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Waldorf, Maryland (301) 870-8025

1	UNITED STATES OF AMERICA
2	FEDERAL TRADE COMMISSION
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4	In the Matter of: )
5	Rambus, Inc. ) Docket No. 9302
6	)
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9	Friday, June 27, 2003
10	9:30 a.m.
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13	TRIAL VOLUME 37
14	PART 1
15	PUBLIC RECORD
16	
17	BEFORE THE HONORABLE STEPHEN J. McGUIRE
18	Chief Administrative Law Judge
19	Federal Trade Commission
20	600 Pennsylvania Avenue, N.W.
21	Washington, D.C.
22	
23	
24	
25	Reported by: Susanne Bergling, RMR
	For The Record, Inc. Waldorf, Maryland (301) 870-8025

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1	PROCEEDINGS
2	
3	JUDGE McGUIRE: This hearing is now in order.
4	Are there any housekeeping items we need to
5	pick up this morning?
6	MR. STONE: I don't believe so, Your Honor.
7	JUDGE McGUIRE: If not, you can continue with
8	your cross examination, Mr. Stone.
9	MR. STONE: Thank you, Your Honor.
10	JUDGE McGUIRE: Good morning, Professor. How
11	are you this morning?
12	THE WITNESS: Good, thank you.
13	MR. ROYALL: Could I ask for one moment? Our
14	computer is having another malfunction.
15	(Pause in the proceedings.)
16	JUDGE McGUIRE: All right, Mr. Stone.
17	MR. STONE: Thank you, Your Honor.
18	CROSS EXAMINATION (cont.)
19	BY MR. STONE:
20	Q. Good morning again, Professor McAfee.
21	A. Good morning.
22	Q. Is it correct that you were not able to tell us
23	based on the assumptions or understanding that you
24	performed what specific claims of any patent
25	applications or patents or what specific patent
	For The Record, Inc.

applications or patents in their entirety should have 1 2 been disclosed according to your understanding and 3 assumptions by Rambus to JEDEC? 4 Α. That's correct. 5 Is it also correct that you can't say as to a 0. 6 specific date when any particular disclosure should 7 have been made by Rambus to JEDEC? 8 Α. I think as I've already testified, I'm not in a 9 position to say what should have been done. In fact, 10 that --11 Q. Let me -- you are correct. Let me withdraw the question. Let me reframe it I think consistent with 12 13 what I have heard you say. 14 Based on the assumptions you have made, you're 15 not able to identify a specific date on which any particular disclosure should have been made by Rambus 16 17 to JEDEC. Is that correct? Well, I don't actually understand the 18 Α. 19 difference in that question. Again, you seem to be calling for a legal conclusion or at least a -- for me 20 to conclude what should have been done in terms of 21 disclosure, which was --22 23 Ο. Right. -- not my --24 Α. 25 Q. I don't mean to ask you that. If I did, I

wasn't clear enough. Let me try to reframe it again. 1 2 You have assumed certain things about Rambus' 3 conduct that has led you to -- that has provided the 4 basis for the opinions you've ultimately formed. 5 Α. That's correct. б 0. I'm just going to ask you about your 7 assumptions, not about any of the conclusions you've 8 formed. I'm just asking you in the course of 9 developing your assumptions, have you made assumptions 10 as to specific dates on which disclosures should have 11 been made by Rambus to JEDEC? 12 Α. I have not. 13 Okay. And have you assumed any particular Ο. 14 triggering event would have caused Rambus to be 15 obligated in some form or another to make a disclosure 16 to JEDEC? 17 No, I haven't assumed anything in the way of --Α. 18 other than the need -- other than there was a 19 requirement or a violation of the process that formed the basis for them to have misled JEDEC or 20 21 misrepresented their IP. 22 Ο. Thank you. 23 Have you assumed in connection with the JEDEC 24 process that when patents are disclosed to JEDEC, that 25 it will then request a RAND assurance or a RAND letter For The Record, Inc.

Waldorf, Maryland (301) 870-8025 1 be provided by the patent holder?

2 So, my understanding is -- what I've assumed is Α. 3 that in order to incorporate the disclosed intellectual 4 property, the -- a RAND letter was necessary, but 5 that -- I could conceive of circumstances where having б heard there was intellectual property, the -- JEDEC 7 decided not to pursue that avenue and didn't seek a 8 RAND letter, just went a different direction. That would not make a difference to my opinion. 9

Q. Have you assumed that if JEDEC was advised of patented technology that was contemplated to be included in a standard, that they would not include that patented technology in the standard without first requesting a RAND assurance from the patent holder?

15 That's my expectation. There is one example in Α. 16 the record I believe or in the trial testimony of a 17 company that was using the -- or at least as I 18 understand it was using the need for a RAND letter as a 19 way of slowing down the proceedings and that after some amount of deliberation, JEDEC decided that there wasn't 20 any actual IP and that this was, in fact, an attempt to 21 22 slow down the JEDEC deliberations, and so there is an 23 instance where they did not seek a RAND letter in the 24 end, but that was because they determined to their satisfaction that, in fact, there was no relevant IP. 25

And do you recall the name of that company? 1 Ο. 2 Not offhand. Α. 3 If I suggested to you that it was Echelon, Q. 4 would that refresh your recollection at all? 5 That sounds right. Α. б 0. Okay. And it was your understanding in that 7 regard, was it not, that as a matter of economics, 8 someone who provides information that might turn out to 9 be incorrect could impose costs on the system? 10 MR. ROYALL: Objection, vaque. I'm not sure what system is being referenced here. 11 JUDGE McGUIRE: 12 Sustained. 13 BY MR. STONE: 14 In regard to the testimony that you referred to Ο. 15 a moment ago about Echelon, was it your understanding 16 that some people thought that Echelon was giving notice 17 that they had intellectual property that applied to 18 certain technologies incorporated in a standard in an 19 effort to slow the standard-setting process down? That is a fair summary I think of my 20 Α. 21 understanding. 22 Okay. And would you agree that the conduct 0. that was at least suggested by some of the testimony 23 24 was the type of conduct that would impose a cost on the standard-setting process employed by JEDEC? 25

whose expectation is being referred to, JEDEC
 collectively or specific JEDEC members?

3 MR. STONE: Let me reframe.

BY MR. STONE:

4

Q. Is it -- have you assumed that when JEDEC is advised that certain technology that is proposed for incorporation into a standard is patented, that JEDEC will request a RAND letter or RAND assurance from the patent holder unless a determination is made that the technology is, in fact, not patented?

A. My understanding is that they -- if they are planning or considering incorporating intellectual property in -- patented intellectual property in a standard, that they won't do that without a RAND letter, and I think that answers your question.

Q. But I was trying to ask a question which also picked up the exception with regard to Echelon that we had talked about earlier, and can you give me a general statement of the policy that you have assumed exists that includes the exception for Echelon?

21 MR. ROYALL: Again, can I ask for clarification 22 as to what is meant by "exception for Echelon"? I 23 don't think the record is clear on that.

JUDGE McGUIRE: Yeah, I don't think it is, Mr.Stone.

1	MR.	STONE:	Sure.

2

24

BY MR. STONE:

Q. Let me ask it this way, Professor McAfee: Tell us, if you would, what you have assumed is JEDEC's policy or rules with respect to when they will request a RAND letter or RAND assurance be provided.

7 When they're planning to incorporate -- when Α. 8 JEDEC is planning or JEDEC members are planning to 9 incorporate -- proposing to incorporate intellectual property into a standard, they will request -- my 10 understanding is they will request a RAND letter or 11 they won't incorporate the intellectual property 12 13 without a RAND letter from the owner of that 14 technology.

15 Now, my understanding is that in terms of 16 Echelon, that because they didn't consider that Echelon 17 had intellectual property in spite of it -- Echelon's 18 statements, that that didn't violate their process, but 19 again, these are -- my assumption is that they will not 20 incorporate the technology that's patented or patent pending without a RAND letter. That's the nature of my 21 22 assumption. And I don't believe Echelon violates that. 23 Okay. Is it a correct statement, then, of your Ο.

assumption that if JEDEC determines that the technology

is, that they may proceed without requesting a RAND
 letter or RAND assurance?

3 A. Well, I think they did exactly that in4 Echelon's case.

Q. Okay. Let me ask you now, if I might, about the but for world that was the subject of some testimony yesterday, and maybe we can bring up DX-233 as a point of reference.

9 You talk in Exhibit -- you testified with respect to DX-233, I believe, that -- let me rephrase 10 I don't need to go back and repeat what you said. 11 it. 12 In the but-for world, you started with the 13 assumption of hypothetically, as you put it, that 14 Rambus did not engage in the challenged conduct that 15 you had described for us, correct? 16 I'm sorry, I was looking at the exhibit. Can I Α. 17 ask you to repeat?

18 Q. Certainly.

In setting up your construct of a but-for
 world, you assumed that Rambus had not engaged in the

1 RAND letter and did not provide it.

A. That's correct.

2

Q. If JEDEC had determined that the technology it sought to include was not patented, a third path could have been followed, which is that JEDEC would not have requested a RAND letter or RAND assurance, correct? A. I think it's correct that that third path -again, this is -- the assumptions about JEDEC are

9 assumptions and not -- and not economic conclusions, 10 but that at least seems plausible as a -- given my 11 reading of the case, it seems possible -- that is, the 12 possibility of that is plausible. That was a contorted 13 sentence.

14 Q. If JEDEC did not -- let me start again.

15 If JEDEC concluded that Rambus would not 16 ultimately be issued patents which would cover the 17 technology that JEDEC sought to incorporate into the 18 standard, it would be consistent with JEDEC's rules and 19 practice that it not request a RAND letter or RAND 20 assurance from Rambus as you have assumed those rules 21 or practices. Isn't that correct?

22 MR. ROYALL: Your Honor, I would object to this 23 line of questioning. Mr. Stone objected at the 24 beginning of the direct examination to anything beyond 25 very limited discussion of the nature of the

1 anyway, and we'll fight it out later if that -- if it 2 turns out -- the disclosure turns out to be right. I 3 did not consider that in constructing the but-for 4 world.

Q. As an economic matter, would it constitute in your opinion exclusionary conduct if JEDEC made a determination that it did not think patents would issue that covered the Rambus technology they sought to incorporate into the standard and for that reason did not request a RAND assurance or RAND letter?

11 MR. ROYALL: I'd ask for clarification. The 12 question is vague as to "exclusionary conduct." On the 13 part of who?

14 MR. STONE: I think --

25

15 JUDGE McGUIRE: We assume it's on behalf of 16 Rambus. Is that correct?

MR. STONE: I think that's the whole reasonwe're here, Your Honor.

19 JUDGE McGUIRE: That seemed pretty clear to me, 20 Mr. Royall.

21 MR. ROYALL: Okay, as long as that's -- as long 22 as that's the question, then it's fine.

23 JUDGE McGUIRE: That's well established at this 24 point.

THE WITNESS: Can I ask you to either read the

1 question back or to restate it?

2 MR. STONE: Would it be possible to have it 3 read back, Your Honor? JUDGE McGUIRE: Go ahead. 4 5 (The record was read as follows:) б "QUESTION: As an economic matter, would it 7 constitute in your opinion exclusionary conduct if JEDEC made a determination that it did not think 8 9 patents would issue that covered the Rambus technology 10 they sought to incorporate into the standard and for 11 that reason did not request a RAND assurance or RAND 12 letter?" 13 THE WITNESSn yonschsND

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1	BY MR. STONE:
2	Q. Okay, and let me follow up on that.
3	If JEDEC knew of the Rambus intellectual
4	property but was not advised of it by Rambus, and if it
5	made the determination that the patents would not issue
6	in such a way that they would cover the technology that
7	they sought to incorporate, and if they then concluded
8	not to request a RAND assurance or RAND letter, would
9	Rambus have engaged in exclusionary conduct in an

Somewhat like the median voter model. 1 Ο. 2 When I use "JEDEC," what I'm referring to is 3 the collective body as you understand it and have tried 4 to understand or model its behavior, if I might. 5 Α. Okay. б 0. With that clarification, which I hope addresses 7 the objection, let me see if I can pose the question this way: 8 If JEDEC was aware that Rambus had or 9 10 potentially could have intellectual property that might 11 be thought to potentially cover technology that JEDEC sought to incorporate into a standard, and if JEDEC 12 13 decided that the intellectual property would not result in issued patents that covered the technology it sought 14 15 to incorporate, and if it decided not to request a RAND 16 letter or RAND assurance, in your opinion as a matter 17 of economics, would Rambus' failure to disclose 18 intellectual property to JEDEC in that instance have 19 constituted exclusionary conduct? 20 Α. The beginning part of your hypothetical was if JEDEC was aware. Now, it turns out that economists

JEDEC was aware. Now, it turns out that economists are -- especially game theorists, that is the branch of economics devoted to the study of games -- are acutely troubled by terms like "aware," and the reason is there are various levels of "aware."

It's not -- it's one thing, for example, for 1 2 the members of JEDEC to independently have knowledge 3 but not be in a position to discuss it or not know that 4 others have the same knowledge. It may or may not be 5 possible through the deliberations of JEDEC for that --6 for that awareness or that knowledge to reach 7 consensus, and as a consequence, I can interpret your 8 question many different ways, and unfortunately, in 9 some of the ways I interpret it, the answer is yes, and 10 in some of the ways I interpret it, the answer is no. Q. Okay, let me try this: If a majority of the 11 JEDEC members who voted on whether or not to 12 13 incorporate the Rambus technology into the JEDEC standards knew that Rambus had potential patent claims 14 15 over that technology and if they concluded -- that is, 16 the majority who had this knowledge -- concluded that 17 Rambus wsotmcter isy7in issued patents which covered 18 that technology, and if on that basis JEDEC dimcter 19 request a RAND assurance or RAND letter from Rambus, wsotmcRambus' assumed failure to disclose constitute in 20 21 your opinion, as a matter of economics, exclusionary 22 conduct?

23 MR. ROYALL: Your Honor, I wsotmcobject to the 24 question as vague. The term "majority" is not defined 25 and the term "potential patent claims" is not defined.

1	JUDGE McGUIRE:	Overruled.
2	THE WITNESS: I	know what "majority" means.
3	So, again, that's rem	mains an incomplete

previously and that to some extent is summarized on 1 2 DX-147 included the need for JEDEC to arrive at a 3 consensus as to what features should be included in a 4 particular standard, correct? 5 Α. As it says, yes. б 0. And have you assumed that the decision to 7 include the four Rambus technologies that we've 8 referred to yesterday was the result of any action Rambus took to move JEDEC from other technologies to 9 10 those? 11 Can I have the question read back? Α. Yeah, it's a -- I haven't thought of a simple 12 Ο. 13 way to phrase this. Let me try a different way and see if I can get to my point. 14 15 I understand your opinion that -- your 16 opinion/assumption that had JEDEC -- had Rambus 17 disclosed to JEDEC, they would have moved from these 18 technologies to others, and I'm not asking you to 19 contradict that opinion. 20 Rather, I'm asking whether you have either 21 assumed or have formed an opinion that anything Rambus 22 did caused JEDEC in the first instance to select any one of the four technologies that we've identified as 23 24 Rambus technologies. 25 Α. I haven't made any assumptions in that regard,

economic opinion that it's your opinion that if JEDEC
 had never -- strike that.

