheless inapplicable? 12:24:19 11 A. I don't believe it applies in isolation. 12:24:26 12 And the reason I know that is because I know what 12:24:29 13 the optimized decoding processes are doing. In 12:24:32 14 the definition, it says -- in the dictionary, it 12:24:35 15 says: "the procedure used in the design of a 12:24:37 16 system to maximize or minimize some performance 12:24:39 17 index." 12:24:42 18 Q. And how is that different from what the 12:24:44 19 optimized decoding processes in this patent are 12:24:47 20 doing? 12:24:50 21 A. The optimized decoding processes in this 12:24:51 22 patent are meant to reduce the complexity of the 12:24:53 23 decoding process so that you can maintain -- 12:25:01 24 maintain quality playbacks, fluidity, video, and 12:25:04 25 audio quality. 12:25:08 Page 82	1 A. Okay. 12:27:07 2 Q. Now, here you state that: Applicant used 12:27:08 3 the term "maintain" to indicate that certain 12:27:15 4 states would continue. 12:27:18 5 Correct? 12:27:19 6 A. Correct. 12:27:21 7 Q. Okay. And then you go on to quote a 12:27:21 8 portion of the patent, correct? 12:27:26 9 A. Correct. 12:27:29 10 Q. And you say on -- you quote a portion of 12:27:29 11 the patent that refers to "On very limited 12:27:33 12 devices." Do you see that? 12:27:37 13 A. I do. 12:27:38 14 Q. What is a very limited device? 12:27:39 15 A. A very limited device, and this is 12:27:41 16 described elsewhere in the patent, refers to one 12:27:45 17 that has limited processing power in memory itself 12:27:49 18 or memory bandwidth access versus other such 12:27:55 19 devices that were used to play back video back in 12:27:59 20 2005. 12:28:03 21 Q. So what amount of memory or memory 12:28:04 22 bandwidth would constitute a level that would make 12:28:09 23 the device a limited device? 12:28:15 24 MR. GLENNON: Objection. Beyond the 12:28:17 25 scope. 12:28:18 Page 84
1 Whether or not that is a system that 12:25:10 2 maximizes or minimizes some indefinitely stated 12:25:14 3 performance index of the dictionary, I don't know. 12:25:19 4 I can look into that and see whether that's a 12:25:22 5 reasonable assumption to make, but that's not 12:25:26 6 specifically what optimized decoding processes 12:25:29 7 means in terms of the patent. 12:25:33 8 Q. Okay. Let's continue on. 12:25:35 9 You refer a few lines down in paragraph 26 12:25:38 10 to the definition of optimal. Do you see that? 12:25:42 11 A. Optimal? 12:25:48 12 Q. Yes. 12:25:48 13 A. Yes, with respect to the definition of 12:25:49 14 optimal, I couldn't find it on the page. I went 12:25:56 15 and looked that reference up, and I couldn't find 12:25:59 16 it on that page. 12:26:02 17 Q. But just to be clear, you in this report 12:26:03 18 haven't offered any opinion regarding how the word 12:26:05 19 "optimal" is used in any claim of the patent, 12:26:08 20 correct? 12:26:11 21 A. Correct. I have not opined on that. 12:26:14 22 Q. Were you asked to opine on that? 12:26:16 23 A. No, I was not. 12:26:19 24 Q. Let me -- let's go to paragraph 31 of your 12:26:20 25 report. 12:26:56 Page 83	1 THE WITNESS: To me it would be one that 12:28:19 2 by decoding using the standard non-optimized, so 12:28:26 3 to speak -- I mean, they didn't call it 12:28:33 4 non-optimized. That the standard algorithms, 12:28:36 5 without using any of the optimized decoding 12:28:39 6 processes, would not produce a quality playback. 12:28:41 7 BY MR. BHANSALI: 12:28:47 8 Q. And what would be a quality playback in 12:28:49 9 that context? 12:28:52 10 A. That fluidity, audio and video quality are 12:28:54 11 maintained. 12:28:57 12 So the state would be, if it's very 12:29:05 13 limited and you didn't use any of these, you would 12:29:07 14 not be able to achieve that. 12:29:09 15 Q. So is one of the limited device dependent 12:29:14 16 only on the device characteristics, or does it 12:29:36 17 also depend on network conditions? 12:29:48 18 MR. GLENNON: Objection. Beyond the 12:29:50 19 scope. 12:29:51 20 THE WITNESS: I didn't specifically look 12:29:51 21 into that more deeply. However, I did read the 12:29:56 22 patent. And the patent mostly based it on the 12:30:01 23 capabilities of the device. But there were 12:30:04 24 several references in the patent that you would 12:30:07 25 pick which multimedia object is part of the 12:30:09 Page 85

1 ability to have quality playback that might be 12:30:13 2 limited by network bandwidth or other network 12:30:17 3 congestion, or similar degradations in the network 12:30:20 4 are mentioned elsewhere in the patent. 12:30:25 5 I would have to go review the patent to 12:30:27 6 figure out where it said that. But I do seem to 12:30:29 7 recall that it mentioned that in there. 12:30:31 8 So it would be more -- it could be the 12:30:35 9 device -- it's very heavily based on the device 12:30:38 10 itself, but it could include a network aspect, at 12:30:41 11 least for parts of the claims of the invention, 12:30:45 12 anyways. Maybe not the entire invention. 12:30:48 13 BY MR. BHANSALI: 12:30:50 14 Q. And what is the difference between a very 12:30:50 15 limited device and a limited device? 12:30:52 16 MR. GLENNON: Objection. Beyond the 12:30:54 17 scope. 12:30:56 18 THE WITNESS: So a POSA in 2005 would know 12:30:59 19 that a very limited device was even more severe in 12:31:02 20 its limitations, versus a limited device. Both 12:31:05 21 would not be capable of having quality playback 12:31:10 22 unless some of these novel decoding -- optimized 12:31:16 23 decoding processes were employed. 12:31:23 24 But a very limited one would require more 12:31:28 25 of the tools to be used or set, depending on the 12:31:30 Page 86	1 into play is that, you know, just like there are 12:32:55 2 limits in device, there are limits in how network 12:32:57 3 degradation actually impacts the end result. 12:33:01 4 I mean, it could at some point in time, 12:33:05 5 and then the network impairment is so bad that it 12:33:07 6 doesn't matter what you do, there's no stream to 12:33:10 7 play back, right? Because it's that bad. You 12:33:12 8 can't make up for data that you don't have. 12:33:14 9 But I did not -- did not look into that, 12:33:18 10 correct. 12:33:21 11 BY MR. BHANSALI: 12:33:21 12 Q. All right. Let's go to column 12, 12:33:24 13 starting at line 25. 12:33:29 14 A. Oh, we're on 6. 12:33:33 15 Q. Yeah, over to the patent, yeah. 12:33:35 16 A. Got ahead of myself. Okay. Column 12, 12:33:39 17 line 5. Yes? 12:33:42 18 Q. No, sorry, line 25. 12:33:49 19 A. Oh, line 25. 12:33:50 20 Q. And if you just read to yourself the 12:33:53 21 sentence there that starts "In addition." 12:33:56 22 A. Okay. 12:33:58 23 Yes, I've read it. 12:34:13 24 Q. Tell me, what is that sentence describing? 12:34:14 25 A. So one of the processes you use when 12:34:23 Page 88
1 tool, at more extreme levels in order to maintain 12:31:34 2 fluidity, audio and video playback -- quality 12:31:38 3 audio and video playback. 12:31:42 4 BY MR. BHANSALI: 12:31:43 5 Q. So if you had a device that was not a 12:31:46 6 limited device, but then the network conditions 12:31:52 7 diminished significantly, could that then become a 12:31:57 8 limited device? 12:32:01 9 MR. GLENNON: Objection. Beyond the 12:32:03 10 scope. 12:32:04 11 THE WITNESS: Well, the device itself 12:32:05 12 wouldn't change, but its ability to play back the 12:32:13 13 stream that was received, if there was a network 12:32:15 14 impairment, could be impacted by this. And I did 12:32:18 15 not study how that impacted how you would apply 12:32:23 16 the tools in the case of a network impairment only 12:32:26 17 versus the device itself. 12:32:29 18 BY MR. BHANSALI: 12:32:32 19 Q. So then you wouldn't be able to answer 12:32:34 20 what would constitute maintaining quality, if 12:32:36 21 anything, in the case of only a network 12:32:40 22 impairment? 12:32:43 23 A. Correct. 12:32:45 24 MR. GLENNON: Objection as to form. 12:32:45 25 THE WITNESS: Correct. The problem comes 12:32:46 Page 87	1 you're decoding -- actually, when you encode it, 12:34:26 2 is there's something known as motion compensation, 12:34:29 3 which is when you're using a compression 12:34:32 4 algorithm, you're trying to estimate where motion 12:34:37 5 would go, but you don't want to encode anything 12:34:40 6 that could be considered redundant. 12:34:43 7 So you basically -- you compensate for the 12:34:47 8 motion using a simpler algorithm in order to do 12:34:51 9 that when you're on the decoding side. So when 12:34:54 10 you're playing it back, you want to play back the 12:34:57 11 inverse of that function for motion compensation. 12:34:59 12 In order to do that, if you're between two 12:35:03 13 locations in the frame, that's what motion 12:35:05 14 compensation is, you typically would use bilinear 12:35:07 15 interpolation. So you're going to interpolate 12:35:11 16 between two positions, and that's where you're 12:35:13 17 going to say the motion is. 12:35:15 18 But that is computationally more intensive 12:35:17 19 than the alternative that's being proposed in 12:35:23 20 Figure 9, which will give a result that will be 12:35:27 21 fluid and have video quality, but, you know, for 12:35:31 22 faster processing, but it will have less quality 12:35:34 23 than if you didn't use it. 12:35:37 24 Again, this is one of the many tools in 12:35:38 25 here where you're trading off audio or video 12:35:40 Page 89

