

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

WESTERN DIGITAL TECHNOLOGIES, INC., Petitioner,

v.

LONGITUDE LICENSING LTD., Patent Owner.

Case IPR2023-01200

U.S. Patent No. 7,697,369

DEPONENT: DR. R. JACOB BAKER

FRIDAY, APRIL 5, 2024

STENOGRAPHICALLY REPORTED REMOTELY VIA ZOOM

VIDEOCONFERENCE

REPORTER: DANNIELLE COPELAND
REGISTERED DIPLOMATE REPORTER
CERTIFIED REALTIME REPORTER
CALIFORNIA CSR 14444
TENNESSEE LICENSE 807
WASHINGTON CSR 22000824

JOB No. 97257

Page 2	Page 4
1 I N D E X 2 3 EXAMINATION: PAGE 4 BY ATTORNEY KROEGER 5 5 6 CERTIFICATE 61 7 8 E X H I B I T S 9 EXHIBIT 1003 DR. BAKER'S DECLARATION 6 10 EXHIBIT 1004 DR. BAKER'S CV 6 11 EXHIBIT 1001 U.S. PATENT 7,697,369 8 12 EXHIBIT 1006 EXCERPTS OF THE PRINCE 18 TEXTBOOK 13 EXHIBIT 1005 LEE REFERENCE 26 14 EXHIBIT 1007 JEDEC STANDARD 41 15 16 17 18 19 20 21 22 23 24 25	1 THE VIDEOGRAPHER: Good morning. We are 2 now on the record. This is the beginning of Media 3 Number 1 in the deposition of Dr. R. Jacob Baker, 4 Ph.D., in the matter of Western Digital Technologies 5 versus Longitude Licensing, LTD. 6 The case number is IPR 2023-01200. This 7 deposition is being held remote via Zoom conference. 8 This deposition is being taken on behalf of defendant 9 on April 5th, 2024, at 9:07 a.m. The court reporter is 10 Dannielle Copeland. I am Mariel Mercado, the 11 videographer, on behalf of First Legal Depositions, 12 located in Los Angeles, California. 13 This deposition is being videotaped at all 14 times unless specified to go off the video record. 15 Would all present please identify 16 themselves, beginning with the noticing attorney. 17 ATTORNEY KROEGER: This is Paul Kroeger 18 from Russ, August & Kabat for Patent Owner Longitude 19 Licensing, Limited. 20 ATTORNEY CLEMENTS: My name is Calmann 21 Clements with Haynes Boone defending Petitioner Western 22 Digital. With me today is my also colleague, Hong Shi, 23 who is an observer today. 24 THE VIDEOGRAPHER: Will the court reporter 25 please swear in the witness.
Page 3	Page 5
1 THE VIDEOTAPED DEPOSITION OF DR. R. JACOB BAKER, 2 TAKEN PURSUANT TO NOTICE HERETOFORE FILED, VIA ZOOM 3 VIDEOCONFERENCE, ON APRIL 5, 2024, AT APPROXIMATELY 4 9:07 A.M., UPON ORAL EXAMINATION, AND TO BE USED IN 5 ACCORDANCE WITH THE CALIFORNIA CODE OF CIVIL PROCEDURE. 6 7 *** ** 8 APPEARANCES 9 VIA ZOOM VIDEOCONFERENCE 10 11 FOR LONGITUDE LICENSING, LIMITED: PAUL KROEGER, ESQ. 12 RUSS, AUGUST & KABAT 12424 WILSHIRE BOULEVARD, 12TH FLOOR 13 LOS ANGELES, CALIFORNIA 90025 PKROEGER@RAKLAW.COM 14 15 16 FOR WESTERN DIGITAL TECHNOLOGIES, INC.: CALMANN CLEMENTS, ESQ. 17 HONG SHI, ESQ. HAYNES AND BOONE, LLP 6000 HEADQUARTERS DRIVE, SUITE 200 18 PLANO, TEXAS 75024 CALMANN.CLEMENTS.IPR@HAYNESBOONE.COM 19 HONG.SHI.IPR@HAYNESBOONE.COM 20 21 ALSO PRESENT: MARIEL MERCADO, VIDEOGRAPHER 22 23 24 25	1 DR. R. JACOB BAKER, CALLED AS A WITNESS 2 HEREIN, HAVING BEEN FIRST DULY SWORN ON OATH, WAS 3 EXAMINED AND TESTIFIED AS FOLLOWS: 4 5 EXAMINATION 6 7 BY ATTORNEY KROEGER: 8 Q. Good morning, Dr. Baker. 9 A. Good morning. 10 Q. Am I right in assuming that you know the 11 exact number of deposition that -- that this is that 12 you're taking this morning? 13 A. Yes. 14 Q. And what number of deposition is that? 15 A. 104. 16 Q. So fair to assume that you're familiar with 17 how depositions proceed? 18 A. Yes. 19 Q. So can I forego the standard admonitions? 20 A. Yes. 21 Q. But you understand you're under oath, 22 correct? 23 A. Yes. 24 Q. Do you have copies of any documents with 25 you?

Page 6 1 A. I have PDFs of my declaration, the patent 2 in this matter, and my cited documents on the laptop 3 I'm on right now, yes. I don't have any printed 4 materials. 5 Q. Okay. And do you have any other 6 applications open on your laptop other than Zoom and 7 what you need to view the electronic documents? 8 A. I have my email open that I used to start 9 this Zoom meeting. 10 Q. And is anyone else present with you in the 11 room that you're located in? 12 A. No. 13 (EXHIBIT 1003 WAS MARKED FOR 14 IDENTIFICATION.) 15 ATTORNEY KROEGER: Okay. I'll go ahead and 16 put into the chat Exhibit 1003, which is your 17 declaration, but you can also use the one you have. 18 And then I'll put Exhibit 1004 in as well, 19 which is your CV. 20 (EXHIBIT 1004 WAS MARKED FOR 21 IDENTIFICATION.) 22 BY ATTORNEY KROEGER: 23 Q. And do you recognize Exhibit 1003 as the 24 declaration that you have offered in this matter? 25 A. Yes.	Page 8 1 needs to be added to it since it was submitted a few 2 months ago. 3 A. I don't think so. I mean, I've done other 4 work, but I don't know if I would say there's anything 5 that needs to be changed in the CV. 6 Q. And you submitted this declaration as part 7 of a request for inter partes review of U.S. Patent 8 7,697,369, correct? 9 A. The declaration I submitted in this matter 10 was related to the patent you mentioned. Yes. Yes. 11 I didn't quite understand the first part of the 12 question. 13 Q. Are you -- are you aware that Western 14 Digital submitted your declaration as part -- to the 15 patent office as part of an IPR on the -- on the '369 16 patent? 17 A. Yes. 18 Q. Did you read -- or have you ever read 19 Western Digital's underlying petition for IPR that your 20 declaration was submitted along with? 21 A. No, not that I recall. 22 (EXHIBIT 1001 WAS MARKED FOR 23 IDENTIFICATION.) 24 BY ATTORNEY KROEGER: 25 Q. And then just for the record, I'll -- I'll
Page 7 1 Q. Did you review your declaration in 2 preposition -- in preparation for today? 3 A. Yes. 4 Q. Did you notice any errors concerning any of 5 the substance of the opinions offered in your 6 declaration during your review? 7 A. No, I didn't notice any errors. 8 I did notice a minor typo where I wrote 9 "controller 120" instead of "controller 140" in 10 paragraph 47 on page 25. 11 Q. Okay. But -- paragraph 47 on page 25. 12 And you said memory controller 140 -- oh, 13 controller 120 instead of controller 140. 14 Any- -- anything else of substance that you noted? 15 A. I didn't see any substant- -- substantive 16 typos. 17 Q. And did you -- did you meet with counsel 18 for Western Digital as part of preparing for today? 19 A. Yes. 20 Q. And about how long was that meeting? 21 A. Several hours. 22 Q. And then I also put your CV, Exhibit 1004, 23 into the chat. 24 And I just want to know if that is -- if that is 25 still accurate or if there's anything of substance that	Page 9 1 put Exhibit 1001 into the chat, which is U.S. Patent 2 7,697,369. 3 And then do you understand that that patent is the 4 patent that your declaration concerns? 5 A. Yes, the '369 patent. 6 Q. And then we've already been doing it, but 7 is it okay if we refer to that as the -- the '369 8 patent as a shorthand during this deposition? 9 A. Yes. 10 Q. About how much time did you -- did you 11 draft your declaration, Exhibit 1003? 12 A. I worked on my declaration with Western 13 Digital's attorneys; but yes, the declaration 14 represents my opinions in this matter. 15 Q. About how much time did you spend drafting 16 the declaration? 17 A. I don't recall. It's been a while. I 18 could guess, but I don't know how accurate the guess 19 would be. 20 Q. Okay. So go ahead and open up your 21 declaration. And I want you to turn to paragraph 4, 22 which begins on page 4 of the declaration. 23 A. Okay. I'm there. 24 Q. So this paragraph 4 says, "In the 25 preparation of this declaration, I have studied" -- A

Page 10 1 is the '369 patent, B is the prosecution history of the 2 '369 patent, and C is U.S. Patent Publication Number 3 2004/0022095 to Lee, et al., and then it is defined as 4 Lee. 5 Do you see that? 6 A. Yes. And then also the JEDEC specification 7 in Part D of that paragraph. 8 Q. And Lee and JEDEC are the two references 9 that you used to opine that the certain claims of the 10 '369 patent are invalid; is that correct? 11 ATTORNEY CLEMENTS: Objection, form. 12 THE WITNESS: Those were what I used for 13 what I wrote as Ground 2 that starts on page 58. 14 I didn't offer any legal opinions. I -- I 15 was explained the law, and my opinion was that 16 Claims 2, 7, and 11 are obvious in view of Lee and 17 JEDEC as a person of ordinary skill in the art would 18 understand at the time, before the priority date of the 19 '369 patent. 20 BY ATTORNEY KROEGER: 21 Q. Thank you. My question was a little -- was 22 a little bit vague. 23 I was just collectively asking you -- asking about 24 the -- about your opinions. But you have -- you have 25 two grounds, and Ground 1 only concerns the Lee	Page 12 1 particular opinions I had in that section. But, I 2 mean, all of my opinions to date are in my declaration. 3 I'm not sure I answered your question. 4 Q. Your dec- -- the declaration does not 5 contain any opinions that the asserted claims are 6 anticipated by -- by either Lee or JEDEC; is that 7 correct? 8 ATTORNEY CLEMENTS: Objection, form. 9 THE WITNESS: Would you mind re-asking the 10 question? 11 BY ATTORNEY KROEGER: 12 Q. Sure. 13 Does -- does your declaration contain any opinions 14 that any claims of the '369 patent are anticipated by 15 Lee? 16 A. My Ground 1 is an obviousness ground. I 17 think, as I wrote in paragraph 40, that it could be an 18 anticipation ground, but what I wrote about was 19 obviousness. 20 Q. And does your declaration have any -- does 21 your declaration have -- contain any opinions that any 22 of the claims are anticipated by JEDEC? 23 A. I'm pausing because the word "anticipation" 24 is a legal term. And my understanding is that when 25 something is anticipated, it would be disclosed in one
Page 11 1 reference; is that correct? 2 A. Yes. Ground 1 is my opinions in view of 3 Lee alone. And Ground 2 is my opinions in view of Lee 4 and JEDEC. 5 Q. Okay. And so looking at page 19, paragraph 6 41, Ground 1 of your opinions is that Claims 1, 16, 10, 7 14, 15, 16, 17, 18, 19, 25, 26, and 27 are obvious in 8 view of Lee, correct? 9 A. You misspoke when you said "16" the first 10 time instead of 6, but yes. 11 Q. Okay. Oh. So it's Claims 1, 6, 10, and 12 then -- and then -- then the rest that I listed are 13 obvious in view of Lee, correct? 14 A. In my opinion, yes. 15 Q. And then Ground 2 of your opinions is that 16 Claims 2, 7, and 11 are obvious in view of Lee and the 17 JEDEC standard, correct? 18 A. Yes. 19 Q. And then do you have any other bases in 20 your declaration concerning invalidity of the claims of 21 the '369 patent? 22 A. I'm not entirely sure what you're asking. 23 I mean, for example, in paragraph 108 on page 60 I 24 talk about what a POSITA would have found obvious, but 25 I used the JEDEC specification to support the	Page 13 1 reference. And so I think the answer to your question 2 is no, but I -- I use JEDEC in combination with Lee, 3 and I use JEDEC more to support my opinion that a 4 person of ordinary skill in the art would have 5 understood that -- would have understood what the claim 6 was claiming, but more -- I used the JEDEC more to 7 support my opinion of what a POSITA would understand. 8 But I didn't -- to answer your question, I didn't 9 use JEDEC alone as an anticipation reference in any 10 of -- for any of the claims. 11 Q. And is there any other art other than Lee 12 or JEDEC that you use as part of your opinions that the 13 asserted claims are obvious? 14 A. I use the '369 patent and what it admits to 15 support my opinions in places. 16 But to answer your question, I didn't point -- 17 other than the '369 patent, the file history, the Lee 18 reference, and the JEDEC reference, I didn't point to 19 any other references. 20 I made comments about what a POSITA would know, 21 but I tried to support that with those references. 22 Q. Were you familiar with the Lee reference 23 before you began your work on the -- on your 24 declaration? 25 A. Maybe at some point. I've looked at

