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UNITED STATES OF AMERICA
FEDERAL TRADE COMMISSION

In the Matter of:)
Rambus, Inc.) Docket No. 9302
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Thursday, May 8, 2003
9:30 a.m.

TRIAL VOLUME 7
PART 1
PUBLIC RECORD

BEFORE THE HONORABLE STEPHEN J. McGUIRE
Chief Administrative Law Judge
Federal Trade Commission
600 Pennsylvania Avenue, N.W.
Washington, D.C.

Reported by: Susanne Bergling, RMR

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P R O C E E D I N G S

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3 JUDGE McGUIRE: On the record. This hearing is
4 now in order.

5 At this time, complaint counsel may call its
6 next witness.

7 MR. OLIVER: Your Honor, this morning Mr. John
8 Weber will be handling the next witness on behalf of
9 complaint counsel.

10 JUDGE McGUIRE: Okay, Mr. Weber.

11 MR. WEBER: Good morning, Your Honor, and also
12 helping me with the video equipment is Melissa Kassier.

13 Complaint counsel call Howard Sussman to the
14 stand.

15 JUDGE McGUIRE: Sir, would you please approach
16 and be sworn by the court reporter.
17 Whereupon--

18 HOWARD SUSSMAN

19 a witness, called for examination, having been first
20 duly sworn, was examined and testified as follows:

21 JUDGE McGUIRE: All right, sir, have a seat
22 right there, if you will.

23 DIRECT EXAMINATION

24 BY MR. WEBER:

25 Q. Good morning, Mr. Sussman. Could you state

1 your name for the record, please?

2 A. It's Howard Sussman.

3 Q. Could you spell your last name for the
4 reporter, please?

5 A. S-U-S-S-M-A-N.

6 Q. Mr. Sussman, are you currently employed?

7 A. Yes, at Sanyo Semiconductor.

8 Q. What is your position at Sanyo Semiconductor?

9 A. The title I believe reads senior manager,
10 business development.

11 Q. Mr. Sussman, could you maybe get a little
12 closer to the microphone so everybody can hear you?

13 A. Okay.

14 Q. Can you repeat that last answer? What is your
15 position at Sanyo Semiconductor?

16 A. Senior manager, business development.

17 Q. Could you describe what your responsibilities
18 are as senior manager for business development at
19 Sanyo?

20 A. It's a combination of watching technology,
21 trying to determine future products for the company,
22 future customers and what we might be able to do to
23 satisfy their needs, technical support that -- I'm a
24 system designer, so I get called in to assist our
25 customers. At times I'll go off and give lectures on

1 technology or I'll be called to discuss system
2 architecture with a customer and make recommendations
3 as to how they might want to partition their system,
4 what types of memories they might want to use where.

5 Q. Would you maybe explain a little bit more from
6 your last answer what you meant when you said you were
7 a system designer?

8 A. A system designer? Sorry, I don't have an easy
9 answer for that. I design systems. I have built
10 enough boxes -- I came out of school to Douglass
11 Aircraft, working on the space system, on the Saturn
12 IV, so I'm looking at how you put the blocks together
13 to do a function. Off the TRW systems, it was doing
14 the communication path for Doomsday Communication Net.
15 At Rockwell, it was doing partially memory testers,
16 partially doing buffer memory for a radar system. So,
17 many systems.

18 Q. Let's talk about your current position at
19 Sanyo. What products do you have responsibility for?

20 A. Primarily memory components, but most of
21 Sanyo's line of semiconductors because of my systems
22 background.

23 Q. To whom do you report at Sanyo Semiconductor?

24 A. The president of Sanyo Semi U.S.

25 Q. And does Sanyo Semiconductor have a parent

1 corporate entity?

2 A. Yeah, and this one I'm not totally familiar
3 with. We report -- I believe Sanyo Semiconductor is
4 owned by Sanyo North America, which is somewhere,
5 somewhere owned by Sanyo Electric Japan.

6 Q. In what geographic area does Sanyo
7 Semiconductor sell or distribute its products?

8 A. Sanyo Semiconductor, for all of North America.

9 Q. Okay. And what's your educational background?

10 A. I have a Bachelor's in electrical engineering.
11 I have done all of the course work for my Master's.

12 Q. And what year -- I hate to date you, but what
13 year was your Bachelor's Degree?

14 A. 1966.

15 Q. And since college, have you pursued a career in
16 electrical engineering?

17 A. Yes, I have.

18 Q. And I think in an earlier answer you gave some
19 examples, but can you just generally describe what
20 areas you've specialized in over the years?

21 A. This is going to be the description of systems
22 again, and within a digital system, how do you store
23 the information, whether it's temporary storage or
24 long-term storage. So, I've been doing partitioning of
25 systems. And from that I once asked at Mostek a group

1 of applications types what they did for a living, and
2 they sort of kind of reached over and grabbed me. So,
3 I've been doing product definition and assisting
4 customers ever since.

5 Q. You mentioned a company called Mostek. Can you
6 put some dates on when you were at Mostek?

7 A. Yeah, Mostek no longer exists. It was based in
8 Dallas. I was there from '77 through '84. During that
9 time, they had maybe 23-24 percent of the worldwide
10 market share of memories.

11 Q. And when you say memories, are you talking
12 about semiconductor memories?

13 A. Yes.

14 Q. Could you --

15 A. They were the primary DRAM house. They also
16 manufactured static memories, also nonvolatile
17 memories.

18 Q. Okay. And can you give us an example of the
19 type of products you were involved with at Mostek?

20 A. Mostek, because of their position in the
21 marketplace, had multiple customers. IBM was a
22 customer, DEC was a consider, TRW was a customer,
23 Honeywell was a customer. There's not very much that I
24 didn't get into, from reasonably small digital systems
25 to point-of-sale terminals to working with Cray on next

1 generation supercomputers. So, really a full line of
2 anything that would need storage.

3 Q. Okay. Now, you said you worked at Mostek until
4 1984. Did you go to another company then?

5 A. Yeah, left Mostek and went to work at NEC in
6 the Boston area.

7 Q. And could you briefly describe your work in the
8 field of semiconductor memories at NEC?

9 A. Here I had three departments, a testing group,
10 a couple of groups that were handling customers, but
11 basically continuing the same thing, what is the
12 direction that we should be proposing the company, what
13 is the product direction that we should be doing. When
14 the field sales could not answer, they would come back
15 in to some of my staff for technical questions, and I
16 would then be the final resource in the U.S. for any
17 question on memory.

18 Q. And how long did you work at NEC?

19 A. Until '92.

20 Q. Okay. And when did -- you left NEC, and where
21 did you go next?

22 A. I went to Sanyo, and I have been at Sanyo
23 since.

24 Q. That's your current job, okay.

25 And continuing forth, could you describe your

1 work in the field of semiconductor memory since you
2 came to Sanyo?

3 A. Continuing more of the same, customer resource.
4 I'll go out and work with our customers as to what are
5 they trying to do, what are the options that they have,
6 what -- help -- basically try to work with them as to
7 what is the best function, the best partitioning that
8 they would be doing. And as I said before, continuing
9 with Sanyo from a business point, where should the
10 company be focusing, what technology should we be
11 after, what products to meet that market.

12 Q. Can you give us an example of how you interface
13 with customers in your current job at Sanyo?

14 A. Yeah, let me pick on one of the hard disk drive
15 people. A hard drive needs a small amount of buffer
16 memory. You're taking information off of rotating
17 disks, sort of like a CD, and you need to store it, you
18 need to modify it, because it will come off the disk
19 with errors, and then packetize it and then send it off
20 to the computer to get used and displayed. So, I would
21 be chatting with them as to what type of memory and
22 could they use a Synchronous DRAM.

23 Q. You used the term "DRAM" in your prior answers.
24 What product does that refer to?

25 A. What product does that refer to, DRAM?

1 Q. Okay --

2 A. Dynamic random access memory? Okay, the -- in
3 this case, the memory storage element -- I think is
4 what you're asking for -- is a capacitor. I've got
5 some amount of charge on a capacitor, and as the
6 capacitor is not ideal, the charge will leak off, and I
7 have got to restore it. Therefore, dynamic.

8 Q. Do you know approximately when the first DRAM
9 was produced and sold in the United States?

10 A. About 1969, I was working on a 512-bit DRAM at
11 Rockwell. About that same time, the first part that
12 came out into the market was from Intel, and it was an
13 1101, 256-bit part.

14 Q. And sir, are you a member of any professional
15 societies of engineers?

16 A. Yes, I belong to the IEEE.

17 Q. And just for the record, IEEE is what
18 organization?

19 A. The Electrical Engineering Association. I have
20 been a member of that now for more than 30 years.

21 Q. Are you a member or participant in any industry
22 standard-setting organizations?

23 A. Yes, the IEEE does set standards, though I am
24 not overly active in that function. And then, of
25 course, JEDEC, which is a standard-setting group.

1 Q. Let's focus on JEDEC for a while. What is
2 JEDEC?

3 A. An industry group of manufacturers, users,
4 suppliers of component pieces within semiconductor, so
5 basically it's got the entire food chain trying to
6 maintain standards.

7 Q. And generally what types of products does JEDEC
8 consider for standardization?

9 A. They -- any -- anything within the
10 semiconductor family, will go from a transistor to
11 analog circuitry to memory chips, the logic chips
12 that -- the glue that holds all this together. How do
13 you test it? What's the terminology? Define the
14 terminology so we all -- there's a JEDEC dictionary.
15 And as well as on a given part, what is its pinout?
16 What is its package? What's the manufacturing
17 tolerance on the package? What is the electrical
18 function, detailed, and perhaps timing of it? So, soup
19 to nuts semiconductor.

20 Q. How did you first become involved at JEDEC?

21 A. I started going to meetings back when I was at
22 Mostek. The applications people were active with
23 memory, and I was pulled along.

24 Q. Can you place a time frame on that?

25 A. Perhaps 1979.

1 Q. And have you participated in JEDEC activities
2 going forward?

3 A. Yes, I have.

4 Q. And would that be -- you mentioned Mostek. How
5 about when you were at NEC and then at Sanyo?

6 A. Yes, continuing at NEC, continuing at Sanyo, so
7 pretty much continuous since '79.

8 Q. Okay. And have you held any positions within
9 JEDEC besides being a representative for Mostek, NEC
10 and Sanyo?

11 A. Yes, I have. I chaired a subcommittee on
12 byte-wide, word-wide memories, sort by-8, by-16s. I
13 have been a committee chair for the nonvolatile memory.
14 I have also been the chair of the overall memory group
15 and currently on the board of directors for Sanyo.

16 Q. When you said chair of the overall memory
17 group, does that have a number or a name associated
18 with it?

19 A. Yes, JC-42.

20 Q. Have you received any awards based on your
21 participation in JEDEC?

22 A. Yes, I have.

23 Q. Could you explain, please, the ones you can
24 recall?

25 A. Maybe six or seven years ago, as one of the

1 long-time strives was retiring, they passed an award on
2 to him, and was rather surprised when I was now called
3 to the front of the room and got another brass eagle
4 for contributing to the standards for so many years.
5 Since then, we've had an awards program put in, so
6 there's a -- now that you're a chair for a number of
7 years, you get an award that comes automatic. So,
8 both.

9 Q. Do you receive any additional remuneration or
10 compensation for serving on these JEDEC committees?

11 A. Only static.

12 JUDGE MCGUIRE: I'm sorry, only what?

13 THE WITNESS: Only static. We go to all these
14 places. It doesn't really matter. Our meetings start
15 at 8:00, they end at 6:00, but when you go to Hawaii in
16 December, you get static.

17 BY MR. WEBER:

18 Q. And are you still active in the JC-42 committee
19 and JC-42.3 subcommittee today?

20 A. Yes, I am.

21 Q. And for the record, the JC-42.3 subcommittee is
22 what part of --

23 A. This is primarily DRAM.

24 Q. Okay. And for how many years have you been
25 active in the JC-42.3 subcommittee or its predecessors?

1 A. Since the beginning, '79.

2 Q. Okay. Now, when I asked you before about the
3 purpose of JEDEC, was one of the things you mentioned
4 the need for standardization or standard parts in the
5 industry?

6 A. Yeah, and people keep asking me what -- what is
7 the standard, what is this group, mostly nontechnical
8 types, and what I've done with them is describe a light
9 bulb. We're all competitors. We're going to slice
10 each other up in the marketplace, but the light bulb
11 from all of us needs to work in that socket, in that
12 lamp at the top, so we have no choice, we must
13 standardize the part so it will fit within the
14 consumer's application.

15 Q. And how does having standardized parts benefit
16 consumers and the industry?

17 A. That says our customers, the general industry,
18 now has multiple sources, and from that multiple
19 sources, you end up with the competition of the market.

20 Q. Are you familiar with the term "open
21 standards"?

22 A. Yes, sir.

23 Q. What's that term mean to you?

24 A. I don't have to define standard, so open, it's
25 available, it's free, everyone can have access to it,

1 everyone knows what we're doing.

2 Q. What is JEDEC's position with respect to open
3 standards?

4 MR. DETRE: Objection, Your Honor, lack of
5 foundation. This witness --

6 JUDGE McGUIRE: Sustained.

7 BY MR. WEBER:

8 Q. Based on your participation in JEDEC, have you
9 come to an understanding of what -- why JEDEC --
10 whether or not JEDEC has a position with respect to
11 open standards?

12 A. Why JEDEC has a position in respect to open
13 standards? Yeah, we're trying for an industry support
14 and industry service, so we're not really that
15 interested in a small grouping of people or small
16 grouping of companies that will generate and ask us to
17 rubberstamp something that is not open and available to
18 the rest of the industry.

19 Q. Do you have a view on whether open standards
20 are a benefit to the industry?

21 A. Yes, I do.

22 Q. What is your view?

23 MR. DETRE: Objection, Your Honor, calling for
24 opinion testimony. Mr. Sussman is not familiar with
25 the entire industry.

1 JUDGE McGUIRE: Sustained.

2 BY MR. WEBER:

3 Q. Based on your participation in JEDEC, do you
4 have a view whether or not open standards are
5 beneficial to the DRAM industry?

6 MR. DETRE: Same objection.

7 JUDGE McGUIRE: I'm going to have to -- you
8 know, you can't ask him his opinion. You can ask him
9 about his firsthand observations and his firsthand
10 knowledge, but opinions --

11 MR. WEBER: Okay.

12 JUDGE McGUIRE: -- are out of bounds here.

13 MR. WEBER: Let me try to rephrase the
14 question, Your Honor.

15 JUDGE McGUIRE: Okay.

16 BY MR. WEBER:

17 Q. Based on your participation in JEDEC since
18 1979, have you come to observe the standard-setting
19 process at work?