1 quality in order to maintain fluidity. 12:35:45 2 Q. And what is "less quality" here, as you 12:35:47 3 just used the phrase? 12:35:52 4 A. I took it to mean that in this particular 12:36:03 5 case, this is a video tool. So some aspect of the 12:36:09 6 video will have less visible quality. In this 12:36:12 7 particular case where the -- I don't know whether 12:36:18 8 it's going to cause more smearing or the location 12:36:20 9 is going to be off. That's what I mean by motion 12:36:23 10 compensation. 12:36:26 11 I'm not sure where it's going to 12:36:27 12 instantiate itself because I haven't actually used 12:36:30 13 these tools myself in my lab and played them back 12:36:34 14 to see the impact of it. 12:36:37 15 But I take it to mean that it's less than 12:36:38 16 the ideal condition, where if you had used the 12:36:41 17 bilinear interpolation, you'd have a better 12:36:44 18 result. 12:36:46 19 But by using the bilinear interpolation, 12:36:47 20 because it's more intensive, overall you might 12:36:50 21 have a dropout, frame jitter, jitter, or some 12:36:55 22 other artifact that's considered more 12:37:01 23 objectionable than the change that you'll get in 12:37:03 24 the motion compensation here, which might be a 12:37:05 25 softer image or a blurred image or something like 12:37:07 Page 90	1 chose, the goal is to maintain -- is to maintain 12:38:50 2 quality. 12:38:58 3 So even if they made -- even if an 12:38:58 4 individual POSA might choose a different way of 12:39:01 5 doing it than another one, just like if you have 12:39:03 6 two companies who decided to compete with each 12:39:06 7 other, and they both want to make solutions that 12:39:08 8 are based on this patent, they might come up with 12:39:13 9 very different solutions based on this patent. As 12:39:17 10 long as both of them end up resulting in 12:39:20 11 maintaining video quality, then they both have a 12:39:22 12 correct solution. 12:39:26 13 So the individual trade-off between some 12:39:30 14 of the things isn't as important as the overall 12:39:32 15 result, which is, again, to maintain quality. 12:39:34 16 BY MR. BHANSALI: 12:39:37 17 Q. Okay. And let's go ahead and mark 12:39:40 18 Exhibit 3, which, hopefully we can figure out the 12:39:43 19 technology to have that. 12:39:48 20 (Deposition Exhibit No. 3 was marked for 12:39:51 21 identification and attached hereto.) 12:39:51 22 A. I'll go open that window up. I still 12:39:51 23 should have it. 12:39:54 24 MR. GLENNON: Before we get into 12:39:55 25 questioning on Exhibit 3, can you give the witness 12:39:56 Page 92
1 that. That could be the end result of applying 12:37:11 2 the tool differently. 12:37:13 3 Q. How do you determine what is more 12:37:14 4 objectionable in terms of the sort of blur or 12:37:16 5 softer image, versus -- 12:37:22 6 A. Well, it's well known to a POSA, even back 12:37:24 7 in -- it's very well known today, but even 12:37:28 8 predating, well predating 2005, that certain video 12:37:32 9 artifacts are more objectionable than other ones. 12:37:36 10 And therefore, when designing the algorithm that's 12:37:40 11 going to be running that, they would favor -- they 12:37:43 12 would favor reducing the quality of some aspects 12:37:46 13 of the video in favor of having a more fluid or 12:37:50 14 video quality in other areas. 12:37:56 15 Q. Let's go to -- could reasonable POSAs have 12:37:59 16 different views on which artifact should be 12:38:10 17 prioritized? 12:38:13 18 MR. GLENNON: Objection. Beyond the 12:38:19 19 scope. And objection as to form. 12:38:21 20 Also, objection, calls for a legal 12:38:33 21 conclusion. 12:38:34 22 THE WITNESS: So here's the issue with 12:38:35 23 that, is obviously you have human beings involved, 12:38:41 24 and people can have different opinions. But at 12:38:44 25 the end of the day, regardless of which they 12:38:47 Page 91	1 some time to print off a copy so he can refer to 12:39:58 2 it? 12:40:00 3 MR. BHANSALI: Is Exhibit 3 -- do you have 12:40:01 4 it there, Mr. Glennon? 12:40:05 5 MR. GLENNON: I don't see it in the 12:40:07 6 Veritext file. 12:40:09 7 THE WITNESS: It's not there. Oh, hold 12:40:10 8 on. I think I see it now. Oh, it just appeared. 12:40:12 9 MR. BHANSALI: It takes a minute to show 12:40:13 10 up. 12:40:14 11 THE WITNESS: All right. So what I would 12:40:15 12 like to do, if it's okay, is to download that and 12:40:17 13 print it. May I do that? 12:40:20 14 BY MR. BHANSALI: 12:40:23 15 Q. You may. You absolutely may. I'm 12:40:24 16 actually just going to ask you a couple questions 12:40:26 17 just to confirm what this is. And so why don't -- 12:40:34 18 A. I actually do know what it is. 12:40:39 19 Q. Okay. Can you tell me what Exhibit 3 is? 12:40:41 20 A. I can. 12:40:44 21 It's a -- it's a paper that I wrote that I 12:40:44 22 presented at -- also at the SCTE's, Society of 12:40:51 23 Cable Telecommunication Engineers, annual trade 12:40:59 24 show in 2013, the Cable-Tec Expo in 2013. 12:41:02 25 Q. Okay. What is the Cable-Tec Expo? 12:41:06 Page 93