3 Is it correct that as a matter of your economic 4 opinion, if Rambus had never joined JEDEC, there would 5 not be exclusionary conduct on Rambus' part? 6 Α. This is actually outside of my hypotheses, but 7 that seems correct, although I have to say I haven't actually -- I'm afraid of saying "yes" unambiguously 8 9 since I haven't really thought about this circumstance deeply; that is to say, certainly my reasoning falls 10 apart if Rambus were not a member of JEDEC. 11 Q. Okay, let me ask again, if we can just for some 12 13 context, bring up DX-145. 14 I want to direct your attention, if I might, to 15 the second bullet point, which is, "Open availability 16 of standard, " if I might. 17 Have you for purposes of the opinions you have formed assumed when standards would be made available 18 19 to the public; that is, JEDEC standards? 20 Α. I can't think of any assumption about when 21 other than prior to the deployment of the standard. 22 Actually, no, that's not fair. It's before the

23 deployment of the standard in the sense that 24 manufacturers of DRAMs and the related components need 25 access to the standard to experiment with it, to learn

about it, to test manufacturing, define problems, so it 1 2 would be prior to the deployment of the standard. 3 Other than that specifically, I haven't really 4 considered the question of when the standard is 5 available other than that it was openly available early б in some sense. 7 Q. And let me just explore that. 8 There is, as a matter of economics, value in 9 having access to the standard during the course of its development and before it becomes final, correct? 10 11 Α. Yes. And manufacturers, you've assumed based on what 12 0. 13 you understand from the record, manufacturers make use of that preliminary information in work that they do. 14 15 That is correct. Α. 16 If the preliminary versions of the standard 0. 17 were made available only to JEDEC members and not to 18 others, would that give an economic advantage to JEDEC 19 members? 20 Α. You didn't say who, but for -- that is, there 21 are some companies that would have an economic advantage from being in JEDEC, but there would be other 22 companies that would not. 23 24 If -- let me just assume hypothetically, if a 0. 25 company was a manufacturer of chipsets, controllers or For The Record, Inc.

1 motherboards and was not a member of JEDEC and did not 2 have access to preliminary versions of the standard, 3 would its competitors who were members of JEDEC have an 4 economic advantage by virtue of their JEDEC membership 5 if that membership resulted in them having access to 6 preliminary versions of the standard?

7 A. Potentially.

Q. Let me ask you about the fourth and fifth9 bullet points, implementation costs and manufacturing

1 evolutionary versus revolutionary.

2 As you use that term, have you formed a view as 3 to whether the switch or transition from EDO to SDRAM would be described as evolutionary or revolutionary? 4 5 A. I think evolutionary/revolutionary is a continuum. The switch from EDO to SDRAM was more 6 revolutionary than it -- than a switch from EDO to 7 burst EDO would have been, but less revolutionary than 8 9 a switch from EDO to RDRAM. So, was it revolutionary 10 or evolutionary? Well, it was more revolutionary than 11 going to the burst EDO, but not as revolutionary as other alternatives available at the time. 12

13 And that is assumption on my part in that I'm

Q. Now, as a matter of economics, there are 1 2 benefits perceived to result from innovation, correct? 3 Α. Generally, yes. 4 And as a matter of economics, we know that it's Ο. 5 that desire to further innovation that led to the 6 creation of the patent policy of the United States, 7 correct? MR. ROYALL: Objection, Your Honor, I think 8 9 this calls for a legal conclusion. 10 MR. STONE: I don't mean to do that. Let me 11 rephrase it. BY MR. STONE: 12 13 Q. It is correct, is it not, that the patent 14 system of the United States creates economic incentives 15 that will in many instances encourage innovation? 16 That's certainly consistent with the economic Α. understanding of patents; that is, the economic theory 17 18 of the patent system. 19 O. Okay. And is it also correct that economic 20 benefit can often be realized from revolutionary ideas? 21 A. I only have trouble with the word "often." 22 Q. Okay, let me take that out. Is it correct that economic benefit can be 23 24 realized from revolutionary ideas? 25 A. Yes.

Q. Okay. And is it also correct that you have
 concluded on prior occasions, such as in your book,
 that established manufacturers may sometimes prefer
 evolution to revolution?

A. So, now I'm only having trouble with "in your book," because I don't actually recall that passage, but I believe I testified here at trial that manufacturers may prefer evolution over revolution, other things equal.

Q. Okay. And it is correct, is it not, that sometimes in the context of economics, it has been concluded by economists such as yourself that outsiders who bring revolutionary ideas to an industry bring benefits that would not have necessarily been realized by the established industry's continued evolutionary progress?

17 A. Was the word "sometimes" in your question?18 Q. Yes.

19 A. Yes, then the answer is yes.

20 Q. Okay. Is it consistent with your economic 21 opinions that JEDEC would prefer evolution over 22 revolution?

A. Again, you've left out "other things equal." A sufficiently large gain in performance is going to lead to a preference for revolutionary, and an inadequately

large gain in performance would prefer evolutionary.
 So --

3 Q. Okay, thank you.

Let's pull up DX-132, if we could. I showed
you this yesterday, Professor McAfee, and I just want
to bring you back to it for a moment.

We talked about the sources of technology and I believe agreed that sometimes the technology can come from DRAM manufacturers, sometimes it could come from technology providers, such as Rambus, and it might on some occasions come from someone like Intel, correct? A. I don't believe we restricted it to that set, but those were members of the set.

Q. Okay. And in the context where the technology
is provided to the manufacturers by independent
technology providers such as Rambus, they -- there's a
price to be charged for that technology, correct?
A. Can I ask you to repeat your question or -Q. Sure.

Just as a matter of economics, when a technology provider that is independent provides the technology to a company that is a manufacturer, you would expect there to be a price for providing that technology.

25

A. I would expect a price, yes.

Okay. And in the context of the work you have 1 0. 2 done in this case, it would be consistent that the 3 price might be measured as a fixed fee plus a royalty, 4 and it also might be measured in other ways. 5 That's correct. Α. 6 0. When the technology is provided internally --7 that is, when a manufacturer develops technology and 8 provides it to itself -- does the manufacturer in that 9 case realize benefits from doing so even though it may 10 not be actually paying a price? Does it realize benefits from what? 11 Α. Developing the technology and making it 12 Ο. 13 available to itself. 14 Α. Yes. 15 And does the measure of those benefits depend Ο. 16 in part on whether it can charge a price to others for 17 the use of the technology? 18 If it is able to charge a price to others, it Α. 19 would benefit insofar as it collected revenue from 20 others; that is, the company that had the technology would benefit insofar as it collected revenue from 21 22 others. And can the company also realize the benefits 23 Ο. 24 of the technology it has developed through obtaining a 25 lead in manufacturing; that is, getting a time

advantage? Let me rephrase it. That seems to be not a
 well-framed question. Let me try again.

Are there ways in which a vertically integrated manufacturer can realize economic benefits from its internal development of technology other than by charging a price to other companies for the use of the technology?

8 Α. Well, we've already spoken about they might use 9 it in their own operations, and so, yes, they could 10 have an advantage in using it in their own operations, but -- and -- but we had already spoken about that. 11 Are you asking me about yet another kind of advantage? 12 13 Q. Let's start with just confirming that one way 14 they could realize an economic advantage is by the use 15 of the technology.

16 A. Yes.

Q. Could they also realize an economic advantage if they were able to patent the technology by using it in cross-licensing negotiations?

A. I expect that -- well, at least in principle --I'm sure there are circumstances where companies have used technologies that they have developed to gain an advantage in cross-licensing arrangements in a way that was advantageous to the company. In fact, I think Mr. Appleton testified approximately to that in the case of

Micron, if I understood the question properly, which I
 think I did, but --

3 Q. Okay. And I'm asking you simply as a matter of 4 economics -- I'm not asking you to remember Mr. 5 Appleton's testimony specifically or not or agree with it or not -- but just as a matter of economics, is 6 7 there economic value in obtaining patents on internally 8 developed technology because they give you benefits in 9 licensing or cross-licensing negotiations? 10 Yes, and in fact, I think my book discusses Α. examples of this as well. 11 Q. And are there also benefits to patenting 12 13 internally developed technology in that you may thereby 14 be able to prevent others from utilizing it? 15 Yes, in principle. Again, not -- it's not Α. 16 always the case, but in principle, that's correct. 17 Q. Okay. And are there economic advantages in being able to participate -- let me strike that. 18 19 Are you familiar as a matter of economics with 20 patent pools? 21 Α. Yes, but I've made no special study of them, but I'm at least somewhat cognizant of them. 22 23 Ο. Okay. And is one of the benefits that may be 24 realized by a company that internally develops technology and patents is that it is able to thereby 25

gain admission, if you will, to a patent pool? 1 2 Α. In principle. 3 JUDGE McGUIRE: All right, now, for the Court's 4 own edification, I need some explanation as to what 5 constitutes a "patent pool." б MR. STONE: Certainly. BY MR. STONE: 7 Professor McAfee, subject to the qualifications 8 Ο. 9 you provided us earlier, would you provide us a general 10 description of a patent pool? 11 A. Companies may in some sense join together or agree not to -- to allow each other's intellectual 12 13 property to be used by all the members of the pool, and 14 that way they eliminate threats of lawsuits and the --15 well, I want to charge you this for this, you charge me that for that and that sort of thing. That's my 16 17 understanding of a patent pool, but this is not 18 something I've made a specific study of. 19 JUDGE McGUIRE: That's all right, that's good 20 enough. That gives the Court some context to the 21 question. 22 Thank you, Your Honor. MR. STONE: BY MR. STONE: 23 24 Let's go back, if we can, to DX-147. Q. 25 Again -- and I am going to ask you simply to For The Record, Inc. Waldorf, Maryland (301) 870-8025

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confirm an assumption that I think we talked about 1 2 yesterday -- you have assumed that JEDEC will not 3 include patented technology in standards it adopts 4 without, at a minimum, first being given a RAND letter 5 or RAND assurance. Is that correct? б MR. ROYALL: Your Honor, I would object to this 7 as asked and answered now several times. I don't see the point in going back over it. 8 9 JUDGE McGUIRE: Sustained. BY MR. STONE: 10 11 Q. Let me just go to the next question, then,

12 Professor McAfee.

1	BY MR. STONE:
2	Q. As a matter of economics, you have considered
3	external restraints on behavior, correct?
4	A. The I don't know what the phrase
5	"external constraints on behavior" means something to
6	me, but I'm just concerned that it may mean something
7	different to you, because it's just an odd choice of
8	phrase. I mean, I think of things like budgets as
9	being external constraints on behavior, and yes, we do
10	consider the effects of that kind of external
11	constraint on behavior.
12	Q. And and I'm sorry, did I interrupt you?
13	A. And laws, lots of things are external
14	constraints on behavior. So, yes, we do consider them.
15	Q. Okay. And one of the things economists
16	consider is that laws from time to time impose
17	constraints on behavior, correct?
18	A. Yes, economists do consider that on occasion.
19	In fact, there's an entire area of economics called law
20	and economics which studies the interaction of the two.
21	Q. Okay. And have you for purposes of the
22	opinions you've formed here considered whether there
23	are any legal constraints that would prevent JEDEC from
24	prohibiting the use of patented technology in standards
25	unless a RAND letter or RAND assurance has been

1 received?

2

5

A. I'm sorry, I need that read back.

3 JUDGE McGUIRE: Could the court reporter please 4 read that question back?

(The record was read as follows:)

6 "QUESTION: And have you for purposes of the 7 opinions you've formed here considered whether there 8 are any legal constraints that would prevent JEDEC from 9 prohibiting the use of patented technology in standards 10 unless a RAND letter or RAND assurance has been 11 received?"

12 THE WITNESS: I have not considered whether 13 there are -- there's a legal prohibition. In fact, I 14 think I stated that I assumed JEDEC was requiring such 15 a RAND letter, and so I did not consider whether there 16 was a law that would have prohibited JEDEC from 17 actually making that requirement.

18 BY MR. STONE:

19 Q. If there were a law that prohibited JEDEC from 20 imposing such a requirement, would that impact your 21 conclusion?

22 MR. ROYALL: Your Honor, I think this question 23 does inherently ask for a legal conclusion.

24 MR. STONE: No, I --

25 JUDGE McGUIRE: Overruled. I don't think it

1 does.

2 THE WITNESS: Well, it would -- as I understand 3 the question, that is, there's a law prohibiting one of 4 my assumptions. That would mean my assumption was 5 violated, and hence, it could have an impact on my б conclusion, because I had assumed that JEDEC would --7 well, at least the conclusions that depend on JEDEC's 8 requirement of the RAND letter, which in particular we 9 use in exclusionary conduct conclusions, it would have 10 an impact, yes.

11 BY MR. STONE:

12 Q. In the course of your work in connection with 13 this case, you have been provided information by 14 complaint counsel, correct?

check your assumptions to some extent, correct? 1 2 Α. Yes. 3 And I want to ask you about this assumption Q. 4 that JEDEC would not allow patented technology to be 5 included in a standard without receiving a RAND letter or RAND assurance in terms of the factual checking б 7 vou've done. That's the focus of my question. 8 If we could turn to Exhibit RX-1211, if we 9 might, and Your Honor, may I approach and --10 JUDGE McGUIRE: Yes. 11 BY MR. STONE: I'm directing your attention to what's been 12 Ο. 13 marked as RX-1211, which is a JEDEC publication, JEP21-H, and I want to ask you to turn, if you would, 14 15 Professor McAfee, to the last page, page 20 of this 16 document, and I'm going to direct your attention 17 specifically to the third paragraph under the heading 18 Notice. 19 You'll note here that it says -- and I really 20 am focused just on the first sentence -- "JEDEC 21 Standards are adopted without regard to whether or not 22 their adoption may involve patents on," I think it should read instead of or, "articles, materials or 23 24 processes." 25 Do you see that sentence?

1 A. I do see that sentence.

Q. Is that sentence -- and I know I'm asking you to look at it alone -- but is that sentence consistent with the assumption you have made about JEDEC's prohibition on the inclusion of patented technology unless a RAND letter or RAND assurance has been provided?

A. I don't understand this sentence to be inconsistent. It certainly is not corroborative or supportive, but I don't understand it to be inconsistent in -- but it's not very specific, and so it's not corroborative of my understanding of the JEDEC rules.

14 Q. It makes no mention of any requirement of a 15 RAND letter or RAND assurance before patented 16 technology is included, does it?

17 A. It does not.

Q. Did you assume for purposes of your work in this case that when JEDEC did adopt the SDRAM standard that we've talked about, that products manufactured in accordance with that standard would not infringe any patents?

A. As I understand your question, my assumption is
actually that when products were manufactured would
violate Rambus patents. So, yes, I did assume that

1 they would violate patents, just not that that was 2 generally known.

Q. Let me reframe it. Undoubtedly my fault again.
Did you assume that when JEDEC adopted the
SDRAM standard, that JEDEC believed that products
manufactured in accordance with that standard would not
infringe any patents?

A. No. In fact, my understanding is there are basically semiconductor patents held by TI that -- in order to manufacture any kind of basic semiconductor device, and there may be other such patents that would apply essentially to any kind of semiconductor manufacture.