20 A. Yes, I have.

21 Q. And based on that experience, have you observed
22 whether there are any benefits of open standards to the
23 DRAM industry?

24 A. In that case, I --

25 MR. DETRE: Objection, Your Honor. Again, this

1 is so broad that it's really just asking for the same
2 opinion in a different way, unless we point him to some
3 particular standard that he's had particular experience
4 with.

5 JUDGE McGUIRE: That one I'll overrule. I'll
6 give him some leeway in the questioning, but it would
7 be very helpful, Counselor, if you could define your
8 inquiries into a much more specific area, and so it
9 would expedite the entire process.

10 MR. WEBER: Okay, very well, Your Honor, but
11 the question was limited to the DRAM industry and the
12 JC-42.3 committee.

13 BY MR. WEBER:

14 Q. Do you have the question in mind, sir?

15 A. No, I'm just wondering if I can answer the
16 question.

17 JUDGE McGUIRE: All right, what is the question
18 at this point? Let's restate it if you would, Mr.
19 Weber.

20 BY MR. WEBER:

21 Q. Okay, based on your experience working in the
22 DRAM industry over the past 20-plus years and at the
23 same time serving on the JC-42.3 committee, what are
24 the benefits, if any, of open standards to the DRAM
25 industry?

1 A. Okay, my customers -- and remember, this is
2 through several companies and many, many slices of the
3 industry -- generally ask if a part is standardized.
4 What they are believing to be is that if the part is
5 standardized, they can buy it from multiple sources,
6 they have options, and in that there are multiple
7 sources, that this is not a sole-source, proprietary
8 item, that they will end up buying it at a -- at the
9 lowest possible price, that the market will set the
10 price for the part. So, often the customers will be
11 very hesitant to design a part into their system that
12 is not standardized. They want more than one vendor to
13 be able to provide it to them.

14 The flip side of that, that says also from a
15 system point, from the end consumer, I can buy it
16 from -- I'm sorry, I have got a Samsung monitor in
17 front of me. I can most likely buy that from six other
18 companies. It all has to work together.

19 Q. Maybe we can go to our first document and let
20 me see if I can turn up the screen here.

21 I direct your attention to what's already in
22 evidence as CX-204, the first document on your stack,
23 Mr. Sussman.

24 A. Okay.

25 Q. Let me pull that up on the screen.

1 It says, "EIA Legal Guides."

2 Have you seen this document before, sir?

3 A. Yes, sir.

4 Q. What is it?

5 A. EIA Legal Guides, Electronic Industries
6 Association.

7 Q. And do you understand that this document
8 entitled EIA Legal Guides applies to the JEDEC meetings
9 you attended?

10 A. Yes, it does.

11 Q. Okay. Could you turn to page 5, if we could
12 pull it up on the screen, Section C, which is on the
13 upper left-hand corner of the document.

14 Do you have it, sir?

15 A. Yes, I do.

16 Q. Okay. And there's a list of six items under
17 Basic Rules for Conducting Programs. Without going
18 through each and every item, do you have an
19 understanding of what -- whether these rules apply to
20 your activities at JEDEC?

21 A. Yes, they do.

22 Q. All right. Would you look at item number 1, if
23 we could highlight item number 1.

24 A. Okay.

25 Q. You'll see it talks about activities being

1 carried on in good faith.

2 A. Yes, sir.

3 Q. Based on your experience at JEDEC, do you have
4 an understanding what is meant by "good faith" as it
5 applies to your standard-setting activities at JEDEC?

6 A. Yes, I do.

7 Q. Could you explain?

8 A. Good faith, we're all competitors, we're all
9 about ready to dice each other in the marketplace, but
10 seeing we're talking about or about to talk on
11 intellectual property, I trust you to do something, and
12 I expect that same set of trust back. If you have IP
13 on something, if you have a proprietary hold, you
14 should inform the rest of the group so we don't waste
15 our time talking on a standard that -- rather than an
16 alternate that we maybe have. So, we expect you to
17 operate, I'm sorry, but in good faith.

18 Q. Could we highlight item number 5? I am not
19 going to read it all, but if we could highlight item
20 number 5 there, focus on that, Mr. Sussman, where it
21 talks about that the activities shall not be for
22 restricting competition, giving a competitive advantage
23 to any manufacturer, excluding competitors from the
24 market, so on and so forth, if we could focus on that
25 part of item number 5.

1 A. Okay.

2 Q. Was that also a requirement that applied to
3 your activities at JEDEC?

4 A. Yeah, now --

5 Q. And what's your understanding of how that
6 related to your standard-setting work at JEDEC?

7 A. Well, obviously the first part, with the
8 antitrust, no price fixing, period, and this is an open
9 group, not a group -- not a grouping of a couple --
10 should not be a grouping of several people driving
11 something through. So, we want something that is open
12 and available to all. So, there is nothing on pricing,
13 nothing on restricting competition, because it is open
14 to all. No one's got a competitive advantage from the
15 stuff that's showing up here. It's available to
16 everyone simultaneously.

17 Q. Based on your years of experience at JEDEC, if
18 a JEDEC participant did not disclose patents or patent
19 implications of which they had knowledge and later
20 sought to enforce those patents against JEDEC members,
21 would you interpret that conduct as being in good faith
22 or not?

23 A. That would not be good faith.

24 Q. Okay. And why do you say that?

25 A. Well, you should not be leading this group to

1 create a standard that must use your electric --
2 intellectual property without my knowing it. So, now
3 that the standard is there, now that my customers are
4 starting to design in the part, now that they're
5 expecting it, suddenly we've gotten a curve ball, and
6 we owe you money.

7 Q. Have you ever heard the term "submarine
8 patents"?

9 A. Yes.

10 Q. What's that term refer to?

11 A. That's the lack of good faith, I guess. We
12 have had, unfortunately, a few people that have taken
13 the information that has shown up in JEDEC and have
14 applied for a patent on it. That I would call a
15 submarine patent. And there has been perhaps some
16 others that have had a patent position, and they have
17 attempted to get the group to standardize whatever they
18 have the position on.

19 Q. Okay. Maybe we can go into some of those
20 examples in a minute. Let me ask you generally,
21 does -- do you understand, based on your understanding
22 and participation in JEDEC, does JEDEC have a patent
23 policy?

24 A. Yes, we do.

25 Q. For how long has JEDEC had a patent policy?

1 A. From before I started. I don't know how long
2 it's been.

3 Q. So, did JEDEC have a patent policy in effect
4 from 1991 consecutively through 1996?

5 A. Yes, sir.

6 Q. What is your understanding of the JEDEC patent
7 policy that was in effect from the 1991 to '96 time
8 period?

9 A. Basically, if you have IP, you are to inform
10 the group of that IP. I would prefer not to waste my
11 time working on your IP if there's an alternate
12 methodology that we can end up standardizing to get --
13 engineering is not an exact science. There are
14 alternates where we can get there. If you can't use A
15 and B, you can use C. And maybe they're all equal. We
16 have differences of opinion, but each of them can do.
17 So, I would prefer if I need to require something, to
18 make it something that's open and not the property of a
19 company.

20 Q. Does JEDEC have rules about disclosure of
21 patents?

22 A. Yes, that patent policy says that if you have
23 it, you need to disclose it.

24 Q. Now, does this policy just apply to issued
25 patents or other things as well?

1 A. Issued patents, patent applications, and if you
2 were about to issue a patent -- if you were about to
3 apply for a patent, all of the above, all inclusive.

4 Q. Do you have an understanding of why it's not
5 just limited to issued patents?

6 A. Yes.

7 Q. Would you explain?

8 A. Well, in the U.S., at least I gather it used to
9 be, applications were secret. I didn't know of a
10 patent until after it issued. And if you were about to
11 apply for a patent, I definitely would not know that.

12 Q. Focusing on the 1991 to '96 time period, can
13 you recall any occasions where JEDEC took steps to
14 change a standard because it was later learned that a
15 company did not disclose or follow the patent policy?

16 A. Yeah, there have been several. Maybe the best
17 example would be quad CAS.

18 Q. Can you -- what can you remember about the quad
19 CAS situation?

20 A. For a system with parity where I need an extra
21 bit, more so I would use this like a module on any of
22 your PCs here, it may be of an advantage to have a part
23 that was like only one-fourth the density. So, one of
24 the vendors proposed a part that had four of the
25 control lines that we call CAS. The standard part had

1 one. The part internally is in segments, so one would
2 put a CAS per segment.

3 So, they proposed a quad CAS, and after the
4 part was standardized, after some modules were
5 standardized, then the company revealed its patent
6 position, and we were rather upset. We had spent a lot
7 of time and energy, wasted a lot of time and energy.
8 So, we went through the balloting proposal and
9 balloting procedure and rescinded the standard.

10 Q. And do you know how the quad CAS situation was
11 eventually resolved or -- do you know that?

12 A. No, that I don't.

13 Q. Okay. Let's put JX-18 up on the screen, if we
14 may. That would be I think the next document in your
15 stack.

16 A. The next document, okay.

17 Q. Do you recognize this document?

18 A. It's the meeting minutes of December '93
19 meeting, JC-42.3.

20 Q. Were you present at this meeting?

21 A. Yes, I was.

22 Q. And I direct your attention to page 7 of the
23 document, item 7.5 of these minutes, and the discussion
24 here carries forward for a couple of pages onto page 8
25 and the top of page 9, if you could look at those

1 pages, and then do these -- were you present for this
2 part of the meeting?

3 A. Yes, I was.

4 Q. And do these minutes reflect the discussion and
5 vote on rescinding the quad CAS standard that you just
6 described?

7 A. It looks like they do.

8 Q. Okay. And I direct your attention to the next
9 to the last paragraph on page 8. If you could go to
10 page 8 and pull up the second paragraph from the
11 bottom, it starts with, "Sanyo."

12 Do you see that?

13 A. Yes, I do.

14 Q. Where it says "Sanyo," who was talking at this
15 point in the meeting?

16 A. This would be myself.

17 Q. And do you recall -- well, does this paragraph
18 accurately summarize or reflect your statement at the
19 time?

20 A. I would think so. It definitely has my belief.

21 Q. Why did you make this comment in the discussion
22 on rescinding the quad CAS standard?

23 A. I did not believe that the quad CAS part, if
24 I -- if there was a patent on it, that it should have
25 been proposed, standardized, that we spent the time and

1 effort continuing both on the part and on the module.
2 So, this is not good faith.

3 Q. Did the other members of the committee share
4 your views?

5 A. You've got a vote tally here of -- it looks
6 like 13 yes, 15 yes? Thirteen yes, two nos. So, I
7 would say yes.

8 Q. Now, I'd like to draw on your long experience
9 going back a number of years at JEDEC and ask if you're
10 aware of any other instances where a JEDEC committee
11 found out after the fact about a patent that was not
12 disclosed, and if you could tell us as best you can
13 recall what happened.

14 A. Yeah, maybe two items. We set a standard for
15 test mode, which is a methodology of reconfiguring the
16 memory, a reasonable amount of argument. There was one
17 individual that wanted a logic in and a logic out. I
18 agreed with his logic in, but I disagreed with the
19 logic out. If there was a system hiccup and you
20 inadvertently got over there, you don't want to turn
21 off your computer to exit it. You want to be able to
22 exit this gracefully and automatically. So, that
23 compromise happened in the meeting.

24 Sometime after that, we found that Hitachi had
25 patented exactly what we had determined in the meeting.

1 It could be a great coincidence, but higher
2 probability, they read the minutes and went off and got
3 a patent. To the best of my knowledge, Hitachi has
4 never tried to apply the patent, so some engineer has a
5 few extra dollars, and basically a don't care.

6 Much worse than that, again some work that
7 happened in the meeting, this is with WANG on making
8 the modules that go -- first of the modules that went
9 into the PCs, and in this case, that ended up in a
10 rather lengthy litigation, crossed multiple houses and
11 cost the industry millions of dollars before the patent
12 was found to be invalid.

13 Q. Do you remember any other instances, like maybe
14 the first instance that -- when you were serving at
15 JEDEC where a patent issue came up?

16 A. Oh, yeah, sorry. When I first came in, a
17 couple years after, we had an individual from SEEQ that
18 was proposing something called silicon signature for
19 standardization, and it turned out that he had -- it
20 was unknown as he was doing that, but he had two patent
21 applications. Basically one was the right hand and one
22 was the left hand, and both hands are slightly
23 different from each other.

24 So, he was telling us about silicon signature
25 and offering it as a royalty-free license to anyone who

1 wanted it, hoping that just as soon as we standardized
2 this, the second patent, which would be die trace,
3 which he had not said anything about, but because it
4 was almost identical, would be insisted upon by the
5 customers, and he could put a tax on us.

6 We drug Larry's name through the mud for years.
7 What we did, as we found out about the second
8 application, is that we did not standardize either of
9 them. We standardized an alternate methodology. It's
10 now manufacturer's ID for those who want to look it up.
11 And it left such a negative taste in our mouth that
12 we -- I'd say we were making nasty comments about SEEQ
13 for years, and that -- for years. That has continued
14 up to a couple of years ago. It's still almost
15 current.

16 So, it has been something that if something
17 came up within the meeting, any of us old-timers would
18 be mumbling about silicon signature, and the new-comers
19 would say, what was that?

20 JUDGE McGUIRE: Okay, Mr. Weber, you can
21 proceed with your next question. I think we lost
22 the --

23 THE WITNESS: I'm sorry.

24 JUDGE McGUIRE: Just try to confine your answer
25 to the question, sir, if you could. I'd appreciate it.

1 THE WITNESS: Yeah.

2 BY MR. WEBER:

3 Q. Going back to the patent disclosure policy,
4 have you seen that set forth in writing in any JEDEC
5 manuals?

6 A. Yes, I have.

7 Q. Could we get CX-208 up on the screen? And do
8 you have it there?

9 A. Yeah, go ahead.

10 Q. Do you recognize this document here?

11 A. Yeah, it's the JEDEC Manual of Organization and
12 Procedure.

13 Q. And do you have an understanding based on your
14 experience at JEDEC what the purpose of this document,
15 CX-208, is?