Page 14 1 literally thousands of patents. But I can't remember 2 right now if -- when or where or that I even was, so 3 I -- I don't know. I would have to answer maybe. 4 Q. Were you familiar with the JEDEC standard 5 before you began work on your declaration? 6 A. Yes. 7 Q. And how were you familiar with the JEDEC 8 standard? 9 A. I worked in industry and designed chips to 10 meet specifications in various JEDEC standards. 11 Q. Let's turn to paragraph 19 of your 12 declaration, concerning the level of ordinary skill in 13 the art. 14 And the first sentence here states, "A person of 15 ordinary skill in the art (POSITA) in the field of the 16 '369 patent, as of its earliest possible filing date of 17 June 8, 2006, would have been someone knowledgeable and 18 familiar with the memory system arts that are pertinent 19 to the '369 patent." 20 Do you see that? 21 A. Yes. 22 Q. What are the memory system arts that are 23 pertinent to the '369 patent? 24 A. It's discussed in the specification. This 25 patent looks like it's geared towards the memory	Page 16 1 BY ATTORNEY KROEGER: 2 Q. So let's turn down to paragraph 20 -- it 3 starts at paragraph 28 of your report, concerning 4 synchronous and asynchronous memory. 5 A. Okay. 6 Q. What, in your opinion, is the difference 7 between synchronous and asynchronous memory? 8 A. I discuss that in paragraphs 29 and 30 of 9 the declaration. 10 At a high level, summarizing those paragraphs, the 11 synchronous memory would transmit data from the 12 controller to the memory in synchronization with a 13 clock signal. 14 And then an asynchronous memory would send 15 information between the memory and a controller that is 16 not necessarily related to an overall clock signal. 17 Like there might be a control signal that's sent with 18 the -- with the data to indicate that something should 19 be read or written. 20 Q. Does synchronous memory -- do synchronous 21 memory systems make use of a continuous clock signal? 22 A. I would need some context, but I would say 23 in general, yes. 24 So a clock signal would be understood as, you 25 know, a -- you've got this free-running stream of
Page 15 1 controller and DRAM in -- and that's dynamic 2 random-access memory -- in various computing platforms, 3 like a desktop or laptop computer. 4 Q. And does the '369 patent address 5 asynchronous memory or synchronous memory? 6 A. I believe, if memory serves, it makes 7 reference to operations which are both synchronous and 8 asynchronous. 9 Q. So in -- in rendering your definition 10 concerning the level of skill of a POSITA in paragraph 11 19, you were looking for someone who had knowledge and 12 familiarity with -- with DRAM and a memory controller; 13 is that right? 14 ATTORNEY CLEMENTS: Objection, form. 15 THE WITNESS: That's a little more specific 16 than what I was thinking. 17 I think if they have experience in that 18 area, that would meet my definition of a POSITA, but I 19 think in general memory systems that, you know, operate 20 with, you know, high speed and -- are used in computing 21 systems. 22 But, I mean, I don't think I would want to 23 narrow it to one specific technology. I would just say 24 memory systems at this point. But maybe I would if I 25 thought more about it.	Page 17 1 pulses that are used to orchestrate the -- the actions 2 in the system. And so in synchronous systems, you 3 would have a clock that's running all the time, and 4 things would try to synchronize to it. 5 In an asynchronous system, you wouldn't be trying 6 to synchronize to a clock, and there may not even be 7 one. 8 But again, I would need some context about what 9 specifically we're talking about. 10 Q. How do you define a free-running stream of 11 pulses? 12 A. "Free running" meaning it continues all the 13 time. It's not a control signal that controls an 14 operation that occurs only when the operation needs to 15 happen. So that's what I mean by "free running." 16 And pulses are like a cadence, like pounding a 17 drum, where things happen at specific times, like the 18 drum beat happens at a specific time. So the pulse 19 goes from, say, zero to one volt or between two 20 voltages, and it's used for timing to, again, 21 orchestrate things that are going on. 22 Q. And so -- so if a -- if a clock signal is a 23 free-running stream of pulses, that would be, in your 24 opinion, a continuous clock signal? 25 A. Again, I need some context, because any

Page 18 1 answer I give could be construed in the wrong context 2 as wrong. 3 For example, if I turned a laptop computer on and 4 the clock starts running and then I shut it off, well, 5 then it's not -- not occurring all the time. But when 6 things are getting done or you might be doing things in 7 operation, then the clock is free running and -- and 8 making sure things are -- are happening if they need to 9 happen, synchronized to that clock. 10 But, again, I don't -- I'd need some specific 11 context to answer a question in more detail than at 12 this high level. 13 Q. So going back to paragraph 28 of your 14 report, you say, "Memory may be either synchronous or 15 asynchronous," and you cite Prince at 17 and 18. 16 Do you see that? 17 A. Yes. 18 (EXHIBIT 1006 WAS MARKED FOR 19 IDENTIFICATION.) 20 BY ATTORNEY KROEGER: 21 Q. I'm going to put into the chat Exhibit 22 1006, which is the Prince textbook, or at least 23 excerpts -- the excerpts of the Prince textbook that 24 were attached to Western Digital's petition. 25 Let me know when you have that open.	Page 20 1 we're talking about the -- the material I cited about 2 what's different between asynchronous and synchronous, 3 I'm not sure that a POSITA working in the area would 4 need to consult a textbook on that. 5 I used this book just to illustrate what was known 6 and what a POSITA would have known, but I -- I don't 7 know if I would testify they would necessarily need to 8 consult this and they wouldn't know already. 9 Q. But is it fair to say that the Prince 10 textbook, at least the portions you cited, represents 11 things that would have been known to a POSITA? 12 A. I think so. 13 Q. So going back to paragraph 28, you state, 14 "Memory may be either synchronous or asynchronous," and 15 you cite to pages 17 to 18 of Prince. 16 What portions of Prince exactly were you relying 17 on in -- in making -- in making that statement? 18 A. For example, the discussion on synchronous 19 and asynchronous SRAMs and fast caches, which is 20 Section 2.3.3. 21 Q. And then you go on to say, "An example of 22 synchronous memory is synchronous dynamic random-access 23 memory (SDRAM)." 24 Do you see that? 25 A. Yes.
Page 19 1 A. Oh, for some reason I thought you said 2 Exhibit 1007. I was looking for that. It's here. Let 3 me download it. 4 I have it open. 5 Q. Were you familiar with the Prince textbook 6 before you began working on your declaration? 7 A. Yes. 8 Q. Have you ever used it in any of your -- any 9 of your teaching coursework? 10 A. Maybe. If I had to guess, I would say yes. 11 But I don't know for sure, and I can't point you to 12 specifically where. 13 Q. So how were you familiar with the Prince 14 textbook -- textbook before you began working on your 15 declaration? 16 A. I have copies of Dr. Prince's books, 17 including this one. I met her probably 25 years ago or 18 so at Micron several times. I attended some of her 19 talks when she visited Micron. 20 I've just been aware of it for quite a long time. 21 Q. And in your opinion, is this the kind of 22 material a POSITA in the '369 patent would -- would 23 consult? 24 A. Again, I would need some specific example 25 of what material we're talking about in the book. If	Page 21 1 Q. And for that you cite to page 23 of Prince, 2 correct? 3 A. Yes. 4 Q. And specifically, are you pointing to at 5 least the -- the sentence in 2.5.1 that talks about 6 synchronous DRAMs and then says, a parenthetical, 7 SDRAMs? 8 A. Yes. 9 Q. And it says it's the case that it's your 10 understanding that the S in the SDRAMs stands for 11 "synchronous"? 12 A. Yes. 13 Q. And then you state that, "An example of 14 asynchronous memory is static random-access memory," 15 and you cite to Prince at 21, correct? 16 A. Yes. 17 Q. Can an SRAM also be synchronous? 18 ATTORNEY CLEMENTS: Objection, scope. 19 THE WITNESS: I didn't opine on that in my 20 declaration. But, I mean, if you look at the page in 21 Prince that we were discussing, page 21, towards the 22 bottom, they talk -- she talks about synchronous SRAMs. 23 I don't -- I can't think of any synchronous 24 SRAMs right off the top of my head, so I don't know if 25 that ever took off. But, I mean, if you ask is it

Page 22 1 possible to have a synchronous SRAM, I would say I 2 think so. 3 But again, I didn't opine on this in my 4 declaration, so it would just be me trying to answer 5 the question sitting here. 6 BY ATTORNEY KROEGER: 7 Q. So in page 21 of Prince, she states, "For 8 processors at 50 megahertz and above, the most 9 cost-effective solution for 586 class systems is the 10 synchronous SRAM, since an asynchronous SRAM must be in 11 a more expensive technology, such as BiCMOS, to have an 12 equivalent speed with an otherwise identical 13 synchronous SRAM." 14 Do you see that? 15 A. I see that. 16 Q. Do you agree with that statement? 17 A. I -- I don't think so. 18 I think that there's several things that -- I 19 think when she's writing that, she's -- she's trying to 20 make the best opinion at the given time. Things 21 change. 22 I -- I -- I don't really have an opinion. I don't 23 think I agree with it, but I would need to think about 24 it. It wasn't something I opined on. 25 Q. So at least as of the date of the Prince	Page 24 1 my declaration or -- or any of the opinions that I've 2 formed. 3 BY ATTORNEY KROEGER: 4 Q. So you mentioned that the technology that 5 she was writing on changed in the '90s, right? 6 So this statement -- I think this book has a 7 copyright date of both 1996 and 1999; is that correct? 8 Do you see that on page 2 of 1006? 9 A. Yes. 10 Q. So at least as of 1999, Dr. Prince was 11 stating that asynchronous technol- -- asynchronous 12 memory required more expensive technology; is that 13 correct? 14 A. She's writing that -- that asynchronous 15 SRAM must be in a more expensive technology, but she 16 clearly has some specific performance or design in 17 mind. I don't know specifically what she was thinking 18 there. But yes, it says -- she's writing that the SRAM 19 must be in a more expensive technology like BiCMOS. 20 But again, I don't -- I would need to know 21 specifically what she's talking about because it's a 22 very vague, general statement, and I don't have any 23 context. And I don't think I can agree with that in 24 general. 25 Q. By the -- by the priority date of the '369
Page 23 1 textbook, was it the case that asynchronous SRAM 2 required more expensive technology than synchronous 3 SRAM to have equivalent speed? 4 ATTORNEY CLEMENTS: Objection, scope. 5 THE WITNESS: I -- I don't think so, but I 6 don't know. I do know that -- let me see what the date 7 is on this book again. 8 In the '90s, people were really hot on 9 integration of bipolar transistors with CMOS 10 technology, and they felt it could -- yeah, this book 11 is from the '90s. 12 They felt it could solve a lot of problems. 13 But it ended up not -- that not being the case, and 14 people stopped fabricating a lot of things that they 15 thought they were going to fabricate in the BiCMOS 16 process. 17 So I think what she was thinking in 18 particular, the context she was thinking may have been 19 true in some contexts but maybe untrue in other 20 contexts, especially as the technology shrank and you 21 didn't need to -- you didn't need to use the more 22 expensive technology to fabricate things. 23 So I don't think I agree with that sentence 24 or what she's opining there, but that -- I mean, I 25 really didn't -- I wasn't -- that wasn't part of my --	Page 25 1 patent, 2006, had the -- the technology changed such 2 that -- strike that. 3 And it's your belief that statement may not be 4 accurate as of later dates because of changes in the 5 technology; is that correct? 6 A. I don't know. 7 I mean, I need to know specifically what we're 8 talking about because it depends on, like, the density 9 of the memory, the distance that you need to write to 10 it. 11 I mean, what happened nowadays is -- and later is 12 that none of the SRAMs are external to the processor 13 like they were about what she's writing about. They 14 all moved on to the processor chip. And so none of 15 this is really relevant or makes any sense nowadays 16 because people aren't buying external SRAM chips for 17 their processors. 18 So I don't know specifically what she had in mind 19 there, so I -- I just can't give an opinion on it. 20 Q. Fair enough. 21 What about as of the priority date of the '369 22 patent; would -- do you have any opinion as to whether 23 or not her statement would have still been viewed as 24 correct as of the 2006 priority date? 25 A. I don't know.