Q. Okay, let me see if I can take that intoaccount in framing my question.

Did you assume for purposes of the opinions you have expressed in connection with this case that when JEDEC adopted the SDRAM standard, it believed that products manufactured in accordance with that standard would not infringe any patents that would apply to SDRAMs specifically but not to all semiconductors?

22 MR. ROYALL: Your Honor, could I ask for 23 clarification in questions like this that when Mr. 24 Stone is referring to JEDEC, he's referring to all 25 members collectively or some kind of clarification so

1 aware of any such patents, but it was not important to 2 my -- to my opinion.

Q. If there were patents that JEDEC was aware of that applied to SDRAM and not to EDO, and if JEDEC did not request RAND letters or RAND assurances with respect to those patents, would that have an impact on your opinions?

8 Α. Well, it would certainly have an impact on the 9 assumption that JEDEC requires a RAND letter, and tracing that through, it would then have an impact on 10 11 the opinions that arose based on my understanding that JEDEC requires a RAND letter. So, potentially, 12 13 although what you've described is actually something that was factual that I didn't assume one way or the 14 15 other, but it would have an impact on my -- on the 16 credibility that I place on one of my assumptions.

Q. Okay. And the assumption whose credibility it might cast doubt on would be the assumption that JEDEC would insist on a RAND letter or RAND assurance before it would include patented technology in a standard, correct?

A. As I -- I understood your question to ask me what if there were other patents that they didn't ask a RAND -- request a RAND letter for, yes, it would -- it would raise red flags on that hypothesis -- on that

1 assumption.

2 Q. Did you consider as part of your factual 3 assumptions that JEDEC was aware when it adopted the 4 SDRAM standard that Motorola had a patent that applied 5 to SDRAM?

A. As I sit here today, I vaguely recollect
something about a Motorola patent, but I don't actually
remember the details, and so I just don't recall.

9 Q. And did you as part of the assumptions you made 10 assume that JEDEC was aware that Hitachi had a patent 11 that applied to SDRAMs that was known to JEDEC at the 12 time the SDRAM standard was adopted?

A. Again, I don't recall the specifics. I think I've already testified that I don't recall any patent -- I didn't recall any patents that applied to SDRAM and not to EDO, and I just don't -- I don't recall anything further about that.

18 Q. Let me just see if I might -- no, I won't do19 that.

20 Let's move to DX-154, if we could bring that 21 up.

You used a power plant and a coal mine as an example of hold-up in your testimony I believe a couple days ago, correct?

25 A. Yes.

1 where they hit the output price, that would shut it 2 down?

A. That would shut it down, yes.

Q. And the solution -- one of the solutions you
talked about in the context of the coal example was to
enter into a long-term contract --

7

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A. Pardon me, I need to amend my previous answer.

8 That's the Principles of Economics 101 version 9 of the story; that is to say, a plant shuts down when 10 the price reaches the average variable cost, but option values actually amend that answer and complicate it, so 11 that is to say, if there -- if there are, say, for 12 13 example, sunk costs associated with shutting down or costs associated with restarting the plant once it's 14 15 shut down, then the decision won't be at that point, 16 but yes, the first path of the decision is that point. 17 I'm sorry to be pedantic about this, but this is 18 something that I teach.

Q. That's all right, I just need a moment to readthe answer again, if I can. Okay.

And one of the ways you testified that the scenario you've described as hold-up can be avoided is by signing a long-term contract before the plant is built.

25 A. That is correct.

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Q. And of course, there are inherent problems that
 you've written about and others have written about with
 long-term contracts.

4 A. That's correct.

5 Q. Which may impose costs on one party or the 6 other that they didn't anticipate.

A. For example.

Q. Okay. And of course, in your hold-up example, one other constraint on the price that could be charged by the coal mine is the cost of transporting coal from a more distant mine to this location.

A. That's -- yes, that's correct.

Q. Okay. Now, directing you back to the technologies at issue here, DRAMs, you would expect as a matter of economics, wouldn't you, that DRAM manufacturers, in considering whether to develop processes to manufacture RDRAM or SDRAM or SLDRAM, would make some assessment of the costs and potential revenues to be realized from each of those decisions?

A. I would.

Q. And as a matter of your understanding of the DRAM industry, you understand that some companies chose to develop the capability to manufacture not just SDRAM, but also RDRAM.

25

7

12

A. I do understand that companies developed the

1 For purposes of your economic opinions that 2 you've expressed in connection with this case, you made 3 certain assumptions about the size of specific 4 investments, correct? 5 Α. Yes. б Ο. And those would be the investments that would 7 be specific to a particular choice of technology, 8 correct? 9 Α. That's correct. 10 Ο. And they include things such as the design costs associated with that particular technology, 11 12 correct? 13 They do. Α. 14 And the development of masks peculiar or unique Ο. 15 to that technology? 16 That's correct. Α. 17 And any testing or qualification processes 0. 18 unique to that technology as well? 19 Α. Those are included. 20 Ο. Are there other categories of costs that you 21 have included in these specific investments that are 22 related to a choice of a particular DRAM technology? 23 Yes, there are costs -- the same kinds of costs Α. 24 associated with other components that work with the 25 DRAM.

Q. So, that would be costs associated with memory
 controllers, motherboards, chipsets and BIOS?

3 A. For example.

Q. And would you agree as a matter of your economic analysis that the costs we have just described as specific investments are incurred in either greater or lesser amounts, but the same category of costs are incurred when a change is made from SDRAM to DDR?

9 A. Well, so, my understanding is that when you go 10 from SDRAM to DDR, minimizing those kinds of costs is 11 part of the design problem faced in choosing DDR.

12 Q. But the same -- but the category of costs are 13 still incurred. Is that correct?

14 A. The category are incurred, yes.

Q. Okay. And the category of costs, again, in greater or lesser amounts, also are incurred when you make transitions from, for example, PC100 SDRAM to PC266 SDRAM. Is that your understanding?

A. Yes, again, the category are incurred, although my understanding is that the size of those costs are -are substantially less than, say, going from EDO to SDRAM.

Q. And in determining the size of the costs, what you have done is relied on information that you've been provided by others, either through the trial testimony,

deposition testimony or your interviews or documents 1 2 you've read. Is that correct? 3 A. Ultimately -- yes, I'm not the original source 4 of any of the data. 5 Q. And have you taken the data that you've 6 received from others and prepared any sort of 7 quantification of the costs by category for different 8 transitions from one technology to another? 9 A. I did not -- yes, I did not. Sorry. 10 Actually, when you reach a convenient stopping point, I would like to use the restroom. 11 Q. Now would be fine. 12 13 JUDGE McGUIRE: Well, I guess this is a good 14 time. Let's take a ten-minute break. 15 (A brief recess was taken.) 16 JUDGE McGUIRE: Back on the record. 17 Mr. Stone, you may proceed. 18 MR. STONE: Thank you, Your Honor. 19 BY MR. STONE: 20 Q. Could we bring up DX-223? I guess I don't

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2

another are greater than the costs that a DRAM
 manufacturer incurs in changing from one interface
 technology to another?

A. The costs of changing a DRAM standard -- I'm
sorry, I am going to need that hear that again.

6 Q. Certainly. Let me try to back up a little bit.

7 One of the things you talked about as part of 8 your opinion is that there would be costs that would be 9 incurred if JEDEC chose to change its standards to 10 eliminate the four Rambus technologies that you have 11 talked about, correct?

12 A. That's correct.

13 Q. And in assessing those costs, you haven't,

A. The cost of removing the four technologies -the question is would the cost of removing the four technologies be less than switching from SDRAM to RDRAM? My understanding is that the answer to that is yes.

Q. And is it your understanding or have you made an assumption -- and if not, that's fine -- that the costs associated with changing from one process technology are greater than the costs of changing from one interface technology to another?

A. What's the -- what specifically do you mean by a "process technology"?

Q. All right, you are familiar with the manufacturing processes that are often referred to in terms of the number of microns?

16 A. Yes.

Q. Okay. Have you assumed one way or the other or not assumed at all that the costs of switching from one process technology to the next are greater than the costs incurred in switching from one interface technology to another?

A. So, my understanding is that the costs of changing an interface technology tend to be greater because they're -- at least their total costs, because they are industry-wide, they include all the other

components, whereas the cost of a die shrink is pretty
 much within the manufacturer and does not spread out
 through the rest of the industry.

Q. Would it be inconsistent with the assumptions you have made if the facts turned out to be that the costs of changing from one process technology to another are greater than the costs of switching from one interface technology to another?

9 A. Well, the costs to whom, the total industry 10 costs or the costs to the manufacturer?

11 Q. Fair point.

12 Would it be inconsistent with the assumptions 13 you've made if the facts turned out to be that the 14 costs to a DRAM manufacturer of switching process 15 technologies were greater than the costs of switching 16 interface technologies?

A. No, I've made no assumption about the costs of the process technology, so it wouldn't matter if that was more or less.

Q. In your understanding of the DRAM industry, howoften are process technologies changed?

A. Eighteen months, two years, something in thatneighborhood.

24 Q. If we could bring up 226.

25 One of the things you spoke about yesterday, I

believe, were barriers to entry, and DX-226 was a
 demonstrative you used in connection with that,

3 correct?

4

A. That's correct.

Q. Let me ask you about scale. Does the scale
factor apply to a new entrant in the technology market?
A. You know, I don't know the answer to that.
It's an interesting question, but I don't know the
answer to it.

Q. Were the barriers to entry that you talked
 about yesterday --

A. Actually, can I add one more thing to myanswer?

14 Q. Certainly.

15 There's certainly the cost of developing Α. technologies that -- there are certainly some scale 16 17 economies to developing technologies, so I think the 18 answer to the question is actually yes, especially if 19 you want to test the technology -- that is to say, you 20 want to see how it implements -- and you would actually need to have some kind of silicon manufacturing 21 facilities, and that would actually create quite a 22 scale economy. The -- yes, so I think there was 23 24 probably a scale economy in the technology markets. 25 Q. When you talked yesterday about barriers to

1 entry and used DX-226 to help illustrate your

2 testimony, were you referring then to barriers to entry

3 in the DRAM manufacturing business?

A. When I used scale, I was referring to the DRAM
5 manufacturing business.

Q. And when you used sunk costs, were youreferring to the DRAM manufacturing business?

- 8 A. Yes.
- 9 Q. And when you used strong learning curve, were

license and 50 percent of the industry rejected the
 license, went ahead to manufacture the products,
 infringing the patents.

4 If that scenario occurred hypothetically, would
5 you have the same difficulty in reaching agreement
6 about a new standard that you testified to yesterday?
7 A. Yes.

Q. Don't all of the manufacturers have an interest
9 in developing standards which will be less costly in
10 terms of the payment of royalties?

A. If we're referring to the question of the ease of reaching agreement, so that this is something that is an ex ante/ex post question, there are issues in my mind, and your question doesn't specify that.

Q. Okay. Assume the situation where 50 percent of the market has taken a license and 50 percent has rejected the license, and an organization that includes all of them as members is confronted with the question of whether to adopt a standard which removes the infringing features. Can you assume that?

21 A. Yes.

Q. Wouldn't all of the manufacturers, those that are paying royalties and those that are in litigation, have an interest in seeing a standard developed that did not incorporate the patented technologies?

The answer is not necessarily, and it depends 1 Α. 2 on other unspecified hypotheses. 3 Okay. And have you made a study in the Q. 4 circumstances of this case as to whether the interests 5 of the 50 percent that are licensed and the 50 percent 6 that are not licensed are all consistently in favor of 7 adopting a standard that eliminates the patented technologies? 8 9 I have actually investigated this question, but Α. I have not reached a conclusion on that question; 10 however, that does not overturn my conclusion that it 11 would nonetheless be a challenge given the differences. 12 13 And that challenge -- let me strike that. Ο. 14 Let's pull up DX-158. 15 You've testified previously about various mechanisms that an organization might take to reduce 16 17 the risk of hold-up ex ante, correct? 18 Α. Yes. 19 0. And you have testified to that as a matter of 20 economics? 21 Α. Yes. 22 Let me ask you about it as a matter of economic 0. theory, if I might. 23 24 The first bullet point on DX-158, IP disclosure 25 commitments, as a matter of economics, you said if we For The Record, Inc.

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1 can tell everyone who participates in the

2 standard-setting process that they need to disclose

3 whatever the pertinent intellectual property is to us,

4 that would be one way to mitigate the risk.

5 A. Yes.

Q. And you mitigate the risk most completely if
you tell every company that they have to tell you about
all of the IP they have.

9 A. All of the relevant IP, yes.

10 Q. All of the relevant IP.

11 And the mitigation you achieve is less if you 12 limit the disclosure obligation simply to the knowledge 13 of the representative at the meeting.

14 A. That's correct.

Q. And if some companies are very large and have many employees, there might, as a matter of economics, be a lot of knowledge that is not held by the representative with respect to relevant IP.

19 A. That's correct.

Q. Similarly, if you're a company that does most of its research and development in another country and if your representative to the organization is not part of the same location or even in the same country where the research is done, they might have less knowledge than the company as a whole.

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A. I'm not sure I see what the other country has to do with it, but if the representative was not part of the research effort or not connected to the research effort of the company, the representative might not deal with a higher number of disclosures because
 there's more -- different technologies being
 considered? That's not clear. Let me see if I can
 draw a picture.

If we assume the funnel that you talked about 5 6 yesterday, and if at the beginning of the process there 7 are five technologies under consideration, and if as we 8 go forward that narrows down to three and then to one, 9 there are costs associated with requiring some 10 disclosure of pertinent intellectual property at the 11 point in time when there are five technologies proposed 12 that are greater than the costs when there are just 13 one, correct?

14 I'm not sure I agree with that proposition, and Α. 15 it depends on the nature of the winnowing process. Ιt 16 may be that if it's easy to project some of the 17 alternatives just because someone says, well, there's 18 IP on this particular alternative, you've actually had 19 a net savings in the deliberation costs, and so I --20 I'm not testifying that that's always the case. It's, 21 rather, that it's not clear to me one way or the other 22 which is the expedient way to do the winnowing process. I appreciate that answer. Let me see if I can 23 Ο. 24 clarify my point.

25

It could vary from organization to organization

whether there was a net benefit in requiring disclosure
 early as opposed to waiting and imposing an obligation
 to disclose later.

4 A. Absolutely.

Q. Okay. Have you performed any analysis of which -- have you performed any analysis of JEDEC's actual costs and benefits in an effort to determine what would be the economically efficient disclosure standard for it to impose?

10 A. No.

A. I have not investigated the efficiency of
 JEDEC's procedures and rules.

Q. Have you formed any opinion as a matter of economics one way or the other as to whether were an organization to require disclosure of patent applications, that procedure would be economically beneficial or not?

8 Α. Well, I think as I testified, these have 9 been -- all of these disclosure requirements that were 10 on the slide which is now off the projector, which could be done to various degrees, they have costs and 11 benefits, and as I understand the question you've just 12 13 asked me, yes, I'm aware of costs and benefits to these, and I haven't actually tried to -- attempted to 14 15 perform any kind of cost-benefit analysis for 16 JEDEC's -- the design of JEDEC's rules.

Q. Okay. Let me ask you about the testimony you gave yesterday, which I think was in your considered judgment, Rambus might have issued a RAND letter if it had been requested to do so. Is that a fair summary of that line of testimony?