16 A. Every organization needs some definition of how
17 to do things, yes.

18 Q. Does this document also have portions that
19 discuss the patent policy?

20 A. Yes, it does.

21 Q. Okay. Could you please turn to page 19 of this
22 document, if we could get that on the screen, and if we
23 could focus on Section 9.3, does that address the
24 patent policy we've been discussing?

25 A. Yes, it does.

1 Q. And if we could focus on the third line, do you
2 see there's a reference to the term "patented item,"
3 and then there's a double starred footnote, and maybe
4 if we could also -- I don't know if it's possible --
5 but get the footnote up on the screen, if we could read
6 the footnote.

7 A. Yes, I've got it.

8 Q. Is it your understanding that the term
9 "patented item," as used here, based on your experience
10 at JEDEC, is limited to issued patents or not?

11 A. No, it's --

12 MR. DETRE: Objection, Your Honor, foundation
13 on how the witness would know what words this
14 document -- the words that this document used.

15 JUDGE MCGUIRE: Do you have any comment on
16 that, Mr. Weber?

17 MR. WEBER: I believe he has laid a foundation
18 for it. He says he's familiar with the manual and he's
19 aware that it describes the patent policy.

20 JUDGE MCGUIRE: Overruled.

21 THE WITNESS: Okay, I had said actually before
22 that it is the -- a patent, a patent application, and I
23 guess they have got over here maybe pending, so to me
24 that is also what I had said before, something that
25 you're about to apply for.

1 BY MR. WEBER:

2 Q. And is that how you interpreted your obligation
3 and the obligation of other members when you attended
4 these JEDEC meetings?

5 A. Yes, sir.

6 Q. The date of this manual if you look on the
7 cover is October 1993. Was it your understanding that
8 the patent policy applied to applications as well as
9 patents before this manual was issued or not?

10 A. Yeah, the example I gave with Larry Jordan/SEEQ
11 must have been '81-'82. So, at least ten years prior,
12 yes.

13 Q. Could we focus on the same page we were looking
14 at? A little farther down the page, there is a Section
15 9.3.1.

16 A. Okay.

17 Q. If we could pull up that paragraph and focus on
18 the third line where it talks about the obligation of
19 participants.

20 Again, do you see the phrase "patents, or
21 pending patents"? Again, is that consistent with your
22 understanding of the practice that it wasn't limited
23 to -- the disclosure requirement was not limited to
24 issued patents?

25 A. Correct.

1 Q. Okay. And another question is on that same
2 sentence, at the end of the sentence, you see the words
3 "the work they are undertaking."

4 Based on your experience at JEDEC, what types
5 of JEDEC work triggered the disclosure obligation?

6 A. Basically any discussion. The earlier that we
7 have the information that something may have some IP on
8 it, the better it turns out to be, so we don't waste
9 time talking of this rather than an alternate.

10 Q. And can you turn to the page 29, which happens
11 to be I think the last page, there's something called
12 Appendix F.

13 A. Okay.

14 Q. And is this a -- something you've seen before?

15 A. Yes, it is.

16 Q. What's your understanding of what's reflected
17 in Appendix F?

18 A. "The following points describe the application
19 of the patent policy." So, basically, in essence, the
20 same thing we have been talking about for the last ten
21 minutes.

22 Q. Okay. Could we focus on the second bullet
23 where it talks about -- starts off, "Discussion of a
24 pending or existing patent does not constitute an
25 acknowledgment of the validity of the patent," so on

1 and so forth, and it mentions both validity and prior
2 art.

3 What's your understanding, based on your
4 experience, about how this provision applied to JEDEC
5 meetings that you were going to?

6 A. You know, we're a grouping of engineers, not a
7 grouping of patent attorneys, so what is the real
8 validity of a patent, how is it constructed, what are
9 the claims, we're not really the experts. For prior
10 art, we most likely have knowledge. So, yeah.

11 Q. Let me direct your attention to the third
12 bullet point right below that, and it talks about
13 discovery of patents that may be required for use in a
14 standard subsequent to the standard's adoption, and so
15 my question to you is, how could this provision apply
16 in a situation where JEDEC had issued a standard, and
17 then subsequent to that, someone had a patent or patent
18 application? What would -- how did the policy work in
19 that situation?

20 A. No difference. The quad CAS I gave you is an
21 example of this one. We learned about it afterwards.
22 We discussed it. We took a vote. The result of the
23 vote was to rescind it. We used an alternate technical
24 implementation. Quad CAS doesn't exist anymore, at
25 least as a standard part.

1 Q. Let me follow up on that last answer.

2 Would a member who subsequently learns of IP
3 after the standard has been adopted need to disclose
4 it?

5 A. I would say yes.

6 Q. And finally, there's some language in the last
7 paragraph on the page, the last paragraph of the page
8 under the bullets, and it talks of -- it talks about --
9 let's see if I can find it -- notice given of a patent
10 that may be required for use in an already approved
11 standard.

12 Based on your understanding, where it says may
13 be required for use in a standard, how is that
14 interpolated -- interpreted based on your experience at
15 JEDEC?

16 MR. DETRE: Clarification, Your Honor, that
17 we're only asking for his understanding of how to
18 interpret it and not others'?

19 MR. WEBER: Absolutely.

20 THE WITNESS: A patent that may be required for
21 use of an already existing -- may wish to make it clear
22 to others -- please now go back and ask the -- if you
23 can read back your question?

24 MR. WEBER: Let me ask it again --

25 JUDGE McGUIRE: Just restate the question,

1 please.

2 MR. WEBER: Sure.

3 BY MR. WEBER:

4 Q. The language that says "may be required for
5 use" --

6 A. Okay.

7 Q. -- based on your experience as JEDEC, how did
8 you interpret that language?

9 A. May be required for use? Something I had to --
10 I had to infringe or I had to make use of your IP to
11 implement the standard.

12 Q. Okay. And in that situation, was it -- what if
13 it was a gray situation, you weren't sure whether or
14 not the IP or the patent would apply or that the claims
15 would read on your --

16 A. In that case I have an obligation to tell you
17 that it exists and for you and your legal side to go
18 off and investigate it. We have many, many patents for
19 circuitry, implementation of, but it's not required,
20 because there are other implementations.

21 Q. Again, based on your experience, did you view
22 this patent disclosure policy we have been discussing
23 as a voluntary option or was it a mandatory requirement
24 on JEDEC members?

25 A. It's required.

1 Q. How did JEDEC members become aware of the
2 patent policy?

3 A. The easiest one for that is that --

4 MR. DETRE: Objection, Your Honor, foundation.
5 He doesn't know how other members became aware of it.

6 JUDGE McGUIRE: That's sustained. I am going
7 to have to ask of you to lay a foundation for your
8 questions, Mr. Weber. Either ask it is it his
9 understanding, is it his observation, so we don't have
10 to keep going through this.

11 MR. WEBER: Absolutely, Your Honor, I
12 appreciate that.

13 BY MR. WEBER:

14 Q. When you were serving as a JEDEC
15 representative, did you ever make disclosures?

16 A. Yes, I did.

17 Q. Can you describe the circumstances?

18 A. Let me do two. As a chair, as I opened the
19 meeting, I would mention the JEDEC patent policy, and I
20 would flash a transparency on the screen. The other
21 part, there has been some cases that the group is
22 starting to talk about items that I've known about, in
23 one case of a patent with a couple of gates and timing
24 that NEC holds with my name on it, and as the group was
25 starting to talk about a similar function, I stood up

1 and said that NEC had IP on this and they need to go
2 off and take a look at it if they want to continue in
3 this area.

4 Q. In that instance you just mentioned, how did
5 you determine whether disclosure was appropriate?

6 A. Seeing as it's got my name on the patent, I've
7 got some concept, and the group is now starting to talk
8 about a timing situation that is very close to what the
9 NEC patent is.

10 Q. You mentioned earlier that you served as
11 chairman of some of these JEDEC committees, and I think
12 you alluded to this in an answer a couple answers ago,
13 but could you elaborate on what steps you took as a
14 JEDEC committee chair to make others aware of the
15 patent policy?

16 A. As the meeting opened, I would wave the patent
17 policy, and there would be a transparency up on the
18 projector with the page with the patent policy on it.
19 Standard procedure as I opened a meeting.

20 Q. Could we go back -- oh, if a -- one more
21 question on that.

22 If a participant at JEDEC had raised any
23 questions, who would you refer that person to for more
24 precise answers on the patent policy?

25 A. JEDEC legal counsel. None of us are lawyers.

1 Q. Okay. And who was that person?

2 A. For today, it's John Kelly.

3 Q. Could we go back to the document CX-208? Do
4 you still have that in front of you?

5 A. Yes, sir.

6 Q. Have you ever heard this document, CX-208,
7 referred to as the Chairman's Manual?

8 A. No.

9 Q. Based on your understanding, was this manual,
10 CX-208, prepared for the use just of JEDEC committee
11 chairs or not?

12 A. No, it was not just for chairs. There were
13 times that JEDEC staff, like this one here is a
14 revision, they would bring hard -- I remember at least
15 a couple times that being brought in as a box of hard
16 copies. So, it was passed out at the meeting.

17 Q. Did you understand this manual to be directed
18 to all members of the JEDEC organization or just
19 committee chairs?

20 A. All members.

21 Q. Could we go back to page 19 of CX-208 again.
22 Could you focus attention on the last sentence under
23 9.3.1, the paragraph we looked at before?

24 Do you see a reference to an EIA
25 sign-in/attendance roster?

1 A. Yes, I do.

2 Q. Based on your experience as JEDEC, do you know
3 what this sentence is talking about?

4 A. Yes.

5 Q. What is it?

6 A. They -- the JEDEC office had a -- in almost all
7 cases a standard form that they would pass around the
8 room that we would sign in on. So, that would be the
9 attendance roster.

10 Q. Let me show you CX-306. I believe it's the
11 next document in your stack, sir.

12 A. Yeah.

13 Q. Do you recognize this document?

14 A. That's the attendance roster.

15 Q. And what was this document used for?

16 A. Sign-in sheet so we would know who was at the
17 meeting.

18 Q. Now, we've seen in the -- I think the minutes
19 that we've been looking at, there's a list of names at
20 the beginning of the minutes. What is your
21 understanding as to how that list was compiled?

22 A. The JEDEC office would take this sign-in sheet,
23 transpose the names onto the minutes.

24 Q. Okay. Could you focus on the -- if we could
25 blow up the second sentence on the instructions on this

1 sheet that talks about -- do you see where it says,
2 "Subjects involving patentable or patented items shall
3 conform to the EIA Policy"?

4 Do you see that?

5 A. Yes, I do.

6 Q. What was your understanding of what's meant by
7 the term "patentable or patented items"?

8 A. Any item that you might have or about to have
9 IP on.

10 Q. Was that limited to just issued patents or not?

11 A. As I said before, that's all inclusive.

12 Q. Do you see a reference then to a statement on
13 the back where it says, "reverse side"? Again, on the
14 top of the page.

15 A. I -- oh, yes, yeah.

16 Q. And if we look at the second page of this
17 document, if we could pull that up, do you see a
18 portion of the second page which relates to the patent
19 policy?

20 A. Yes, I do.

21 Q. And could you point us to that? Is that the
22 lower right-hand corner?

23 A. Lower right-hand corner, yes.

24 Q. If we could just blow that up, okay.

25 A. Reference to Patented Products in EIA

1 Standards.

2 Q. And is it your recollection when these
3 attendance sheets were passed around that this notice
4 was on the back?

5 A. There are several generations of forms. It is
6 on the back. Was it on the -- but then again, when we
7 didn't have something like this, I passed around a
8 notepad, but generally the JEDEC office had this, so I
9 would ask -- I would answer your question, generally,
10 yes.

11 Q. Mr. Sussman, are you familiar with something
12 called the patent tracking list?

13 A. Yes, I am.

14 Q. What's your recollection of what that
15 document -- maybe I can withdraw the question. Maybe
16 we can take a look at one.

17 Could you look at JX-18? That was the first
18 set of minutes that we looked at. And if you could
19 turn to pages 17 and 18 of that document, and if we
20 could get page 17 up on the screen, and if we could
21 blow up particularly the top.

22 A. Yeah.

23 Q. Do you see it says, "Patent Issues to Track"?

24 A. Yes, sir.

25 Q. And do you recall seeing lists such as these

1 presented at JEDEC meetings?

2 A. Yes.

3 Q. Who compiled the list?

4 A. Jim Townsend.

5 Q. Who's Jim Townsend?

6 A. Jim, a long-time member, now deceased, was very
7 sensitized by the WANG case and started to compile a
8 list.

9 Q. Do you know what role Mr. Townsend had at JEDEC
10 in the 1991 to '96 time frame when he was still living?

11 A. As I said, a long-time member and leader, so he
12 has held leadership positions within JEDEC.

13 Q. Did Mr. Townsend inform the meeting as to the
14 purpose of maintaining such a list?

15 A. Yeah, these were patents that either Jim found
16 or someone said, hey, there might be something here,
17 would you please put it on your list? So that the
18 members -- either Jim or a member asked to be added to
19 alert the committee.

20 Q. Okay. And if we look at this list, in the
21 first column under Patent Number, there's a seven-digit
22 number. Would you -- what would that refer to?

23 A. That would be the U.S. patent number.

24 Q. And where there's no number listed, what would
25 it mean?

1 A. That we -- either we don't know the number or
2 someone has said that there's something happening
3 and -- by the rumor mill, there is some application
4 out.

5 Q. And could we maybe get the top of the next
6 page, if we could go to page 18 of this document? If
7 we could blow up the second entry here, it says,
8 "Motorola."

9 A. Yes.

10 Q. Are you familiar with that particular patent
11 which says, "Synch DRAM"?

12 A. Yes, Synch DRAM, Motorola.

13 Q. And do you remember how that patent came to
14 be -- patent or patent application -- here it's a
15 listed patent, but do you recall how that IP was first
16 disclosed to the JEDEC committee?

17 A. Who asked -- well, according to this sheet, the
18 one on the right says that the source of the
19 information was Motorola, so some Motorola
20 representative passed it on to Jim, at least -- yeah.

21 JUDGE MCGUIRE: All right, can I interject here
22 just a second for my edification? Is it clear from
23 this tracking sheet as to whether the patent involved
24 is an issued patent or just a patent application?