1 MR. GLENNON: Sorry, can we stop for a 12:41:08 2 second and go off the record? 12:41:09 3 MR. BHANSALI: No, there is a question 12:41:11 4 pending. 12:41:13 5 MR. GLENNON: I can't see the exhibit. 12:41:13 6 MR. BHANSALI: Okay. Why don't we check 12:41:15 7 with the tech. 12:41:17 8 It's in the Exhibit Share. 12:41:21 9 MR. GLENNON: I'm trying to download it. 12:41:24 10 But when I try and download it, I get an error 12:41:25 11 message that says: An error occurred while 12:41:28 12 downloading Exhibit 3. Enter title of Exhibit 3 12:41:32 13 here. 12:41:32 14 And then I just can't download it. I 12:41:33 15 can't even see what it is. Like all I can see is 12:41:35 16 that there is an Exhibit 3 and what the title is. 12:41:35 17 MR. BHANSALI: Okay. Let's do this. Why 12:41:38 18 don't we -- can you email me the marked version, 12:41:41 19 and we'll just use the screen share? 12:41:43 20 MR. GLENNON: Give me one second. 12:41:47 21 THE VIDEOGRAPHER: Did you want to go off 12:41:48 22 the record while you're doing this? 12:41:50 23 MR. BHANSALI: No, it will just take a 12:41:51 24 second. I'm just going to get a copy and put it 12:41:52 25 in the screen share. It will be faster than 12:41:54 Page 94	1 What is Exhibit 3? 12:44:06 2 A. Exhibit 3 is a technical paper that I 12:44:09 3 presented to the Society of Cable 12:44:13 4 Telecommunication Engineers at their annual trade 12:44:14 5 show, which is known as Cable-Tec Expo, in 2013. 12:44:18 6 Q. Okay. And what is -- who are the Society 12:44:22 7 of Cable Telecommunication Engineers? 12:44:26 8 A. It's a trade group of cable 12:44:30 9 telecommunication engineers, industry trade group. 12:44:33 10 Q. Okay. And what was the context of your 12:44:38 11 presentation there? 12:44:45 12 A. I mean, this was -- I presented this a 12:44:46 13 long time ago. I can only refer to the title. I 12:44:49 14 haven't reviewed the paper recently. And, again, 12:44:52 15 I would like to believe that I have an eidetic 12:44:55 16 memory, but I don't. 12:45:01 17 Obviously, per the title, this is what the 12:45:02 18 title is saying the paper is, it's referring to 4K 12:45:04 19 ultra high definition television and examining 12:45:09 20 methods for acquiring, exchanging, and 12:45:12 21 distributing high-quality content. 12:45:15 22 Q. Okay. 12:45:17 23 MR. GLENNON: At this point I'd like to 12:45:19 24 suggest that we take a ten-minute break so that 12:45:20 25 the witness can refresh his recollection as to the 12:45:22 Page 96
1 trying to -- 12:42:00 2 THE WITNESS: I'm going to refrain from 12:42:04 3 printing this until I understand whether or not 12:42:06 4 we're going to be referencing it. 12:42:08 5 BY MR. BHANSALI: 12:42:10 6 Q. Yeah. One second. 12:42:10 7 MR. GLENNON: Yeah, I'm getting an -- I 12:42:22 8 tried to reload the page, and now I'm getting a 12:42:23 9 different error. It just says network failure. 12:42:26 10 Yeah, no matter what I try. 12:42:48 11 MR. BHANSALI: There it is. Give me one 12:42:50 12 second. 12:42:54 13 (Brief pause in the proceedings.) 12:42:55 14 BY MR. BHANSALI: 12:43:38 15 Q. Okay. Are you able to see -- 12:43:38 16 MR. GLENNON: I can see your screen, which 12:43:41 17 has just the very top of the document. 12:43:42 18 MR. BHANSALI: Let's zoom out a little 12:43:45 19 bit. 12:43:47 20 Okay. All right. Hopefully now everybody 12:43:59 21 can see the exhibit, right? 12:44:01 22 MR. GLENNON: Yes. 12:44:03 23 THE WITNESS: I can. 12:44:04 24 BY MR. BHANSALI: 12:44:04 25 Q. Okay. So let's start over. 12:44:05 Page 95	1 contents of this paper before we go into 12:45:24 2 questioning on specific portions that might be 12:45:26 3 taken out of context. 12:45:28 4 MR. BHANSALI: No, we're not going to do 12:45:30 5 that. 12:45:32 6 BY MR. BHANSALI: 12:45:32 7 Q. I'm going to direct your attention to 12:45:34 8 page 14 of the PDF here. 12:45:38 9 Can you see that? 12:45:46 10 A. I can. 12:46:02 11 Q. Okay. Now, here you're discussing the 12:46:05 12 evolution of video compression, correct? 12:46:10 13 A. I'd need to see it bigger. 12:46:16 14 Q. Hold on. I'll make it bigger. 12:46:20 15 A. That is what the graph is. I'd have to 12:46:24 16 read the content to see what's going with that, 12:46:29 17 but -- 12:46:34 18 Q. Is that a little better? 12:46:39 19 A. Yeah. That's what the figure itself is 12:46:40 20 showing. I haven't read the contents to know if 12:46:42 21 that's what I'm referring to. But, yes. 12:46:44 22 Q. Now, here under the figure it says: For 12:46:47 23 direct-to-home scenarios, such as cable 12:46:50 24 television, HEVC has the potential -- what is 12:46:52 25 HEVC? 12:46:57 Page 97

1 A. High Efficiency Video Coding. It's a 12:46:57 2 coding technology that was developed subsequent to 12:46:59 3 the coding technology that's referred to in the 12:47:06 4 patent. 12:47:08 5 Q. Okay. And how is it different from the 12:47:10 6 coding technology referred to in the patent? 12:47:15 7 MR. GLENNON: Objection. Beyond the 12:47:18 8 scope. 12:47:19 9 THE WITNESS: So two things. It has -- it 12:47:20 10 has more specific tools in it that were made 12:47:27 11 possible to be able to implement, in real time, 12:47:36 12 hardware and/or software that was impossible to do 12:47:39 13 earlier due to technology changes. 12:47:43 14 And that's typically what happens in 12:47:45 15 coding technology. Over time, as processor speeds 12:47:47 16 become more increased, as memory bandwidth becomes 12:47:54 17 larger, as the cost of memory becomes lower, the 12:47:57 18 practical implementation of more efficient coding 12:48:00 19 algorithms becomes possible. 12:48:03 20 And there's a logical progression that's 12:48:05 21 shown in this graph between MPEG-2 video; AVC, 12:48:08 22 which is Advanced Video Coding, which is different 12:48:14 23 than -- that's more advanced than the MPEG-4 12:48:18 24 Simple Profile. They're both MPEG-4 specs. AVC 12:48:23 25 is MPEG-4 Part 10. There's -- and MPEG-4 Part 2 12:48:28 Page 98	1 I meant here about "in the eyes of the beholder." 12:49:42 2 In the case of the patent, it's referring 12:49:45 3 to whether or not you're maintaining whatever 12:49:47 4 level it is that you pick. And that's what it's 12:49:50 5 doing. 12:49:53 6 Q. And are the levels in the patent the six 12:49:54 7 aspects of quality that are referred to in 12:50:01 8 paragraph -- at column 14? 12:50:06 9 A. Of the patent column 14? 12:50:10 10 Q. Yes. 12:50:12 11 A. And what was the question you're asking me 12:50:16 12 again? 12:50:19 13 Q. Well, in your last answer, you said: "In 12:50:19 14 the case of the patent, it's referring to whether 12:50:22 15 or not you're maintaining whatever level it is 12:50:24 16 that you pick." 12:50:26 17 And so my question is -- 12:50:27 18 A. Well, it's more than just those -- 12:50:29 19 Q. Sorry, let me finish the question. 12:50:31 20 A. My apologies. 12:50:32 21 Q. So is it referring to the items in column 12:50:33 22 14? 12:50:39 23 A. It would include the items in column 14, 12:50:39 24 but there's other stuff -- there's other aspects 12:50:42 25 of the patent that are included in column 14. I 12:50:45 Page 100
1 is the Simple Profile, as mentioned in the patent. 12:48:35 2 And then HEVC then was developed, roughly, 12:48:39 3 as you can see, on a cadence of about ten years 12:48:42 4 later the standard was available. 12:48:46 5 BY MR. BHANSALI: 12:48:48 6 Q. And just one further question here. You 12:48:49 7 say a little further down: "While what 12:48:53 8 constitutes acceptable picture quality is 12:48:56 9 literally is in the eyes of the beholder." 12:48:59 10 What did you mean by that? 12:49:02 11 MR. GLENNON: Objection. Beyond the 12:49:03 12 scope. Objection, Counsel has not let the witness 12:49:04 13 review the document in its entirety to figure out 12:49:07 14 what's being said here instead of taking portions 12:49:09 15 out of context. 12:49:12 16 BY MR. BHANSALI: 12:49:13 17 Q. You can answer, to the extent you can 12:49:13 18 answer. 12:49:15 19 A. So what I'm referring to here is absolute 12:49:16 20 picture quality, what would be acceptable as 12:49:19 21 absolute picture quality. And that differs from 12:49:22 22 what the patent is talking about, which is talking 12:49:25 23 about maintaining picture quality. 12:49:28 24 So what is acceptable at a particular 12:49:29 25 level, you know, as an absolute value, that's what 12:49:36 Page 99	1 don't believe that the -- the six -- those are the 12:50:50 2 six steps that tell you how to apply the different 12:50:52 3 elements, what level, high, medium or low, you're 12:50:56 4 going to apply them at. But there are more tools 12:50:59 5 that are involved than just the six. In other 12:51:02 6 words, there's multiple aspects here. 12:51:06 7 Figure 13 is a mechanism through which you 12:51:09 8 can apply some of the tools here. But there's 12:51:11 9 more tools that are mentioned in the patent. 12:51:16 10 Q. And in order to maintain quality under the 12:51:19 11 patent, do you have to maintain the levels of all 12:51:23 12 six of the aspects described in column 14 from 12:51:27 13 line 30 to 43? 12:51:33 14 A. No, that's a misunderstanding of how video 12:51:35 15 and audio engineering works. You don't -- it 12:51:39 16 doesn't really matter what the individual levels 12:51:44 17 of each things are. It matters what the overall 12:51:46 18 result is. 12:51:49 19 The way I look at it, it's sort of like 12:51:50 20 building a house. You have a hammer, nails, saw, 12:51:53 21 screws. You've got power tools, everything else. 12:51:58 22 There are many different ways of applying those 12:52:02 23 tools that will end up with the same result of a 12:52:05 24 quality-built house. And you can build it all 12:52:07 25 sorts of different ways. 12:52:10 Page 101