Page 26 1 Q. Were a majority of SRAMs external to the 2 processor in 2006? 3 ATTORNEY CLEMENTS: Objection, scope. 4 THE WITNESS: I don't think so, but I don't 5 know for sure. 6 (EXHIBIT 1005 WAS MARKED FOR 7 IDENTIFICATION.) 8 BY ATTORNEY KROEGER: 9 Q. I'm going to put the Lee reference, Exhibit 10 1005, into the chat. 11 Let me know when you have that open. 12 A. I'm downloading. 13 Q. Okay. 14 A. I have it open. 15 Q. Okay. And this is the -- the reference 16 that is the basis of your -- the Ground 1; is that 17 correct? 18 A. Yes. 19 Q. So going back to your declaration, in -- 20 you state in paragraph 30, "Asynchronous memory, 21 however, is not synchronized with the system clock," 22 and you cite to Lee paragraph 28; is that correct? 23 A. I went to paragraph 28. Where were you in 24 my declaration? 25 Q. I was in paragraph 30 of yours. Sorry. On	Page 28 1 correct? 2 A. Yes. But just to be clear, I'm just 3 looking at the terms in the claims, I haven't done an 4 analysis of these claims like I did in the '369 patent. 5 I mean, majority of -- or some of what I relied upon is 6 in paragraphs 34 and 35 related to both synchronous and 7 asynchronous. 8 So I -- I can look at the words and answer 9 questions related to are these words present in those 10 claims, but I haven't analyzed the claims in the way 11 one analyzes the claims. 12 Q. Is it fair to say that one of the inventive 13 aspects of Lee is foregoing the need for having -- for 14 using a continuous clock signal? 15 ATTORNEY CLEMENTS: Objection, form. 16 THE WITNESS: I don't know if I would 17 totally agree with that. Lee gives examples of -- of 18 different things that can be done. And again, they're 19 discussed in paragraphs 34 and 35. 20 So I do think it says that a strobe 21 signal -- I'm reading in paragraph 35. "A strobe 22 signal can be implemented using a clock signal that is 23 toggled on only during a desired period" so that the 24 clock is always running but the strobe signal that goes 25 with the data for read or writes only synchronize to
Page 27 1 page 13. 2 A. Yes. That -- that is saying that the 3 strobe signal that gets transmitted with the data 4 either for a read or a write isn't synchronized with 5 the system clock. 6 Q. Did Lee purport to invent asynchronous 7 memory? 8 ATTORNEY CLEMENTS: Objection, scope. 9 THE WITNESS: I'm not exactly sure what you 10 are asking. 11 In Claim 1 of Lee, it claims an 12 asynchronous semiconductor memory device. So to the 13 extent when you ask does Lee purport to invent 14 asynchronous memory, I think at least some aspect, yes, 15 as claimed. 16 BY ATTORNEY KROEGER: 17 Q. And in fact, there were -- are many claims 18 of Lee that are limited to an asynchronous memory, 19 correct? 20 Let me -- let me ask a different question. 21 So Claim 1 is limited to an asynchronous sem- -- 22 semiconductor memory device, correct? 23 A. Yes. 24 Q. And Claim 2 depends on Claim 1 and also 25 claims an asynchronous semiconductor memory device,	Page 29 1 the clock signal when you're doing a read or write 2 operation. 3 So, I mean, that's just one example of what 4 Lee discloses. 5 BY ATTORNEY KROEGER: 6 Q. And -- and then going back to paragraph 34, 7 he states, "As is discussed above, typically the amount 8 of current consumed by a memory system in a standby 9 state results from the clock signal being used to 10 synchronize operations of a synchronous memory. 11 "If the memory uses the clock signal as an 12 operation reference signal, the clock signal typically 13 continues to be generated even while in the standby 14 state, thus internal circuits that" -- it says "us" but 15 I believe means "use" -- "or generate the clock signals 16 continue to operate and consume current. 17 "However, according to embodiments of the present 18 invention, as illustrated for example in Figure 3, the 19 strobe signals, such as SCA and SDtM, that are used as 20 transmission references or synchronous signals are used 21 in the memory 120 only as a latch enable or latching 22 signal." 23 Do you see that? 24 A. I see that. And I think that's consistent 25 with what I was answering a moment ago.

Page 30 1 Q. So is it fair to say, then, that Lee is 2 trying to avoid sending a continuous clock signal to 3 the memory as a way of reducing current? 4 A. Lee is teaching that if you don't send the 5 strobe signals, which are derived from the clock 6 signals, that you can reduce memory. 7 I think it's teaching that if you need the 8 clock -- even in a standby state -- for operations, the 9 clock would be transmitted. I think it also says 10 that -- well, it says specifically you continue to send 11 the clock in a standby state. 12 I mean, Lee teaches different embodiments and then 13 what a POSITA would know in those paragraphs. So, I 14 mean, I -- I'm not really sure I'm answering your 15 question, so maybe you need to ask -- ask it again. 16 And when we get a good breaking point, can we take 17 a break? 18 ATTORNEY KROEGER: Yes. We can take a 19 break now. That's fine. 20 THE WITNESS: Ten minutes? 21 ATTORNEY KROEGER: Yeah. 22 THE WITNESS: Okay. 23 THE VIDEOGRAPHER: Okay. Off the video 24 record at 10:03 a.m. 25 (RECESS TAKEN.)	Page 32 1 the date of Lee, that a synchronous memory using a 2 continuous clock signal would typically be producing 3 the clock signal regardless of whether an operation was 4 actually being performed? 5 A. Again, I'm not entirely sure I follow what 6 you're saying. 7 If we're talking about a clock signal being used 8 for an operation where it's sent along with the data in 9 a read or a write, I think Lee recognizes that once the 10 clock signal -- once you stop doing that particular 11 operation, that the clock signal still running may -- 12 may use power that may not need to be used. That's why 13 Lee teaches the strobe signals that it uses. 14 But I'm not sure I'm answering your question. 15 Q. No, I think you got it. 16 So in a synchronous memory that uses a continuous 17 clock signal, that clock signal will still be generated 18 even when no read or write operation is being 19 performed; is that correct? 20 A. So the term "uses" is a little confusing 21 because is it the clock signal being used for reading 22 and writing to strobe in the data and then when you're 23 not -- the operation is not doing a read or a write, 24 you're not using the clock signal to strobe in the 25 data, but there are other operations that the clock
Page 31 1 THE VIDEOGRAPHER: On the video record at 2 10:13 a.m. 3 BY ATTORNEY KROEGER: 4 Q. So, Dr. Baker, if we can go back up to 5 paragraph 5 of Lee. Let me know when you're there. 6 A. I am there. 7 Q. Okay. So here in paragraph 5, Lee states, 8 The standby current generated in a conventional memory, 9 such as a synchronous memory, having a clock tree 10 structure may be substantially the same as that in a 11 nonstandby state. This may be the case because the 12 clock signal is used as a transmission reference signal 13 for synchronous memory operations and, therefore, the 14 clock signal is, typically, internally produced 15 irrespective of whether an operation is being performed 16 by the synchronous memory." 17 Do you see that? 18 A. I see those words, yes. 19 Q. Did you consider that paragraph of Lee in 20 rendering your opinions? 21 A. I'm not exactly sure what you mean, 22 "consider." 23 I read Lee and understood what Lee taught. So I 24 guess from that point of view, I considered it. 25 Q. And then do you agree, then, at least as of	Page 33 1 signal may be using. 2 I think that's why Lee teaches the use of the 3 strobes, and there's discussion in there in the 4 internal workings of the chip that if you are sending 5 that clock signal through -- and I think that was 6 discussed further in my paragraph 34 or 35 where we 7 were just at -- that there are trees and delays and 8 wasted power and all that. 9 But from a high level, we need to define what 10 operation the clock is being used for and how it's 11 being used, because Lee teaches specific ways of still 12 having the clock signal running but using the strobes 13 for those delay trees and to send with the data to 14 reduce power. 15 Q. Where does Lee teach having -- does Lee 16 teach having the clock signal running when the strobe 17 signals are not being sent? 18 Let me ask it a different way. 19 Does Lee teach the clock signal running when the 20 memory is not in either a read or a write operation? 21 A. So if we go to page 17 of my declaration, 22 for an example. 23 Sorry, that's not what I wanted to point at. 24 I'm trying to find a figure with the clock signal 25 in it. Lee does teach that. I mean, it taught it in

Page 34 1 the paragraph that we were just looking at. I want to 2 find -- 3 Q. Paragraph 5? 4 A. Sorry? 5 Q. You said the paragraph we were just looking 6 at. 7 Are you talking about paragraph 5? 8 A. Yeah, paragraph 34, more specifically. 9 Q. Okay. 10 A. But give me just a sec. I thought there 11 was a figure that showed the clock signal, but maybe 12 I'm wrong. 13 I guess it doesn't matter. It's disclosed in the 14 text. 15 Q. So -- so just -- just to be clear, at least 16 as of right now, you're unable to locate a figure 17 showing the clock signal running when the memory is not 18 in a read or write operation in Lee? 19 A. On paragraph 34, it says, "If the memory 20 uses the clock signal as an operation reference clock, 21 the clock signal typically continues to be generated 22 even while in the standby state." 23 And then there's some discussion of Lee's 24 embodiments there, but I -- give me a second. If it 25 matters, I think it's clear that Lee discloses the	Page 36 1 memory operation." 2 A. Right. 3 Q. Do you see that? And then -- 4 A. They're used as strobes. 5 Q. Right. 6 And then it says, in the last sentence, 7 "Accordingly, certain embodiments of the present 8 invention may be capable of reducing the standby 9 current in the memory 120 as no clocks need be 10 generated or utilized as a reference signal for the 11 operations to the memory write." 12 Do you see that? 13 A. I see those words. 14 But, I mean, in -- a couple sentences later, in 15 paragraph 35, it says, "For example, a strobe signal 16 can be implemented using a clock signal that is toggled 17 only on during a desired period." 18 Meaning a clock signal is running and then you 19 turn on, for strobing, the data for reading and writing 20 based on the clock signal. 21 Q. Well, doesn't "toggled" mean to turn on or 22 off? 23 A. The strobe signals? Yes. 24 Q. Right. So I think the sentence you're 25 saying in 35 says the strobe signal can be implemented
Page 35 1 clock continues to operate. But give me a sec. I can 2 see if I can find a figure that shows the continuous 3 operation of the clock or even the clock signal that's 4 discussed. I'm not sure if that's shown because if 5 it's just run, it's -- I mean, yeah. 6 I don't see a figure. 7 Q. Okay. So but looking at paragraph 4 [sic] 8 and that sentence you just said, "If the memory uses 9 the clock signal as an operation reference signal, the 10 clock signal typically continues to be generated even 11 while in the standby state, thus internal circuits that 12 use or generate the clock signals continue to operate 13 and consume current." 14 Then it says, "However, according to embodiments 15 of the present invention, as illustrated in Figure 3, 16 the strobe signals" -- and it goes on -- "are used in 17 memory only as a latch enable or latching signal." 18 Do you see that? 19 A. Yes. And we kind of changed topics 20 between -- or subjects between a clock signal and a 21 strobe signal. 22 But yes, I see those words. 23 Q. And then -- then the next sentence says, 24 "That is, the strobe signals SCA and SDtM are not used 25 as a reference signal (e.g., a clock signal) for a	Page 37 1 using a clock signal that is toggled only during the 2 desired period. 3 So doesn't that mean that the clock signal is 4 turned on or off only during the desired period? 5 A. I would read that as the strobe signal is 6 implemented where it can be toggled on during a desired 7 period when the data is on the command address bus or 8 the data bus. I think that's very consistent with the 9 figures that are in Lee. 10 Q. Well, paragraph 35 references Figure 2 of 11 Lee, which is shown in paragraph 42 of your report, 12 correct? 13 A. Yes. 14 And you can see the strobe signals. I've 15 annotated those. And as disclosed in paragraph 35 of 16 Lee, they can be implemented using a clock signal. 17 Q. And so if -- and for the strobe signal, 18 you're referring to SDtM; is that correct? 19 ATTORNEY CLEMENTS: Objection, form. 20 THE WITNESS: One of the strobe signals is 21 SDtM, yes. 22 BY ATTORNEY KROEGER: 23 Q. And based off that figure, that strobe 24 signal is only on during the write operation; is that 25 correct?