25 THE WITNESS: Ah, there's some of both. If the

1 number is there, it's definitely an issued patent. If
2 the number is not there, it might be an application or
3 maybe that I know that he has been -- he has been
4 mumbling about this and says he has done something, so
5 I've added it to this. So, it may be --

6 JUDGE McGUIRE: So, you are not even clear
7 whether it's an application inherently. You just have
8 some idea that these ideas have been talked about, and
9 so you felt compelled to put it or someone felt
10 compelled to put it on the tracking list?

11 THE WITNESS: Yeah, in this particular patent's
12 case, one of the individuals on that patent -- not
13 Motorola -- a gentleman from Apple, I provided them
14 information on the Synchronous DRAM. I circled back a
15 year later saying, okay, this is the results of some of
16 our earlier discussions, and he said, oh, ah, ah, I've
17 just done a patent application with Motorola on that.
18 I said, you did what?

19 JUDGE McGUIRE: Okay, now, whose job was it to
20 transcribe any information on these sheets, these
21 tracking sheets? I mean, who had that responsibility?
22 Jim Townsend?

23 THE WITNESS: Jim Townsend.

24 JUDGE McGUIRE: Could anyone else include any
25 information they had on these sheets, or did they have

1 to first go through him and say, here's information I
2 have, please put it on the tracking list?

3 THE WITNESS: Jim had the -- Jim was the one
4 who had the list, so if you had something you wanted --

5 JUDGE McGUIRE: You had to go through him?

6 THE WITNESS: -- you went to him and you did
7 it.

8 JUDGE McGUIRE: Okay.

9 THE WITNESS: There was no -- it was basically
10 if you made the request, it was there.

11 JUDGE McGUIRE: Okay, Mr. Weber, you may
12 proceed.

13 MR. WEBER: Okay, Your Honor, I think the next
14 series of questions on this document may clarify some
15 of this.

16 JUDGE McGUIRE: Okay.

17 BY MR. WEBER:

18 Q. Would you take the next set of minutes, which
19 is JX-7, if we could pull that up on the screen.

20 Do you recognize this document?

21 A. Yeah, these are the minutes of the September
22 '91 meeting, DRAM committee 42.3.

23 Q. And were you present at this meeting?

24 A. Yes.

25 Q. And at this time you were with NEC, you hadn't

1 joined Sanyo yet?

2 A. I had not joined Sanyo yet.

3 Q. Okay. Could you turn to page 23.

4 A. Okay.

5 Q. And it says, "Patent Issues to Track."

6 Do you recognize this page?

7 A. Yeah, this is an earlier version of the same
8 list.

9 Q. And do you recall a minute ago we were talking
10 about a Motorola patent that appeared on the '93 list?

11 A. Correct.

12 Q. And on this list, do you see an entry for
13 Motorola Sync DRAM?

14 A. Yeah, there it is, Motorola Sync DRAM,
15 committee.

16 Q. Now, on this list under Patent Number, there is
17 no number.

18 A. No number.

19 Q. Do you have an understanding why there wouldn't
20 be a number in September '91?

21 A. At this point in time, it may not yet have been
22 issued.

23 Q. And under Source, it says, "Committee."

24 Do you have an understanding of what that entry
25 means?

1 A. That might have been one of us that said, hey,
2 I'd like it added, but please don't use my name.

3 Q. Based on your experience, as items were put on
4 the list that were not issued patents, later on would
5 then the number, once it was issued, be added to the
6 list?

7 A. If someone came back to Jim to add the number,
8 to update it, the answer would be yes.

9 MR. WEBER: Your Honor, at this time I would
10 like to offer JX-7 into evidence.

11 JUDGE McGUIRE: Any objection?

12 MR. DETRE: No objection, Your Honor.

13 JUDGE McGUIRE: So entered.

14 (JX Exhibit Number 7 was admitted into
15 evidence.)

16 BY MR. WEBER:

17 Q. I'm not sure this is clear from your earlier
18 answer on your background, but when did you first
19 become involved with DRAM products?

20 A. Perhaps 1970.

21 Q. Okay. And was that -- you mentioned something
22 about North American Rockwell, have I got the right
23 job?

24 A. Yes, at North American Rockwell.

25 Q. Okay, and you mentioned also I think in an

1 earlier answer a product called a Synchronous DRAM.

2 A. Yes.

3 Q. Is that also known as SDRAM?

4 A. Yes, it is.

5 Q. All caps.

6 Is it also referred to as a Sync, S-Y-N-C,
7 DRAM?

8 A. Yes.

9 Q. All three names are the same thing?

10 A. All the same part.

11 Q. And what is a Synchronous DRAM?

12 A. Dynamic random access memory, as I described
13 before, but in this case synchronous in that we're also
14 making use of the system clock.

15 Q. How does a Synchronous DRAM differ from other
16 types of DRAMs?

17 A. Multifaceted, sir. The core of the DRAM is the
18 same, the same memory cell. The very, very, very early
19 parts were clocked. It was just basically a memory
20 array, and we had to provide everything external. As
21 the technology moved forward and we're now able to
22 integrate more and more components inside the chip, we
23 ended up adding the stuff on the side.

24 As the systems got to be faster, we ended up
25 again taking the system-level clock and adding it into

1 the -- into the memory. So, just prior to this, the
2 page mode or the EDO parts took the system clock
3 through a controller and then turned on the part.
4 We're now using the system clock. So, the memory is
5 like a microprocessor peripheral.

6 Q. Have your job responsibilities included design
7 or development of Synchronous DRAMs?

8 A. Yes, it did.

9 Q. When did you start work on design and
10 development of the Synchronous DRAM?

11 A. I started this maybe 1988. Systems were now
12 getting fast enough that I'm looking for ways of
13 removing timing skew.

14 Q. Why did you start working on developing an
15 SDRAM?

16 A. Part of my function is to keep track of
17 technology and try to position my company's products
18 two or three years hence. I decided that there was a
19 need for such a part.

20 Q. Why the need to look so far in advance?

21 A. It takes us a couple of years to design and
22 debug a DRAM. They are that complex. There's not that
23 many pieces in it. So, I need to be at least two years
24 out and then start teaching my customer about it a year
25 and a half out, just slightly in advance of the part.

1 Q. When you started working on this Synchronous
2 DRAM back in 1988, what DRAM products were being widely
3 used at that time?

4 A. As I said, page mode and EDO.

5 Q. Okay. What is EDO?

6 A. EDO directly stands for extended data out,
7 and --

8 Q. Could you maybe briefly explain what that means
9 in terms of the product?

10 A. What that means, okay. The -- the page mode
11 part allowed the user to sequentially walk down
12 addresses, and each time it did, it went to a -- an
13 unknown state and then back to data and then to an
14 unknown state. If I just simply put a flip-flop, a
15 latch, on the output of the part, I would have valid
16 data to valid data to valid data, and as a result, the
17 system clock could be faster. So, it was just an
18 evolution, adding another component.

19 Q. Okay. When did page mode first become commonly
20 used in the DRAM industry?

21 A. In the early seventies.

22 Q. When did EDO first become commonly used in the
23 DRAM industry?

24 A. In the -- maybe '86-'88, in that time -- '89
25 time frame.

1 Q. Were page mode and EDO standardized at JEDEC?

2 A. Yes, they were.

3 Q. Were you involved in standardizing those parts?

4 A. Yes, I was.

5 Q. How would you characterize the changes over
6 time, going from page mode to EDO and eventually SDRAM
7 and more recent technologies?

8 A. Mostly evolutionary. The customer base does
9 not really want to jump ahead to something new and
10 different. They're comfortable with something, I can
11 introduce a new feature or two new features, so it's --

12 Q. And what -- I'm sorry.

13 A. I was just saying, it's easier for the engineer
14 to make such movement.

15 Q. What applications or end products would use
16 these DRAMs?

17 A. Basically everything that needed to temporarily
18 store data, a very wide range of products. It could be
19 from today's MP3 music to the supercomputer that NASA
20 would have.

21 Q. Has the demand for these DRAM parts been
22 growing over time?

23 A. Yes, it has been.

24 Q. How important, based on your experience both in
25 the DRAM industry and at JEDEC, how important are JEDEC

1 standards in the DRAM industry?

2 MR. DETRE: Objection, Your Honor, calls for
3 speculation, calls for a --

4 JUDGE McGUIRE: Overruled, no, I will hear that
5 answer.

6 THE WITNESS: Okay, I partially answered this
7 one before when I said that my customers are asking me
8 for standardized parts. Is the part standard? So, the
9 user is looking for a standard part.

10 BY MR. WEBER:

11 Q. And working at -- you said you've worked with
12 customers in your jobs over the years.

13 A. Yes, sir.

14 Q. In working with these customers, have they
15 requested JEDEC-compliant DRAMs?

16 A. Yes, they have.

17 Q. Have you ever had any customer indicate to you
18 that they would only accept a JEDEC-compliant part for
19 a particular application?

20 A. I think we have had some military programs that
21 they were insisting in their documents that they needed
22 to be JEDEC standard, yes.

23 Q. Has that occurrence happened rarely,
24 frequently, occasionally?

25 A. Rather frequently.

1 Q. And is JEDEC the most important
2 standard-setting organization for DRAMs?

3 A. Yes, it is.

4 Q. Let's go back to the Synchronous DRAM. At some
5 point did you bring the Synchronous DRAM concept you
6 had been working at -- let's just make sure I've got
7 the right company now. You were at NEC at this time?

8 A. I was at NEC.

9 Q. Okay. At some point did you bring the
10 Synchronous DRAM concepts you had been working at NEC
11 on to JEDEC?

12 A. Yes, I did.

13 Q. When was that?

14 A. The Anchorage meeting of May '91.

15 Q. And -- now, you testified you started work on
16 the concept in 1998 (sic), and it was '91 when you
17 brought it to JEDEC. What were you doing in the three
18 years in between? Like why did it take so long?

19 A. Well, I have more than one task and am working
20 on more than one product, I'm juggling, but I'm also
21 trying to find the part a definition that I can use for
22 a very low-end system -- I made the mistake of thinking
23 that Apple would only use one or two pieces -- and then
24 something that a very, very high-end multiprocessor
25 would use. I'd like to have one part.

1 Q. Why did you bring these Synchronous DRAM
2 concepts to JEDEC?

3 A. I would bring it to JEDEC because I needed
4 industry standardization. It was introduced at that
5 meeting and earlier than I had anticipated it. There
6 was already discussion of clock memory. Willie Maier
7 from Siemens was making a presentation on a clock
8 memory, had some questions that he couldn't answer, so
9 he turned to another committee member whose company was
10 key in the definition. That company couldn't answer as
11 to why that feature -- and we're a room of engineers,
12 so we start talking about options.

13 So, I grabbed a transparency, drew out a timing
14 chart, and went up and made a proposal and invited the
15 group to join me in defining the last 5 percent of it.

16 Q. Did the Synchronous DRAM you were working on
17 contain features that were programmable?

18 A. Yes, it did.

19 Q. Could you explain?

20 A. The Hitachi patent that I talked about earlier
21 of putting a register in the part allowed me to program
22 the part. So, with that programmable register, we
23 added additional features.

24 Q. Are you familiar with something called
25 programmable CAS latency?

1 A. Yes, I am.

2 Q. And what -- was that one of the features?

3 A. That is a feature.

4 Q. And could you briefly explain how that worked
5 in the SDRAM you were working on?

6 A. Yes. I'm sorry for being so slow. I've got
7 enough of the technology that to me it's second nature,
8 and I'm looking at some of --

9 JUDGE McGUIRE: Take your time.

10 THE WITNESS: The memory device, I need to
11 decode the address, I need to take the data off of the
12 capacitor and sense it, and then I need to get the
13 information from that sense amplifier to the output.

14 By simply putting a register between those
15 three items, I can pipeline the part, and I have a
16 choice of the pipeline. I can make that register a
17 feed through part, i.e., it doesn't take a clock, or I
18 can allow it to be a full register. I still have a
19 circuit there as a buffer.

20 So, if I control that buffer, it now becomes
21 pipeline, pipeline of one, pipeline of two, pipeline of
22 three, so I'm controlling the pipeline. Very simple,
23 very -- very identical to what I'm already doing in a
24 system. No big deal.

25 Q. Let me ask about another programmable feature

1 that's been talked about here, programmable burst
2 length. Are you familiar with that concept?

3 A. Yes, I am.

4 Q. Was that also something you were working on at
5 the time, with the SDRAM concept?

6 A. Yes, it is, um-hum.

7 Q. And how were you using that feature?

8 A. Okay, we already had the part, I talked about
9 page mode, where I could go clink-clink-clink-clink.
10 I've now put a counter inside the part, so it's
11 automatically counting, so I'm just balloting the
12 counter. Do you want to count from zero to three? Do
13 you want to count from zero to seven? Do you want to
14 count from zero to the end of the line and wrap it? I
15 still have this programmable register. I'm just -- and
16 I have the counter, so I'm just controlling the
17 counter.

18 Q. In a prior answer a couple minutes ago you used
19 the term "pipeline."

20 How did you mean that?

21 A. How do I mean a pipeline? I'm sorry. In a
22 system, to pipeline something is to break the process
23 into pieces, and I can be running a piece somewhere
24 downstream and start a new piece upstream. So, I'll --
25 let's say like I cut it in half. So, the first one's

1 going to take its normal time to get there. As I'm
2 working on the second half, I can start a first half.
3 So, I will end up doing things in parallel. Very
4 common technique in computer systems.

5 Q. Let me see if I understand what you said. You
6 were also talking about the concept of latency. Is
7 pipeline the same thing as latency?

8 A. What you're calling CAS latency is really a
9 pipeline, yes.

10 Q. Now, once you made your initial presentations
11 on the SDRAM concept to JEDEC in May of 1991, did you
12 take any steps to win others over to your point of
13 view?

14 A. Of course.

15 Q. What did you do?

16 A. Continued to provide data to as many people as
17 possible, answer questions to as many people as
18 possible, but noting the stack of documents here in
19 front of me, the one up here on the top, I also helped
20 organize meetings with several of my competitors and as
21 many potential customers as all of us could find.

22 I said that there were multiple opinions in
23 that JEDEC meeting, so there's other ways of doing it.
24 So, we need to get people discussing the alternates and
25 see if we can come to a consensus on a standard.

1 Q. How many such meetings did you organize?

2 A. Three within JEDEC -- sorry, three outside of
3 JEDEC, one within JEDEC.

4 Q. And who were some of the attendees or people
5 you invited or who attended these meetings?

6 A. Basically every potential user we could find.
7 That would be like in the Boxborough meeting, IBM
8 showed up, HP showed up, Digital Equipment showed up,
9 BBN showed up, a couple of smaller houses that were
10 doing supercomputers in the Boston area at that time,
11 and a number of my competitors.