A. It might have. I guess that's why I explored both branches of the tree, as to -- I didn't come to the conclusion that it would not have. That was actually what I judged to be more likely, but -- but it

1 might have.

2 Q. I want to ask you about that. Bring up, if we 3 could, DX-234.

You used DX-234 to illustrate some of your
testimony about the reasons why your considered
judgment was that it would be more likely that Rambus
would not issue a RAND letter than that it would,
correct?

9 A. That's correct.

As a matter of economics, when the question was 10 Ο. posed as to whether or not to provide a RAND letter, 11 you would assume, would you not, that whatever 12 13 knowledge JEDEC had about alternatives to the use of 14 the Rambus technology would also be known to Rambus? 15 Well, most of them. I don't know about all of Α. them, but generally that would be my starting point. 16 17 O. And one of the risks that Rambus would need to 18 consider in deciding whether or not to issue a RAND 19 letter is whether or not JEDEC would adopt a

20 non-infringing alternative technology, correct?

A. That would be one of the things they wouldconsider.

Q. And in that regard, as a matter of economics,
do you assume that their calculation of that risk would
be the same as what JEDEC's calculation of that risk

1 would be?

A. I wouldn't assume it was the same, but I would probably assume what's known as an unbiased -- that it was unbiased, which is to say if it's different, it's not different in any particular direction. It's just there may be -- it may be different, but correct on average -- or it's the same on average rather than correct.

9 Q. If Rambus had been requested to provide a RAND 10 letter or RAND assurance and if it had concluded that 11 in the event it did not it would be likely that JEDEC 12 would adopt competing or alternative technologies that 13 were not infringing, there would be economic benefits 14 to Rambus in giving a RAND letter, correct?

A. Well, there -- again, it -- there would be costs and benefits in giving a RAND letter, but you're now asking me about the heart of why I was unable to determine that it would not issue a RAND letter.

Q. And so let me just -- I'm asking you not about net benefit or net costs at the moment. I'm trying to identify that both exist.

At the time -- let's assume hypothetically, as you have, that Rambus was asked for a RAND letter, and if there was a risk that noninfringing alternatives might be adopted by JEDEC, there would be some benefits

1 to Rambus in providing a RAND letter, correct?

A. Yes.

2

Q. And as a matter of economic theory, there might
be costs to Rambus in providing a RAND letter, correct?
A. There might be costs.

Q. And the costs would be, in terms of categories,what?

8 Α. Well, the costs of issuing a RAND letter are 9 things that are listed on this slide, in particular 10 that it -- not issuing a RAND letter might help RDRAM 11 succeed by delaying the JEDEC standard-setting process. It would -- by not issuing a RAND letter, they would --12 13 if the technology were still to be adopted, Rambus would then be able to charge what it wanted to 14 15 discriminate and so forth. So, there would be these 16 sorts of considerations.

Q. But as to the latter consideration, haven't you assumed that the technology would not be adopted if Rambus refused to provide a RAND letter?

A. I do not think the technology -- yes, I have assumed the technology would not be adopted, at least in this -- in this context.

Q. So, for purposes of your economic opinions
here, the only cost to Rambus of issuing a RAND letter
would be that they might not obtain some benefit for

1 the future success of RDRAM.

2 Well, I guess the way I tend to think about Α. 3 this is I rarely think of anything as certain, and I 4 think about this in terms of probability. So, when I 5 say that JEDEC wouldn't include the IP, I mean it's --6 that's their requirement. Is there no chance that 7 there would be infringement? I don't make that -- I 8 don't draw that conclusion, that is to say, 9 particularly.

10 There might be another patent that's held by Rambus that is not one of the four technologies which 11 is then infringed. This has also gone beyond my --12 13 it's now -- it strikes me as it's going into facts rather than -- and legal opinions even, which I'm not 14 15 trying to draw, but I guess the full answer to your 16 question is is that I tend to think about these things 17 as being probabilistic rather than certain, and that 18 means there may be small advantages just on the -- on 19 other branches of the tree that aren't actually listed 20 on the slides.

Q. And I'm trying not to call for legal conclusions or even fact issues. I'm only trying to call for your economic opinions. I may not always succeed in asking the question that way, but that's my goal.

As a matter of economic opinion, have you formed an opinion as to whether it would have been in Rambus' economic interest to issue a RAND letter if it had been requested to do so?

5 I'm not in a position actually to make that Α. 6 determination, and if I thought it was really in 7 Rambus' interest to issue a RAND letter or fully -that is to say, it was decidedly in their interest to 8 issue a RAND letter, then I would have testified that I 9 10 felt that were the likely outcome, but I -- I -- this involves a lot of trade-offs in the sense of what's the 11 likelihood that RDRAM succeeds in being the dominant 12 13 memory, what's the likelihood that JEDEC standards 14 infringe. I'm not in a position to assess those 15 probabilities as of the time that's relevant for this 16 assessment, and so I can't say one way or the other.

Q. Once it became well known to JEDEC that Rambus claimed that it had patents which covered products manufactured in accordance with JEDEC's standards, was -- as you understand the policy and as you have assumed it -- JEDEC required to then request a RAND letter or RAND assurance from Rambus?

A. You mean in the year 2000?
Q. The year 2000 would be fine for purposes of
that question.

A. I don't know what JEDEC -- the JEDEC process or
 rules require. The testimony that I -- again, this is
 a fact issue, I think, that I haven't needed to rely on

Q. Okay. The -- we talked yesterday about the dates for SDRAM and DDR SDRAM on which you would have expected a negotiation to occur, but I want to be clear about the DDR SDRAM ex ante negotiation, if I might.

Is it your -- is it part of your opinion that the hypothetical ex ante negotiation that would have occurred with respect to DDR SDRAM would have occurred before or after Rambus sent its formal letter of withdrawal to JEDEC in June of 1996?

10 My hypothetical is that at the time that the Α. technology was being -- so, let me remind myself of the 11 hypothetical. The hypothetical is Rambus has 12 13 disclosed. At the time of the disclosure -- the disclosure occurs when they're discussing the relevant 14 15 technology, so it's the dual edge clocking. At the 16 time of the disclosure, when they're discussing dual edge clocking -- actually, so that's an interesting 17 18 question.

I wouldn't have expected the disclosure -- the negotiation to occur until they reached a point where they were considering actually incorporating dual edge clocking into the standard, and that might have happened after Rambus had already left.

Q. Okay. In any event, any analysis we make today of how the negotiation would have occurred in the past

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1 is something that economists struggle with in various 2 contexts from time to time, correct?

3 A. That's correct.

Q. And in the patent context, for example, 4 economists often are called upon to express their 5 opinion as to what a reasonable royalty would have been б 7 had a negotiation occurred at an earlier point in time. MR. ROYALL: Objection, Your Honor, that he has 8 9 any foundation to say what economists are asked to do 10 in the patent context. 11 MR. STONE: Let me reframe.

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1 occurs.

2 I am familiar with that fact. Α. 3 And you are familiar with the fact that in the Q. 4 context of patent litigation, courts are often called 5 upon to decide what a reasonable royalty would be. б Α. Yes, but you're reaching the limit of my 7 knowledge. 8 Q. Okay. Have you as an economist ever looked at 9 the question of how you would determine what a 10 reasonable royalty would be based upon a hypothetical negotiation that occurred at an earlier point in time? 11 The answer is yes, but I haven't -- it's quite 12 Α. 13 recent, but I have not attempted to apply it to this 14 case -- what I learned to this case. 15 Q. Okay, but you're familiar -- are you familiar 16 that there's sort of an established methodology, 17 sometimes referred to as the Georgia Pacific 18 methodology, for making such a determination? 19 Α. I have seen reference to that. 20 Q. Okay. 21 Your Honor, at this time I need to go to some 22 of the in camera information, and I am going to work on my questions, as well. 23 24 JUDGE McGUIRE: Okay, and I'm just kidding. 25 MR. STONE: I understand.

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JUDGE McGUIRE: I have heard bad questions from both sides.

	3	All right, again, to those in the audience, by
	4	prior court order, it's been determined that the
	5	evidence we are about to take on the testimony is
	б	confidential, and as a consequence, this part of the
	7	hearing will be closed to the public. So, I'll ask all
	8	of you in the audience that are not otherwise cleared
	9	to have access to this information to please vacate the
	10	courtroom, and I'll ensure that you're advised when
	11	we're done with this portion of the proceeding.
	12	UNIDENTIFIED SPEAKER: Your Honor, I just
	13	wondered if you had any idea whether that would be
	14	before or after lunch.
	15	JUDGE McGUIRE: I'm sorry1sRE: hetw5esas your
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9	12	MR. STONUIRE:ting wire nch.
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1 follows.)

2 MR. STONE: No further questions, Your Honor. 3 JUDGE McGUIRE: Okay, very good. It's ten 4 until 12:00. I quess this would be a good time then to break, unless, Mr. Royall, you wanted to proceed with 5 6 your questioning. I have no idea how much time you're 7 going to be spending on this witness. 8 MR. ROYALL: I do think breaking now might help me to assess that. I don't think I'll need to go too 9 10 long, but I could see it taking an hour and a half 11 maybe. JUDGE McGUIRE: Well, then --12 13 MR. ROYALL: Please don't hold me to it. My 14 estimates haven't been so accurate in the past. 15 JUDGE McGUIRE: It's ten to 12:00. Why don't we return back at guarter after 1:00. Hearing in 16 17 recess. 18 (Whereupon, at 11:50 a.m., a lunch recess was 19 taken.) 20 21 22 23 24 25

from your testimony earlier in the past few days? 2 Α. Yes. 3 Ο. And this slide relates to certain 4 anticompetitive effects that in your economic -- that 5 you have concluded from the standpoint of economics 6 have either been caused or have been threatened by Rambus' conduct? 7 8 Α. Yes. 9 The third bullet refers to the threat of higher Ο. DRAM prices, and I'd like to ask you a couple of 10 11 questions about that. We have talked about the DDR royalties charged 12 13 by Rambus, that's what we've been talking about just in 14 the last few minutes, and what I'd like to ask is, have 15 you seen -- in your review of the record, have you seen 16 any evidence that corroborates your views or that you 17 have concluded for purposes of your analysis 18 corroborates or supports your views that, in fact, 19 Rambus' DDR royalties do threaten to bring about higher 20 DRAM prices? 21 Α. Yes, I have. 22 MR. ROYALL: Your Honor, may I approach? JUDGE McGUIRE: 23 Yes. 24 BY MR. ROYALL: Q. Professor McAfee, I've just handed you two 25

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documents. I'd like to take them one at a time, and
 let's start with what's -- the document that's marked
 CX-2558.

4 A. Um-hum, yes.

5 Q. Do you have that?

6 A. I do.

Q. Is this document one of the documents that you were referring to in response to my prior question when you said that you had seen evidence that corroborated your views about the threat of higher DRAM prices as a result of Rambus' DDR royalty?

12 A. Yes, it is.

13 MR. STONE: Objection, Your Honor.

14 JUDGE McGUIRE: Mr. Stone?

MR. STONE: Objection, leading, and secondly, this goes into the areas of factual testimony by this witness that Mr. Royall objected to. Every time I would go into an area about the underlying facts, he objected. I had objected yesterday. And he's now getting into areas that are not appropriate for this witness' testimony.

22MR. ROYALL: May I respond, Your Honor?23JUDGE McGUIRE: Yeah, go ahead.

24 MR. ROYALL: First of all, I don't think it's a 25 leading question at all. I asked whether this is one

of the documents that he was referring to, and it 1 2 either or isn't, and he can tell us, but --3 JUDGE McGUIRE: He can answer the question to 4 that extent only, is this one of the documents he was 5 referring to. 6 MR. ROYALL: And I believe he's already 7 answered that question before the objection. 8 JUDGE McGUIRE: Well, I don't care if he 9 started an answer -- oh, he's already answered that 10 part of the question? 11 MR. ROYALL: I believe he has answered, yes. 12 JUDGE McGUIRE: Then what's your next question? 13 MR. ROYALL: My next question relates to the 14 substance of the document. 15 JUDGE McGUIRE: At that point we may hear again 16 from opposing counsel, but go ahead and state your next 17 question. 18 BY MR. ROYALL: 19 Q. How, if at all, Professor McAfee, does this 20 document relate to your conclusions about the 21 threatened effects of higher DRAM prices resulting from Rambus' DDR-related royalties? 22 23 I do object, Your Honor, that this MR. STONE: 24 is an area of his interpretation of the facts for purposes of this testimony, is exactly the areas in 25 For The Record, Inc.

Waldorf, Maryland (301) 870-8025 which both my objections and Mr. Royall's objections
 have been sustained.

3 JUDGE McGUIRE: All right, he is not going to 4 be able to testify as to the interpretation of the 5 facts as stated in the objection, but I believe the 6 question says, does this document relate to your 7 conclusions, so to that extent, he can answer that question, and then if he gets beyond that where he is 8 9 interpreting the facts, then I am going to uphold the 10 objection.

MR. ROYALL: Yes, thank you, Your Honor.BY MR. ROYALL:

13 Q. Do you have the question in mind?

14 A. I don't.

Q. The question was, how, if at all, does this document relate to your conclusions about the threatened effects of higher DRAM prices resulting from Rambus' DDR-related royalties?

A. As I testified, the -- I perceived a long run threat of higher prices associated with the royalties, and this document talks about -- this is my understanding, is that this document is corroborating that threat by suggesting a different positioning of DDR relative to what the -- let me say, a difference in business plans that would result in higher prices for

1 DDR.

2 Q. Can you point us to the language that you're 3 referring to in the document?

A. DRAM suppliers -- it's comments that DRAM
suppliers have made that they do not want to produce
DDR DRAMs if they have to pay this high royalty.

7 MR. STONE: Move to strike, Your Honor.
8 That --

9 JUDGE McGUIRE: Just a second.

10 Mr. Stone?

11 MR. STONE: Move to strike on the grounds that 12 that is now interpreting the document. Furthermore, 13 his reliance on hearsay like that is an inappropriate 14 basis for his testimony.

MR. ROYALL: May I respond, Your Honor?JUDGE McGUIRE: Yes.

17 MR. ROYALL: First of all, Mr. Stone has asked 18 this witness today in reference to his assumptions 19 about a number of documents, and all I am doing is asking him further about documents in reference to 20 21 understanding his assumptions, and so this is no 22 different than what he's done, and in that regard, I would say it's highly -- it's entirely appropriate. 23 24 JUDGE McGUIRE: Mr. Stone, how is he 25 interpreting this document? Because I'm not quite

1 clear on how he's done that just based on his last 2 answer.

3 MR. STONE: Well, clearly implicit in his 4 answer is he is giving meaning to the words in order to say that they are support. I did not ask him to 5 interpret any documents. I asked him to explain what 6 7 his assumptions were in detail. I just tried to get 8 more detail for his assumptions. I didn't show him 9 documents and say, did these support your assumptions? I did ask him whether a statement in a document was 10 consistent or inconsistent with his assumptions, but 11 not whether it supported them or not. 12

13	MR. ROYALL: Your Honor, let me say
14	JUDGE McGUIRE: One last comment.
15	MR. ROYALL: Well, this is a very significant

not clear to me whether he's interpreting a document, but you can ask him again to what extent he factored in this document, but I don't want any testimony regarding what could be construed as interpretation of the language.