Page 38 1 A. Did you mean to say read operation? 2 Q. Well, I was looking at the -- at the -- so 3 I guess let's take it both. 4 Based on Figure 2, your annotations, during a 5 write operation, is SDtM using a clock signal? 6 ATTORNEY CLEMENTS: Objection, form. 7 THE WITNESS: As disclosed in paragraph 35, 8 it says that the strobe signals, strobe or SDtM -- I'm 9 sorry, SDFM and SDtM, which are used to -- for the 10 reading and the writing, are used to strobe in the 11 data. And they can be toggled on and off -- that's why 12 you see them not always running -- and that they can be 13 derived by the clock signal. 14 I mean, that's what that sentence says. 15 BY ATTORNEY KROEGER: 16 Q. Okay. And just so I understand how the 17 figure is written, when the -- when the line is flat; 18 i.e., doesn't have any peaks, that would be when the 19 signal is off; is that correct? 20 A. Are we talking about the strobe signals, 21 the SDtM and SDFM? 22 Q. Correct. 23 A. When it's not oscillating, it's not 24 strobing anything. Correct. 25 Q. And when it's not oscillating, does that	Page 40 1 BY ATTORNEY KROEGER: 2 Q. Do paragraph 34 and 35 of Lee relate to the 3 same embodiment? 4 A. I think it's clear that they're talking 5 about various embodiments on the present invention or 6 what is known. 7 I mean, for example, in the beginning of paragraph 8 35, it says, "According to embodiments," plural, "of 9 the present invention." 10 And then in paragraph 34 it's talking about what's 11 discussed above, which would include the background 12 section about how synchronous memory is operating, so 13 those would be different embodiments. 14 Q. And just going back up to the top of -- the 15 title of Lee, the title of Lee is, "Asynchronous Memory 16 Using Source Synchronous Transfer and System Employing 17 The Same," correct? 18 A. That's the title, yes. 19 Q. Does Lee have embodiments that concern 20 synchronous memory, in your opinion? 21 A. When you say "embodiments," are you talking 22 about embodiments of the invention, or are you talking 23 about just description of what was known and how 24 synchronous memory operates? 25 Because if it's embodiments of the invention, I
Page 39 1 mean that the strobe signal is off or not being 2 generated? 3 A. Yes. 4 If there's not a signal there, then there's no 5 signal being generated. 6 Q. Sorry. My lone remaining landline is going 7 off. It'll stop in a second. Okay. 8 For systems that make use of a continuous clock 9 signal, such as what's being discussed in the first two 10 sentences of paragraph 34 or 35, is it possible that 11 that signal could consume as much as 30 percent of the 12 power? 13 ATTORNEY CLEMENTS: Objection, scope. 14 THE WITNESS: I don't know. I'd need some 15 context about what's going on, if the memory is being 16 written to or -- or read from. 17 I think paragraph 34 talks about a clock 18 signal being used all the time, even in standby, but 19 paragraph 35 just -- it's -- it's saying that the 20 strobe signals can be toggled on and off and the strobe 21 signals can be generated by the clock signal. 22 So I -- paragraph 35, I don't -- I mean, 23 I'd need to read the rest of it, but I don't see it 24 talking about the -- as much detail as paragraph 34 25 about the clock signal.	Page 41 1 think, as you mentioned, Lee is related to asynchronous 2 memory using a synchronous source, but Lee talks about 3 what is known in synchronous memory as well. 4 Q. Thank you. 5 So let's jump down to paragraph 107 and the JEDEC 6 standard. And then for your reference I will put 7 Exhibit 1007 in the chat, which is the JEDEC standard. 8 (EXHIBIT 1007 WAS MARKED FOR 9 IDENTIFICATION.) 10 BY ATTORNEY KROEGER: 11 Q. So in paragraph 107 of your report, you 12 state, "The JEDEC standard describes using a clock 13 signal CK that is synchronized with command signals. 14 As shown in the figure below, the CK signal is a 15 continuous clock signal that is synchronized with the 16 command signal." 17 And here I guess is it correct, then, based off 18 this figure of -- that you produced in paragraph 107, 19 the clock signal is continuous because it's 20 continuously oscillating? 21 A. Yes. It's -- it's free running. 22 Q. Okay. And then going down to paragraph 111 23 of your report, you state, "POSITAS knew how to 24 implement memories using a continuous clock because 25 industry standards defined how to do so. The JEDEC

Page 42 1 standard is an example. As explained above, the JEDEC 2 standard defines the use of a continuous clock signal 3 that is transmitted from the controller to a memory," 4 and then you reproduced Figure 34. 5 Do you see that? 6 A. Yes. 7 Q. And then in Figure 112 -- in paragraph 112 8 you state, "As can be seen from the figure above, the 9 command and address lines are synchronized with the 10 clock signal CK. Accordingly, a POSITA would have 11 found it obvious to implement Lee's SCA signal using a 12 continuous clock, consistent with the JEDEC standard." 13 Do you see that? 14 A. Yes. 15 Q. And that is -- in terms of your obviousness 16 opinion, that is what you -- that is the teaching from 17 JEDEC that you believe should be combined with Lee to 18 render Claims 2, 7, and 11 obvious; it's the use of the 19 continuous clock signal; is that correct? 20 ATTORNEY CLEMENTS: Objection, form. 21 THE WITNESS: I mean, I don't know if I can 22 answer yes to that. It's kind of a vague, high-level 23 question. 24 I mean, I wrote, for example, in paragraph 25 108, that a POSITA would have found it obvious to -- to	Page 44 1 I can, but I don't really know the context about what 2 we're talking about. 3 BY ATTORNEY KROEGER: 4 Q. Lee does not have any embodiments of its 5 invention that uses a continuous clock signal; is that 6 correct? 7 A. Didn't we already discuss that Lee 8 disclosed that a clock signal could be used to generate 9 strobe signals, and the strobe signals could be toggled 10 on and off? 11 I don't know if that's claimed in any of the 12 claims. I didn't -- as I testified earlier, I didn't 13 look at the claims of Lee or do an analysis on those 14 claims, so I don't know if I can answer that question 15 without looking at the claims and -- and saying 16 specifically "in this embodiment." 17 But I think it's clear Lee talks about using the 18 clock signal to generate strobe signals and using 19 strobe signals to transmit along with the data for 20 reads and writes. 21 Q. I see. So going back to paragraph 35 of 22 Lee -- 23 A. Give me just a sec. 24 Q. Sure. 25 A. I've got to close that -- I got to -- I
Page 43 1 implement Lee's strobe command address strobe, the SCA 2 signal, as a continuous clock. And then to support my 3 opinion, I point to the JEDEC specification and say 4 here it's already done. 5 But, I mean, I use that knowledge of what a 6 POSITA would know with support that it's already known 7 in the JEDEC specification and those claims, yes. 8 BY ATTORNEY KROEGER: 9 Q. And if the continuous clock of the JEDEC 10 signal -- strike that. 11 If the continuous clock of the JEDEC standard were 12 implemented into Lee, would the signal be continued to 13 be used even in a standby state? 14 ATTORNEY CLEMENTS: Objection, scope. 15 THE WITNESS: I mean, I think we already 16 talked about Lee saying that and discussing what 17 happens if the clock is used in a standby state. 18 So, I mean, I think it's a design choice on 19 how you use the -- that clock signal. And I think a 20 POSITA would understand based upon the disclosures that 21 the clock signal may or may not be used in a standby 22 state, depending on how the system's designed. 23 I mean, I didn't -- I mean, if you have 24 some specific claim or opinion that I have that you can 25 point me to, I'm trying to answer the questions as best	Page 45 1 closed that one. I got to open it back up. 2 Okay. 35. I'm there. 3 Q. Yeah. 4 So when it -- in the second sentence, when it 5 says, "For example, a strobe signal can be implemented 6 using a clock signal that is toggled only during the 7 desired period," it's your understanding that the clock 8 signal is continuously generated, it's only the strobe 9 signal that is toggled on and off? 10 A. This seems like a logic question, because I 11 don't think you can generate a strobe signal if the 12 clock is off. So I think it has to be the strobe 13 signal is toggled on and off and generated from the 14 clock signal. 15 Q. So the clock signal has to be continuously 16 generated, and then the strobe signal would be -- would 17 be turned on or off as needed in accordance with the 18 read or write operation? 19 A. I think overall I'm okay with that 20 sentence. But, I mean, when you say the clock signal 21 has to be continuously generated, there's disclosure 22 that the clock signal is continuously generated, but 23 then there's also disclosure that the clock signal, in 24 paragraph 34, can be -- I mean, there's just 25 different -- different ways of doing things. It's a

Page 46 1 design choice. 2 In those two paragraphs they say you can have the 3 clock signal going all the time. You can even have it 4 going during standby. You can use the clock signal to 5 generate the strobe signals, and then you can toggle 6 the strobe signals on and off so that they don't go 7 through delay chains in the chips to reduce the power. 8 I think those disclosures are clear in those two 9 paragraphs. It doesn't mean that's the only way or 10 that things have to be done that way. It's just one 11 way that they can be done. I mean, that's why they say 12 if the memory uses the clock signal as an operation 13 reference, because it's just a design choice. 14 Q. Let's turn -- look at paragraph 115 of your 15 report -- of your declaration. 16 A. Okay. 17 Q. So, "Lee explains that the SCA signal can 18 be implemented using a clock signal." And you quote 19 paragraph 35 that we were just looking at. 20 And then you say, "Thus, a POSITA would understand 21 that the SCA signal is a clock signal during the 22 above-described period. It would have been obvious to 23 modify Lee to use a continuous clock as discussed in 24 Section VIII.B.2." 25 Do you see that?	Page 48 1 A. Lee teaches using the SCA signal strobe 2 command address to strobe into the command and address 3 information into the memory. 4 A person of ordinary skill in the art would have 5 understood that if you already have a clock signal, a 6 continuous clock that's running, that you could use 7 that to do the clocking in of the command and 8 addresses. 9 But taking my opinion that that would be an 10 obvious design choice I don't think is really -- I 11 think you really need to have support that that would 12 have been known at the time, and that's why I pointed 13 to the JEDEC specification where that's -- the clock 14 signal's actually used for strobing in the command and 15 address signals. 16 And I discuss that -- I discuss that earlier, 17 but -- in paragraph 108, about what a POSITA would have 18 understood and why they would have been motivated to 19 look to the JEDEC specification for design 20 implementation -- implementations of a synchronous 21 memory. 22 Q. And then looking back at paragraph 34 of 23 Lee, where it talks about, "If the memory uses the 24 clock signal as an operation reference signal, the 25 clock signal typically continues to be generated even
Page 47 1 A. Yes. 2 Q. So I'm just trying to understand the basis 3 for your opinion here. 4 If -- if it's your opinion that Lee already 5 describes using a continuous clock signal, why would 6 you need to modify Lee to use a continuous clock using 7 the JEDEC standard? 8 ATTORNEY CLEMENTS: Objection, form. 9 THE WITNESS: I think if I understand the 10 question at a high level, if you have a continuous 11 clock already and you can use that for the strobe of 12 the command address, then a person of ordinary skill in 13 the art would say, well, I can use that for the command 14 address strobe, so I don't need the -- the -- I can use 15 that in place of the SCA signal. 16 BY ATTORNEY KROEGER: 17 Q. So I guess my question is: Why did you 18 feel the need to combine Lee with the JEDEC signal 19 [sic] to meet the limitations of Claim 2 as you opined 20 in -- in -- in these paragraphs of your report, 21 starting with 114? 22 ATTORNEY CLEMENTS: Objection, form. 23 BY ATTORNEY KROEGER: 24 Q. What's missing from Lee that you felt the 25 need to consult JEDEC about?	Page 49 1 while in the standby state," is that -- is that a 2 discussion of the type of signal that is disclosed by 3 the JEDEC standard that you're relying on? 4 A. To the extent we're talking about the clock 5 signal being the CK signal in the figures that I 6 referenced from the JEDEC specification, yes. 7 I think as far -- just to make sure it's 8 understood, you can have a clock signal and it can 9 dissipate some power, but if you're using that clock 10 signal for other things, like strobing and data or pass 11 to go through delay chains inside the memory and using 12 it for other things, it can dissipate even more power. 13 And Lee was about trying to reduce the power, and 14 it says, well, you can leave the clock signal running 15 and derive these strobes and then not use the clock 16 signal for all this other stuff even though it's 17 running and then reduce your overall power. 18 Q. Where does Lee teach -- to use the words 19 you just said -- not using the clock signal for all 20 this other stuff even though it's running? 21 A. So for example, the last sentence in 22 paragraph 34, which that particular one is for standby 23 when you're not using signals to access the memory 24 array, which I mean when I -- it says "operations of 25 the memory array." To me, that means reading and