12 Q. Did you report back to JEDEC about these
13 meetings?

14 A. Yes, we documented the consensus at the end of
15 each meeting, came back to the next JEDEC meeting with
16 the consensus and with a collection of handouts for
17 anyone that wanted them.

18 Q. Did you ever try to exclude anyone from
19 participating in these meetings?

20 A. No.

21 Q. And you have mentioned a document. Could you
22 take a look at CX-20? I think it's the next document.

23 A. It's the one on top.

24 Q. Pull that up on the screen, please.

25 Do you recognize this document?

1 A. Yes, I do. This is the first of those
2 meetings.

3 Q. And what is the document?

4 A. Okay, this is the consensus -- a listing of the
5 people that were at the meeting in Boxborough, a
6 consensus of where we were. The next page is business
7 cards so that everyone can see who the people were and
8 how you could contact them. And the last page is my
9 timing diagram, consensus.

10 Q. Who prepared this document?

11 A. I did.

12 Q. Particularly the first page.

13 A. I did.

14 Q. Okay. And what -- under the list of attendees,
15 there's some paragraphs. What were you attempting to
16 summarize in these paragraphs? If we could pull up the
17 first few paragraphs, please, the first three
18 paragraphs or so.

19 A. Okay, what you've got pulled up -- so, the
20 first one is that present -- the vendors, presentations
21 were made by IBM, NEC, Siemens and Toshiba, so there
22 are multiple competitors. And after the discussion,
23 there was consensus that a fully synchronous clock
24 device would best fit. The length of the address field
25 would be programmable.

1 There was not an agreement on the clocking.
2 Some of the people preferred single edge, and there
3 were a couple people that were proposing double edge
4 clocks.

5 Q. Okay. What's the difference between a single
6 edge clock and a double edge clock as you're using
7 those terms?

8 A. Do I increment the part on one edge of the
9 clock or on both edges of the clock?

10 Q. And what were the users telling you about a
11 dual edge clock at this point in time?

12 A. It was mixed. There were some users that could
13 make the clock a 50 percent duty cycle, so truly 50/50,
14 and there were others that did not have that system
15 control, so it would be maybe not 50, but maybe it
16 would be 70 -- 65 or 70. They didn't quite have yet
17 the experience of running high-speed clocks. The
18 graphics people did. Some of the larger computer
19 people did not.

20 So, I didn't have, to my feeling, a large
21 enough group of the user base, to Howard Colter at IBM,
22 who was really pushing it very hard, he already had it
23 running in systems.

24 Q. Could you pull up the very top of the document
25 where it has the date that this meeting that you're

1 recording here took place in August of '91?

2 A. Yes, sir.

3 Q. Now, at this time, in August of '91, had you
4 heard of Rambus?

5 A. No, I had not.

6 MR. WEBER: Your Honor, at this time I would
7 like to offer CX-20 into evidence.

8 JUDGE McGUIRE: Objection?

9 MR. DETRE: No objection, Your Honor.

10 JUDGE McGUIRE: So entered.

11 (CX Exhibit Number 20 was admitted into
12 evidence.)

13 BY MR. WEBER:

14 Q. Now, I would like to go through some JEDEC
15 meeting minutes. Did you continue making presentations
16 to JEDEC on the SDRAM?

17 A. Yes, I did.

18 Q. Okay, let's take a look at JX-10. Do you
19 recognize this document?

20 A. Yes, I do.

21 Q. What is it?

22 A. It's the December '91 minutes from a meeting in
23 Hawaii of 42.3.

24 Q. Were you present at this meeting?

25 A. Yes, I was.

1 Q. Do you see the list of attendees includes
2 someone from Rambus who was present? I think it's on
3 the second page, a Billy Garrett.

4 A. Ah, yeah, Billy was there.

5 Q. Was this the first time you saw someone from
6 Rambus at a JEDEC meeting?

7 A. Yeah, Billy previously was with NCR.

8 Q. And could you turn to Attachment H, which is
9 pages 49 through 55 of the document, and we will just
10 pull up the first -- the first page and ask if you
11 recognize this presentation.

12 A. Yes, I do.

13 Q. What is it?

14 A. Okay, this appears to be my presentation at the
15 meeting. I'm reporting on the next of the outside
16 JEDEC meetings -- out-of-JEDEC meeting on synchronous
17 at the meeting, so that's the Portland meeting, and a
18 summary of what has happened there and some additional
19 flushing out of details of the Sync DRAM.

20 Q. Okay, if we could turn and put up on the screen
21 page 50, the next page. You said you presented a
22 summary. Is that what's reflected on these seven
23 points?

24 A. Yes, it is.

25 Q. Let's go through some of them. First of all,

1 point number 1, what's -- is this -- are these items --
2 what's represented by these seven points?

3 A. That we're going to end up -- well, item 1,
4 that we're using in this case the -- a single edge of
5 the clock rather than a double; that we are going to be
6 JEDEC standard as far as the interface. Item --

7 Q. Let me just direct your attention, we don't
8 need to go through all of them.

9 Number 2 where it says, "The latency of data to
10 the clock should be programmable"?

11 A. That's CAS latency, the pipeline that I
12 described before.

13 Q. So, that would be programmable CAS latency?

14 A. Yes, sir.

15 Q. Could we look at item number 5, where it talks
16 about burst sequence, then there are companies in
17 parentheses, and it says, "Wrap length should be
18 programmable."

19 What is this describing?

20 A. This is programmable burst length.

21 Q. And the term "wrap length," is that -- how does
22 that relate to burst length?

23 A. When do you wrap or do you wrap -- when you
24 come to the end of the count, you go back to zero, like
25 does it continually circle or does it end up stopping.

1 So, if you wrap, it goes back to zero. If you don't,
2 you just stop at the last -- at the last count.

3 Q. When you use the term "wrap length" and also
4 the term "burst length," do you view those terms as
5 synonymous or different?

6 A. Basically synonymous.

7 Q. What were the advantages to using these
8 programmable features in an SDRAM?

9 A. I had a range of customers. The largest
10 customer, of course, is the PC, so that's an
11 application, but I also had a number of smaller
12 customers with slightly different requirements. They
13 could all fold and use the PC one, but it would be more
14 convenient for them, the part would become more
15 flexible.

16 Q. Now, as a JEDEC member who was making this
17 presentation, what was your expectation under the
18 patent policy if another participant at the meeting who
19 would have patents or some other intellectual property
20 relating to either programmable CAS latency or
21 programmable burst length?

22 A. I would expect them to reveal that their
23 company had potentially an IP position on this.

24 Q. What kind of information would the committee
25 need in that situation? Use it as an example.

1 A. The individual standing up and saying I believe
2 my company has IP or I believe your company has IP. It
3 doesn't have to be mine.

4 Q. Now, you understand that patent applications,
5 at least at this time, were nonpublic in the U.S.?

6 A. Correct.

7 Q. Would the committee need to see the actual
8 nonpublic patent application to evaluate all the
9 claims?

10 A. No, the claims are still in progress. It
11 may -- they may change. We need to know concept.

12 Q. Okay. Would it be enough to just disclose the
13 concept and no information about what was being
14 claimed?

15 A. Give us the concept and no information -- at
16 least enough information to know what you're doing.
17 No, you cannot give me the alphabet.

18 Q. Did anyone speak up at this December '91 JEDEC
19 meeting and say they had IP on either of these
20 features, programmable CAS latency or programmable
21 burst length?

22 A. No, they did not.

23 Q. Would you please turn to page 54 of this
24 presentation?

25 A. Okay.

1 Q. What's being depicted here on these diagrams,
2 if we can blow them up a little bit on the left and the
3 right?

4 A. An industry standard DRAM pinout on the left,
5 and on the right is the one I'm proposing for
6 synchronous.

7 Q. Okay. And could you just comment generally --
8 they seem to be like the same number of pins. Could
9 you just comment generally on sort of the magnitude of
10 changes you were proposing?

11 A. Okay, this was proposing evolutionary, that
12 maybe we could make use of the same plastic package,
13 the same metal lead frame, basically minimal cost
14 incurred or actually zero cost in the area of packaging
15 from the standard part to the new one.

16 Q. And why did you -- why were you recommending a
17 minimal change in the pinouts? Is it just the cost
18 factor?

19 A. Cost factor.

20 Q. Okay. Where it says NC, take an example on the
21 one you were proposing on the right, pin number 24, NC.

22 A. Okay, um-hum.

23 Q. What's that refer to where it says NC?

24 A. This is a no-connect, the pin is not used.

25 Q. What's this pin used for?

1 A. Nothing. No function.

2 Q. Why is it there? Excuse me?

3 A. Ah, basically for convenience. You stamp them
4 all out together.

5 Q. Could the no-connect pin be used for another
6 function?

7 A. Yes.

8 Q. Could the no-connect pin be another way to
9 program CAS latency or burst length?

10 A. You could.

11 MR. DETRE: Objection, calls for opinion
12 testimony.

13 MR. WEBER: Your Honor, we're asking about his
14 particular presentation that he gave and the pinout
15 diagram.

16 MR. DETRE: Well, unless that's part of the
17 presentation, it's just now a hypothetical question.

18 JUDGE MCGUIRE: That's sustained.

19 BY MR. WEBER:

20 Q. Okay, based on your experience in the industry,
21 did anyone ever propose using a no-connect pin to
22 program CAS latency or burst length or any additional
23 feature?

24 A. There were a number of presentations on using
25 the no-connect pin for other functions.

1 Q. And specifically with respect to the
2 presentations made at this meeting or the discussion of
3 this concept at this meeting, were there any
4 alternatives being proposed by others at the meeting,
5 without necessarily going through each and every
6 presentation?

7 A. The answer to that one is yes. The -- the
8 Howard definition is not yet accepted. I still have
9 competitors that want to do it their way.

10 Q. The Howard definition being Howard Sussman's?

11 A. Yes.

12 Q. Okay. What were some of the other ways that
13 were being proposed for programming CAS latency or
14 burst length?

15 A. Some companies were saying that we shouldn't
16 have it at all. Their customers only are a very narrow
17 base, not needed. There were some that were proposing
18 that we do it by fuse option. There were a couple that
19 were saying that maybe we should use the extra pin or
20 add additional pins to the package and make those
21 pins -- however you connected those pins would
22 determine what was there. So, rather than programming
23 a register, you would use the pin, and you'd program it
24 by the circuitry on the printed circuit board.

25 Q. And you said some said it wasn't needed. What

1 were -- what would they be doing for CAS latency or
2 burst length instead of using a programmable feature?

3 A. There were a couple customers -- a couple
4 customers. There were a couple vendors that were
5 totally focused on the IBM PC, and the IBM PC had a
6 cache line burst length requirement, and they didn't
7 really care about anything else.

8 Q. Have you heard of the term "fixed burst length"
9 or "fixed CAS latency"?

10 A. Yes.

11 Q. Is that the same thing you're talking --

12 A. That would be the same thing.

13 Q. Okay. Now, with all these alternatives on the
14 table, if it had been disclosed at the JEDEC discussion
15 that there were patent issues with one of the
16 alternatives, in your view, would that have influenced
17 the discussion?

18 A. Yeah, I had a lot of arguing to do to get the
19 degree of programmable features into the part.

20 Q. If another member had disclosed IP relating to
21 these two technologies you were recommending,
22 programmable CAS latency and programmable burst length,
23 would that have changed your recommendation to JEDEC?

24 MR. DETRE: Objection, Your Honor, hypothetical
25 question, calls for speculation.

1 JUDGE McGUIRE: Sustained.

2 BY MR. WEBER:

3 Q. Let's turn to page 84 of this document.

4 A. Okay.

5 Q. This is a one-page presentation, Attachment M.
6 Were you present for this presentation?

7 A. Yes, I was.

8 Q. What's your understanding of what was being
9 proposed here or discussed?

10 A. Discussed? Okay, this is from Mark Kellogg at
11 IBM. Early on he was not so hip on Synchronous DRAM,
12 so I think there's a statement down there at the bottom
13 that -- but basically he was promoting high-speed
14 toggle mode, which was a -- a spin-off of a device that
15 IBM already had in production that used -- it took data
16 on both the rise and fall of the clock signal.

17 Q. You said it took data on both the rise and fall
18 of the clock signal. Is that also referring to dual --
19 are you referring to dual edge clocking or something
20 else?

21 A. Basically the same thing.

22 Q. Okay. As a member of JEDEC listening to this
23 presentation on high-speed toggle mode, would it have
24 been relevant to know if another member had IP claims
25 on dual edge clocking technology?

1 A. It would be useful. At this time it's being
2 proposed and being pushed hard. It should have been if
3 it was.

4 Q. Okay. Let me ask you to look at the next
5 document, which is JX-12. Do you recognize this
6 document?

7 A. Yeah, this is the February '92 42.3 meeting in
8 Seattle.

9 Q. And were you present at this meeting?

10 A. Yes, I was.

11 Q. Again representing NEC, if we look on the list?

12 A. Yes, I was.

13 Q. And if you could turn to Attachment I, which
14 starts at page 39, if we could pull that up. If we
15 could blow up sort of the first two-thirds of the page.

16 It says "NEC" at the top of the page. Do you
17 recognize this presentation?

18 A. Yes, I do.

19 Q. What is it?

20 A. Again, this would be the presentation that most
21 likely I gave -- I think I may have something out of
22 order here. Let me just use your screen rather than --

23 Q. Okay, can you see it on the screen?

24 A. I can see it on the screen. Go ahead.

25 Q. Okay. And does this presentation relate to the

1 concept of programmable CAS latency? Again, if you
2 could just focus on the page on the screen.

3 A. Yes, it does, programmable RAS/CAS latency
4 using WCBR. So, this is the same test mode
5 methodology, programmable, that we have had for years.

6 Q. Okay. And does this presentation also relate
7 to the concept of programmable burst length?

8 A. Yeah, the line above it, programmable wrap
9 length.

10 Q. And do you think the engineers at the meeting
11 who saw this presentation would have understood that?

12 A. Ah --

13 MR. DETRE: Objection, Your Honor, calls for
14 speculation.

15 JUDGE MCGUIRE: Sustained.

16 BY MR. WEBER:

17 Q. Okay, the same question I asked you before.
18 Would you expect, based on your knowledge and
19 participation in JEDEC and knowledge of the JEDEC
20 patent policy, would you expect that any participant at
21 the meeting with IP relating to programmable CAS
22 latency or programmable burst length, seeing this
23 presentation, would be required under the JEDEC patent
24 policy to make a disclosure?