6 Now, maybe, again, this is going to have to 7 come up again. It's not clear to me at this point to 8 what extent he's interpreting the terms of the 9 document. So, I am going to let you proceed, and then 10 I'll hear again I'm sure from opposing counsel if it 11 gets beyond where we are.

MR. ROYALL: Well, could I just put in context 12 13 my response, because I can imagine this may come up again. I'm not asking this witness to interpret the 14 15 This witness has made it extremely clear document. 16 that he is not testifying as to what the facts are or 17 are not. He has also made it clear that he's made 18 assumptions and that he has conducted a factual 19 investigation to corroborate those assumptions and that 20 it's important --

JUDGE McGUIRE: In that context, that's fine. I think the problem opposing counsel is having was his answer appeared to be interpreting this document, even if he stated at an earlier point in this hearing that he's not attempting to do that. The answer could come

out as if he were, and that was, as I understand the
 objection, the context under which that was noted.

3 So, I'm going to give you a chance to ask the 4 question again in the proper context, and again, I'll 5 admonish the witness to avoid any testimony that may be 6 construed as interpreting any evidence in this case.

7 MR. ROYALL: Your Honor, I think the point I'm 8 making is that in order for the witness to explain the 9 facts that he considered in developing his assumptions, 10 the factual assumptions that he made, he needs to 11 comment on documents, and if every time --

JUDGE McGUIRE: I didn't say he couldn't comment on it. I just want to be sure his testimony does not appear to be interpreting the document, and as long as, again, we put it in the proper context, then we'll see if it doesn't clear the problems that opposing counsel is having.

18 MR. ROYALL: All right, let me try --JUDGE McGUIRE: If I understand what he was 20 saying, was that it was how the testimony was coming 21 out that he had the problem with, so...

22 MR. ROYALL: Let me try to frame the questions 23 with that input in mind.

24 BY MR. ROYALL:

25 Q. Professor McAfee, I'm not asking you to

interpret for us what the facts are, the facts in this case do or do not prove, and I think you've made it clear that you have -- you understand that's not your role. On the other hand, you've made assumptions about facts, as you've testified, and based on those assumptions, you've conducted an economic analysis.

7 What I'm asking you is can you explain how this 8 document, which you've identified as one that you 9 viewed before, how this document -- how you took it 10 into account in developing your factual assumptions in 11 this case?

A. Let me do the reverse of what my reasoning isand start with my conclusions.

14 One of my conclusions was that there was a 15 threat to long run DRAM prices, that is, a threat of 16 increase of long run DRAM prices and a decreasing 17 quantity, and I reached that conclusion because 18 ordinarily it wouldn't be just a threat, it would be --19 you would expect to see an actual harm, but this 20 industry is unusual from an economist's perspective in that the other characteristics that we discussed lead 21 to what's called a vertical supply or a perfectly 22 inelastic supply. 23

That is to say, the DRAM manufacturers will continue to produce DRAM whether or not there's a

significant increase in their input prices because the -- of the big fixed costs of their operations, and as a result, in this industry you wouldn't expect to see higher DRAM prices immediately, that is, you wouldn't expect to see, as in other industries, cost increases in the form of royalties passed on to final consumers right away.

8 What was significant to me about this document 9 in crafting my assumptions was the suggestion that, 10 well, perhaps DDR -- there would be a diversion of 11 resources away from DDR immediately. That is, it 12 suggested that the royalties might be passed on rapidly 13 rather than -- rather than only over the long term. 14 Q. Now, let me ask you with respect to the second

document that I handed you, CX-2561, is this a document that you considered in developing the factual assumptions that you have developed for purposes of your economic analysis?

A. Yes, it is, if you will give me a moment toreview it. (Document review.) Okay.

Q. Have you had an opportunity to review it?A. I have.

23 Q. Is there any aspect of this document that you

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economic analysis?

2 A. Yes, there is. Q. And can you point us to that, where in the 3 document you see language that relates to your 4 5 assumptions? б A. Well, in particular, with respect to the 7 conclusion concerning effects on prices, in the numbered list, item 2, there's a statement that says, 8 9 "Will also factor in impact of IP royalty." Q. Can you -- oh, I see. Is this -- what's been 10 11 highlighted on the screen, is this what you're referring to? 12

1 Can we pull up DX-248?

2 MR. DAVIS: Our computer seems to have frozen 3 up a little bit here.

4 JUDGE McGUIRE: Excuse me? 5 MR. ROYALL: The computer is frozen up. 6 JUDGE McGUIRE: Oh. 7 MR. ROYALL: Actually, we can -- I can ask this question without reference to the exhibit. 8 9 BY MR. ROYALL: 10 Q. Do you recall yesterday Mr. Stone asked you 11 some questions about the time frame that would be relevant from your standpoint in terms of the 12 13 disclosure of Rambus intellectual property to JEDEC?

1 fashion, a little better fashion.

BY MR. ROYALL:

Q. And do you recall what time frame you indicatedwas relevant to your analysis?

A. I -- as the document says -- well, actually, I was asked to explain this on more than one occasion and to give the time period on more than one occasion, and I may have given short forms of the answer on some of those occasions.

Q. Let me try -- let me try it this way: Do you see in this slide, DX-248, you have listed in the first bullet point the date June 18, 1996?

13 A. I do.

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14 Q. And what is your understanding of the 15 significance of that date?

A. This is my understanding -- in fact, I believe, as I testified on direct, that this is the date that Rambus left JEDEC. That's an assumption on my part.

19 Q. And does that date have any significance from 20 the standpoint of the timing of intellectual property 21 disclosures within JEDEC that are relevant for purposes 22 of your economic analysis?

A. Well, as I believe I clarified on the direct testimony and may have been confused again during the cross examination, my opinion as an economist -- I

1 don't have an opinion about what should have been
2 disclosed. That's -- that strikes me as being
3 essentially a legal issue. My opinion as an economist
4 that whatever should have been disclosed should not be
5 enforced. That was my economic conclusion.

I sort of wish I hadn't used the date June I sort of wish I hadn't used the date June I sth, 1996, but instead, to just refer to the economic conclusion, which relates what should have been disclosed, whatever that might be, to -- to nonenforcement, and so that is to say, rather than use the date June 18th, 1996, it's whatever is found to be what should have been disclosed should not be enforced.

Q. Do you recall -- do you recall that you were asked some questions by Mr. Stone relating to network issues?

16 A. Yes.

Q. And in that regard, I believe that you may have given some testimony as to what you understand the word "network" or "network effects" to mean as to how this relates to your analysis in this case?

A. I believe I may have garbled my answer, yes.
Q. Do you recall if that issue is discussed in
your expert report?

24 A. It is.

25 Q. And do you have the expert report in front of

1 you?

2 Let me ask you to turn to page 56 of your 3 expert report, and I would focus your attention on 4 paragraph 71.

5 MR. STONE: Your Honor, I object to the use of 6 the expert -- the expert reports we've already 7 determined -- the Court has ruled they are not 8 admissible. If Mr. McAfee needs to supplement, correct 9 or change his testimony, I think he should be asked to 10 do that rather than rely on a document the Court has 11 determined is inadmissible.

JUDGE McGUIRE: Sustained. I think you can ask the question without referring to his expert report.

14 BY MR. ROYALL:

15 Q. Are you familiar, Professor McAfee, with the 16 term "direct network compatibility"?

17 A. Yes.

18 Q. And is that a term that's used in economics?19 A. It is.

20 Q. And what do you understand that term to mean? 21 A. It's the requirement of devices to interact 22 with each other, interoperate. It was originally used 23 with local telephone networks, which weren't 24 necessarily able to contact other telephone networks, 25 and it was -- as we know, the value of a telephone is

1	greater the more people you can call, and so that
2	became known as a network effect or a direct network
3	effect. So, this is the requirement of
4	interoperability.
5	It's something that we have seen in this case

1 particular design.

2 Q. I'm going to shift to another issue now.

3 A. Okay.

Q. Do you have an understanding as to whether any court has reached any final determination as to the validity and enforceability of Rambus' or any of Rambus' SDR or DDR SDRAM patents?

8 MR. STONE: Calls for a legal conclusion, Your9 Honor.

10 JUDGE McGUIRE: Sustained.

MR. ROYALL: Your Honor, the question -- may I be heard?

13 JUDGE McGUIRE: You may be heard.

MR. ROYALL: The question was not whether he had an understanding. It was whether there had been any such decision. I'm not asking him to interpret it or give any legal testimony at all, but as Mr. Stone asked the witness earlier about legal issues from the standpoint of an economic analysis, it's in the same context that I'm asking this question.

21 MR. STONE: Well, Your Honor, A, it's beyond 22 the scope. I didn't ask him about any decision about 23 validity. B, to the extent I wanted to ask him about 24 the Federal Circuit and his understanding, Mr. Royall 24 Waldorfersarylis ion, Your 1 conclusion, which was sustained, and so no testimony on 2 that was given.

JUDGE McGUIRE: It was beyond the scope in anyevent, so it is still sustained.

5 MR. ROYALL: What I had in mind was within the 6 scope, and --

JUDGE McGUIRE: Mr. Royall, I have sustained8 the objection.

9 MR. ROYALL: I understand, Your Honor. What I 10 had in mind was within the scope, and I can ask it in a 11 different way and make that clear.

JUDGE McGUIRE: You can go on and ask your next question in any event.

14 BY MR. ROYALL:

Q. Do you recall being asked by Mr. Stone about whether you had made assumptions about whether Rambus patents read on or covered either SDRAM or DDR?

A. I don't specifically recall those terms, but I was definitely asked about the -- whether the -whether Rambus had patent coverage or something like that, the patents were relevant or something. I don't remember exactly what I was asked.

Q. And for purposes of your conclusions on monopoly power, do you make assumptions about the coverage of Rambus patents?

A. Well, I think as I testified, I am not
 questioning that Rambus has IP that they can enforce
 against the standards.

Q. For purposes of your economic analysis and your conclusions about monopoly power, is it an essential assumption -- and I'm asking for your assumptions -- is it an essential assumption on your part that a court of proper jurisdiction has rendered a final conclusion as to the validity and enforceability of Rambus' patents?

- 10 A. No, it's not.
- 11 Q. Why not?

Well, to be fair, I'm not sure that I'm 12 Α. 13 positioned to interpret the phrase "court --" I've 14 forgot, a court of something jurisdiction, but the 15 important thing from my perspective is Rambus' ability 16 to enforce its patents; that is to say, if Rambus had no ability to enforce its patents, I think we could all 17 go home, but the -- insofar as they have an ability to 18 19 enforce their patents, whether that's a final determination or not I can't see would be relevant. 20

21 Q. And when you say "enforce patents," what are 22 you referring to?

A. Against JEDEC-compliant standards, devices.Against the manufacturer of those devices.

- 25
- Q. And does the existence of license agreements,

actual license agreements, relate in any way to
 conclusions that you would draw about Rambus' -- let me
 restate that.

Have you made any assumptions about the ability
of Rambus to enforce its SDRAM and DDR SDRAM-related
patents?

A. I think, as I just testified, that I am assuming that they can do that, and I have seen, of course, evidence in the record, because companies don't sign license agreements unless they -- there's a threat of enforcement. That doesn't actually speak to the legal issue directly, nor do I need to assume anything about the legal issue.

And actually, from an economic perspective, it doesn't matter one way or the other whether they actually have the patent rights. If they can enforce them and charge for them, it's the charges that matter from an economic perspective.

19 Q. Can we pull up DX-229?

20 Do you recall this slide, Professor McAfee?21 A. I do.

Q. And in this slide, do you -- you use the term
"equal or superior products."

- 24 Do you see that?
- A. I do see that.

Q. And do you recall that Mr. Stone yesterday 1 2 asked you some questions about those terms? 3 Α. Yes, I do recall, but not specifically. 4 And can you tell us, just so the record's 0. 5 clear, what you mean by use of those terms in the context of your economic analysis? б 7 Well, these are products that -- the use I'm Α. making of them is these are the products that the 8 9 buyer -- that a -- that the buyers would -- would 10 choose; that is to say, that are equal or superior from the perspective of substitution by buyers. 11 When you use those terms, are you using them in 12 0. 13 the technical sense or in an economic sense? 14 I'm using them in an economic sense. Α. 15 Does your use of this terminology relate at all Ο. 16 to your use of the term, which has come up in your 17 testimony, of "commercially viable alternatives"? 18 It does. Α. 19 0. How are those two concepts related as they 20 factor into your economic analysis? 21 Α. So, commercially viable alternatives are 22 price-constraining alternatives; that is to say, from 23 the buyer's perspective, if the price of a given 24 alternative is increased, if it's too high, the buyers can substitute one of the other alternatives, and so --25

I should say equal or superior from an economic
 perspective always includes prices. It's not -- you
 can't actually assess whether it's equal or superior
 without prices.

5 And so, the issue of equal or superior 6 products -- excuse me, the relationship between the 7 price-constraining alternatives and equal or superior 8 products is that at reasonable prices or at nearly 9 similar prices, similar prices, the commercially viable 10 alternatives are equally -- equal or superior.

Q. And have you reached any conclusion as -- in terms of your own economic analysis as to whether Rambus' challenged conduct has resulted in the exclusion of equal or superior products as you define that term from the economic perspective?

A. Yes, as I testified, their conduct has -- given
my assumptions, their conduct has excluded equal or
superior products.

19 Q. And do you recall -- with reference to the term 20 "commercial viability," do you recall that Mr. Stone 21 asked you whether you're aware of that term appearing 22 in any economic textbook?

23 A. I do.

Q. And do you recall that he asked you whether that term appeared in the DOJ-FTC Merger Guidelines?

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t he asked you whether

I do recall that question. 1 Α. 2 And do you recall your answer to that question? Ο. I didn't recall it -- I did not recall the term 3 Α. 4 "commercial viability" appearing in the FTC-DOJ Guidelines. 5 6 Ο. Does --7 Those aren't actually exactly identical Α. 8 guidelines, by the way, but they are very similar. 9 Does the term "commercial viability" as you Ο. 10 have used the term for purposes of your economic 11 analysis relate at all to the concept of price-constraining alternatives that you discussed 12 13 earlier in your testimony? 14 That is my definition of commercial viability, Α. 15 is that it's a price-constraining alternative. So, 16 yes, not only does it relate; it's the same concept. 17 O. Are you familiar with or do you know whether 18 the term "price-constraining alternative" appears 19 anywhere in the economic literature? Yes, it does. 20 Α. 21 Do you know whether that term appears anywhere 0. in either FTC or DOJ Guidelines? 22 23 It is my recollection that it appears in the --Α. 24 in both. MR. ROYALL: May I approach, Your Honor? 25 For The Record, Inc.

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1 JUDGE McGUIRE: Yes. 2 BY MR. ROYALL: 3 Q. Professor McAfee, I have just handed you a 4 document that for the record I would mark as CX-3094. (CX Exhibit Number 3094 was marked for 5 6 identification.) 7 BY MR. ROYALL: Do you recognize this document? 8 Ο. 9 This is -- appears to be the Federal Α. Yes. 10 Trade Commission version of the -- of the Horizontal 11 Merger Guidelines. Q. And could I ask you to turn to -- referring to 12 13 the bottom left-hand corner, the numbers there, could I 14 ask you to turn to page 6 of 26? 15 Α. Yes. 16 And roughly halfway down, in the middle of the 0. 17 page, do you see the paragraph beginning with the words, "In considering"? 18 19 Α. I do. 20 Ο. And that sentence states, "In considering the 21 likely reaction of buyers to a price increase, the 22 agency will take into account all relevant evidence, 23 including but not limited to the following, " and then 24 there are four items listed under that sentence. 25 Do you see that?