Page 50	Page 52
1 writing to the memory array. 2 Q. But there may be other things that the 3 clock signal's being used for? 4 A. Yes. 5 For example, to look at information on a bus to 6 tell it when to go out of the standby state. 7 Q. Does Lee discuss -- does Lee discuss using 8 the clock signal for things other than read or write 9 operations? 10 A. Lee mainly discusses using the strobe 11 signals for reading and writing. 12 Q. Put it this way. 13 I mean, does Lee discuss what uses the clock 14 signals have in a -- in a memory? 15 A. I mean, beyond what we discussed that can 16 be used to generate the strobe signals? 17 Q. Correct. Anything other than those? 18 A. I mean, the JEDEC standard, for example, 19 would inform the person of ordinary skill in the art in 20 the timeframe before 2006 what other uses the clock 21 signal could have, everything from putting it in a 22 standby state to waking up the part to doing refreshing 23 of the -- the DRAM, probably many, many other things if 24 I took a moment and looked at the spec and looked at 25 all the things the clock signal does.	1 what Lee refers to as the -- the second strobe signal, 2 correct? 3 ATTORNEY CLEMENTS: Objection, form. 4 THE WITNESS: Yes. 5 BY ATTORNEY KROEGER: 6 Q. And then the write data signal for 7 Limitation 1.1 is what's shown in Figure 1 as the data 8 being sent over 164? 9 A. Yes, as discussed in more detail in 10 paragraph 48 and the annotated Figure 1 of Lee. 11 Q. Why did you -- did you consider pointing to 12 S -- the SCA sent over 162 as the first data strobe 13 signal? 14 ATTORNEY CLEMENTS: Objection, scope. 15 THE WITNESS: I mean, the claim says that 16 the controller adapted to send out a first data strobe 17 signal and a write data strobe signal in a write 18 operation, so the data I pointed to is the write data 19 and the SDtM is the first data strobe signal associated 20 with the write data. 21 The SCA would be the strobe for the command 22 and address information that is used to strobe in the 23 command and address information 160, so it doesn't make 24 sense to point to the SCA as the -- as the claimed 25 first data strobe because it has to be with a write
Page 51	Page 53
1 Q. And the JEDEC standard is -- is that for 2 synchronous memory, asynchronous memory, or both? 3 A. The one that we're referring to, Exhibit 4 1007, is specifically for double data rate, DDR, 5 synchronous DRAM. But there are other JEDEC 6 specifications. 7 Q. All right. So let's go back up to your 8 discussion of Claim 1 and Lee, which starts on 9 paragraph 24 of your declaration, to about paragraph 10 45. 11 A. I'm there. 12 Q. Let's start with Limitation 1.1, "a 13 controller adopted to send out a first data strobe 14 signal and a write data signal in a write operation." 15 A. Okay. 16 Q. It's your opinion that the -- the first 17 data strobe signal is SDtM 166; is that correct? 18 ATTORNEY CLEMENTS: Objection, form. 19 BY ATTORNEY KROEGER: 20 Q. Let me ask that again. 21 It's your opinion that the first data strobe 22 signal is SDtM sent over line 166; is that correct? 23 A. Yes, as discussed in more detail in 24 paragraph 48. 25 Q. And it's kind of confusing, but SDtM is	1 signal and a write operation. 2 I mean, maybe if I thought about it, there 3 might be some way that that would work because you do 4 need address information when you do a write operation, 5 so maybe that signal would have taught this element as 6 well, but that's not what I -- that's not what I 7 pointed to. I think it was more consistent with what 8 the '369 was teaching to point to what I -- I indicated 9 there in that section. 10 BY ATTORNEY KROEGER: 11 Q. And then turn to Claim 1.2 on page 29. 12 "The write data signal being synchronized with the 13 first data strobe signal." 14 And here I believe you're relying on the text from 15 paragraph 20 of Lee, at least, that talks about how for 16 a write operation the memory controller 140 transfers 17 data, capped DATA, to the memory 120 via a data bus 18 164, and transfers, as a transmission synchronous 19 signal, the second strobe signal SDtM to the memory 120 20 via a signal line 166; is that correct? 21 A. Yes. 22 You can see the write data signal being 23 synchronized with the first data strobe signal on the 24 previous page, where I annotated Lee Figure 2. So this 25 would be the top of page 28.

Page 54 1 Q. And they're synchronized because they're 2 both oscillating at the same time? 3 A. They're synchronized because if you don't 4 have synchronization, there's no point in sending a 5 strobe along with the data. 6 I mean, it would be just a wasted signal because 7 if there's no relationship or synchronization, then 8 it's not -- it's not useful to send a strobe with 9 the -- the data strobe signal with the write data, the 10 write -- that tells the memory when to latch or capture 11 the data, so they've got to be synchronized. 12 Q. Now, the last sentence of your paragraph 51 13 is, "I further note that synchronization of the strobe 14 signal does not necessarily make the memory synchronous 15 memory because it is not necessarily synchronized with 16 the system clock." 17 Do you see that? 18 A. Yes. 19 Q. Why did you feel the need to make that 20 point? 21 A. I think it's -- synchronous memory as 22 taught in Lee and in the JEDEC specification, things 23 are done in synchronization with the clock. So I 24 wanted to make sure that just simply sending a strobe 25 signal with data, either during a write or a read,	Page 56 1 you've annotated Lee Figure 1 to identify the signals; 2 is that correct? 3 A. Yes. 4 Q. So the -- the read data signal is the data 5 being sent over line 164; is that correct? 6 A. Yes. 7 Q. And the read data strobe signal is SdFm 8 over line 168; is that correct? 9 A. Yes. 10 Q. And the second data strobe signal is SdTM 11 sent over line 166; is that correct? 12 A. Yes. 13 Q. And then in paragraph 54, you state that, 14 "Lee further describes the signals of the write 15 operation in Figure 2 as shown below." 16 Do you see that? 17 A. Yeah, of the read operation. Yes. 18 Q. That was -- that was my question. 19 Did you mean to refer to the read operation in 20 paragraph 54? 21 A. Yes. 22 Q. How is the -- how does Lee describe the 23 read data signal being sent in synchronization with the 24 read data strobe signal? 25 A. It shows it, but as we discussed earlier,
Page 55 1 doesn't mean it's a synchronous system. It just is a 2 way to transmit high-speed data that's -- you have a 3 strobe signal to capture. 4 ATTORNEY KROEGER: Why don't we go ahead 5 and take a ten-minute break, and then we'll finish off 6 Claim 1, if that's okay. 7 THE WITNESS: Sounds great. 8 ATTORNEY KROEGER: Okay. 9 THE VIDEOGRAPHER: Okay. Off the video 10 record at 11:03 a.m. 11 (RECESS TAKEN.) 12 THE VIDEOGRAPHER: On the video record at 13 11:14 a.m. 14 BY ATTORNEY KROEGER: 15 Q. Dr. Baker, let's turn to your discussion of 16 Lee and Limitation 1.3, starting on page 30 of your 17 report, around paragraph 53. 18 A. Okay. 19 Q. And so this limitation is, "the controller 20 being adapted, in a read operation, to send out a 21 second data strobe signal and to receive a read data 22 signal in synchronization with a read data strobe 23 signal"; is that correct? 24 A. Yes. 25 Q. And then at the bottom of paragraph 53,	Page 57 1 if it's not in synchronization, there's no reason or 2 need to send a strobe signal with the read data. I 3 mean, it's pointless then. The strobe signals used 4 were synchronized with the data so that the controller 5 knows when to capture that read information. 6 Q. And then in paragraph 56, you state that, 7 "the SdTM signal of the read operation (the second data 8 strobe signal) is different than the SdTM signal of the 9 write operation (the first data strobe signal) because 10 they are sent at different times." 11 Do you see that? 12 A. Yes. 13 Q. And is there any -- do you rely on any 14 specific discussion from Lee stating that the two SdTM 15 signals are sent at different times? 16 A. I mean, if they're not, that's kind of 17 taking the position that reading and writing occurs at 18 the same time, which is nonsensical. So they've got to 19 be at different times. 20 Q. And that's why you invoke Figure 1 of the 21 '369 patent to show that the signals are sent at 22 different times; is that correct? 23 ATTORNEY CLEMENTS: Objection, form. 24 THE WITNESS: I pointed it out simply just 25 to show that the -- just like the '369 and Lee, they

Page 58 1 both use one wire to -- for those signals. They 2 just -- the signals go at different times. But the 3 point of the -- the Figure 1 in '369 on the bottom of 4 page 34 is to show that it's a -- it's a wire between 5 the controller and the memory. 6 BY ATTORNEY KROEGER: 7 Q. And then Section 1 -- then going to Claim 8 Limitation 1.4, "the read data strobe signal being 9 received by the controller in response to the second 10 data strobe signal." 11 Do you see that? 12 A. Yes. 13 Q. And for this you're relying on a teaching 14 of paragraph 21 of Lee, that the memory 120 internally 15 generates a third strobe signal SDFM in response to the 16 second strobe signal, SDtM, correct? 17 A. Yes. 18 Q. And then the Limitation 1.5, "a memory 19 adapted to receive the write data signal in 20 synchronization with the first data strobe signal in 21 the write operation," for this limitation you're 22 primarily invoking your discussions in 1.0, 1.1, and 23 1.2 above, correct? 24 A. Yes, as discussed in paragraphs 62, 63, and 25 64.	Page 60 1 controller and the memory, you can have really 2 well-defined transfers, functions, and speed. 3 But I'm answering at a high level because anything 4 I answer can be contradicted for a specific example, 5 so -- but, I mean, in general, you have better speed 6 performance for synchronous, but not always. I mean, 7 there's -- it just depends on the application. 8 And an asynchronous can sometimes be lower power, 9 but not always. It just depends on how things are 10 implemented and what specifically the goals are. 11 ATTORNEY KROEGER: Mr. Clements, I think 12 I'm finished with my direct. I don't know if you have 13 any -- if you have any redirect. 14 ATTORNEY CLEMENTS: I have no questions. 15 ATTORNEY KROEGER: All right. I think 16 we're done. 17 THE VIDEOGRAPHER: Okay. Are you ready to 18 go off the record, Counsel? 19 ATTORNEY KROEGER: Yes. 20 ATTORNEY CLEMENTS: Yeah. 21 THE VIDEOGRAPHER: Okay. This concludes 22 the deposition of Dr. R. Jacob Baker, Ph.D., on April 23 5th, 2024. Off the video record at 11:26 a.m. 24 Please stand by while I stop recording. 25 (CONCLUDED AT 11:26 A.M.)
Page 59 1 Q. And then Limitation 1.6 is, "the memory 2 being adapted, in the read operation, to output the 3 read data strobe signal in response to the second data 4 strobe signal and to send the read data signal 5 synchronized with the read data strobe signal." 6 And for here you're primarily relying on your 7 discussions from 1.3 and 1.4 above; is that correct? 8 A. And paragraphs 21 and 25 -- 25 from Lee. 9 Q. Just in general, say -- use Lee for a 10 second. 11 Are there any benefits that asynchronous memory 12 offers over synchronous memory that a POSITA would 13 consider in designing a memory system in the 2006 14 timeframe? 15 A. I mean, there -- yes. There are design 16 trade-offs where you have pros and cons of various 17 approaches. 18 Q. Do you know what some of those design 19 trade-offs -- or some -- what some of those pros and 20 cons are? 21 A. It depends on the context of what the goal 22 is; for example, in what someone defines as synchronous 23 and what someone defines as asynchronous. But to the 24 extent synchronous means doing everything at the beat 25 of the system clock or the clock between the -- the	Page 61 REPORTER'S CERTIFICATE 1 2 3 I, DANNIELLE COPELAND, RDR, CRR, DO HEREBY CERTIFY 4 THAT THE FOREGOING DEPOSITION OF DR. R. JACOB BAKER WAS 5 TAKEN BEFORE ME AT THE TIME AND PLACE AND FOR THE 6 PURPOSE IN THE CAPTION STATED; THAT THE WITNESS WAS 7 FIRST DULY SWORN TO TELL THE TRUTH, THE WHOLE TRUTH, 8 AND NOTHING BUT THE TRUTH; THAT THE DEPOSITION WAS 9 TAKEN BEFORE ME STENOGRAPHICALLY AND AFTERWARDS 10 TRANSCRIBED UNDER MY DIRECTION; THAT THE FOREGOING IS A 11 FULL, TRUE, AND CORRECT TRANSCRIPT OF THE SAID 12 DEPOSITION SO GIVEN; THAT THERE WAS A REQUEST THAT THE 13 WITNESS READ AND SIGN THE TRANSCRIPT; THAT THE 14 APPEARANCES WERE AS STATED IN THE CAPTION. 15 I FURTHER CERTIFY THAT I AM NEITHER OF COUNSEL NOR 16 OF KIN TO ANY OF THE PARTIES TO THIS ACTION, AND AM IN 17 NO WAY INTERESTED IN THE OUTCOME OF SAID ACTION. 18 WITNESS MY SIGNATURE ON APRIL 12, 2024. 19 20 <i>Danniel Copeland</i> 21 22 DANNIELLE COPELAND, RDR, CRR 23 CALIFORNIA CSR 14444 24 TENNESSEE LICENSE 807 25 WASHINGTON CSR 22000824