25 A. Yes, they would.

1 MR. WEBER: Your Honor, at this time I would
2 like to offer JX-12 into evidence.

3 MR. DETRE: No objection, Your Honor.

4 JUDGE McGUIRE: Entered.

5 (JX Exhibit Number 12 was admitted into
6 evidence.)

7 BY MR. WEBER:

8 Q. Could you take a look at the next document,
9 CX-34, and let me know if you recognize it.

10 A. Yeah, this is the memory meeting, July --
11 sorry, May '92 in New Orleans.

12 Q. Okay. And were you present at this meeting?

13 A. Yes, I was.

14 Q. And I direct your attention to page 30 of this
15 document, if we could pull that up on the screen.

16 A. Okay.

17 Q. And you'll see a reference to a task force
18 meeting in Dallas in April '92.

19 A. Correct.

20 Q. Do you understand what is being done when this
21 is being attached to the -- first of all, were you at
22 the April '92 task force group meeting?

23 A. Yes. Yes, I was.

24 Q. What's your understanding of what's being done
25 here in the minutes in terms of this particular

1 attachment?

2 A. Okay, this was one of the meetings I talked
3 about earlier this morning. I said there were three
4 outside of JEDEC and then one within JEDEC. So, this
5 particular one is a JEDEC task group meeting. I helped
6 organize the meeting, but because it's a task group,
7 it's chaired by Gordon Kelley.

8 Q. And what's your understanding of why this task
9 group meeting was called?

10 A. There is enough interest in Synchronous DRAM
11 and enough time -- we need additional time to focus on
12 the options and move it forward. So, rather than
13 talking of all DRAM, we're now a special meeting just
14 on synchronous.

15 Q. Okay. Would you pull up a couple of pages
16 later, page 32, could you pull up that page on the
17 screen, please.

18 I direct your attention to sort of the second
19 half of the page, there is a presentation by Mr.
20 Hardell, H A R D E L L, of IBM.

21 Do you see that?

22 A. Okay, yes, um-hum.

23 Q. Were you present at the April '92 meeting for
24 this presentation?

25 A. Yes, I was.

1 Q. What was your understanding at the time of what
2 Mr. Hardell was proposing?

3 A. Okay, Bill Hardell is out of the server group
4 in Austin at that point in time, and he is still
5 pushing a double edge clock version of the part.

6 Q. And again, based on your expectation as a JEDEC
7 member, if others present at the meeting had IP
8 relating to dual edge clocking technology, what was
9 your expectation under the patent policy?

10 A. That it would be revealed.

11 Q. Would it matter if this was a task force
12 meeting as opposed to a regular committee meeting of
13 JEDEC?

14 A. No, the task group is -- often a task group
15 will be just embedded as part of the committee meeting,
16 but basically it's still a JEDEC meeting.

17 Q. So, are you saying the rules -- the same rules
18 would still apply?

19 A. The same rules apply.

20 Q. Okay. Could you turn to a presentation
21 starting at page 58 of this document, CX-34, and it
22 actually continues on through I think page 81. Again,
23 I think it's an NEC.

24 Now, we are looking now in this attachment,
25 Attachment I, at presentations that were made at the

1 regular meeting in May, right? Am I right?

2 A. Yes.

3 Q. Okay. And what is this presentation?

4 A. This is still the NEC proposal for the
5 Synchronous DRAM with a bit more detail and explanation
6 of why some of the features.

7 Q. Could you turn -- could we turn to page 63, put
8 that on the screen.

9 A. Okay.

10 Q. And maybe blow it up -- whoops. Blow it up a
11 little bit. Can everybody see that?

12 At the top it says, "Mode-Register." My
13 question -- was this part of your presentation?

14 A. Yes, it was.

15 Q. And what is depicted here on page 63?

16 A. Okay, this is that same programmable register
17 that I've been mentioning, and what we're now doing is
18 saying that this is the -- these are the values for the
19 wrap length, for the wrap type and for the latency.

20 Q. What was your expectation, again, under the
21 patent policy of fellow members with IP relating to
22 programmable CAS latency and/or programmable burst
23 length who saw or read this presentation?

24 A. That they would reveal their patent -- their IP
25 position.

1 Q. Okay. Would you please turn to another
2 presentation at page 149 of this document, if we can
3 blow that up.

4 Were you present for this presentation at the
5 meeting in May of '92?

6 A. Yes, I was.

7 Q. And it references a gentleman named Grossmeier
8 at a company called Cray Research. Do you have an
9 understanding what kind of company Cray -- what they
10 were involved in?

11 A. Yeah, Al's a component engineer. Cray is doing
12 supercomputers.

13 Q. And what is your understanding of what he's
14 proposing here?

15 A. Al is proposing -- Al has -- the supercomputer
16 market is reasonably small, reasonably specialized, so
17 Al is describing what he would like for Cray's machine,
18 but he would still like it to be programmable, but in
19 his case he's suggesting we do it by blowing a fuse.

20 Q. And can you point us to where on this page we
21 see that?

22 A. The last sentence before the Alan Grossmeier,
23 the bottom -- yeah, right there.

24 Q. And when you say he's proposing a fuse
25 programmable, would that be for both CAS latency and

1 burst length or one or the other?

2 A. Well, he has two different latencies up here
3 that would be programmable, and he has two different
4 wrap lengths, so the answer is yes.

5 Q. Okay, so he's doing programmable, but he's not
6 using the mode register?

7 A. Right, he's saying I need it programmable to be
8 the left or programmable to be the right, both of those
9 will have different latencies and different wrap
10 lengths.

11 Q. Okay. Now, at this stage we have seen several
12 presentations that you made and some other
13 presentations. What was the next step in the JEDEC
14 process toward developing an SDRAM that would be
15 standardized?

16 A. When we finally get to where we think we have
17 consensus or mostly consensus, there would be a
18 proposal for ballot. That proposal for ballot would be
19 voted on by the committee. If approved, a ballot would
20 be generated, sent out by the JEDEC office, and it
21 would be counted at the next committee meeting.

22 Q. Okay. And have you over the years cast ballots
23 in representing NEC and Sanyo at these meetings?

24 A. Of course.

25 Q. Would you look at JX-59.

1 A. Fifty-nine?

2 Q. Yeah. It's a -- it's the next -- yeah.

3 A. Okay, you have got I think 50 up on the
4 screen -- yeah, 59.

5 Q. There you go.

6 A. Yes, thank you. This looks like a JEDEC
7 ballot.

8 Q. And do you recognize this particular ballot as
9 relating at all to the -- what you were proposing at
10 JEDEC in May of '92?

11 A. Yeah, its subject is Proposed Standard for Sync
12 DRAM Mode Register.

13 Q. And if you could turn to -- if we could get on
14 the screen the third page of this ballot and maybe blow
15 it up.

16 Does this page here look familiar?

17 A. Yes, this is basically very close to the last
18 one that you showed me.

19 Q. Okay, that came from your presentation?

20 A. The answer to that one is yes, and this one
21 even has "From NEC Electronics" on the -- on the fax at
22 the top of the page.

23 Q. Now, does this proposed ballot relate to the
24 concept of programmable CAS latency?

25 A. Yes, it does.

1 Q. Does this proposed ballot relate to the concept
2 of programmable burst length?

3 A. Yes, it does.

4 Q. And I direct your attention to page 2 of this
5 document. Do you see there's a bunch of -- on the
6 left-hand side, if we blow up sort of the middle of the
7 document, there is four lines, and then there's a bunch
8 of options for what people can do.

9 Am I -- is that --

10 A. I'm counting five lines.

11 Q. Okay, five lines.

12 What are the options on -- maybe just to start
13 again, looking at this, can you explain what the
14 options are generally that a JEDEC member has on voting
15 on a ballot like this?

16 A. Yeah, I can approve the ballot. I can not
17 approve the ballot. I can abstain on the ballot. I
18 can approve it with comments. And the bottom one is
19 saying that regardless of what I do, ignoring any of
20 the above things, I can also point out that I know of
21 or I believe there might be a patent that could read on
22 the -- on this concept, on this ballot.

23 Q. Okay. Could we blow up that -- thank you, the
24 last point you were just making where it says, "If
25 anyone receiving this ballot is aware of patents," do

1 you understand that to only mean issued patents?

2 A. No, this is, again, the -- my all inclusive,
3 patents, patent applications or something that you're
4 about to file.

5 Q. And let me ask you to go up to -- could we
6 focus on two -- two paragraphs above that where it
7 says, "I do not approve," that paragraph, and at the
8 end it says, "Mandatory."

9 What's your understanding of what was required
10 of someone voting "no" on the ballot?

11 A. Okay, if you give a negative vote, we need an
12 explanation of your vote, if -- and we would like it to
13 be a technical explanation rather than "I don't like
14 you and your company." With that negative vote and the
15 explanation of it, we can -- for this to pass, we need
16 to consider all of the negative votes, all of the
17 negative comments, and there had been cases that a
18 single negative vote has revealed a fatal flaw and has
19 put the ballot on a hold as we go off and find
20 something else to do. So, very important. It is
21 required that you give me why.

22 Q. Let me ask you to look at the next document,
23 which is JX-13, if we could put that on the screen.

24 Do you recognize this document?

25 A. Yes, I do. It's the 42.3 minutes of the Denver

1 meeting in July '92.

2 Q. Were you in attendance at this meeting?

3 A. Yes, I am.

4 Q. Okay. I direct your attention, there's an item
5 16, and it actually starts at page 9 and continues on
6 through pages 10 and 11, where it says, "DRAM Ballot
7 Counts."

8 Were you present for the discussion of the DRAM
9 ballot counts in July of '92 at this meeting?

10 A. Yes, sir, I was.

11 Q. And what was being discussed here?

12 A. Okay, this is the Synchronous DRAM ballots.
13 The one that you showed me looks like it's one of
14 the -- one of the ones that are here.

15 Q. And at this time in the process, procedurally
16 at JEDEC and in the committee, what was happening?

17 A. Okay, as I said before, we had gotten at the
18 previous meeting the approval to send out a ballot,
19 because it appeared that we were approaching consensus.
20 The ballots have gone out. They have come back. They
21 have been tabulated. This is the next meeting. So,
22 the chair is now reporting on the tabulation of those
23 ballots.

24 Q. On these particular ballots, were there any
25 "no" votes?

1 A. Ah, yes --

2 MR. DETRE: Your Honor, this is the third time
3 we have had testimony about these ballots. It seems
4 cumulative to me.

5 MR. WEBER: I was about to get into something
6 else.

7 JUDGE MCGUIRE: Yeah, sustained. I think we
8 have gone into that adequately, Mr. Weber.

9 MR. WEBER: Okay.

10 BY MR. WEBER:

11 Q. Do you recall how Rambus voted on these
12 ballots?

13 MR. DETRE: Same objection, Your Honor.

14 THE WITNESS: It's in the record that the --

15 JUDGE MCGUIRE: All right, just a second, sir.
16 I have to consider this objection.

17 THE WITNESS: Oh, sorry.

18 JUDGE MCGUIRE: Any comment on that, Mr. Weber?

19 MR. WEBER: Yes, I'm about to elicit some
20 testimony about his state of mind when Rambus voted
21 "no" at this meeting.

22 JUDGE MCGUIRE: Then I'll overrule that
23 objection. Proceed.

24 BY MR. WEBER:

25 Q. Do you recall how Rambus voted on these

1 ballots?

2 A. Yeah, it's in the minutes here that there were
3 three negative votes, IBM, Rambus and Compaq.

4 Q. Do you recall what your thinking was at the
5 time when Rambus voted "no" on these ballots on the
6 Sync DRAM standard?

7 A. Yes, I do.

8 Q. What? What can you recall?

9 A. That the activity of Rambus was more to delay
10 the standardization process as this was basically a
11 competing option for the Rambus DRAM, so not assisting
12 in the standards.

13 Q. Did the JEDEC committee take Rambus' "no" votes
14 into consideration?

15 A. Yes, sir.

16 Q. At the time these ballots were discussed, did
17 any Rambus representative disclose any IP relating to
18 programmable CAS latency or programmable burst length?

19 A. No, sir.

20 Q. Turn back to the attendance roster, and at page
21 1 you'll see there's a Mr. Crisp who was at -- who was
22 listed here.

23 A. Okay.

24 Q. Do you know who he was?

25 A. Yeah, I know Richard.

1 Q. Was he a Rambus representative at these
2 meetings?

3 A. Yes, sir.

4 Q. And on the second page, under Others Present,
5 you will see a gentleman named Dave Mooring.

6 A. Yes, I do.

7 Q. Do you know what Mr. Mooring's position was at
8 Rambus?

9 A. He's a senior person at the company.

10 Q. Now, at the time of the voting on this ballot,
11 if a participant in the meeting at JEDEC had reason to
12 believe it had claims or was in the process of drafting
13 claims covering the JEDEC SDRAM standard, did that
14 member have a duty to disclose under the JEDEC patent
15 policy or not?

16 MR. DETRE: Objection, Your Honor, leading.

17 JUDGE MCGUIRE: Sustained.

18 BY MR. WEBER:

19 Q. Okay. What's your understanding of what the
20 JEDEC patent policy would indicate if at the time of
21 the voting on this ballot a JEDEC member had reason to
22 believe it had claims or was in the process of drafting
23 claims covering the JEDEC SDRAM standard?

24 A. The -- if they had IP on it, they should have
25 gotten up and said that they had IP. If I can point

1 out again, you didn't ask, but I did mention that at
2 the beginning of each meeting, that the chair basically
3 announced the patent policy and showed it, and now that
4 I've got this document in my hand, page 4, it has
5 Chairman Townsend showing the patent policy. So, yes.

6 Q. If someone at the meeting had --

7 A. I'm sorry, they are putting up page 4, and I
8 was just saying it was item number 4 on that page.

9 Q. Okay, if we could just highlight that.

10 If someone at the meeting had stood up and
11 disclosed IP claims on the technologies at the time
12 these ballots were discussed, what would you have done?