1 I do. Α. And the first of those items refers to evidence 2 Ο. 3 that buyers have shifted or have considered shifting 4 purchases between products, and I read only a portion 5 of it, but do you see that language? 6 Α. I do. 7 I'm sorry, I didn't --Ο. 8 Α. I do see that language, yes. Then the fourth item refers to the timing and 9 Ο. costs of switching products. 10 11 Do you see that language? I do see that. 12 Α. 13 When you said earlier that you recalled the Ο. 14 concept of price-constraining alternatives being 15 discussed in the FTC and DOJ Guidelines, were you 16 recalling this -- this language that I've pointed you 17 to or something else? 18 No, strictly --Α. 19 MR. STONE: Your Honor, Counsel is leading the witness. He should -- all he needs to ask is where in 20 the document -- where in the document does it appear? 21 22 He's leading him. If the witness can't find it, it is 23 relevant evidence. To point him to it is to lead him. 24 Now, we all know that the Guidelines will be argued before Your Honor in any event, so my objection 25

is that that sentence is probably a bit moot, but I do 2 think counsel continues to lead the witness. 3 JUDGE McGUIRE: It is moot, but it is sustained 4 as well, Mr. Royall. BY MR. ROYALL: 5 б Ο. Well, without reference to necessarily the 7 language that I read but by reference to the 8 document -- and take your time to review the 9 document -- but is there anything in this document that you've identified that relates to the concept of 10 11 price-constraining alternatives that we identified a 12 moment ago? 13 I think as I testified on direct, the -- my Α. 14 notion of price-constraining alternatives embodied in 15 commercial viability is exactly parallel and analogous 16 to the language of the Horizontal Merger Guidelines 17 with which I'm quite familiar and have, in fact, 18 published about; that is, I have written papers about 19 the Horizontal Merger Guidelines, and the parts that I 20 would point to is the evidence that buyers have shifted 21 or considered shifting purchases between products in 22 response to relative changes in price, so this is talking directly about buyer substitution, which I 23 24 think was actually even on the slide that I presented 25 in discussing price-constraining alternatives, and then

1

the timing and costs of switching products as well. 1 2 These -- this conceptually is identical. I 3 gave it a different name rather than a sniff test, 4 partly because when I do a sniff test, I tend to 5 actually have data about buyer purchases available to б me. Here, I don't actually have the data available about buyer purchases. Instead, I'm having to rely on 7 8 discussions with engineers and the published record from the time that would indicate the same kinds of 9 concepts; that is, evidence that the buyers have 10 shifted or have considered shifting their choices. 11 But in that sense, I think the language is identical in 12 13 meaning and intent from my definition. 14 MR. ROYALL: Your Honor, at this time I would 15 move in evidence CX-3094. 16 JUDGE McGUIRE: Mr. Stone, objection? 17 MR. STONE: I do object, Your Honor. I think 18 this is a document which is properly cited as 19 authority, as we would cite a case to Your Honor. I don't think the Guidelines are themselves evidence. 20 21 This is a legal document published by the FTC, and I think it's -- it can be cited for -- as an authority 22 with respect to antitrust issues, but I don't think 23 24 it's permissible as an exhibit. It's not evidence. JUDGE McGUIRE: The Court will take notice of 25

1 the document.

2 MR. STONE: I think that's appropriate, Your 3 Honor.

4 JUDGE McGUIRE: But it will not be entered into 5 the record.

6 MR. ROYALL: Thank you, Your Honor. 7 BY MR. ROYALL: 8 Q. Do you recall, Professor McAfee, that in his 9 questions to you yesterday, Mr. Stone asked you 10 about -- he asked you a hypothetical question about 11 hypothetically what impact, if any, it would have on 12 your assumptions -- let me restate that.

He asked you -- Mr. Stone asked you whether it would have any impact on your assumptions --

JUDGE McGUIRE: Excuse me, I want to make clear on my last comment that when I said the Court will take notice of the document, it's inferred that I mean judicial type notice other than just it's noted.

19 MR. STONE: Yes, Your Honor.

20 JUDGE McGUIRE: Are we clear on that?

21 MR. STONE: That was my understanding.

MR. ROYALL: Thank you, Your Honor. Let mestart over again.

JUDGE McGUIRE: I'm sorry, Mr. Royall.
MR. ROYALL: No, no, I garbled the prior

1 question.

BY MR. ROYALL:
Q. You were asked yesterday or do you recall being
asked yesterday about what, if any, impact it would
have on your assumptions if hypothetically Rambus had
made disclosures to JEDEC relating to the relevance of

Well, I recognize it as JEDEC minutes. 1 Α. 2 This document attaches a number of documents, Ο. 3 and if I could point you to a particular attachment, 4 which is on page 13 of the document, page 13 of CX-91A. 5 Attachment C, yes. Α. б 0. Yes, Attachment C, and do you recognize that 7 document? 8 Α. Yeah, I -- I --9 And by that I mean do you recognize it as Ο. something that you have reviewed or considered in 10 connection with your economic analysis in this case? 11 I have definitely reviewed it. I recognize it. 12 Α. 13 And the document, as is clear from the record, Ο. 14 is a September 11, 1995 letter on Rambus stationery, 15 and do you recall the subject of this letter? 16 I'm sorry, I'm really having trouble reading Α. 17 this document. (Document review.) Yes, I remember 18 this document. Do I recall the -- I recall my analysis 19 and the reading of this document. 20 Ο. I'm sorry, you said you recall? 21 Is there a question -- was I asked a question? Α. I had asked for time just to actually read it, because 22 I had --23 24 Q. Well, I can repose the question. 25 Can we pull up DX-230? For The Record, Inc.

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DX-230 is now on the screen. Do you recall 1 2 that we discussed this slide as part of your testimony 3 earlier? 4 Α. Yes. And this relates to the principal assumptions 5 Ο. 6 that you have made relating to the nature of Rambus' 7 challenged conduct? 8 Α. Yes, I recall that. 9 And the second bullet point here states, Ο. "Rambus failed to disclose relevant IP as required by 10 11 JEDEC rules/process." Do you see that? 12 13 Yes, I do. Α. 14 Now, then, referring back to the document that 0. 15 you have in your hand, Attachment C to CX-91A, can you 16 explain whether in your view of that document you 17 reached any conclusion as to whether that document was consistent with or in any way inconsistent with the 18 19 assumption that you made about Rambus' failure to disclose IP to JEDEC? 20 MR. STONE: Your Honor, I object that this is 21 22 outside the scope of my cross examination. I asked the 23 witness on pages 7549 and 7550 to assume for purposes 24 of my questions that Mr. Crisp had advised JEDEC in the context of talking about SyncLink of Rambus patents so 25

1 as to establish that he had a certain level of 2 awareness of the patents in the context of the last 3 bullet point on the demonstrative that Mr. Royall just 4 referred to, namely, the risk-taking issue, and the use 5 in this regard, that's not an assumption that we're now 6 going through, that I questioned about.

7 It goes beyond the scope of my cross
8 examination, and the use of this document in that
9 context is also beyond the scope.

10 JUDGE McGUIRE: Mr. Royall?

11 MR. ROYALL: Your Honor, I don't believe it is beyond the scope when Mr. Stone asked the witness about 12 13 a hypothetical letter, and the witness did consider it 14 an actual letter of the sort that he hypothesized, to 15 then present the witness with that letter and ask him 16 what, if any, conclusions he reached as to whether that 17 affected his assumptions. It seems directly within the 18 scope of his examination.

MR. STONE: Your Honor, and if this were asking about the appropriate issue, namely, the last bullet point on the demonstrative, not the second one, I would not be rising in objection to it, but it's beyond the scope of anything I did with that assumption about a letter.

JUDGE McGUIRE: Sustained.

25

1 MR. ROYALL: One moment, Your Honor. 2 Could I confer briefly with Mr. Stone? 3 JUDGE McGUIRE: You may. 4 (Counsel conferring.) BY MR. ROYALL: 5 6 Ο. Let me withdraw the question and the document 7 for the moment, and let's go back to -- to DX-230. 8 We just talked about this slide, Professor 9 McAfee, DX-230, and this relates to the assumptions --10 principal assumptions that you've made for purposes of 11 your analysis relating to Rambus' challenged conduct. 12 Α. Is there a question? 13 I just want to clarify that again for the -- is Ο. that correct, that's your understanding? 14 15 Α. That's correct, yes. 16 And as was just noted on the record, Mr. Stone 0. 17 asked you about the last bullet on this page. Do you 18 recall being asked questions about that bullet, which 19 reads, "Rambus was aware of legal risk associated with this conduct (i.e., equitable estoppel)"? 20 21 Α. I recall that series of questions. And do you recall that in the context of those 22 0. questions or in the context of this bullet point, Mr. 23 24 Stone asked you about the concept of mistake? 25 A. Yes, that had been part of my direct testimony,

and he asked me more than one question about mistakes. 1 2 Q. And one of the questions he asked you related to the question of whether it's possible for 3 corporations to make mistakes? Do you recall that? 4 He did ask that, and I agreed that it was. 5 Α. And in making the assumptions that you made б Q. about Rambus' conduct, did you consider the possibility 7

Q. And as part of the work that you did to develop and corroborate your factual assumptions, did you review evidence relating to that subject?

A. I did.

4

5 Q. Did you see anything in the evidence that you 6 reviewed that caused you to modify this assumption?

A. I saw -- I've considered that my assumption was corroborated by a substantial amount of evidence and that I felt comfortable in assuming that Rambus was aware of the legal risks and that this was not just an outcome of a mistake on Rambus' part.

MR. ROYALL: May I approach, Your Honor?JUDGE McGUIRE: Yes.

14 BY MR. ROYALL:

Q. Professor McAfee, I've just handed you a document that's been marked for identification as CX-1942, and do you recognize this as a document that you reviewed in connection with your economic analysis in this case?

20 A. I do.

Q. And is this a document that relates to the issue that we've been discussing; that is, the work that you did to develop your factual assumptions and corroborate your factual assumptions with reference to the legal risks or the assumptions that you made with

1 reference to the legal risks associated with Rambus' 2 conduct?

A. It is. My understanding of this document is
that these are notes --

5 MR. STONE: Object, Your Honor. The question 6 as framed can be answered yes or no. I think the 7 witness answered it when he said, "It is." I want to 8 preserve, if I might, my ability to object to the 9 interpretation of the document by this witness, which 10 subject to the prior rulings, he may not be permitted 11 to do so.

JUDGE McGUIRE: All right, that's sustained,and you can ask your next question.

14 BY MR. ROYALL:

Q. To be clear, Professor McAfee, I'm not asking you to offer an interpretation as to what this letter says in terms of the facts of this case or what may or may not be the facts in this case.

I don't know whether I saw this document before 1 Α. 2 I made that assumption or after I made that assumption. 3 I just don't recall today, but it would not cause me to 4 modify it. It may have actually informed my choice of 5 assumption; that is to say, I may have seen it before I 6 made the assumption rather than after. But -- but 7 either way, it certainly does -- it certainly comforts me in my assumption, makes me more comfortable in my 8 9 assumption.

Q. What is it about this document that -- from the standpoint of your own assumptions and developing and corroborating those assumptions -- causes you to have comfort in your assumption?

MR. STONE: Your Honor, I would object. This is an effort to have this witness testify to Rambus' state of mind. That's an area covered by Your Honor's in limine. We did not get into it on cross.

18 JUDGE McGUIRE: Right.

MR. STONE: The only thing that is permissible here, I believe, in light of Your Honor's in limine is for the witness to state his assumptions about Rambus' state of mind and then the finding of fact on those issues is directed to Your Honor's province, not the subject of expert testimony. So, this witness states his assumptions, and then ultimately you'll determine

whether the facts support his assumptions or don't.
 Whatever evidence this witness relied on or didn't is
 irrelevant and really is an effort to testify directly
 to Rambus' state of mind in his opinion.

5 JUDGE McGUIRE: Mr. Royall, you can respond to 6 that.

7 MR. ROYALL: Your Honor --

3 JUDGE McGUIRE: You do understand my prior9 holding on this issue, I'm sure.

10 MR. ROYALL: Yes, I clearly do, and I'm not asking this witness to testify as to the state of mind 11 of Rambus or anyone else. On the other hand, he was 12 13 questioned in cross examination about this very 14 assumption and the potential that Rambus had made 15 mistakes and whether that was something that he took 16 into account in forming his assumptions, and I am 17 simply probing that issue, and I -- I would note, and I 18 could cite to the number of cases that were in our 19 prior filings, but it is a perfectly appropriate thing 20 to do --

JUDGE McGUIRE: I will entertain the question in the context of my prior rulings on the state of mind.

24 MR. ROYALL: Thank you, Your Honor.25 BY MR. ROYALL:

Q. Professor McAfee, understanding that I am not asking you to interpret the facts and am certainly not asking you to interpret anyone's state of mind, all I'm asking you about is the process that you went through in developing your assumptions and then corroborating those assumptions by review of information in the factual record.

8 The question I had for you, I posed for you, is 9 whether there's anything in this document that caused 10 you either to modify your assumptions or to reach any 11 determination as to whether you were comfortable with 12 the assumptions that you defined for purposes of 13 conducting your economic analysis.

A. The answer is yes, that this document was useful in my evaluation of the assumptions. I understand the author of this document, I don't believe is on the record at the moment, to be Lester Vincent, who is an attorney employed by Rambus --

JUDGE McGUIRE: All right, hold on there, Mr.
 McAfee.

21 MR. STONE: Your Honor, this is the witness 22 testifying to what the document means and what it is. 23 JUDGE McGUIRE: Sustained, and that last

24 comment will be stricken from the record.