1 It's the same thing with video and audio 12:52:11 2 processing tools in the case of the patent 12:52:14 3 optimized decoding processes. There's multiple 12:52:16 4 ways to apply them. As long as the end result is 12:52:20 5 to maintain quality, it's not really important 12:52:23 6 which level is what in each one. What matters is 12:52:26 7 you've achieved your end goal. 12:52:30 8 Q. And the end goal is just quality? 12:52:38 9 A. The end goal is maintaining quality. 12:52:40 10 Which, again, as I said earlier, it's not focused 12:52:43 11 on an absolute level of quality. It's focused on 12:52:46 12 whatever quality level you believe you have, you 12:52:50 13 would like to be able to maintain that. 12:52:53 14 As we've mentioned, and you've mentioned, 12:52:55 15 and I've mentioned several times during today's 12:52:57 16 deposition or testimony, is you're trying to do 12:53:02 17 the best you can with the cards you've been dealt, 12:53:05 18 so to speak. 12:53:08 19 If there just isn't enough processing 12:53:11 20 power or memory in the device, leaving out for now 12:53:13 21 the fact it's this extra factor of network 12:53:17 22 performance or network behavior, for the sake of 12:53:20 23 simplicity for the discussion, then you want to 12:53:23 24 perform the best you can on that, which you 12:53:26 25 already know is going to have some level of 12:53:30 Page 102	1 tool is implemented. 12:54:40 2 The guidance is the table. It's saying 12:54:43 3 whether or not based on the -- based on the 12:54:47 4 capabilities of the device, whether it's high, 12:54:49 5 medium or low. Then you apply the tool on that. 12:54:51 6 You could have different settings at the end of 12:54:56 7 the day would result in the same overall 12:54:59 8 maintaining of the final result. 12:55:01 9 And that is really a key aspect of the 12:55:05 10 patent, is that you apply tools -- again, it's 12:55:08 11 like building -- you can do them in different ways 12:55:15 12 as long as the end result is done. 12:55:18 13 So if you have two competing companies 12:55:19 14 that are building a product based on this, they 12:55:21 15 might come up with a different solution. But it 12:55:23 16 doesn't matter. They still use the tools that are 12:55:26 17 in the patent to achieve their goal of maintaining 12:55:29 18 quality. That is -- that would be covered under 12:55:32 19 the scope of the patent. 12:55:35 20 BY MR. BHANSALI: 12:55:36 21 Q. Let me just understand. I'm just trying 12:55:36 22 to understand maintaining quality. 12:55:39 23 So you mentioned earlier the concept of a 12:55:41 24 reference stream, correct? 12:55:44 25 A. In part of my explanation. I was using 12:55:47 Page 104
1 degradation versus the ideal, by definition. 12:53:32 2 Because the way they have the ideal is if 12:53:36 3 you didn't have these limitations in processing 12:53:38 4 power and memory bandwidth, and therefore, to 12:53:40 5 translate to what we're talking about here, the 12:53:43 6 overall quality rating and the six steps there 12:53:50 7 would all be set to high. That would guarantee 12:53:52 8 you the highest unabated quality. 12:53:57 9 But you're not dealing with that. You're 12:53:59 10 dealing with the device -- well, you don't know 12:54:01 11 that. If you're dealing with a device that you 12:54:03 12 determine through that expert evaluation process 12:54:05 13 has that, you're all set. If not, you need to 12:54:07 14 start applying some of these tools so you can 12:54:09 15 maintain quality, which, again, is fluidity, audio 12:54:13 16 and video quality is maintained. 12:54:16 17 Q. But to maintain, you wouldn't maintain -- 12:54:18 18 you wouldn't have to maintain each of those six 12:54:22 19 aspects at the level of the reference stream, 12:54:25 20 correct? 12:54:28 21 MR. GLENNON: Objection. Asked and 12:54:28 22 answered. 12:54:29 23 THE WITNESS: Yeah, it's -- with 12:54:30 24 apologies -- with all due respect, you're 12:54:34 25 misunderstanding levels of a setting versus how a 12:54:37 Page 103	1 that to show if you're going to do a difference 12:55:50 2 between two streams, you have to have one as a 12:55:53 3 reference, yes. 12:55:55 4 Q. Okay. So if I have a reference stream, 12:55:56 5 and then I have another stream that I'm going to 12:55:58 6 compare that to -- 12:56:01 7 A. May I suggest a different way of saying 12:56:03 8 that? 12:56:04 9 Q. Let me go with my hypothetical, and then 12:56:05 10 we can -- 12:56:07 11 A. Okay, fair enough. 12:56:07 12 Q. I have a reference stream, and then I have 12:56:09 13 another stream that I'm going to evaluate based on 12:56:13 14 the reference stream. Is that fair? 12:56:18 15 A. Okay, I'm following you. 12:56:20 16 Q. Okay. How do I tell whether quality has 12:56:21 17 been maintained as between the reference stream 12:56:25 18 and the stream that I'm evaluating? 12:56:28 19 MR. GLENNON: Objection as to form. 12:56:32 20 THE WITNESS: So I would have to change 12:56:34 21 how you asked me the question in order for me to 12:56:38 22 answer it. Because in the way that you worded the 12:56:40 23 question, it doesn't have engineering -- it 12:56:44 24 doesn't make engineering sense to me. So may I? 12:56:48 25 /// Page 105