13 MR. DETRE: Objection, Your Honor,
14 hypothetical.

15 JUDGE MCGUIRE: Sustained.

16 BY MR. WEBER:

17 Q. What happened next with respect to the SDRAM
18 standard?

19 A. After the discussion and the addressing of the
20 negative votes, the -- there was again a vote of the
21 committee to send this on to JEDEC Council, and council
22 would end up reviewing the ballot and reviewing the
23 procedures to make sure that due process had been
24 followed. After council, it would have been published
25 as a standard.

1 Q. Do you know if the SDRAM standard became
2 finalized at some point?

3 A. It finally did.

4 Q. Do you know approximately when?

5 A. Sometime in '93. We were standardizing slices
6 of the definition, and that was happening early. They
7 were eventually all compiled in a single document.

8 Q. Okay. Can you look at the next document on
9 your stack, which is JX-56, if we can just pull that up
10 on the screen.

11 Do you recognize this document, sir?

12 A. Yes, it is.

13 Q. And what is it?

14 A. This document has the -- is published, all of
15 the standards for all of the memory types, the DRAM,
16 the SDRAM, the ROMs, the flash, so it's got the pinouts
17 and the basic functionality for all of our parts.

18 Q. Do you know if this particular standard
19 includes the concepts of programmable CAS latency and
20 programmable burst length using a mode register?

21 A. Yes, it does.

22 Q. Could we pull up page 114 on the screen,
23 please, and maybe we can -- well, can you tell me
24 what's depicted on page 114 or described here?

25 A. Yeah, this is the programmable register, and

1 again, we are defining the definition of the various
2 positions in it, so it's got programmable burst length,
3 programmable burst type and programmable latency, as
4 well as the test mode entry.

5 Q. Now, at the time JEDEC adopted this standard,
6 the SDRAM standard in 1993, were you aware that Rambus
7 might have patent rights covering either programmable
8 CAS latency or programmable burst length?

9 A. No, I was not.

10 Q. Let me ask you a few questions about this
11 particular slide. Could we go to the -- blow up the
12 top of the screen, the paragraph under SDRAM Mode
13 Register, please.

14 Now, where it says, "SDRAM Mode Register," does
15 this standard require that the SDRAM device have
16 programmable CAS latency and programmable burst
17 features on the mode register in order for the device
18 to be manufactured in compliance with the standard?

19 A. Yes, it does.

20 Q. Is that an option or a requirement if somebody
21 wants to a make a device in compliance with the
22 standard?

23 A. These features are required.

24 Q. In order for an SDRAM device to be in
25 compliance with the standard, is it required that the

1 mode register store information that controls the CAS
2 latency and burst length?

3 A. Yes.

4 Q. Let me -- could we highlight the second line
5 that starts, "This data," that sentence?

6 "This data is written after power-on and before
7 normal operation."

8 Do you see that, sir?

9 A. Yes, sir.

10 Q. Actually, it's the sentence -- the sentence
11 before that. Okay.

12 Is this a requirement or an option for someone
13 seeking to manufacture a JEDEC-compliant SDRAM part,
14 that the data is written after power-on and before
15 normal operation?

16 A. This is a requirement.

17 Q. Are you familiar with the term "configure" as
18 it applies to the operation of SDRAM devices?

19 A. Yes, I am.

20 Q. What does that term mean?

21 A. After power-up, because before power-up, there
22 is no meaning, I am not looking at anything, but after
23 I power up the part and before I start normal
24 organization, I need to configure it. That is, I need
25 to tell the part what it is. What is your pipeline,

1 i.e., what is your CAS latency, what is your burst
2 length, what -- what are you? How should you work?
3 So, yes.

4 Q. Is the -- let me see if I understand. When the
5 mode register is programmed -- the mode register is
6 sitting on the DRAM?

7 A. Correct.

8 Q. When the mode register is programmed, is that
9 when the SDRAM is configured?

10 A. That would be the active configuring it,
11 programming the register.

12 Q. Oh, okay. Now, does the CAS latency feature
13 we've been discussing require the SDRAM to wait a
14 specified time before responding to a read command?

15 A. Different wording, but the answer to that one
16 is yes.

17 Q. Okay. How would you, if possible, change the
18 question?

19 A. No, no, it's okay. I just -- yes.

20 Q. Okay. Are you familiar with the term "chip
21 select"?

22 A. Yes, I am.

23 Q. What's that refer to?

24 A. There is an additional pin on this device that
25 is used to enable a part, so it's a chip select.

1 Q. And how are chip select lines used in an SDRAM
2 in connection with read and write commands?

3 A. Okay, if you gave the part a read or write or
4 any other command and had not selected it, it would
5 ignore it. So, the chip select being active allows it
6 to recognize the other commands.

7 Q. Is the -- and how is the chip select line
8 actually activated? Is there a signal that goes
9 through a wire?

10 A. There is a signal that goes to the part.

11 Q. Now, we're up to the year 1993, and we see that
12 JEDEC has completed work on the SDRAM standard. What
13 did the JC-42.3 committee do next?

14 A. Start on the next evolutionary part.

15 Q. Okay. At this time, were you thinking that
16 that part was going to come out in the next year or so
17 after '93 or not?

18 A. I have already answered that it would take two
19 or three years to get a part out there, so no, we need
20 to start working early.

21 Q. Why start so soon on the next generation
22 standard?

23 A. Just it takes us that long. It does take two
24 to three years to design the part, debug it, get it out
25 into the marketplace.

1 Q. Now, to be fair, were you as involved in the
2 developing of the next generation standard after SDRAM
3 as you were in the SDRAM standard we've just been
4 discussing?

5 A. Not as involved. I still attended the
6 meetings, but a participant rather than as a driver.
7 With Synchronous DRAM, I'm driving it.

8 Q. Do you recall any of the additional
9 technologies or features being considered for the next
10 generation SDRAM?

11 A. Yes, I do.

12 Q. What do you recall?

13 A. Well, Howard Kalter's dual edge clock is
14 finally to the point that the industry can handle it.
15 Some of the group are talking on a device this fast,
16 maybe the phase lock loop or the DLL that's on the
17 system level as a separate chip maybe should be
18 integrated into the memory. Others are talking maybe
19 we also need to add some protocols to the part in
20 addition to the -- the programmability features. But
21 what do we need to go faster?

22 Q. You used the term "phase lock loop" and "delay
23 lock loop" in your answer. Those -- when we see the
24 acronym PLL or DLL, is that also the shorthand?

25 A. Yes.

1 Q. And were these PLL or DLL circuits to go right
2 on the memory chip itself?

3 A. Some were proposing it.

4 Q. What other proposals were you aware of?

5 A. Some were proposing -- well, there were some
6 systems that currently had these DLLs or PLLs, but they
7 put them on the printed circuit board as a separate
8 piece from the memory. So, now there was a debate,
9 were they -- should they remain on the printed circuit
10 board, or should we integrate them inside the memory?
11 What would be the more cost-effective way of doing it?
12 What would give higher performance? Ten engineers; 12
13 opinions.

14 Q. Okay. In this time frame, were there any new
15 alternative architectures for DRAMs that were proposed
16 in the JEDEC JC-42.3 committee? And when I say "in
17 this time frame," I'm speaking in the '94 to '96 time
18 frame.

19 A. You're asking SyncLink?

20 Q. I don't know, I'm --

21 A. Yes.

22 Q. What are -- okay.

23 A. Sorry.

24 Q. What was -- what is SyncLink? What were you
25 referring to?

1 A. The EDO, the page mode, the Synchronous DRAM
2 are all random access devices. SyncLink was a proposal
3 for a packet -- packetized device, a little bit
4 different from what we're doing. So, yes, totally
5 different architecture.

6 Q. Other than the fact that it was a packetized
7 device, do you recall any other features of the
8 SyncLink DRAM that was presented or discussed at JEDEC?

9 A. Double edge clock, did not have the phase lock
10 built into it, not directly involved in it, so just
11 watching the presentations.

12 Q. Okay, well, let's look at some presentations,
13 and we won't belabor it, but let's start with JX-21.

14 Do you recognize this document?

15 A. Yes, it is. It's the Albuquerque meeting 42.3,
16 September '94.

17 Q. And were you present at this meeting?

18 A. I believe so. I'm not on the page that you've
19 got up there, but yes.

20 Q. Okay. And could you turn to Attachment AA, all
21 caps, at page 86? It starts at page 86, goes through
22 page 92.

23 A. Okay.

24 Q. And were you present for this presentation?

25 A. I believe so.

1 Q. Okay. And this was -- at this time, you were
2 not with NEC, though, you were -- had switched to
3 Sanyo?

4 A. I am now with Sanyo.

5 Q. Okay. And can we pull up pages 91 and 92? Is
6 it possible to get them on the same screen?

7 A. Okay.

8 Q. Do you see there's a couple of slides in the
9 NEC presentation that talk about a PLL enable mode?

10 A. Correct.

11 Q. As an engineer sitting looking at this
12 presentation, when it refers to PLL enable mode, do you
13 have an understanding of what was being presented?

14 A. Yes, I do.

15 Q. What? What is that understanding?

16 A. Basically in this case, the NEC techs were
17 talking of the advantages and disadvantages of putting
18 the phase lock loop on the Synchronous DRAM, so yeah,
19 basically they're options.

20 Q. Okay. And just so the record is clear, going
21 back to the standard we just looked at a minute ago,
22 the SDRAM standard from 1993 that you worked on, did
23 that include a phase lock loop or not?

24 A. The SDRAM did not.

25 Q. And as a member of the JC-42.3 committee

1 considering this NEC proposal, what was your
2 expectation of your fellow JEDEC members under the
3 patent policy to disclose any IP relating to the
4 concept of putting a PLL on a DRAM?

5 A. If you had an IP position, you should be
6 speaking up.

7 Q. And did anyone speak up at this meeting and
8 indicate that they had IP on the concept of putting a
9 PLL on a DRAM?

10 A. I do not believe so.

11 Q. Let me show you JX-26, and again, focusing on
12 the first page, do you recognize this document?

13 A. Yes, this is the New Orleans meeting in May of
14 '95, it looks like. Yes.

15 Q. And were you present at this particular meeting
16 in New Orleans in May of '95?

17 A. Yes, I was.

18 Q. And could you turn to page 10 of JX-26. You'll
19 see at -- starting at the bottom of the page, item
20 13.7, 13.8, and it actually goes onto the next page,
21 there's another item, you'll see references the
22 SyncLink?

23 A. Yes, I do.

24 Q. Were you present at the time of the
25 presentations on SyncLink at this meeting?

1 A. Yes, I was.

2 Q. And if we could focus on the top of the next
3 page also, get that on the screen, do you see a
4 reference -- do you see a reference to a presentation
5 by Mitsubishi, Attachment AA?

6 A. Yeah, 13. -- it looks like 9, yes.

7 Q. And if we could turn to page 111, which is
8 Attachment AA, and if you could also look at the next
9 page, 112.

10 A. Okay, I have them. I'm sorry, they are not up
11 on the screen.

12 Q. 111 and 112 of the document. Maybe if we can
13 put the second page up as well.

14 Were you present for this presentation on the
15 SyncLink DRAM -- SDRAM, excuse me?

16 A. I believe so.

17 Q. Okay. And you mentioned earlier something
18 about dual edge clocking. Did you observe anything in
19 this presentation by Mitsubishi relating to the concept
20 of dual edge clocking?

21 A. The answer to that would be yes, on page 112,
22 where it's showing the D zero through eight, those data
23 bits are changing on both the rise and the fall of the
24 clock above it.

25 Q. Okay, you're looking at the diagram at the

1 lower right-hand -- or the right-hand --

2 A. Oh, the right-hand side of the screen, yes.

3 Q. Okay. Is there also anything in the text above
4 that that indicates it's a dual edge clock?

5 A. Reference clock, both edge for input, yep.

6 Q. Okay. Again, speaking as a long-time JEDEC
7 participant looking at this proposal, what would be
8 your expectation of your fellow JEDEC members that
9 might have IP relating to the general concept of dual
10 edge clocking?

11 A. It needs to be disclosed.

12 Q. Now, do you recall anyone from Rambus
13 responding at all -- excuse me, let me strike that.

14 Do you recall anyone disclosing any IP relating
15 to the concept of dual edge clocking at this meeting in
16 May of 1995?

17 A. Not for the dual edge clocking, no.

18 Q. Okay. Can we look at the -- go back to the
19 page that we were looking at in the minutes. I think
20 it's page -- the first page of -- page -- hold on a
21 minute. Page 10, I think. Can we blow up that
22 discussion under 10 -- towards the bottom of the page?

23 Do you see there's a reference there to patent
24 issues in that paragraph?

25 A. Yes, I do.

1 Q. Okay. Do you recall anyone from Rambus
2 responding at all to patent issues raised in connection
3 with the SyncLink presentation at this meeting in May
4 of '95?

5 A. Perhaps this meeting, perhaps the next one,
6 there was some concern -- maybe this one -- that
7 SyncLink and Rambus to me were competing proposals from
8 two California professors, and somewhere along the
9 line, there was some mumbling from Richard about
10 SyncLink. Was it this meeting? Other than Richard
11 standing up and throwing darts at SyncLink, I can't
12 answer, but yes, he did.

13 Q. Maybe we can take a look at the minutes from a
14 later meeting. Could you look at JX-27, please. It
15 should be the next document.

16 A. The next document.

17 Q. Do you recognize this document?

18 A. Yeah, this is the September '95 meeting,
19 Crystal City, Virginia, 42.3.

20 Q. Were you present at this meeting as well?

21 A. Yes, I was.

22 Q. Would you please turn to Attachment C, which is
23 at page 26.

24 Do you recognize this -- what's on this
25 particular page?

1 A. Yes, I do.

2 Q. So, you remember this from the meeting?

3 A. Well, this -- this may be what I was just
4 talking about, yes.

5 Q. Okay. What is this or what -- what do you
6 recall in connection with this page of the document at
7 the meeting?

8 A. This document is from Richard Crisp, looks like
9 it was faxed to him there at the hotel, and basically
10 he is saying that Rambus has I -- has IP on their part,
11 and it's very close to the SyncLink, so he's saying
12 that SyncLink may be covered by some IP from Rambus.
13 Yeah.