25 Now, we're not going to go into this too much

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1	further, Mr. Royall. If I have any more problems, I am
2	just going to interject and you're off this subject.
3	MR. ROYALL: I understand, Your Honor, and I
4	will if I can conclude this this
5	JUDGE McGU7rdthis

THE WITNESS: Thank you very much, Your Honor. 1 2 JUDGE McGUIRE: Thank you, Professor. 3 Then Mr. Royall, did you have any other 4 testimony you wanted to put on this afternoon? 5 MR. ROYALL: The only other testimony, there б may have been -- there may be a couple of 7 evidentiary -- minor evidentiary points. 8 MR. STONE: Your Honor, if I might, just while 9 they're working, if I can just raise an issue that's 10 sort of housekeeping. 11 JUDGE McGUIRE: Yes, go ahead. MR. STONE: Because some of the in camera 12 13 documents came up as early as today, and we had planned to file the motion today, if we could have until early 14 15 next week --16 JUDGE McGUIRE: Yes, that's no problem. 17 MR. STONE: Thank you. 18 JUDGE McGUIRE: There is no rush on that. 19 MR. ROYALL: I would, Your Honor, like to mark Professor McAfee's book as a demonstrative exhibit. 20 21 JUDGE McGUIRE: I have no problem with that. 22 Mr. Stone? 23 I think copies should be provided MR. STONE: 24 by whatever party marks it to all counsel and --JUDGE McGUIRE: Okay, let's see, where are we 25

1 Mr. Vincent. Is that correct? 2 MR. ROYALL: Oh, I am told that there is 3 something else that we're prepared to do today. 4 MR. WEBER: We are ready to continue with Mr. 5 Karp's reading. 6 JUDGE McGUIRE: You just ruined my plans for an 7 early weekend. 8 MR. WEBER: We can come back on Monday, Your 9 Honor, whatever you want to do. 10 JUDGE McGUIRE: No, I want to -- now, again, 11 this is a -- this can be off the record at this point. (Discussion off the record.) 12 13 (A brief recess was taken.) 14 JUDGE McGUIRE: Okay, Mr. Weber, proceed. 15 MR. WEBER: In terms of where we are, we 16 finished -- the Infineon video transcript we finished 17 for the record, that was CX-2059. Right now we are in 18 the FTC transcriptjT5we

1 (CX Exhibit Number 2955 was admitted into 2 evidence.) 3 MR. WEBER: We are going to see if we have got 4 the computer situated or set up. We are going to pull 5 up the document that we were about to get to at the 6 last reading, which was CX-1744. 7 JUDGE McGUIRE: How much time do we picture 8 this exercise taking this evening, certainly by 5:00? 9 MR. WEBER: I think more like an hour or an 10 hour and a half maximum. This is a live reading, so we don't have an exact estimate. 11 MR. PERRY: My estimate is 45 minutes, Your 12 13 Honor. 14 JUDGE McGUIRE: Okay, good. 15 MR. PERRY: I think it's relatively 16 objection-free, but about 20 minutes from now there are 17 some objections that we will have to make. 18 JUDGE McGUIRE: Okay. 19 MR. WEBER: Okay, Your Honor.e minutes from noTer situated katnsftuate9

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1 with 1744, so we will go to 1744A anyway.

2 JUDGE McGUIRE: We are almost in camera anyway, 3 aren't we?

MR. WEBER: Yeah, but it excludes the in camera stuff, so we will go to the A version. I assume the page numbers are the same, page 6, and we will be reading from page 100, lines 17 through 25, of the transcript, and if we could pull up at the top of the screen where it says, "Geoff, one on one."

10 (Whereupon, the transcript citations were read 11 into the record in open court.)

MR. PERRY: Excuse me, Your Honor, the question as read at the deposition was "1:1," and that's how it should be read.

15 JUDGE McGUIRE: All right, noted. Please 16 restate.

MR. WEBER: Sure.

17

18 (Whereupon, the transcript citations were read 19 into the record in open court.)

20 MR. PERRY: Your Honor, Mr. Weber has 21 misunderstood me. I am not asking him to read all the 22 punctuation. He was -- the document has a colon in it. 23 He told the -- he told you it was "one on one," which 24 has a different meaning. He should just be reading the 25 question that he read before in the deposition.

JUDGE McGUIRE: Well, I'll agree. Isn't that 1 2 what he just did this second time? 3 MR. PERRY: I just thought if he was going to 4 start putting all the punctuation in from the -- we 5 would be here forever. б JUDGE McGUIRE: Okay, yeah, I understand. We 7 don't need all the punctuation. Just read it as it goes, Mr. Weber. 8 9 MR. WEBER: Okay, page 100, line 17. (Whereupon, the transcript citations were read 10 into the record in open court.) 11 MR. WEBER: Now we will read at page 105, lines 12 13 5 through 13. This doesn't refer to any pages of the 14 document. 15 (Whereupon, the transcript citations were read into the record in open court.) 16 17 MR. WEBER: Can we go to page 47 of CX-1744, 18 and we will be reading from page 123, line 19, through 19 page 124, line 9. This is one of respondent's 20 designations. (Whereupon, the transcript citations were read 21 into the record in open court.) 22 23 The next excerpt is also from this MR. WEBER: 24 page, if we could pull up, there's a reference to the last three lines, if we could blow that part up of this 25

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page, and we're going to be reading from page 126, 1 2 lines 2 through 16. 3 (Whereupon, the transcript citations were read 4 into the record in open court.) 5 MR. WEBER: If we could go to the next page, б page 48 of CX-1744. Okay, we are going to be reading 7 line 126 -- I'm sorry, I --8 JUDGE McGUIRE: Yeah, line 23 --9 MR. WEBER: -- Mr. Perry has pointed out I missed a question and answer, and we will go back to 10 11 the prior page, if we could put that up. JUDGE McGUIRE: All right, page 126? 12 13 MR. WEBER: Yeah, I forgot to read the question at line 12 and the answer through line 16. So, we will 14 15 read that. I'm trying to move too fast, Your Honor. I 16 apologize. 17 (Whereupon, the transcript citations were read 18 into the record in open court.) 19 MR. WEBER: All right, the next excerpt will be 20 on the next page, we will be reading page 126, line 23, 21 through page 127, line 19. 22 (Whereupon, the transcript citations were read into the record in open court.) 23 24 MR. WEBER: Now, the next excerpt we are going 25 to go to --

to page 94 of CX-1744, and this is Bates ending 758. 1 2 We are going to be reading from page 136, lines 1 3 through 24. 4 (Whereupon, the transcript citations were read 5 into the record in open court.) 6 MR. WEBER: Next we are going to be at page 104 7 of CX-1744, and we'll be reading from page 138, line 11, stopping at page 140, line 7, then we'll move on to 8 9 another page of the document. So, starting at page 138, line 7. 10 (Whereupon, the transcript citations were read 11 into the record in open court.) 12 13 MR. WEBER: Okay, we are going to move on to page 122 of CX-1744, and we're going to be reading from 14 15 page 140, lines 8 through 24, and then we'll go on to 16 another page after that. 17 (Whereupon, the transcript citations were read 18 into the record in open court.) 19 MR. WEBER: Now we're going to page 126 of 20 CX-1744, and continuing on page 140, line 25, through 21 page 143, line 10. 22 (Whereupon, the transcript citations were read into the record in open court.) 23 24 MR. WEBER: Next designation is from page 136 of CX-1744, and this is respondent's designation. 25 We For The Record, Inc.

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 14.

3 (Whereupon, the transcript citations were read4 into the record in open court.)

5 MR. WEBER: Next we're going to page 141 in 6 CX-1744, and we will be reading in from the transcript 7 at lines -- at page 146, line 7, through 147, line 16.

8 (Whereupon, the transcript citations were read9 into the record in open court.)

10 MR. WEBER: Next we'll be going to page 150 of 11 CX-1744, which includes designations from both parties, 12 and we will be reading from CX -- from page 149, line 13 16, through page 150, line 14.

14 (Whereupon, the transcript citations were read15 into the record in open court.)

MR. WEBER: Next we will be looking at page 161 of CX-1744A, and this excerpt, we will be reading from page 152, line 13, through page 155, line 1, and then we will be going to something else in the transcript.

20 (Whereupon, the transcript citations were read21 into the record in open court.)

22 MR. WEBER: Now we are going to go to a 23 different document, but before we do, I would like to 24 offer CX-1744A. I believe CX-1744 is in, but because 25 parts are in camera and CX-1744A is the public portions

1	of the document, we would like to offer that.
2	MR. PERRY: No objection.
3	JUDGE McGUIRE: Entered.
4	(CX Exhibit Number 1744A was admitted into
5	evidence.)
6	MR. WEBER: Now we are going to go to a
7	different document that is CX-1040 actually, I need
8	to yeah, CX-1040, if we could get that up on the
9	screen, and we're going to be reading from page 155,
10	line 2, through page 156, line 18, and then we'll be on
11	a different document at that point.
12	(Whereupon, the transcript citations were read

1 16.

2 (Whereupon, the transcript citations were read3 into the record in open court.)

4 MR. WEBER: Next we are going to have a series 5 of short designations on -- starting at page 161, line 6 25, continuing through page -- actually, 161, line --7 164, line 18. This includes designations by both 8 sides.

9 (Whereupon, the transcript citations were read 10 into the record in open court.)

MR. WEBER: The next excerpt will be page 165,
line 5, through page 166, line 2, again with

13 designations from both sides.

14 (Whereupon, the transcript citations were read15 into the record in open court.)

16 MR. WEBER: Now we're going to be reading from 17 page 166, lines 15 through 23.

18 (Whereupon, the transcript citations were read19 into the record in open court.)

20 MR. WEBER: The next excerpt we have is page 21 167, lines 4 through 16. It starts with actually the 22 witness restating the question.

23 (Whereupon, the transcript citations were read24 into the record in open court.)

25 MR. PERRY: Excuse me, but it's a clarification

of the question, and I think it's appropriate for me to 1 2 be Mr. Stone and say so. MR. WEBER: All right. 3 (Whereupon, the transcript citations were read 4 5 into the record in open court.) б MR. WEBER: Now we move on to the next 7 designation, which is page 167, line 18, through page 169, line 22. 8 9 (Whereupon, the transcript citations were read 10 into the record in open court.) 11 MR. WEBER: If we could pull up on the screen

(Whereupon, the transcript citations were read 1 2 into the record in open court.) 3 MR. WEBER: Page 174, lines 9 through 17. 4 (Whereupon, the transcript citations were read 5 into the record in open court.) б MR. WEBER: Now we're moving ahead to page 182, 7 line 7, through page 183, line 7. 8 (Whereupon, the transcript citations were read 9 into the record in open court.) 10 MR. WEBER: Now we're going to be getting to another exhibit. Could we pull up CX-1031 on the 11 screen, please? And we will be reading from page 183, 12 13 line 11, to page 185, line 13. 14 (Whereupon, the transcript citations were read 15 into the record in open court.) 16 MR. WEBER: We need to go back to CX-1040 for a 17 counter-designation. This is going to be page 186, 18 lines 1 through 17, and the question relates to or the 19 comment is going to relate to part C, if you could pull 20 that up at the bottom of the page. 21 (Whereupon, the transcript citations were read into the record in open court.) 22 23 MR. WEBER: Now we're going to be moving on to 24 some general questions without -- or at least this next excerpt will be without reference to specific 25

1 documents, page 198, lines 8 through 21.

2 MR. PERRY: Excuse me. Your Honor, we have 3 objections to a series of questions over the next few 4 pages, and they relate to the effort by complaint 5 counsel to show the witness documents he hadn't seen before, patent applications, and had him explain what's 6 7 in them, and there's been -- you have dealt with this 8 issue before with various witnesses. They are 9 documents that predated his employment with Rambus, and 10 he's simply being asked to interpret them, as he says in the deposition, on the fly, and we have objections 11 to those questions. 12 13 JUDGE McGUIRE: All right, response?

MR. WEBER: A couple of responses. First of all, at one point in the deposition -- and we may get to it when I read it -- I asked him if he was comfortable answering the questions, and he said yes.

applications that had been filed years before and 1 2 examine them. He says he was comfortable with the 3 technology, Your Honor. He said he was doing it on the 4 fly. There was no foundation laid --5 JUDGE McGUIRE: Sustain the objection. б MR. WEBER: And so we will not read any of page 7 198. We will continue to page 199, lines 6 through 21. I believe there's no objection to this excerpt. 8 9 MR. PERRY: To that one, that's correct. MR. WEBER: And we need to see CX-1517. 10 (Whereupon, the transcript citations were read 11 into the record in open court.) 12 13 MR. WEBER: Okay, then we had a question about the document at page 201, line 23, through 202, line 14 15 12. 16 Objection to this? 17 MR. PERRY: No. 18 (Whereupon, the transcript citations were read 19 into the record in open court.) 20 MR. WEBER: The next excerpt is -- is this 21 something you are going to object to, Steve? 22 Yes, sir. MR. PERRY: 23 MR. WEBER: Same grounds as before? MR. PERRY: Yes, sir. 24 25 JUDGE McGUIRE: Is it on the same grounds? For The Record, Inc. Waldorf, Maryland (301) 870-8025

1 MR. PERRY: Yes, Your Honor. 2 MR. WEBER: It would be the same grounds. So, 3 given Your Honor's previous ruling, we will move on. 4 JUDGE McGUIRE: It's the same finding, then. 5 Sustained. 6 MR. WEBER: Okay, we are going to skip the next 7 counter-designation in light of Your Honor's ruling, so 8 we will move to the next one, see if there's an issue 9 here. 10 Well, Your Honor, this is different, because this relates to an issued patent. 11 12 JUDGE McGUIRE: What page are we talking about? 13 MR. WEBER: We're talking about page 211 to 14 212. I don't know if he's going to maintain the same 15 objection, but I would argue this is different because 16 it was an issued patent, so it was part of the Rambus 17 patent portfolio. 18 JUDGE McGUIRE: Okay, I'll hear the objection. 19 MR. PERRY: Yes, Your Honor, there was no 20 foundation laid in the deposition that he had had any 21 role in analyzing this patent. All he's doing is 22 pointing him to a claim and asking him to explain it. That's all he's doing, and that's not part of his job 23 24 at Rambus. MR. WEBER: The -- may I be heard, Your Honor? 25

1 JUDGE McGUIRE: Yes. 2 MR. WEBER: The question at line 22 of page 3 211, "Have you seen this patent before?" 4 "ANSWER: Yes." 5 So, I laid the foundation. JUDGE McGUIRE: Overruled. I will hear the б 7 question. 8 MR. PERRY: He has seen it before, Your Honor. There was no foundation laid that he had any role in 9 10 anything that led up to its issuance. Its issuance predated his arrival at Rambus. So, there was no 11 12 foundation laid that he ever analyzed the claims before 13 or he could say what the claims covered. 14 JUDGE McGUIRE: All right, overruled. I will 15 hear the question. 16 MR. WEBER: If we could get the patent, 17 CX-1494, up on the screen, and I think the questions 18 will relate to page 23, which will be claim 1 on the 19 left-hand side of the page. 20 Starting at page 211, line 19, through 212, line 24. 21 22 (Whereupon, the transcript citations were read into the record in open court.) 23 24 MR. WEBER: The next is a counter-designation 25 from respondents that they wanted read in if the prior For The Record, Inc. Waldorf, Maryland (301) 870-8025

objections were overruled, and we have an objection 1 2 that the answer is nonresponsive. So, we are at page 3 213, lines 13 through 22. I guess we're asking for 4 some quidance from Your Honor. 5 JUDGE McGUIRE: What's the issue again? б MR. PERRY: Well, what happened is the witness 7 said, "Didn't I just say that?" JUDGE McGUIRE: Yes. 8 9 MR. PERRY: And then Mr. Weber said, "Can you answer my question? It's very simple." 10 11 So, now we're going to hear the answer to his 12 question. 13 JUDGE McGUIRE: All right, that's sustained. 14 MR. PERRY: I'm sorry, Your Honor, that --15 JUDGE McGUIRE: Oh, I'm sorry, overruled. I was thinking it was your objection. It's his 16 17 objection. We will overrule the objection. 18 MR. WEBER: Okay, we will be happy to read it 19 in. 20 JUDGE McGUIRE: It's that late. 21 MR. WEBER: Okay, we are going to read it in. 22 JUDGE McGUIRE: Wait a minute, didn't I just 23 say that was overruled? 24 MR. PERRY: Yes, it was his objection to our 25 desire to actually hear the answer to the question. For The Record, Inc.