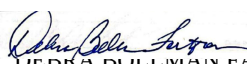
1 BY MR. BHANSALI: 12:56:51 2 Q. Sure. 12:56:51 3 A. Okay. So I would have -- a reference 12:56:52 4 stream would be the stream under test. Whatever 12:56:56 5 stream you're using on. And you have decided 12:57:00 6 through the setting of the tools that are in here, 12:57:04 7 based on the device capabilities, what your level 12:57:06 8 of -- what your level of applying the optimized 12:57:11 9 decoding processes will be. And then that's going 12:57:15 10 to be playing on that. 12:57:17 11 And then the same stream you would look at 12:57:19 12 later in time, okay? Then you would compare the 12:57:23 13 quality of that against the reference stream. And 12:57:28 14 the point behind these tools is, by using these 12:57:33 15 tools, the quality is no worse than what you 12:57:36 16 have -- already have. That's what you mean by 12:57:41 17 maintain. 12:57:43 18 Now, how would you evaluate that? We did 12:57:44 19 discuss this earlier, that a POSA or a POSITA, 12:57:47 20 through experience and training, would be able to 12:57:53 21 just see that one has been degraded and then make 12:57:57 22 some adjustments in the algorithm in order to 12:58:00 23 accomplish that, and therefore adjust the program 12:58:03 24 that they've designed, that expertise thing that 12:58:06 25 they've designed, to account for that. 12:58:09 Page 106	1 So you know for sure that you're 12:59:29 2 maintaining quality, even if you disagree what the 12:59:31 3 absolute value of that quality is. 12:59:35 4 Q. Okay. Let's go to column 13 of the 12:59:41 5 patent. 12:59:43 6 A. I have it. 12:59:43 7 Q. Okay. Starting on line 4, there's two 12:59:45 8 sentences there. Can you read those just to 12:59:50 9 yourself, first? 12:59:53 10 A. If you're referring to the one that says 12:59:55 11 "This can result in"? 12:59:57 12 Q. Yes. That, and the next one. 12:59:59 13 A. Correct, I've read it, yes. 13:00:09 14 Q. Okay. So this is referring to reduced 13:00:10 15 video output quality; is that right? 13:00:12 16 A. It's -- yes, that's what the wording it 13:00:17 17 uses here, "result in reduced video output 13:00:20 18 quality." 13:00:23 19 Q. And video output quality may sometimes in 13:00:23 20 the context of the patent be reduced in order to 13:00:27 21 maintain fluidity; is that fair? 13:00:30 22 A. It is. 13:00:32 23 Q. Okay. And then it says: Reduced color 13:00:33 24 definition is often not as noticeable on 13:00:37 25 constrained devices. 13:00:40 Page 108
1 But you could measure it, that difference, 12:58:11 2 using an analyzer. And, again, as was -- as is 12:58:15 3 mentioned at the time, the absolute value of what 12:58:23 4 is known as quality might have been arguable at 12:58:26 5 the time back in 2005. But what is not arguable 12:58:29 6 is whether or not, whichever objective measurement 12:58:33 7 you take, that if you take a second objective 12:58:37 8 measurement using the same mechanism, you can tell 12:58:40 9 whether or not that next one is the same, better, 12:58:45 10 or worse. 12:58:47 11 So you're adjusting your algorithm that 12:58:49 12 you're -- again, you're producing a product based 12:58:52 13 on this. And in the course of ordinary 12:58:55 14 engineering, this is how you design and refine a 12:58:59 15 product. So that you're designing it using these 12:59:02 16 tools so that you're maintaining quality. And the 12:59:04 17 guidance that you're being provided is through 12:59:07 18 the -- through that list. It's on there how you 12:59:10 19 do it. 12:59:16 20 And, again, if you're an engineer, 12:59:17 21 sometimes you're a good engineer, and sometimes 12:59:18 22 you're not. Sometimes some companies have better 12:59:20 23 products than others. You might choose a Samsung 12:59:22 24 phone versus an Apple phone because of the way it 12:59:25 25 acts. This is the same type of thing. 12:59:27 Page 107	1 Do you see that? 13:00:41 2 A. I do. 13:00:42 3 Q. What does it mean for reduced color 13:00:43 4 definition to be noticeable? 13:00:46 5 MR. GLENNON: Objection. Beyond the 13:00:48 6 scope. 13:00:49 7 THE WITNESS: So a -- myself and a POSA 13:00:50 8 would know that the human visual system is more 13:00:58 9 sensitive to luminance than it is to chrominance. 13:01:01 10 So you can sacrifice more quality in color, and it 13:01:05 11 will be less objectionable than sacrificing a 13:01:10 12 definition that you get in luminance, or 13:01:15 13 brightness. And this is well known to someone who 13:01:17 14 is a POSITA in the area of video processing. 13:01:20 15 BY MR. BHANSALI: 13:01:25 16 Q. And will the objectionability of the 13:01:29 17 sacrifice depend on the viewer? 13:01:33 18 MR. GLENNON: Objection as to form. 13:01:38 19 Objection, beyond the scope. 13:01:40 20 THE WITNESS: If you look at a single 13:01:40 21 viewer in isolation, there could be differences. 13:01:49 22 However, those differences are not meaningful. 13:01:51 23 Because it is true that if the choice was 13:01:54 24 made to treat luminance and chrominance the same 13:01:57 25 and reduce quality of both in order to maintain 13:02:02 Page 109

1	that fluidity, audio quality playback, the	13:02:05
2	playback that we've established as the requirement	13:02:09
3	here, or if you gave more preference to	13:02:12
4	chrominance over luminance, in both cases, within	13:02:14
5	reasonable certainty, all viewers would find it	13:02:19
6	more objectionable than if you gave preference to	13:02:24
7	luminance over chrominance.	13:02:27
8	BY MR. BHANSALI:	13:02:42
9	Q. Let's go to column 14, line 13.	13:02:42
10	Do you see where it refers to: "The	13:02:49
11	output video can be unrecognizable at times"?	13:02:51
12	A. Correct.	13:02:57
13	Q. What does it mean for an output video to	13:02:58
14	be unrecognizable?	13:03:00
15	A. It means that --	13:03:01
16	MR. GLENNON: Objection. Beyond the	13:03:01
17	scope.	13:03:03
18	THE WITNESS: My apologies. I'm sorry.	13:03:04
19	Could you repeat yourself, Michael?	13:03:05
20	MR. GLENNON: Objection. Beyond the	13:03:07
21	scope.	13:03:08
22	THE WITNESS: So what this means is that	13:03:16
23	in spite of everything that you're trying to do,	13:03:20
24	reducing complexities, it's still not possible,	13:03:24
25	even with everything that you've done, to get an	13:03:29
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1	image where -- where the quality -- you know, the	13:03:34
2	video is unrecognizable. It's the best you can	13:03:44
3	do. But it's still better than what it would be	13:03:48
4	if you didn't apply the tools.	13:03:51
5	But it's just so bad. Something so bad	13:03:53
6	happened, like, for instance, there's a network	13:03:56
7	glitch or something. It's just you have to make	13:03:59
8	an adjustment and then -- but it's -- but, again,	13:04:02
9	in favor of trying to get the best quality you can	13:04:05
10	or maintain quality.	13:04:10
11	It could happen. I mean, this is a	13:04:11
12	realtime network, realtime processing, realtime	13:04:13
13	everything, and it could happen that just in spite	13:04:16
14	of everything you've done, it's still not good	13:04:18
15	enough. That's what this means. And that's why	13:04:21
16	there's high, medium, and low levels here.	13:04:23
17	In other words, that device just can't	13:04:25
18	play the stream.	13:04:28
19	BY MR. BHANSALI:	13:04:31
20	Q. Let's go to paragraph 29 of your report.	13:04:31
21	A. Oh. Yes?	13:04:36
22	Q. You refer here about halfway down to	13:04:48
23	defendants citing "The Authoritative Dictionary of	13:04:50
24	IEEE Standards" for a definition that starts with	13:04:52
25	"The totality of the features."	13:04:58
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1	Do you see that?	13:04:59
2	A. I do. But, again, I refer to the	13:05:01
3	defendants citing that.	13:05:04
4	Q. Understood. But my question is do you	13:05:05
5	agree that this definition is applicable to	13:05:13
6	construing quality in the context of the '849	13:05:20
7	patent? And I'm referring just to the IEEE	13:05:25
8	definition.	13:05:38
9	A. I mean, quality -- I mean, it's hard to	13:05:39
10	really say because this could be -- there's	13:05:52
11	different uses of the word "quality" in isolation	13:05:55
12	versus in this particular case, it's maintain	13:05:57
13	quality playback.	13:06:00
14	So it has some bearing on that.	13:06:02
15	Q. How do -- in what way does it have bearing	13:06:10
16	on quality as used in maintain quality playback?	13:06:15
17	A. It's referring to the ability to satisfy a	13:06:20
18	given need or a characteristic or attribute. And	13:06:23
19	as we mentioned, we're trying to maintain quality	13:06:29
20	playback as best we can.	13:06:33
21	But as with the example that we just	13:06:34
22	referred to in the patent, it's making it clear	13:06:36
23	that there could be cases where you're doing the	13:06:39
24	best you can, and yet -- and yet that's not --	13:06:42
25	that's not what people -- it's considered	13:06:50
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1	unrecognizable. So in that particular case,	13:06:53
2	you're maintaining the best you can do, but it's	13:06:56
3	still not possible.	13:06:59
4	So the problem with it here is it's trying	13:07:04
5	to compare quality to some absolute value, as	13:07:06
6	opposed to in reference to getting the best you	13:07:08
7	can to maintain the quality playback.	13:07:14
8	Q. Let's look at the other reference to	13:07:17
9	quality. If you just -- we can stay with your	13:07:25
10	report. If you go to page 13, there is a	13:07:27
11	reference to the term which appears in the patent,	13:07:34
12	"fluidity, video quality and audio quality are	13:07:36
13	maintained."	13:07:38
14	Do you see that?	13:07:40
15	A. Are you talking about the first sentence	13:07:41
16	of 33?	13:07:42
17	Q. Well, I'm really just talking about the	13:07:43
18	term that's being discussed in 33. Do you see --	13:07:45
19	A. Oh, just the whole construction of	13:07:47
20	"fluidity, video quality and audio quality are	13:07:48
21	maintained," D, line D?	13:07:51
22	Q. Yeah, I'm just -- I'm just -- yeah.	13:07:53
23	You see you got --	13:07:53
24	A. Okay.	13:07:53
25	Q. -- the term out of the patent, right?	13:07:56
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1 A. Correct. 13:07:58 2 Q. You're aware of that, right? You're aware 13:07:58 3 that's a term in the patent? 13:08:01 4 A. Correct. 13:08:02 5 Q. Okay. 13:08:03 6 So the definition of -- the dictionary 13:08:06 7 definition of "quality" from the IEEE that we were 13:08:08 8 looking at a moment ago, does that bear on how the 13:08:12 9 term "quality" -- how the word "quality" is used 13:08:16 10 in this claim term? 13:08:18 11 A. I mean, this is why it's difficult to 13:08:24 12 answer. Because, as I've said before, is that 13:08:27 13 term "quality" is an assumption is it's meeting 13:08:31 14 some minimum level. And here, we're trying to 13:08:36 15 maintain that minimum -- not minimum, a quality 13:08:39 16 level. 13:08:45 17 In other words, it's an action. We're 13:08:46 18 trying to do something. It's an aspiration, a 13:08:49 19 goal. It could become impossible to do that, but 13:08:53 20 it doesn't mean the patent is any less applicable. 13:08:56 21 Q. And what does it mean in the context of 13:09:00 22 this term to maintain video quality in the context 13:09:04 23 of this term, the one that's being discussed in 13:09:09 24 paragraph -- well, in Section D of your report? 13:09:12 25 A. Again, it's referring to the best possible 13:09:20 Page 114	1 MR. GLENNON: Same objection. 13:10:46 2 THE WITNESS: But if I were a POSA 13:10:47 3 implementing this back in 2005, I would apply what 13:10:52 4 my knowledge to know that you would impact the 13:10:59 5 video more than you would impact the audio before 13:11:02 6 you impact fluidity. 13:11:04 7 It becomes a little bit more difficult 13:11:07 8 with audio because audio is a little bit more 13:11:09 9 subjective -- not subjective. More -- subjective 13:11:12 10 is not the right word. More -- the human audience 13:11:16 11 is very sensitive to changes in audio. So you 13:11:23 12 would know that if you're going to make 13:11:30 13 compromises in order to keep fluidity, that you 13:11:31 14 would -- you would compromise the video before you 13:11:34 15 try to compromise the audio. 13:11:37 16 You would just know that through being a 13:11:39 17 video or audio engineer. 13:11:42 18 BY MR. BHANSALI: 13:11:44 19 Q. Okay. And so the video quality may be 13:11:45 20 diminished in order to maintain fluidity? 13:11:48 21 A. Correct. 13:11:51 22 MR. GLENNON: Objection as to form. 13:11:53 23 BY MR. BHANSALI: 13:11:54 24 Q. So here, maintaining video quality, in 13:11:55 25 your view, means possibly diminishing it but only 13:11:58 Page 116
1 picture, the best sounding audio that you can get 13:09:27 2 while maintaining fluidity in the stream. 13:09:31 3 So it might not be perfect, but it's the 13:09:35 4 best you can, with the understanding that a POSA 13:09:39 5 would have that the preference is to have fluidity 13:09:42 6 in the stream. 13:09:48 7 Q. Okay. So it's really maintaining the 13:09:49 8 fluidity while obtaining the best possible audio 13:09:52 9 and video quality? 13:09:58 10 MR. GLENNON: Objection as to form. 13:10:00 11 THE WITNESS: Say it again. Please 13:10:02 12 repeat. 13:10:06 13 BY MR. BHANSALI: 13:10:07 14 Q. So you're reading "audio quality" and 13:10:07 15 "video quality" here to mean the best possible 13:10:10 16 audio quality and video quality that can be 13:10:15 17 obtained while maintaining fluidity? 13:10:18 18 A. Correct. 13:10:22 19 Q. Okay. And so it's possible here that the 13:10:22 20 audio quality might actually be diminished in 13:10:29 21 order to maintain fluidity? 13:10:32 22 MR. GLENNON: Objection as to form. 13:10:35 23 THE WITNESS: It could be. 13:10:37 24 BY MR. BHANSALI: 13:10:43 25 Q. And same for the video quality? 13:10:43 Page 115	1 as much as you have to do in order to maintain 13:12:03 2 fluidity? 13:12:05 3 A. Correct. And I do want to elaborate on 13:12:11 4 that a little bit. 13:12:13 5 The whole purpose behind these tools is to 13:12:14 6 make the minimally -- is to be -- I don't know 13:12:18 7 what the right term is -- minimally invasive on 13:12:22 8 the result. 13:12:26 9 You want to implement the tool that's 13:12:28 10 going to have the least impact visually and orally 13:12:30 11 and on fluidity in order to make this work. And, 13:12:35 12 again, of the fluidity, audio and video, you would 13:12:38 13 know as a POSITA how to apply the tools that you 13:12:43 14 have in order to minimize the degradation. 13:12:45 15 But it's inevitable if the device is not 13:12:50 16 capable of doing a quality playback due to 13:12:54 17 limitations in processing power or memory 13:12:57 18 bandwidth or the amount of memory, then there is 13:13:01 19 going to be degradation. That's the point. And 13:13:03 20 the patent provides a toolkit, or set of tools, in 13:13:08 21 order to alleviate that issue and give a better 13:13:12 22 result. 13:13:16 23 Q. Let me go back to paragraph 22 of your 13:13:16 24 report. 13:13:28 25 A. Paragraph 22, I'm there. 13:13:48 Page 117