Exhibits	1.4 58:8 59:7	41:22	53:20 56:11	2023-01200 4:6
Exhibit 1001 2:11 8:22 9:1	1.5 58:18	112 42:7	168 56:8	2024 4:9 60:23
Exhibit 1003 2:9 6:13,16,23 9:11	1.6 59:1	114 47:21	17 11:7 18:15 20:15 33:21	21 21:15,21 22:7 58:14 59:8
Exhibit 1004 2:10 6:18,20 7:22	10 11:6,11	115 46:14	18 11:7 18:15 20:15	23 21:1
Exhibit 1005 2:13 26:6,9,10	1001 8:22 9:1	11:03 55:10	19 11:5,7 14:11 15:11	24 51:9
Exhibit 1006 2:12 18:18,21, 22	1003 6:13,16,23 9:11	11:14 55:13	1996 24:7	25 7:10,11 11:7 19:17 59:8
Exhibit 1007 2:14 19:2 41:7,8 51:3,4	1004 6:18,20 7:22	11:26 60:23,25	1999 24:7,10	26 11:7
1	1005 26:6,10	120 7:9,13 29:21 36:9 53:17,19 58:14	2	27 11:7
1 4:3 10:25 11:2,6,11 12:16 26:16 27:11,21,24 51:8 52:7,10 55:6 56:1 57:20 58:3,7	1006 18:18,22 24:8	13 27:1	2 10:13,16 11:3, 15,16 24:8 27:24 37:10 38:4 42:18 47:19 53:24 56:15	28 16:3 18:13 20:13 26:22, 23 53:25
1.0 58:22	1007 19:2 41:7,8 51:4	14 11:7	2.3.3 20:20	29 16:8 53:11
1.1 51:12 52:7 58:22	104 5:15	140 7:9,12,13 53:16	2.5.1 21:5	3 29:18 35:15
1.2 53:11 58:23	107 41:5,11,18	15 11:7	20 16:2 53:15	30 16:8 26:20,25 39:11 55:16
1.3 55:16 59:7	108 11:23 42:25 48:17	16 11:6,7,9	2004/0022095 10:3	34 28:6,19 29:6 33:6 34:8,19 39:10,17,24 40:2,10 42:4 45:24 48:22 49:22 58:4
	10:03 30:24	160 52:23	2006 14:17 25:1,24 26:2 50:20 59:13	
	10:13 31:2	162 52:12		
	11 10:16 11:16 42:18	164 52:8 53:18 56:5		
	111	166 51:17,22		

35 28:6,19,21 33:6 36:15,25 37:10,15 38:7 39:10,19,22 40:2,8 44:21 45:2 46:19 369 8:15 9:5,7 10:1,2,10,19 11:21 12:14 13:14,17 14:16,19,23 15:4 19:22 24:25 25:21 28:4 53:8 57:21,25 58:3 4 4 9:21,22,24 35:7 40 12:17 41 11:6 42 37:11 45 51:10 47 7:10,11 48 51:24 52:10 5 5 31:5,7 34:3,7	50 22:8 51 54:12 53 55:17,25 54 56:13,20 56 57:6 58 10:13 586 22:9 5th 4:9 60:23 6 6 11:10,11 60 11:23 62 58:24 63 58:24 64 58:25 7 7 10:16 11:16 42:18 7,697,369 8:8 9:2	8 8 14:17 9 90s 23:8,11 24:5 9:07 4:9 A a.m. 4:9 30:24 31:2 55:10,13 60:23,25 above- described 46:22 access 49:23 accordance 45:17 accurate 7:25 9:18 25:4 actions 17:1 adapted 52:16 55:20 58:19 59:2 added 8:1 address 15:4 37:7 42:9 43:1 47:12,14 48:2,15 52:22,	23 53:4 addresses 48:8 admits 13:14 admonitions 5:19 adopted 51:13 agree 22:16,23 23:23 24:23 28:17 31:25 ahead 6:15 9:20 55:4 amount 29:7 analysis 28:4 44:13 analyzed 28:10 analyzes 28:11 Angeles 4:12 annotated 37:15 52:10 53:24 56:1 annotations 38:4 answering 29:25 30:14 32:14 60:3 anticipated 12:6,14,22,25 anticipation 12:18,23 13:9	Any- 7:14 application 60:7 applications 6:6 approaches 59:17 April 4:9 60:22 area 15:18 20:3 array 49:24,25 50:1 art 10:17 13:4,11 14:13,15 47:13 48:4 50:19 arts 14:18,22 aspect 27:14 aspects 28:13 asserted 12:5 13:13 assume 5:16 assuming 5:10 asynchronous 15:5,8 16:4,7, 14 17:5 18:15 20:2,14,19 21:14 22:10 23:1 24:11,14 26:20 27:6,12,
---	--	--	---	---

14,18,21,25 28:7 40:15 41:1 51:2 59:11,23 60:8 attached 18:24 attended 19:18 attorney 4:16,17,20 5:7 6:15,22 8:24 10:11,20 12:8, 11 15:14 16:1 18:20 21:18 22:6 23:4 24:3 26:3,8 27:8,16 28:15 29:5 30:18,21 31:3 37:19,22 38:6, 15 39:13 40:1 41:10 42:20 43:8,14 44:3 47:8,16,22,23 51:18,19 52:3, 5,14 53:10 55:4,8,14 57:23 58:6 60:11,14,15, 19,20 attorneys 9:13 August 4:18 avoid 30:2 aware 8:13 19:20	B back 18:13 20:13 26:19 29:6 31:4 40:14 44:21 45:1 48:22 51:7 background 40:11 Baker 4:3 5:1,8 31:4 55:15 60:22 based 36:20 37:23 38:4 41:17 43:20 bases 11:19 basis 26:16 47:2 beat 17:18 59:24 began 13:23 14:5 19:6,14 beginning 4:2,16 40:7 begins 9:22 behalf 4:8,11 belief 25:3 benefits 59:11 Bicmos	22:11 23:15 24:19 bipolar 23:9 bit 10:22 book 19:25 20:5 23:7,10 24:6 books 19:16 Boone 4:21 bottom 21:22 55:25 58:3 break 30:17,19 55:5 breaking 30:16 bus 37:7,8 50:5 53:17 buying 25:16 C caches 20:19 cadence 17:16 California 4:12 CALLED 5:1 Calmann	4:20 capable 36:8 capped 53:17 capture 54:10 55:3 57:5 case 4:6 21:9 23:1, 13 31:11 chains 46:7 49:11 change 22:21 changed 8:5 24:5 25:1 35:19 chat 6:16 7:23 9:1 18:21 26:10 41:7 chip 25:14 33:4 chips 14:9 25:16 46:7 choice 43:18 46:1,13 48:10 circuits 29:14 35:11 cite 18:15 20:15 21:1,15 26:22 cited 6:2 20:1,10	CK 41:13,14 42:10 49:5 claim 13:5 27:11,21, 24 43:24 47:19 51:8 52:15 53:11 55:6 58:7 claimed 27:15 44:11 52:24 claiming 13:6 claims 10:9,16 11:6, 11,16,20 12:5, 14,22 13:10, 13 27:11,17, 25 28:3,4,10, 11 42:18 43:7 44:12,13,14, 15 class 22:9 clear 28:2 34:15,25 40:4 44:17 46:8 Clements 4:20,21 10:11 12:8 15:14 21:18 23:4 26:3 27:8 28:15 37:19 38:6 39:13 42:20 43:14 47:8,22 51:18 52:3,14 57:23 60:11,14,20
---	---	--	---	---

clock 16:13,16,21, 24 17:3,6,22, 24 18:4,7,9 26:21 27:5 28:14,22,24 29:1,9,11,12, 15 30:2,5,8,9, 11 31:9,12,14 32:2,3,7,10, 11,17,21,24, 25 33:5,10,12, 16,19,24 34:11,17,20, 21 35:1,3,9, 10,12,20,25 36:16,18,20 37:1,3,16 38:5,13 39:8, 17,21,25 41:12,15,19, 24 42:2,10,12, 19 43:2,9,11, 17,19,21 44:5, 8,18 45:6,7, 12,14,15,20, 22,23 46:3,4, 12,18,21,23 47:5,6,11 48:5,6,13,24, 25 49:4,8,9, 14,15,19 50:3, 8,13,20,25 54:16,23 59:25	closed 45:1 CMOS 23:9 colleague 4:22 collectively 10:23 combination 13:2 combine 47:18 combined 42:17 command 37:7 41:13,16 42:9 43:1 47:12,13 48:2, 7,14 52:21,23 comments 13:20 computer 15:3 18:3 computing 15:2,20 concern 40:19 concerns 9:4 10:25 CONCLUDED 60:25 concludes 60:21 conference 4:7 confusing 32:20 51:25	cons 59:16,20 considered 31:24 consistent 29:24 37:8 42:12 53:7 construed 18:1 consult 19:23 20:4,8 47:25 consume 29:16 35:13 39:11 consumed 29:8 context 16:22 17:8,25 18:1,11 23:18 24:23 39:15 44:1 59:21 contexts 23:19,20 continue 29:16 30:10 35:12 continued 43:12 continues 17:12 29:13 34:21 35:1,10 48:25 continuous 16:21 17:24 28:14 30:2 32:2,16 35:2 39:8 41:15,19, 24 42:2,12,19	43:2,9,11 44:5 46:23 47:5,6, 10 48:6 continuously 41:20 45:8,15, 21,22 contradicted 60:4 control 16:17 17:13 controller 7:9,12,13 15:1,12 16:12, 15 42:3 51:13 52:16 53:16 55:19 57:4 58:5,9 60:1 controls 17:13 conventional 31:8 Copeland 4:10 copies 5:24 19:16 copyright 24:7 correct 5:22 8:8 10:10 11:1,8,13,17 12:7 21:2,15 24:7,13 25:5, 24 26:17,22 27:19,22 28:1 32:19 37:12, 18,25 38:19, 22,24 40:17 41:17 42:19 44:6 50:17	51:17,22 52:2 53:20 55:23 56:2,5,8,11 57:22 58:16, 23 59:7 cost-effective 22:9 counsel 7:17 60:18 couple 36:14 coursework 19:9 court 4:9,24 current 29:8,16 30:3 31:8 35:13 36:9 CV 6:19 7:22 8:5 D Dannielle 4:10 data 16:11,18 27:3 28:25 32:8,22, 25 33:13 36:19 37:7,8 38:11 44:19 49:10 51:4,13, 14,17,21 52:6, 7,12,16,17,18, 19,20,25 53:12,13,17, 22,23 54:5,9, 11,25 55:2,21, 22 56:4,7,10,
---	---	--	---	--