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1 and there's a foundation objection again.

2 MR. PERRY: Yes.

3 MR. WEBER: Okay, I'll withdraw 246.

4 JUDGE McGUIRE: Boy, I'm -- it's really great 5 to see --

6 MR. PERRY: It is Friday afternoon, Your Honor. 7 THE WITNESS: Your Honor, it's my birthday. I 8 am trying to leave as fast as possible.

9 MR. WEBER: Here's what we have left, Your 10 Honor: We have a series of questions that were at the 11 end of my examination that were asked by counsel for 12 Rambus. I don't know if Mr. Perry wants to read them 13 in or me to read them in. I'm happy to do it, but we 14 do have some objections and we have designated some 15 ourselves.

JUDGE McGUIRE: Well, I'm not --

MR. PERRY: I don't particularly care about reading them in. You guys are doing great. Go ahead. MR. WEBER: Okay. Well, we have got objections to the first couple of them. It's at page 276, Your Honor.

22 JUDGE McGUIRE: Okay.

16

23 MR. WEBER: And our first couple of objections 24 are what we call outside the scope of designated 25 testimony. As you're aware, the rule on

designations -- for designating a party opponent, they have the right to counter-designate what's only in fairness as responding to our designations. So, I think these first two questions are outside the scope of what we designated, and we're looking specifically at page 276, line 15, through 277, line 1. We have that objection.

8 JUDGE McGUIRE: Mr. Perry, how is it in the 9 scope?

MR. PERRY: Your Honor, I think this is well within the scope, if not of what we've heard today but what we've heard before, and I think that should as well be the rule when we're talking about depositions that stretch over time, that you shouldn't have to have something within the scope if it's during the same day. It's very short.

JUDGE McGUIRE: All right, I'll hear the questions.

MR. WEBER: Okay, question at 276, line 15, andwill continue to 277, line 1.

21 (Whereupon, the transcript citations were read22 into the record in open court.)

23 MR. WEBER: Okay, then we have another question 24 and answer. We've objected both on the scope grounds 25 but also lack of foundation, so Your Honor, the

1 question is -- the excerpt is page 277, lines 13 2 through 23. 3 MR. PERRY: Withdrawn. 4 JUDGE McGUIRE: All right. 5 MR. WEBER: Next we have our part of Mr. 6 Stone's questions. We designated a couple questions of 7 our own. This is page 281, lines 14, through page 228, 8 line 11. So, I just -- if we could read that. 9 (Whereupon, the transcript citations were read 10 into the record in open court.) 11 MR. WEBER: Now we have the counterdesignation, which would be page 282, line 13, through 12 13 page 284, line 5. 14 (Whereupon, the transcript citations were read 15 into the record in open court.) 16 MR. WEBER: Okay, next we have another 17 counter-designation. It's going to be page 285, line 18 4, through page 286, line 1. Is that -- is this --19 MR. PERRY: Line 1. 20 MR. WEBER: Okay. 21 MR. PERRY: That's okay, we can withdraw it. 22 Withdraw 285. 23 MR. WEBER: Your Honor, you can see we're 24 getting to the end of this. Next I have a -- there's something at page 293. 25 For The Record, Inc.

Waldorf, Maryland (301) 870-8025 appropriate form objection as was required by the FTC
 rules at the time.

JUDGE McGUIRE: Let's save some time. Let's go through it, and then I'll entertain the objections per question. I don't want to come back on this again on Monday and find out whether this has already been in the record or not.

8 MR. WEBER: Okay.

9 MR. PERRY: All right.

10 JUDGE McGUIRE: Let's just hear each question 11 and I'll rule as we go.

12 (Whereupon, the transcript citations were read13 into the record in open court.)

14 MR. WEBER: The question on page 294 that we 15 objected to as outside the scope and hearsay is --

16 JUDGE McGUIRE: How is it hearsay?

MR. WEBER: It's hearsay because Mr. Karp is not in court and he is not a party opponent to them when they are offering it. So, it would be hearsay. The document is hearsay.

21 MR. PERRY: Your Honor, there was no objection 22 made at the deposition to the mere identification of 23 the document, and certainly under Rule 3.33, there 24 needed to be one, so --

25 JUDGE McGUIRE: All right, overruled.

(Whereupon, the transcript citations were read 1 2 into the record in open court.) 3 MR. PERRY: May we request that RX-217 be put up on the screen? 4 JUDGE McGUIRE: All right, let me -- just so I 5 б haven't screwed this up, when you said it's outside the 7 scope and hearsay, that's your objection, right? 8 MR. WEBER: Yes, Your Honor. 9 JUDGE McGUIRE: Then I just overruled that 10 objection, but yet you're going into the next question. 11 Is that what we're doing here? MR. WEBER: I think since Your Honor overruled 12 13 it, we're reading it into the record. 14 JUDGE McGUIRE: Okay -- oh, right. It's really 15 getting late. I'm sorry. 16 MR. PERRY: It is. And moreover, I have to say 17 it's raining as well. 18 JUDGE McGUIRE: Well, all right, I just want to 19 be sure that I know what I'm doing. 20 MR. PERRY: And it's the witness' birthday, 21 but --22 THE WITNESS: It's my birthday. 23 JUDGE McGUIRE: Oh, my goodness. 24 (Discussion off the record.) 25 MR. WEBER: I am going to read this in, right? For The Record, Inc.

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I want to make sure I've got this right. The question
 is at 294, line 2.

3 (Whereupon, the transcript citations were read4 into the record in open court.)

5 MR. WEBER: Then the question that I have an 6 objection to is, "As best you can recall, did you 7 capture in these notes the -- accurately the substance 8 of the conversation or the --"

JUDGE McGUIRE: Sustained -- oh, I thought we
were talking about the new objection.

11 MR. WEBER: It is a new -- the objection is 12 going to be leading, Your Honor, when we get to it.

13 (Whereupon, the transcript citations were read14 into the record in open court.)

MR. WEBER: I preserved a form objection. So,the objection is leading.

17 JUDGE McGUIRE: And that's sustained.

18 MR. PERRY: Your Honor, I appreciate that. I 19 don't think that just saying "objection to the form of 20 the question" preserves the objection.

JUDGE McGUIRE: No, it is leading at this
point, so I am sustaining it on that basis.

23 MR. PERRY: I appreciate that.

24 JUDGE McGUIRE: All right.

25 MR. WEBER: The next question and answer, we

have the same objection, outside the scope and hearsay objection. This is page 295, lines 3 through 18, if you want to look at it, Your Honor. There's also a form objection, but I'm going to just stick to the outside the scope and hearsay at this point.

JUDGE McGUIRE: All right, Mr. Perry, the sameresponse on the scope question?

MR. PERRY: Well --

8

9 JUDGE McGUIRE: Or is this a new outside the 10 scope issue?

11 MR. PERRY: Your Honor, I'm not sure what the outside the scope bit is since he's already said there 12 13 was discussion of this in Infineon. I don't -- in the Infineon deposition. If certainly that was him or --14 15 you know, obviously Infineon, I hope, but counsel for 16 Infineon who put this document in front of the witness, 17 and so there has already been a designation by someone, 18 so it's not outside the scope. I just don't remember 19 who did those earlier designations. So, I don't 20 believe it's outside the scope.

21 JUDGE McGUIRE: All right. Do you also have an 22 objection on hearsay?

23 MR. WEBER: Yes, Your Honor.

24 JUDGE McGUIRE: I'm going to uphold it on the 25 hearsay ground.

1 MR. WEBER: Then the next question and answer, 2 we actually have three objections, outside the scope, 3 hearsay and lack of foundation, and this is the 4 question at page -- line 20 of page 295, and the answer 5 continues to page 296, line 17.

JUDGE McGUIRE: I'll also uphold that objectionon hearsay grounds.

8 MR. WEBER: Next we have another document that 9 was marked by Mr. Stone, and we have I think the same 10 objection, hearsay and outside the scope. The document 11 is marked at page 296, line 19, but the designated 12 testimony that we object to starts at page 297, line 17 13 and continues through page 298, line 25, at the bottom 14 of 298.

JUDGE McGUIRE: All right, you are saying that is, what, hearsay?

17 MR. WEBER: And also outside the scope of 18 anything we've designated. He is just marking an 19 exhibit and trying to get some testimony on it. It's 20 nothing that was used in our designations.

JUDGE McGUIRE: Did you want to respond? MR. PERRY: Your Honor, I think it's appropriate for the witness to be able to identify the document. He identified it as his notes.

25 MR. WEBER: Your Honor, they have Mr. -- I'm

1 sorry.

2	JUDGE McGUIRE: Go ahead, Mr. Perry.
3	MR. PERRY: And since he was present for this
4	and he's talking about his understanding of what
5	happened at this meeting, we've heard a lot of
6	testimony over the past eight weeks elicited by
7	complaint counsel about people's understanding of what
8	was being said at meetings, and if the rule had been we
9	couldn't do that, we would all be home by now.
10	MR. WEBER: Your Honor, may I respond?
11	JUDGE McGUIRE: Yes.
12	MR. WEBER: They have Mr. Karp on their witness
13	list. If they want to get his understanding of these
14	documents in evidence, they can call him in their case
15	in chief.
16	MR. PERRY: Well, but when witnesses were on
17	the stand, they were allowed to be asked these
18	questions, so the objection he's making has been
19	overruled before, so I don't it's the fact that
20	he's on the witness list doesn't mean anything.
21	JUDGE McGUIRE: All right, overruled.
22	MR. WEBER: Okay, Your Honor, we will then
23	start reading from page 296, lines 19 through 21, and I
24	don't know if you know what RX this is. We'll be happy
25	to put it up on the screen for you.

1 MR. PERRY: 307, please. 2 MR. WEBER: RX-307. (Whereupon, the transcript citations were read 3 4 into the record in open court.) 5 MR. WEBER: Now we get to the rest of the 6 designation on this document, which is at page 297, 7 line 17, through page 298, line 25, then we go on to a 8 different document after that. 9 (Whereupon, the transcript citations were read 10 into the record in open court.) 11 MR. WEBER: Now we move on to the next 12 document --13 MR. PERRY: We would move Exhibit RX-307 into 14 evidence. 15 MR. WEBER: It's hearsay, Your Honor. It's a 16 hearsay document. 17 MR. PERRY: Excuse me. 18 (Counsel conferring.) 19 MR. WEBER: Okay, counsel has reminded me of 20 something. We will not object to this document at this 21 time. JUDGE McGUIRE: Entered, entered. 22 23 (RX Exhibit Number 307 was admitted into 24 evidence.) 25 MR. WEBER: Now we go to one we don't have an For The Record, Inc. Waldorf, Maryland (301) 870-8025

objection, and this one I believe is RX-1220, if we can 1 2 pull that up on the screen. Is that right, 1220? 3 MR. PERRY: 388? RX-388. 4 MR. WEBER: This sure isn't it. Okay, RX-388, let's see if that's it. Oh, I'm a document ahead, 5 6 okay. By the way, this is lines -- page 299, line 7, 7 through page 301, line 4 we're reading from, Your 8 Honor. 9 (Whereupon, the transcript citations were read into the record in open court.) 10 11 MR. WEBER: Now we move on to another document 12 we haven't objected to -- do you know the RX number? 13 MR. PERRY: RX-411. 14 MR. WEBER: 411. So, we will be reading from 15 page 301, line 2, through 302, line 1. 16 (Whereupon, the transcript citations were read 17 into the record in open court.) 18 MR. WEBER: Next we have --19 MR. PERRY: 6 14 tion. P-yen to ae recevide reado 12t 1.

(Whereupon, the transcript citations were read 1 2 into the record in open court.) 3 MR. WEBER: Now we're moving on to Exhibit 39, 4 which I think I've got right, is RX-1220 -- no? 5 MR. PERRY: 499. 6 MR. WEBER: 499. 1220's coming up, Your Honor. 7 RX-499, put that on the screen. We'll be reading from page 304, line 11, through page 30 -- we 8 9 actually have an objection at 308, so I'll read --10 MR. PERRY: I'll withdraw 308. MR. WEBER: Okay, so we'll read to 308, line 1, 11 which is I think the answer from 307. 12 13 (Whereupon, the transcript citations were read 14 into the record in open court.) 15 MR. WEBER: Okay, if we can pause for a minute, we need to get the exhibit on the screen. 16 MR. PERRY: RX-2153 is what we're talking about 17 18 on page 305 of the transcript. 19cript citations were read 13, if we can pause2 308, seeecor er from 307. 7ut 46.5199 Tm/Cs6 cth w2t66Tnfo? fcbsrT nfo? fc1 022citat1 13

reading at 305, line -- I actually don't know where we 1 2 stopped. Line 23? 3 MR. PERRY: Go for it. 4 (Whereupon, the transcript citations were read 5 into the record in open court.) б MR. WEBER: That takes us to page 308, line 1. 7 I think the next question and answer have been 8 withdrawn, but we will continue at page 308, line 12, excuse me, through 309, line 22 on the same topic. 9 10 (Whereupon, the transcript citations were read into the record in open court.) 11 MR. PERRY: We can withdraw the rest on that 12 13 page as cumulative. That's page 309. 14 And finally, we will read from 310, MR. WEBER: 15 lines 7 through 19, and this is I believe RX-1220, and 16 this is our designation, if we can put that on the 17 screen. 18 MR. PERRY: And by the way, when I was speaking 19 of page 309, we withdrew our designations on page 309, 20 lines 14 through 22. 21 JUDGE McGUIRE: Noted. 22 MR. WEBER: Moving ahead to page 310, lines 7 23 through 19. 24 (Whereupon, the transcript citations were read 25 into the record in open court.)

1 MR. WEBER: Finally, Your Honor, there is just 2 a couple more questions and answers that I asked at the 3 end when Mr. Stone was finishing on some of the subject 4 matter he covered. So, we will be reading from page 311, line 22, through 312, line 20, and that will be 5 6 the last designation for today. 7 (Whereupon, the transcript citations were read into the record in open court.) 8 9 MR. WEBER: So, we are through with that 10 transcript. We have the Micron transcript, which is on 11 video, to go, and we'll try to queue that up for you on 12 Monday. 13 JUDGE McGUIRE: Okay, very good. 14 This hearing will be adjourned until 9:30 on 15 Monday. Everybody have a good weekend. 16 Off the record. 17 (Whereupon, at 4:30 p.m., the hearing was 18 adjourned.) 19 20 21 22 23 24 25

1 CERTIFICATION OF REPORTER 2 DOCKET NUMBER: 9302 3 CASE TITLE: RAMBUS, INC. 4 DATE: JUNE 27, 2003 5 б I HEREBY CERTIFY that the transcript contained 7 herein is a full and accurate transcript of the notes 8 taken by me at the hearing on the above cause before 9 the FEDERAL TRADE COMMISSION to the best of my 10 knowledge and belief. 11 12 DATED: 6/30/03 13 14 15 SUSANNE BERGLING, RMR 16 17 CERTIFICATION OF PROOFREADER 18 19 I HEREBY CERTIFY that I proofread the 20 transcript for accuracy in spelling, hyphenation, punctuation and format. 21 22 23 24 DIANE QUADE 25 For The Record, Inc. Waldorf, Maryland (301) 870-8025