1 Q. You say: In this patent, this involves 13:13:50 2 the use of a server to transcode. 13:13:54 3 Do you see that? 13:13:57 4 A. Yes. 13:14:08 5 Q. Just for the record, what are you 13:14:08 6 referring to when you refer to "transcode" here? 13:14:10 7 A. Transcode, as it's used in the patent, 13:14:16 8 refers to taking your signal that's in one format 13:14:20 9 and converting it to a more efficient technique. 13:14:24 10 So whether or not it's analog or 13:14:32 11 uncompressed digital or an older form of 13:14:34 12 compression, the transcoder would then transcode 13:14:38 13 it to a more efficient compression to begin with. 13:14:41 14 In this case the state-of-the-art at the 13:14:46 15 time of the writing of this patent was MPEG-4. It 13:14:49 16 doesn't say it here on this page. But the MPEG-4 13:14:52 17 it's referring to here is the event MPEG-4 Simple 13:14:55 18 Profile and the Advanced Audio Codec, AAC. 13:14:59 19 Q. And do the claims here in the patent, as 13:15:03 20 you understand them, require transcoding? 13:15:05 21 MR. GLENNON: Objection. Beyond the 13:15:07 22 scope. 13:15:08 23 THE WITNESS: I believe it's -- some of 13:15:10 24 the claims have a preference for making the stream 13:15:16 25 as efficient as possible before you apply the -- 13:15:20 Page 118	1 made. 13:16:51 2 So if these devices are still in use five 13:16:51 3 years later, they'd be even more problematic and 13:16:54 4 would need the features of this patent even more 13:16:58 5 to obtain a fluid playback, using one of those 13:17:01 6 more advanced algorithms. 13:17:05 7 BY MR. BHANSALI: 13:17:07 8 Q. Have you ever worked with the Villegas & 13:17:09 9 Cefo firm before? 13:17:13 10 A. Yes. 13:17:15 11 Q. In how many cases? 13:17:16 12 A. In one other case. 13:17:18 13 Q. What was that case? 13:17:19 14 A. That case was -- I have to look up the 13:17:24 15 patent number, but I believe it was -- do you 13:17:28 16 mind -- actually, I don't have any to look up. 13:17:33 17 I mean, I did work on one. It was a few 13:17:35 18 months ago. I believe it's '472, is the last 13:17:38 19 three numbers of the patent. 13:17:42 20 Q. Do you remember the name of the case? 13:17:43 21 A. If I heard it, I would know if it was 13:17:48 22 true. 13:17:50 23 Q. Was the plaintiff named BSD Crown? 13:17:51 24 A. Yes. 13:17:55 25 Q. Okay. And was the inventor on the patent 13:17:56 Page 120
1 the optimized decoding processes. 13:15:29 2 And the reason is obvious to a POSA; that 13:15:31 3 the better efficiency -- this has to do with a 13:15:36 4 chart that you showed earlier in the paper that I 13:15:39 5 presented to SCTE. The more efficient you have to 13:15:41 6 start with, the more likelihood you can apply 13:15:46 7 lesser of the tools that are described in order to 13:15:50 8 get a higher picture quality. 13:15:55 9 If you start with something that is just 13:15:57 10 so high in bandwidth and so processing intense, 13:15:59 11 you won't be able to even decode it. Like I said, 13:16:06 12 you have limited bandwidth in the network, and you 13:16:10 13 have network impacting. And that's why it's 13:16:13 14 mentioning here get the input stream to the best 13:16:15 15 format you can. And the suggested one was such as 13:16:18 16 these two. It doesn't require it. 13:16:23 17 It's equally applicable to the later 13:16:26 18 codecs, AVC and HEVC, that I described. They just 13:16:28 19 weren't available at this time. But the patent is 13:16:33 20 equally applicable to that. And then you can 13:16:35 21 apply the tools on top of that if the device is 13:16:37 22 not capable of doing the tools in it. Because, 13:16:41 23 obviously, the later compression algorithms that 13:16:44 24 didn't exist at this time would be even more 13:16:46 25 complex, the process, because assumptions are 13:16:48 Page 119	1 Carmel? 13:18:00 2 A. Yes. 13:18:01 3 Q. Okay. What was the scope of opinion that 13:18:01 4 you offered? 13:18:04 5 MR. GLENNON: Objection. Beyond the 13:18:04 6 scope. 13:18:05 7 THE WITNESS: I'd have to see my -- my -- 13:18:05 8 in that case, my declaration in order for me to 13:18:11 9 recall. 13:18:14 10 I work on thousands of things, and I don't 13:18:14 11 have eidetic memory. 13:18:18 12 BY MR. BHANSALI: 13:18:21 13 Q. Do you remember, was it related to claim 13:18:21 14 construction? 13:18:24 15 MR. GLENNON: Objection. Beyond the 13:18:24 16 scope. 13:18:25 17 THE WITNESS: It was -- I really would 13:18:26 18 need to look at it. 13:18:32 19 BY MR. BHANSALI: 13:18:33 20 Q. When was it approximately, if you know? 13:18:33 21 A. A few months ago. 13:18:35 22 Q. Do you know if that was filed with the 13:18:36 23 court or with the PTAB or anything like that? 13:18:38 24 A. It was filed with the patent office. 13:18:43 25 Q. Okay. 13:18:45 Page 121