23,24 57:2,4, 7,9 58:8,10, 19,20 59:3,4,5	delay 33:13 46:7 49:11	desired 28:23 36:17 37:2,4,6 45:7	51:23 52:9 56:25 58:24	5:2
date 10:18 12:2 14:16 22:25 23:6 24:7,25 25:21,24 32:1	delays 33:7	desktop 15:3	discusses 50:10	dynamic 15:1 20:22
dates 25:4	density 25:8	detail 18:11 39:24 51:23 52:9	discussing 21:21 43:16	E
DDR 51:4	depending 43:22	device 27:12,22,25	discussion 20:18 33:3 34:23 49:2 51:8 55:15 57:14	e.g 35:25
dec- 12:4	depends 25:8 27:24 59:21 60:7,9	difference 16:6	discussions 58:22 59:7	earlier 44:12 48:16 56:25
declaration 6:1,17,24 7:1, 6 8:6,9,14,20 9:4,11,12,13, 16,21,22,25 11:20 12:2,4, 13,20,21 13:24 14:5,12 16:9 19:6,15 21:20 22:4 24:1 26:19,24 33:21 46:15 51:9	deposition 4:3,7,8,13 5:11,14 9:8 60:22	Digital 4:4,22 7:18 8:14	dissipate 49:9,12	earliest 14:16
defendant 4:8	depositions 4:11 5:17	Digital's 8:19 9:13 18:24	distance 25:9	electronic 6:7
defending 4:21	derive 49:15	direct 60:12	documents 5:24 6:2,7	element 53:5
define 17:10 33:9	derived 30:5 38:13	disclosed 12:25 34:13 37:15 38:7 44:8 49:2	double 51:4	email 6:8
defined 10:3 41:25	describe 56:22	discloses 29:4 34:25	download 19:3	embodiment 40:3 44:16
defines 42:2 59:22,23	describes 41:12 47:5 56:14	disclosure 45:21,23	downloading 26:12	embodiments 29:17 30:12 34:24 35:14 36:7 40:5,8, 13,19,21,22, 25 44:4
definition 15:9,18	description 40:23	disclosures 43:20 46:8	draft 9:11	Employing 40:16
	design 24:16 43:18 46:1,13 48:10, 19 59:15,18	discuss 16:8 44:7 48:16 50:7,13	drafting 9:15	enable 29:21 35:17
	designed 14:9 43:22	discussed 14:24 28:19 29:7 33:6 35:4 39:9 40:11 46:23 50:15	DRAM 15:1,12 50:23 51:5	ended 23:13
	designing 59:13		DRAMS 21:6	equivalent 22:12 23:3
			drum 17:17,18	errors 7:4,7
			DULY	

et al 10:3	fabricating 23:14	find 33:24 34:2 35:2	G	grounds 10:25
exact 5:11	fact 27:17	fine 30:19	geared 14:25	guess 9:18 19:10 31:24 34:13 38:3 41:17 47:17
EXAMINATION 5:5	fair 5:16 20:9 25:20 28:12 30:1	finish 55:5	general 15:19 16:23 24:22,24 59:9 60:5	H
EXAMINED 5:3	familiar 5:16 13:22 14:4,7,18 19:5,13	finished 60:12	generate 29:15 35:12 44:8,18 45:11 46:5 50:16	happen 17:15,17 18:9
examples 28:17	familiarity 15:12	flat 38:17	generated 29:13 31:8 32:17 34:21 35:10 36:10 39:2,5,21 45:8,13,16,21, 22 48:25	happened 25:11
excerpts 18:23	fast 20:19	follow 32:5	generates 58:15	happening 18:8
exhibit 6:13,16,18,20, 23 7:22 8:22 9:1,11 18:18, 21 19:2 26:6,9 41:7,8 51:3	feel 47:18 54:19	forego 5:19	give 18:1 25:19 34:10,24 35:1 44:23	Haynes 4:21
expensive 22:11 23:2,22 24:12,15,19	felt 23:10,12 47:24	foregoing 28:13	goal 59:21	head 21:24
experience 15:17	field 14:15	form 10:11 12:8 15:14 28:15 37:19 38:6 42:20 47:8,22 51:18 52:3 57:23	goals 60:10	held 4:7
explained 10:15 42:1	figure 29:18 33:24 34:11,16 35:2, 6,15 37:10,23 38:4,17 41:14, 18 42:4,7,8 52:7,10 53:24 56:1,15 57:20 58:3	formed 24:2	good 4:1 5:8,9 30:16	high 15:20 16:10 18:12 33:9 47:10 60:3
explains 46:17	figures 37:9 49:5	found 11:24 42:11, 25	great 55:7	high-level 42:22
extent 27:13 49:4 59:24	file 13:17	free 17:12,15 18:7 41:21	ground 10:13,25 11:2, 3,6,15 12:16, 18 26:16	high-speed 55:2
external 25:12,16 26:1	filing 14:16	free-running 16:25 17:10, 23		history 10:1 13:17
F		functions 60:2		Hong 4:22
fabricate 23:15,22				hot 23:8
				hours 7:21

I	inform 50:19	J	12:11 16:1 18:20 22:6 24:3 26:8 27:16 29:5 30:18,21 31:3 37:22 38:15 40:1 41:10 43:8 44:3 47:16,23 51:19 52:5 53:10 55:4,8, 14 58:6 60:11, 15,19	25 34:18,25 37:9,11,16 40:2,15,19 41:1,2 42:17 43:12,16 44:4, 7,13,17,22 46:17,23 47:4, 6,18,24 48:1, 23 49:13,18 50:7,10,13 51:8 52:1,10 53:15,24 54:22 55:16 56:1,14,22 57:14,25 58:14 59:8,9
i.e. 38:18	information 16:15 48:3 50:5 52:22,23 53:4 57:5	Jacob 4:3 5:1 60:22		
identical 22:12	inside 49:11	JEDEC 10:6,8,17 11:4,17,25 12:6,22 13:2, 3,6,9,12,18 14:4,7,10 41:5,7,12,25 42:1,12,17 43:3,7,9,11 47:7,18,25 48:13,19 49:3, 6 50:18 51:1,5 54:22		
IDENTIFICATION 6:14,21 8:23 18:19 26:7 41:9	integration 23:9			
identify 4:15 56:1	inter 8:7			
illustrate 20:5	internal 29:14 33:4 35:11			
illustrated 29:18 35:15	internally 31:14 58:14		L	
implement 41:24 42:11 43:1	invalid 10:10	jump 41:5	landline 39:6	Lee's 34:23 42:11 43:1
implementation 48:20	invalidity 11:20	June 14:17	laptop 6:2,6 15:3 18:3	legal 4:11 10:14 12:24
implementations 48:20	invent 27:6,13	K	latch 29:21 35:17 54:10	level 14:12 15:10 16:10 18:12 33:9 47:10 60:3
implemented 28:22 36:16, 25 37:6,16 43:12 45:5 46:18 60:10	invention 29:18 35:15 36:8 40:5,9, 22,25 44:5	Kabat 4:18	latching 29:21 35:17	Licensing 4:5,19
include 40:11	inventive 28:12	kind 19:21 35:19 42:22 51:25 57:16	law 10:15	limitation 51:12 52:7 55:16,19 58:8, 18,21 59:1
including 19:17	invoke 57:20	knew 41:23	leave 49:14	limitations 47:19
industry 14:9 41:25	invoking 58:22	knowledge 15:11 43:5	Lee 10:3,4,8,16,25 11:3,8,13,16 12:6,15 13:2, 11,17,22 26:9, 22 27:6,11,13, 18 28:13,17 29:4 30:1,4,12 31:5,7,19,23 32:1,9,13 33:2,11,15,19,	limited 4:19 27:18,21
	IPR 4:6 8:15,19	knowledgeable 14:17	latch 29:21 35:17	lines 42:9
	irrespective 31:15	Kroeger 4:17 5:7 6:15, 22 8:24 10:20	latching 29:21 35:17	

listed 11:12	15:6 25:15	12,19,24 16:4, 7,11,12,14,15, 20,21 18:14 20:14,22,23 21:14 24:12 25:9 26:20 27:7,12,14,18, 22,25 29:8,10, 11,21 30:3,6 31:8,9,13,16 32:1,16 33:20 34:17,19 35:8, 17 36:1,9,11 39:15 40:12, 15,20,24 41:2, 3 42:3 46:12 48:3,21,23 49:11,23,25 50:1,14 51:2 53:16,17,19 54:10,14,15, 21 58:5,14,18 59:1,11,12,13 60:1	47:24 misspoke 11:9 modify 46:23 47:6 moment 29:25 50:24 months 8:2 morning 4:1 5:8,9,12 motivated 48:18 moved 25:14	nowadays 25:11,15 number 4:3,6 5:11,14 10:2
literally 14:1	making 18:8 20:17			O
locate 34:16	Mariel 4:10			oath 5:2,21
located 4:12 6:11	MARKED 6:13,20 8:22 18:18 26:6 41:8			Objection 10:11 12:8 15:14 21:18 23:4 26:3 27:8 28:15 37:19 38:6 39:13 42:20 43:14 47:8,22 51:18 52:3,14 57:23
logic 45:10	material 19:22,25 20:1			
lone 39:6	materials 6:4			
long 7:20 19:20	matter 4:4 6:2,24 8:9 9:14 34:13			
Longitude 4:5,18	matters 34:25		N	
looked 13:25 50:24	meaning 17:12 36:18		narrow 15:23	observer 4:23
Los 4:12	means 29:15 49:25 59:24	mentioned 8:10 24:4 41:1	necessarily 16:16 20:7 54:14,15	obvious 10:16 11:7,13, 16,24 13:13 42:11,18,25 46:22 48:10
lot 23:12,14	Media 4:2	Mercado 4:10	needed 45:17	obviousness 12:16,19 42:15
lower 60:8	meet 7:17 14:10 15:18 47:19	met 19:17	nonsensical 57:18	occurring 18:5
M	meeting 6:9 7:20	Micron 19:18,19	nonstandby 31:11	occurs 17:14 57:17
made 13:20	megahertz 22:8	mind 12:9 24:17 25:18	note 54:13	offer 10:14
majority 26:1 28:5	memories 41:24	minor 7:8	noted 7:14	offered 6:24 7:5
make 16:21 22:20 39:8 49:7 52:23 54:14, 19,24	memory 7:12 14:18,22, 25 15:2,5,6,	minutes 30:20	notice 7:4,7,8	offers 59:12
makes		missing	noticing 4:16	

office 8:15	opinion 10:15 11:14 13:3,7 16:6 17:24 19:21 22:20,22 25:19,22 40:20 42:16 43:3,24 47:3,4 48:9 51:16,21	20:13 26:20, 22,23,25 28:21 29:6 31:5,7,19 33:6 34:1,3,5,7,8, 19 35:7 36:15 37:10,11,15 38:7 39:10,17, 19,22,24 40:2, 7,10 41:5,11, 18,22 42:7,24 44:21 45:24 46:14,19 48:17,22 49:22 51:9,24 52:10 53:15 54:12 55:17, 25 56:13,20 57:6 58:14	17 14:16,19, 23,25 15:4 19:22 25:1,22 28:4 57:21 patents 14:1 Paul 4:17 pausing 12:23 PDFS 6:1 peaks 38:18 people 23:8,14 25:16 percent 39:11 performance 24:16 60:6 performed 31:15 32:4,19 period 28:23 36:17 37:2,4,7 45:7 46:22 person 10:17 13:4 14:14 47:12 48:4 50:19 pertinent 14:18,23 petition 8:19 18:24 Petitioner 4:21 Ph.d.	4:4 60:22 place 47:15 places 13:15 platforms 15:2 plural 40:8 point 13:16,18,25 15:24 19:11 30:16 31:24 33:23 43:3,25 52:24 53:8 54:4,20 58:3 pointed 48:12 52:18 53:7 57:24 pointing 21:4 52:11 pointless 57:3 portions 20:10,16 POSITA 11:24 13:7,20 14:15 15:10, 18 19:22 20:3, 6,11 30:13 42:10,25 43:6, 20 46:20 48:17 59:12 POSITAS 41:23 position 57:17 pounding
open 6:6,8 9:20 18:25 19:4 26:11,14 45:1	opinions 7:5 9:14 10:14,24 11:2, 3,6,15 12:1,2, 5,13,21 13:12, 15 24:1 31:20	paragraphs 16:8,10 28:6, 19 30:13 46:2, 9 47:20 58:24 59:8		
operate 15:19 29:16 35:1,12	orchestrate 17:1,21	parenthetical 21:6		
operates 40:24	ordinary 10:17 13:4 14:12,15 47:12 48:4 50:19	part 7:18 8:6,11, 14,15 10:7 13:12 23:25 50:22		
operating 40:12	oscillating 38:23,25 41:20 54:2	partes 8:7		
operation 17:14 18:7 29:2,12 31:15 32:3,8,11,18, 23 33:10,20 34:18,20 35:3, 9 36:1 37:24 38:1,5 45:18 46:12 48:24 51:14 52:18 53:1,4,16 55:20 56:15, 17,19 57:7,9 58:21 59:2	output 59:2	pass 49:10		
operations 15:7 29:10 30:8 31:13 32:25 36:11 49:24 50:9	Owner 4:18	patent 4:18 6:1 8:7, 10,15,16 9:1, 3,4,5,8 10:1,2, 10,19 11:21 12:14 13:14,		
opine 10:9 21:19 22:3	pages 20:15			
opined 22:24 47:19	paragraph 7:10,11 9:21, 24 10:7 11:5, 23 12:17 14:11 15:10 16:2,3 18:13			
opening 23:24				