1 A. I don't know. It might have been filed 13:18:50 2 with the court. I know it was filed with the 13:18:52 3 patent office. 13:18:54 4 Q. Okay. And so were you working on an IPR 13:18:54 5 then, or -- inter partes review proceeding? Do 13:18:59 6 you know? 13:19:03 7 A. I don't recall. 13:19:03 8 Q. And has any court ever excluded an opinion 13:19:04 9 that you've offered? 13:19:12 10 A. No. 13:19:14 11 Q. Has any court ever stricken an opinion or 13:19:16 12 report that you've offered? 13:19:19 13 A. No. 13:19:21 14 Q. Okay. Give me just a few minutes and see 13:19:21 15 if I have anything else, but we may be wrapping up 13:19:32 16 here. 13:19:35 17 A. Okay. May I ask for a bio break, then? 13:19:36 18 MR. BHANSALI: Yeah, yeah, we're going to 13:19:38 19 go off the record. 13:19:40 20 THE VIDEOGRAPHER: Going off the record. 13:19:40 21 The time is 1:19 p.m. 13:19:42 22 13:19:42 23 (Recess ensued from 1:19 p.m. 13:35:39 24 to 1:35 p.m.) 13:35:39 25 13:35:39 Page 122	1 So what it was basically saying was it was 13:37:15 2 already -- the state-of-the-art at the time of 13:37:19 3 2005 was already difficult for some of these 13:37:21 4 devices to be able to produce quality playback 13:37:24 5 without using any of the novel ideas in this 13:37:30 6 patent. It would be even more so as time went 13:37:34 7 forward with the later codecs. 13:37:38 8 BY MR. BHANSALI: 13:37:41 9 Q. So is AVC itself an optimized decoding 13:37:42 10 process? 13:37:46 11 MR. GLENNON: Objection as to form. 13:37:47 12 THE WITNESS: I really can't answer it 13:37:48 13 that way, or the implication for answering it. 13:37:54 14 In every code -- well, I mean, nothing 13:37:58 15 is -- the issue that you have is the absolute 13:38:00 16 definition or dictionary definition of the word 13:38:03 17 "optimized" in isolation. One could argue that in 13:38:06 18 their day, so MPEG-2 video, which was H.262 back 13:38:12 19 in 1994 when I first, you know -- one of the first 13:38:18 20 standards that I was involved with got released, 13:38:23 21 it was the best that could be done at the time. 13:38:27 22 So whether you would consider that 13:38:30 23 optimized or not, it was the best that could be 13:38:31 24 done. And, again, we have a strict definition of 13:38:34 25 the word "optimize" or "optimization" in 13:38:37 Page 124
1 THE VIDEOGRAPHER: We're back on the 13:35:57 2 record. The time is 1:35 p.m. 13:35:58 3 BY MR. BHANSALI: 13:36:03 4 Q. Shortly before we broke, you made a 13:36:04 5 comment about later codecs, like AVC and HEVC. 13:36:07 6 And you said the latter compression algorithms 13:36:12 7 that didn't exist at this time would be even more 13:36:15 8 complex a process. 13:36:19 9 What did you mean by saying they were even 13:36:20 10 more complex? 13:36:23 11 MR. GLENNON: Objection. Outside the 13:36:25 12 scope. 13:36:26 13 THE WITNESS: So, as mentioned earlier in 13:36:27 14 my testimony when you brought up the AVC and HEVC, 13:36:33 15 these are later codecs that became possible 13:36:39 16 because of advances in technology. You have 13:36:42 17 Moore's Law, so you have more processing power, 13:36:47 18 memory is smaller and cheaper, et cetera, and so 13:36:49 19 you're able to use more algorithms. That means 13:36:52 20 both the encode side and the decode side require 13:36:54 21 more processing power. 13:36:57 22 So if you have a device that was out there 13:36:59 23 and it was trying to process one of these other 13:37:03 24 codecs, it would be even more difficult for it to 13:37:06 25 process higher level codecs, or near impossible. 13:37:10 Page 123	1 isolation, it becomes difficult to answer that. 13:38:39 2 Then you launch ten years later, so in 13:38:42 3 2003 or 2002 when you have MPEG-4 Simple Profile, 13:38:45 4 which is MPEG-4 Visual Part 2 -- or MPEG-4 Part 2 13:38:53 5 Visual, I should say, or MPEG-4 Part 10, which is 13:39:00 6 Advanced Video Coding, AVC, at the time they were 13:39:04 7 coming out, they could have been considered, 13:39:08 8 quote, optimized, or they used optimizations. 13:39:12 9 But, again, it's all relative against something. 13:39:18 10 And that's why, you know, as a 13:39:21 11 professional I have a problem with the word 13:39:23 12 "optimized" or "optimization" used out of context. 13:39:25 13 Because, you know, again, it seeks an absolute 13:39:30 14 value or something. The same way this patent 13:39:32 15 isn't trying to say -- when it uses the word 13:39:35 16 "optimized decoding process," it's simplified or 13:39:37 17 improved way of doing it so that you get a better 13:39:42 18 result at the output. And that's really what all 13:39:45 19 this is related back to. 13:39:47 20 Because then, you know, ten years later, 13:39:50 21 we have HEVC, and then I hate to say this to you, 13:39:53 22 we have a newer one after that called VVC, 13:39:55 23 Versatile Video Coding. 13:40:01 24 BY MR. BHANSALI: 13:40:02 25 Q. Have you ever been involved with a codec 13:40:02 Page 125

1 called AVC1? 13:40:04 2 A. AVC1? Are you sure -- are you sure it's 13:40:08 3 not AV1? 13:40:12 4 Q. Maybe it's AV1. Have you ever been 13:40:13 5 involved with that? 13:40:15 6 A. I know somewhat about AV1, yes. 13:40:16 7 Q. Okay. And -- 13:40:19 8 A. Or its predecessor, VP9. 13:40:21 9 Q. And are those, in your view, optimized 13:40:25 10 decoding processes? 13:40:28 11 MR. GLENNON: Objection as to form. 13:40:29 12 THE WITNESS: It's the same answer I just 13:40:31 13 gave before. It's difficult to use the word 13:40:33 14 "optimized" in any of these things. Everybody had 13:40:36 15 different approaches at the time and did the best 13:40:39 16 they could at the time. 13:40:41 17 Arguably, that's why there are so many 13:40:43 18 codecs to pick from, is because people believe 13:40:46 19 that one form of another is -- of these 13:40:49 20 optimize -- in other words, there is more than one 13:40:54 21 way to do something. And AV1 or VP9 or MPEG-2 or 13:40:56 22 MPEG-4 or HEVC, VVC, and so on, they're all 13:41:05 23 different ways that they all at some point in time 13:41:09 24 were optimizing what they were doing. 13:41:11 25 It's just, again, the problem I have is 13:41:16 Page 126	1 THE VIDEOGRAPHER: We are off the record 13:42:52 2 at 1:42 p.m., and this concludes today's testimony 13:42:53 3 given by Matthew Goldman. The total number of 13:42:56 4 media used was four and will be retained by 13:42:58 5 Veritext. 13:43:00 6 (PROCEEDINGS CONCLUDED AT 1:43 p.m., 129.) 13:43:04 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 Page 128
1 taking the word "optimize" or "optimization" in 13:41:18 2 isolation. 13:41:22 3 BY MR. BHANSALI: 13:41:23 4 Q. All right. Thank you. I don't have any 13:41:24 5 further questions. 13:41:25 6 MR. GLENNON: And I don't have any 13:41:28 7 redirect for this witness. 13:41:29 8 MR. BHANSALI: Okay. Thank you. Thank 13:41:33 9 you for your time, Mr. Goldman. I think we can go 13:41:34 10 off the record. 13:41:36 11 (Court Reporter Clarification of orders.) 13:41:46 12 THE VIDEOGRAPHER: Mr. Glennon, did you 13:42:22 13 want a copy of the video? 13:42:25 14 MR. GLENNON: If you're going to have a 13:42:26 15 copy of the video, then I -- 13:42:27 16 THE VIDEOGRAPHER: Yes, of course. 13:42:33 17 MR. GLENNON: Hold on. 13:42:36 18 Josh, are you still on the call? 13:42:36 19 I don't think we need the video. 13:42:39 20 THE VIDEOGRAPHER: You can call Veritext 13:42:42 21 if you need it. 13:42:43 22 MR. GLENNON: I will reach back out. 13:42:44 23 THE VIDEOGRAPHER: Shall I take us off the 13:42:48 24 record? 13:42:49 25 (Court Reporter Clarification.) 13:42:51 Page 127	1 UNITED STATES DISTRICT COURT 2 NORTHERN DISTRICT OF CALIFORNIA 3 SAN JOSE DIVISION 4 WITHROW NETWORKS, INC.,) 5) 6 Plaintiff,) 7) CASE No. 8 vs.) 5:24-CV-03203-PCP 9) 10 GOOGLE LLC and YOUTUBE,) 11 LLC,) 12) 13 Defendants.) 14 15 I, DEBRA BOLLMAN FARFAN, CSR No. 11648, in 16 and for the State of California, do hereby certify 17 that the foregoing is a true and accurate 18 transcript of the proceedings taken down by me in 19 shorthand and thereafter reduced to typewritten 20 form, on Monday, July 21, 2025, as thereon stated. 21 And the same is a true, correct, and complete 22 transcript of the testimony at said proceedings. 23 I further certify that I am not interested 24 in the event of the action. 25 Executed at Norco, California, on the 26 27th of July, 2025. 27 28  29 DEBRA BOLLMAN FARFAN, CSR 11648 30 RMR, RDR, CRR, CRC Page 129

1 MICHAEL GLENNON 2 Mglennon@calfee.com 3 July 28, 2025 4 RE: Withrow Networks, Inc. v. Google LLC 5 7/21/2025, Matthew S. Goldman, (#7463733). 6 The above-referenced transcript has been 7 completed by Veritext Legal Solutions and 8 review of the transcript is being handled as follows: 9 ___ Per CA State Code (CCP 2025.520 (a)-(e)) – Contact Veritext 10 to schedule a time to review the original transcript at 11 a Veritext office. 12 __XX_ Per CA State Code (CCP 2025.520 (a)-(e)) – Locked .PDF 13 Transcript - The witness should review the transcript and 14 make any necessary corrections on the errata pages included 15 below, notating the page and line number of the corrections. 16 The witness should then sign and date the errata and penalty 17 of perjury pages and return the completed pages to all 18 appearing counsel within the period of time determined at 19 the deposition or provided by the Code of Civil Procedure. 20 Contact Veritext when the sealed original is required. 21 ___ Waiving the CA Code of Civil Procedure per Stipulation of 22 Counsel - Original transcript to be released for signature 23 as determined at the deposition. 24 ___ Signature Waived – Reading & Signature was waived at the 25 time of the deposition. Page 130	1 Withrow Networks, Inc. v. Google LLC 2 Matthew S. Goldman (#7463733) 3 E R R A T A S H E E T 4 PAGE_____ LINE_____ CHANGE_____ 5 _____ 6 REASON_____ 7 PAGE_____ LINE_____ CHANGE_____ 8 _____ 9 REASON_____ 10 PAGE_____ LINE_____ CHANGE_____ 11 _____ 12 REASON_____ 13 PAGE_____ LINE_____ CHANGE_____ 14 _____ 15 REASON_____ 16 PAGE_____ LINE_____ CHANGE_____ 17 _____ 18 REASON_____ 19 PAGE_____ LINE_____ CHANGE_____ 20 _____ 21 REASON_____ 22 _____ 23 _____ 24 (Matthew S. Goldman) Date 25 _____ Page 132
1 ___ Federal R&S Requested (FRCP 30(e)(1)(B)) – Locked .PDF 2 Transcript - The witness should review the transcript and 3 make any necessary corrections on the errata pages included 4 below, notating the page and line number of the corrections. 5 The witness should then sign and date the errata and penalty 6 of perjury pages and return the completed pages to all 7 appearing counsel within the period of time determined at 8 the deposition or provided by the Federal Rules. 9 ___ Federal R&S Not Requested - Reading & Signature was not 10 requested before the completion of the deposition. 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____ 18 _____ 19 _____ 20 _____ 21 _____ 22 _____ 23 _____ 24 _____ 25 _____ Page 131	1 Withrow Networks, Inc. v. Google LLC 2 Matthew S. Goldman (#7463733) 3 ACKNOWLEDGEMENT OF DEPONENT 4 I, Matthew S. Goldman, do hereby declare that I 5 have read the foregoing transcript, I have made any 6 corrections, additions, or changes I deemed necessary as 7 noted above to be appended hereto, and that the same is 8 a true, correct and complete transcript of the testimony 9 given by me. 10 _____ 11 _____ 12 Matthew S. Goldman Date 13 *If notary is required 14 SUBSCRIBED AND SWORN TO BEFORE ME THIS 15 _____ DAY OF _____, 20____. 16 _____ 17 _____ 18 _____ 19 NOTARY PUBLIC 20 _____ 21 _____ 22 _____ 23 _____ 24 _____ 25 _____ Page 133

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[4 - adds]

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California Code of Civil Procedure

Article 5. Transcript or Recording

Section 2025.520

(a) If the deposition testimony is stenographically recorded, the deposition officer shall send written notice to the deponent and to all parties attending the deposition when the Original transcript of the testimony for each session of the deposition is available for reading, correcting, and signing, unless the deponent and the attending parties agree on the record that the reading, correcting, and signing of the transcript of the testimony will be waived or that the reading, correcting, and signing of a transcript of the testimony will take place after the entire deposition has been concluded or at some other specific time.

(b) For 30 days following each notice under subdivision (a), unless the attending parties and the deponent agree on the record or otherwise in writing to a longer or shorter time period, the deponent may change the form or the substance of the answer to a question, and may either approve the transcript of the deposition by signing it, or

refuse to approve the transcript by not signing it.

(c) Alternatively, within this same period, the deponent may change the form or the substance of the answer to any question and may approve or refuse to approve the transcript by means of a letter to the deposition officer signed by the deponent which is mailed by certified or registered mail with return receipt requested. A copy of that letter shall be sent by first-class mail to all parties attending the deposition.

(d) For good cause shown, the court may shorten the 30-day period for making changes, approving, or refusing to approve the transcript.

(e) The deposition officer shall indicate on the original of the transcript, if the deponent has not already done so at the office of the deposition officer, any action taken by the deponent and indicate on the original of the transcript, the deponent's approval of, or failure or refusal to approve, the transcript. The deposition officer shall also notify in writing the parties attending the deposition of any changes which the deponent timely made in person.

(f) If the deponent fails or refuses to approve the transcript within the allotted period, the

deposition shall be given the same effect as though it had been approved, subject to any changes timely made by the deponent.

(g) Notwithstanding subdivision (f), on a seasonable motion to suppress the deposition, accompanied by a meet and confer declaration under Section 2016.040, the court may determine that the reasons given for the failure or refusal to approve the transcript require rejection of the deposition in whole or in part.

(h) The court shall impose a monetary sanction under Chapter 7 (commencing with Section 2023.010) against any party, person, or attorney who unsuccessfully makes or opposes a motion to suppress a deposition under this section, unless the court finds that the one subject to the sanction acted with substantial justification or that other circumstances make the imposition of the sanction unjust.

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