17:16 power 32:12 33:8,14 39:12 46:7 49:9,12,13,17 60:8 preparation 7:2 9:25 preparing 7:18 preposition 7:2 present 4:15 6:10 28:9 29:17 35:15 36:7 40:5,9 previous 53:24 primarily 58:22 59:6 Prince 18:15,22,23 19:5,13 20:9, 15,16 21:1,15, 21 22:7,25 24:10 Prince's 19:16 printed 6:3 priority 10:18 24:25 25:21,24 problems 23:12 proceed 5:17	process 23:16 processor 25:12,14 26:2 processors 22:8 25:17 produced 31:14 41:18 producing 32:2 pros 59:16,19 prosecution 10:1 Publication 10:2 pulse 17:18 pulses 17:1,11,16,23 purport 27:6,13 put 6:16,18 7:22 9:1 18:21 26:9 41:6 50:12 putting 50:21 Q question 8:12 10:21 12:3,10 13:1, 8,16 18:11 22:5 27:20 30:15 32:14 42:23 44:14	45:10 47:10, 17 56:18 questions 28:9 43:25 60:14 quote 46:18 R random- access 15:2 20:22 21:14 rate 51:4 re-asking 12:9 read 8:18 16:19 27:4 28:25 29:1 31:23 32:9,18,23 33:20 34:18 37:5 38:1 39:16,23 45:18 50:8 54:25 55:20, 21,22 56:4,7, 17,19,23,24 57:2,5,7 58:8 59:2,3,4,5 reading 28:21 32:21 36:19 38:10 49:25 50:11 57:17 reads 44:20 ready	60:17 reason 19:1 57:1 recall 8:21 9:17 receive 55:21 58:19 received 58:9 RECESS 30:25 55:11 recognize 6:23 recognizes 32:9 record 4:2,14 8:25 30:24 31:1 55:10,12 60:18,23 recording 60:24 redirect 60:13 reduce 30:6 33:14 46:7 49:13,17 reducing 30:3 36:8 refer 9:7 56:19 reference 11:1 13:1,9, 18,22 15:7 26:9,15 29:12 31:12 34:20 35:9,25 36:10 41:6 46:13	48:24 referenced 49:6 references 10:8 13:19,21 29:20 37:10 referring 37:18 51:3 refers 52:1 refreshing 50:22 relate 40:2 related 8:10 16:16 28:6,9 41:1 relationship 54:7 relevant 25:15 relied 28:5 rely 57:13 relying 20:16 49:3 53:14 58:13 59:6 remaining 39:6 remember 14:1 remote 4:7 render 42:18
---	---	--	---	--

rendering 15:9 31:20	Russ 4:18	semiconductor 27:12,22,25	35:2 56:25	19 53:1,5,12, 13,19,20,22, 23 54:6,9,14, 25 55:3,21,22, 23 56:4,7,10, 23,24 57:2,7, 8,9 58:8,10, 15,16,19,20 59:3,4,5
report 16:3 18:14 37:11 41:11, 23 46:15 47:20 55:17	S	send 16:14 30:4,10 33:13 51:13 52:16 54:8 55:20 57:2 59:4	shrank 23:20	
reporter 4:9,24	SCA 29:19 35:24 42:11 43:1 46:17,21 47:15 48:1 52:12,21,24	sending 30:2 33:4 54:4,24	shut 18:4	
represents 9:14 20:10	scope 21:18 23:4 26:3 27:8 39:13 43:14 52:14	sense 25:15 52:24	sic 35:7 47:19	signal's 48:14 50:3
reproduced 42:4	SDFM 38:9,21 56:7 58:15	sentence 14:14 21:5 23:23 35:8,23 36:6,24 38:14 45:4,20 49:21 54:12	signal 16:13,16,17, 21,24 17:13, 22,24 27:3 28:14,21,22, 24 29:1,9,11, 12,22 30:2 31:12,14 32:2, 3,7,10,11,17, 21,24 33:1,5, 12,16,19,24 34:11,17,20, 21 35:3,9,10, 17,20,21,25 36:10,15,16, 18,20,25 37:1, 3,5,16,17,24 38:5,13,19 39:1,4,5,9,11, 18,21,25 41:13,14,15, 16,19 42:2,10, 11,19 43:2,10, 12,19,21 44:5, 8,18 45:5,6,8, 9,11,13,14,15, 16,20,22,23 46:3,4,12,17, 18,21 47:5,15, 18 48:1,5,24, 25 49:2,5,8, 10,14,16,19 50:8,21,25 51:14,17,22 52:1,6,13,17,	signals 29:15,19,20 30:5,6 32:13 33:17 35:12, 16,24 36:23 37:14,20 38:8, 20 39:20,21 41:13 44:9,18, 19 46:5,6 48:15 49:23 50:11,14,16 56:1,14 57:3, 15,21 58:1,2
request 8:7	SDRAM 20:23	sentences 36:14 39:10		
required 23:2 24:12	SDRAMS 21:7,10	serves 15:6		
response 58:9,15 59:3	SDTM 29:19 35:24 37:18,21 38:5, 8,9,21 51:17, 22,25 52:19 53:19 56:10 57:7,8,14 58:16	Shi 4:22		simply 54:24 57:24
rest 11:12 39:23		shorthand 9:8		sitting 22:5
results 29:9		show 57:21,25 58:4		skill 10:17 13:4 14:12,15 15:10 47:12 48:4 50:19
review 7:1,6 8:7		showed 34:11		solution 22:9
room 6:11		showing 34:17		solve 23:12
run 35:5		shown 35:4 37:11 41:14 52:7 56:15		Sounds 55:7
running 17:3,12,15 18:4,7 28:24 32:11 33:12, 16,19 34:17 36:18 38:12 41:21 48:6 49:14,17,20	sec 34:10 35:1 44:23	shows		
	section 12:1 20:20 40:12 46:24 53:9 58:7			
	sem- 27:21			

source 40:16 41:2	standard 5:19 11:17 14:4,8 41:6,7, 12 42:1,2,12 43:11 47:7 49:3 50:18 51:1	states 14:14 22:7 29:7 31:7	strokes 33:3,12 36:4 49:15	13,23 55:22 56:23 57:1 58:20
spec 50:24		static 21:14	strobing 36:19 38:24 48:14 49:10	synchronize 17:4,6 28:25 29:10
specific 15:15,23 17:17,18 18:10 19:24 24:16 33:11 43:24 57:14 60:4	standards 14:10 41:25	stating 24:11 57:14	structure 31:10	synchronized 18:9 26:21 27:4 41:13,15 42:9 53:12,23 54:1,3,11,15 57:4 59:5
specifically 17:9 19:12 21:4 24:17,21 25:7,18 30:10 34:8 44:16 51:4 60:10	standby 29:8,13 30:8, 11 31:8 34:22 35:11 36:8 39:18 43:13, 17,21 46:4 49:1,22 50:6, 22	stopped 23:14	stuff 49:16,20	synchronous 15:5,7 16:4,7, 11,20 17:2 18:14 20:2,14, 18,22 21:6,11, 17,22,23 22:1, 10,13 23:2 28:6 29:10,20 31:9,13,16 32:1,16 40:12, 16,20,24 41:2, 3 48:20 51:2,5 53:18 54:14, 21 55:1 59:12, 22,24 60:6
specification 10:6 11:25 14:24 43:3,7 48:13,19 49:6 54:22	stands 21:10	stream 16:25 17:10, 23	submitted 8:1,6,9,14,20	
specifications 14:10 51:6	start 6:8 51:12	strike 25:2 43:10	substance 7:5,14,25	
speed 15:20 22:12 23:3 60:2,5	starting 47:21 55:16	stroke 27:3 28:20,21, 24 29:19 30:5 32:13,22,24 33:16 35:16, 21,24 36:15, 23,25 37:5,14, 17,20,23 38:8, 10,20 39:1,20 43:1 44:9,18, 19 45:5,8,11, 12,16 46:5,6 47:11,14 48:1, 2 50:10,16 51:13,17,21 52:1,12,16,17, 19,21,22,25 53:13,19,23 54:5,8,9,13,24 55:3,21,22 56:7,10,24 57:2,3,8,9 58:8,10,15,16, 20 59:3,4,5	substant- 7:15	
spend 9:15	starts 10:13 16:3 18:4 51:8		substantially 31:10	
SRAM 21:17 22:1,10, 13 23:1,3 24:15,18 25:16	state 20:13 21:13 26:20 29:9,14 30:8,11 31:11 34:22 35:11 41:12,23 42:8 43:13,17,22 49:1 50:6,22 56:13 57:6		substantive 7:15	
SRAMS 20:19 21:22, 24 25:12 26:1	statement 20:17 22:16 24:6,22 25:3, 23		summarizing 16:10	system 14:18,22 17:2, 5 26:21 27:5 29:8 40:16 54:16 55:1 59:13,25
stand 60:24			support 11:25 13:3,7, 15,21 43:2,6 48:11	system's 43:22
			swear 4:25	systems 15:19,21,24 16:21 17:2 22:9 39:8
			SWORN 5:2	
			synchronizatio n 16:12 54:4,7,	

T	technology 15:23 22:11 23:2,10,20,22 24:4,12,15,19 25:1,5	23:15 34:10 53:2	59:16,19	typos 7:16
taking 5:12 48:9 57:17	tells 54:10	thousands 14:1	Transfer 40:16	U
talk 11:24 21:22	Ten 30:20	time 9:10,15 10:18 11:10 17:3,13, 18 18:5 19:20 22:20 39:18 46:3 48:12 54:2 57:18	transfers 53:16,18 60:2	U.S. 8:7 9:1 10:2
talked 43:16	ten-minute 55:5	timeframe 50:20 59:14	transistors 23:9	unable 34:16
talking 17:9 19:25 20:1 24:21 25:8 32:7 34:7 38:20 39:24 40:4,10,21,22 44:2 49:4	term 12:24 32:20	times 4:14 17:17 19:18 57:10, 15,19,22 58:2	transmission 29:20 31:12 53:18	underlying 8:19
talks 19:19 21:5,22 39:17 41:2 44:17 48:23 53:15	terms 28:3 42:15	timing 17:20	transmit 16:11 44:19 55:2	understand 5:21 8:11 9:3 10:18 13:7 38:16 43:20 46:20 47:2,9
taught 31:23 33:25 53:5 54:22	testified 5:3 44:12	title 40:15,18	transmitted 27:3 30:9 42:3	understanding 12:24 21:10 45:7
teach 33:15,16,19, 25 49:18	testify 20:7	today 4:22,23 7:2,18	tree 31:9	understood 13:5 16:24 31:23 48:5,18 49:8
teaches 30:12 32:13 33:2,11 48:1	text 34:14 53:14	toggle 46:5	trees 33:7,13	untrue 23:19
teaching 19:9 30:4,7 42:16 53:8 58:13	textbook 18:22,23 19:5, 14 20:4,10 23:1	toggled 28:23 36:16, 21 37:1,6 38:11 39:20 44:9 45:6,9,13	true 23:19	utilized 36:10
technol- 24:11	things 17:4,17,21 18:6,8 20:11 22:18,20 23:14,22 28:18 45:25 46:10 49:10, 12 50:2,8,23, 25 54:22 60:9	top 21:24 40:14 53:25	turn 9:21 14:11 16:2 36:19,21 46:14 53:11 55:15	V
Technologies 4:4	thinking 15:16 23:17, 18 24:17	topics 35:19	turned 18:3 37:4 45:17	vague 10:22 24:22 42:22
	thought 15:25 19:1	totally 28:17	type 49:2	versus 4:5
		trade-offs	typically 29:7,12 31:14 32:2 34:21 35:10 48:25	video 4:14 30:23 31:1 55:9,12 60:23
			typo 7:8	

view 6:7 10:16 11:2,3,8,13,16 31:24	49:18		
viewed 25:23	work 8:4 13:23 14:5 53:3	Y	
VIII.B.2. 46:24	worked 9:12 14:9	years 19:17	
visited 19:19	working 19:6,14 20:3	Z	
volt 17:19	workings 33:4	Zoom 4:7 6:6,9	
voltages 17:20	write 25:9 27:4 29:1 32:9,18,23 33:20 34:18 36:11 37:24 38:5 45:18 50:8 51:14 52:6,17,18,20, 25 53:1,4,12, 16,22 54:9,10, 25 56:14 57:9 58:19,21		
W	writes 28:25 44:20		
waking 50:22	writing 22:19 24:5,14, 18 25:13 32:22 36:19 38:10 50:1,11 57:17		
wanted 33:23 54:24	written 16:19 38:17 39:16		
wasted 33:8 54:6	wrong 18:1,2 34:12		
ways 33:11 45:25	wrote 7:8 10:13 12:17,18 42:24		
well-defined 60:2			
Western 4:4,21 7:18 8:13,19 9:12 18:24			
wire 58:1,4			
word 12:23			
words 28:8,9 31:18 35:22 36:13			