14 Q. Were you present at the meeting when Mr. Crisp
15 presented this letter?

16 A. Yes, I was.

17 Q. And what was your reaction when Mr. Crisp
18 presented this letter?

19 A. My reaction? Watching him and Hans Wiggers
20 from HP.

21 Q. Would you turn to the last paragraph --

22 MR. STONE: Your Honor, did we get an answer to
23 that?

24 JUDGE McGUIRE: Yes, can we get an answer to
25 that?

1 MR. WEBER: Oh, I'm sorry.

2 BY MR. WEBER:

3 Q. Had you completed your answer? I'm sorry.

4 A. Apparently -- as I watched this, saying yes,
5 from Richard's actions, there was definitely some IP of
6 Rambus that was within the SyncLink device. Not being
7 on top of either of the devices, I can't tell you what,
8 but from the activity and the emotion, there was
9 something there.

10 JUDGE MCGUIRE: Now, the question was, what was
11 your reaction? So, is that what you're saying was your
12 reaction, that there was some emotion there?

13 THE WITNESS: No, no, I'm watching the emotion
14 of the two people --

15 JUDGE MCGUIRE: But the question was, what was
16 your reaction?

17 THE WITNESS: My reaction? That most likely
18 the SyncLink part has IP that Rambus is claiming.

19 JUDGE MCGUIRE: All right, Mr. Weber.

20 BY MR. WEBER:

21 Q. Now, could you turn to the last -- if we could
22 blow up the last paragraph on this particular page from
23 Mr. Crisp's letter in September '95, do you see where
24 it says, "At this time, Rambus elects not to make a
25 specific comment on our intellectual property position

1 relative to the SyncLink proposal," and it goes on?

2 A. Okay.

3 Q. How did you -- what was your reaction to that
4 particular part of the letter at the time?

5 A. Basically what he -- to me, this is saying that
6 he is claiming that Rambus has IP that will read upon
7 the SyncLink part, but that's all that he's saying
8 about it, that he's not going to talk about it, what he
9 has, what he doesn't have, what we could standardize
10 that is not covered. He's not -- not really operating
11 cooperatively in good faith.

12 Q. Is he giving you enough information about the
13 Rambus IP so that the committee can make a
14 determination about what direction to go in its
15 standard setting?

16 A. Unfortunately --

17 MR. DETRE: Objection, Your Honor, lack of
18 foundation. The witness has testified that he wasn't
19 really involved in the SyncLink standardization
20 process.

21 JUDGE MCGUIRE: Sustained. You may restate.

22 BY MR. WEBER:

23 Q. Based on your experience in 23 years with JEDEC
24 and working with the JEDEC patent policy and as a JEDEC
25 committee chair, was this statement by Mr. Crisp giving

1 the committee enough information to make a
2 determination about Rambus' IP?

3 MR. DETRE: Same objection, Your Honor, and
4 also no foundation to talk about the whole committee.

5 JUDGE McGUIRE: Overruled. I will entertain
6 the answer to that question.

7 THE WITNESS: So, this one I would end up
8 saying no, from this I do not have enough information
9 to know what you have. All I can do is determine that
10 you have something. You're pissed. You're agitated.
11 You obviously have something. And you're telling me
12 that you do have something. But I don't know what it
13 is.

14 BY MR. WEBER:

15 Q. Is there anything in this letter that would put
16 you or the other members of JEDEC on notice about what
17 features or technologies in the SyncLink proposal
18 Rambus had patents or patent applications pending on?

19 MR. DETRE: Objection only to the extent the
20 question is asking about what other members of JEDEC
21 would notice.

22 JUDGE McGUIRE: You can answer the question to
23 the extent that is there anything that would put you on
24 notice, not other members.

25 THE WITNESS: Okay, in that case, to -- well,

1 sir, to me -- to my ears, this was almost the same as
2 his previous question, and I've already answered that
3 as a no. Is there a difference in what he is asking?
4 Am I missing something? I don't have enough
5 information to -- at this point in time from the
6 meeting to know what or -- what Rambus has IP on, other
7 than they have IP.

8 BY MR. WEBER:

9 Q. Is there anything in this letter to put you on
10 notice that Rambus has patents or patent applications
11 relating to dual edge clocking technology?

12 A. No.

13 Q. Is there anything in this letter to put you on
14 notice that Rambus has patents or patent applications
15 relating to on-chip PLL or DLL?

16 MR. DETRE: Objection, Your Honor, leading.

17 JUDGE MCGUIRE: Overruled.

18 THE WITNESS: The answer to that one is no.

19 BY MR. WEBER:

20 Q. Was SyncLink ever adopted as a JEDEC standard?

21 A. No, it was not.

22 Q. What was the next generation standard that was
23 adopted by JEDEC? We're moving a little ahead in time,
24 but what was it?

25 A. The double data rate SDRAM.

1 Q. Prior to the adoption of the double data rate
2 SDRAM standard, did Rambus ever disclose in JEDEC or
3 anywhere else that it had patents relating to DDR
4 SDRAM, to the best of your knowledge?

5 A. No.

6 Q. Could you turn to page 12 of this document, if
7 we could blow up item 14, please.

8 Are you familiar with the SDRAM Lite features
9 task group that's referred to?

10 A. Yes, I am.

11 Q. What was your understanding of what that task
12 group was doing?

13 A. They were proposing removing a number of the
14 programmable features of the Synchronous DRAM and
15 focusing the part primarily for the PC market.

16 Q. What -- do you have an understanding of what
17 the SDRAM task force -- the SDRAM Lite task force was
18 looking at for either CAS latency or burst length?

19 A. The -- basically they were saying that there's
20 not much need for programmability. Module 4 is all
21 that the PC needed, to take out the rest of them.

22 Q. So, instead of using a mode register to program
23 the CAS latency or burst length, what were they
24 proposing instead?

25 A. They would end up fixing the -- having as a

1 fixed -- fixed length, not programmable.

2 Q. Okay. What happened to the SDRAM Lite task
3 force proposal on these two issues?

4 A. We elected not to accept it.

5 Q. Okay. As a JEDEC member, would it have been
6 relevant to your consideration of the SDRAM Lite task
7 force proposal on going back to a fixed burst length or
8 CAS latency to know if someone had IP on the other
9 options, programmable CAS latency and programmable
10 burst length?

11 A. If I understood that there was IP on the
12 programmable, I would have voted -- changed my
13 direction and voted to take the fixed one.

14 Q. Now, is there work ongoing -- you mentioned
15 just generally there was work ongoing in looking at
16 what the next generation was going to be at this point
17 in time, September '95?

18 A. Correct.

19 Q. Okay. Could you -- could I direct your
20 attention to page 14, the next to the last paragraph, a
21 couple of pages later, if you could pull that up.

22 Do you see there's a reference to a survey
23 ballot on the next generation issues stated above, and
24 I think they're -- if we go up on the page, there may
25 be a section -- actually, there isn't in this one.

1 Okay, let's just focus on that sentence that
2 she's highlighted, the survey ballot.

3 A. Okay.

4 Q. Were you part -- were you present at this part
5 of the meeting when this was raised?

6 A. Yes, I was.

7 Q. And what does this refer to when it talks about
8 a survey ballot on next generation issues?

9 A. Okay, I've already said most of our work was
10 incremental, evolutionary. What we would normally do
11 if -- for the next generation, the next part, if we had
12 a reasonable amount of discussion of should we add
13 something or not add something, we would generate a
14 survey ballot and send it out to the membership and at
15 times send it out to companies we believed would be
16 interested that were not regularly attending JEDEC.
17 So, to collect information.

18 Q. Okay, and you may have anticipated my next
19 question. What is your understanding generally of a
20 survey ballot as used within JEDEC? Would you add
21 anything to your answer on -- your last answer?

22 A. No, I don't think so.

23 Q. Okay. Do you consider a survey ballot to be
24 work of the JEDEC committee as that term is defined in
25 the JEDEC manual that we looked at earlier, CX-208,

1 Section 9.3.1?

2 Maybe we could pull that back on the screen, if
3 you need it. It's at page 19, I believe, of CX-208.

4 A. Okay. So, this is -- what you're asking me is
5 the patent policy on a survey ballot?

6 Q. Yeah, that's a better question.

7 Does the patent policy apply to a survey ballot
8 based on your experience at JEDEC?

9 A. And I've already answered that basically yes,
10 as soon as possible in the discussion, we'd like to
11 know.

12 Q. And what if you were a JEDEC member, okay, and
13 you received this survey ballot in the mail and you
14 don't even vote or you abstain on the ballot, were you
15 still subject to the patent policy in that situation?

16 A. You've asked me what if I don't receive the
17 ballot -- if I don't receive the information, am I
18 still subject to it? Actually, any time I'm -- I'm in
19 any of the discussions, I am subject to it.

20 Q. Okay.

21 A. But I should have gotten a copy of the
22 material. It's sent out to everybody.

23 Q. Can we pull up JX-28, please?

24 JUDGE McGUIRE: Counsel, perhaps this is a time
25 to consider what -- how we're going to proceed. How

1 much more time do you think you'll need on this
2 witness?

3 MR. WEBER: I would estimate a half hour,
4 possibly a little bit more. I'm pretty close to
5 finishing up a line of questions here in the next five
6 minutes.

7 JUDGE MCGUIRE: Okay, I'll let you do that, and
8 then if you want to take a ten-minute break, we can, or
9 at that point we can -- I think I'd just as soon go on
10 until he's completed, say another half hour, and then
11 we'll take off for lunch and then come back for cross
12 examination.

13 MR. DETRE: That's fine with me, Your Honor.

14 JUDGE MCGUIRE: Okay, let's proceed.

15 BY MR. WEBER:

16 Q. Why don't we finish up on this survey ballot,
17 and if you could look at JX-28, do you recognize this
18 document?

19 A. JX-28? This is the one on the screen, okay.
20 Yeah, this would be the December '95 in Dallas, 42.3.

21 Q. And --

22 A. And I am there.

23 Q. So, you were present at this meeting?

24 A. Yes, sir.

25 Q. Okay. Could you turn to Attachment G, which

1 goes from pages 35 through 48. Were you present for
2 this part of the meeting?

3 A. This is up on the screen. It looks like maybe
4 the results of the survey ballot.

5 Q. Okay.

6 A. I'm sorry, I'm not looking far enough back into
7 the document to make certain, but it is the results of
8 the survey ballot.

9 Q. Okay. And you were present when the results
10 were discussed?

11 A. Yes, sir.

12 Q. Okay. And do you know if this survey ballot
13 included questions relating to programmable CAS latency
14 and/or programmable burst length?

15 A. The survey ballot had many items. Some of them
16 we would not put on because it was not in contention.
17 Reading here, we've got changing the latency, so most
18 likely still programmable. Okay, do not eliminate the
19 burst. So, I am going to say that it included the two
20 items.

21 Q. Did this survey ballot also include questions
22 on dual edge clocking? And if you need to, sir,
23 it's -- if you can't find it on 35, we can also pull up
24 page 45. Can we put that on the screen?

25 A. Clock survey?

1 Q. Maybe if we blow up the top part where the
2 questions are. They're a little hard to see.

3 A. Yeah, it does have dual edge clock.

4 Q. Okay. And did this survey ballot also include
5 questions about the use of an on-chip PLL or DLL?

6 A. That one it did, yes.

7 Q. Now, do you recall anyone at this meeting where
8 this survey ballot was discussed disclosing any
9 intellectual property relating to on-chip PLL or DLL?

10 A. No, I do not.

11 Q. Okay. Do you recall someone --

12 A. Well, hang on, hang on, hang on. I've answered
13 a question but not necessarily the one that you've
14 answered -- that you've asked me. Do I remember anyone
15 saying that they have a position on the -- on adding it
16 to the part, that is no. That's the question that you
17 didn't ask that I answered.

18 But Dick Foss/MOSAID I believe said that he had
19 some or his company had some IP on DLLs or phase lock
20 loop in memory.

21 Q. Okay. And maybe if we can pull up page 6 of
22 this document where the survey ballot is discussed,
23 Section 8.8 of JX-28.

24 A. Okay, patent pending on DLL. Okay.

25 Q. Does this minutes reflect the disclosure that

1 you were just remembering?

2 A. Yes, it does.

3 Q. And you were present at the meeting when this
4 disclosure was made?

5 A. Yes, it does.

6 Q. Were there -- excuse me?

7 A. Yes.

8 Q. Were there any other disclosures made relating
9 to IP relating to on-chip PLL or DLL at this meeting?

10 A. Not that I'm aware of.

11 Q. And what kind of company is MOSAID?

12 A. Basically IP. They will assist you in a
13 design, provide design concepts, an IP company mostly.

14 Q. And did you view MOSAID's disclosure here as
15 complying with JEDEC patent policy?

16 A. Yes, I did, and doubly so in that, hey, I have
17 it, but it's not required to be used.

18 Q. Comparing this MOSAID disclosure to the prior
19 exhibit that we discussed, which was Mr. Crisp's
20 letter, JX-27, at page 26 -- I don't know, is it
21 possible to bring that up?

22 MS. KASSIER: Twenty-seven?

23 MR. WEBER: It's page 26 of JX-27.

24 BY MR. WEBER:

25 Q. Based on your experience at JEDEC and

1 experience with the patent policy, are both of these --
2 the information in both of these, are they both in
3 compliance with the patent policy or not?

4 MR. DETRE: Objection, Your Honor, asked and
5 answered. I'm not sure what the purpose of the compare
6 and contrast exercise is.

7 JUDGE McGUIRE: No, it hasn't been asked and
8 answered I don't believe, Counsel. Overruled.

9 THE WITNESS: Okay, in the case of MOSAID, Dick
10 has said that he has an IP position which is a
11 particular implementation of this DLL, and it's not
12 required. So, he's saying that he has something, you
13 can design around it, you don't have to use it. So,
14 he's giving us some information in here which is more
15 than what Richard gave me or Richard's lawyers gave me
16 in the sheet on the right of the screen. So, I would
17 say Dick complied, and maybe Richard, marginally no.

18 BY MR. WEBER:

19 Q. Okay. Did Rambus at any time, while they were
20 participating in JEDEC, inform JEDEC that it might have
21 patent claims or any IP relating to on-chip PLL or DLL?

22 MR. DETRE: Objection, Your Honor, it lacks
23 foundation. The witness was not necessarily present at
24 all the meetings or all the discussions.

25 JUDGE McGUIRE: Sustained.

1 BY MR. WEBER:

2 Q. To the best of your knowledge, sir, based on
3 your participation in JEDEC in the 1991 to '96 time
4 period -- by the way, the '91 to '96 time period, how
5 many meetings did you miss?

6 A. I don't think I missed any meetings, but he is
7 correct, I do have to go out to the bathroom
8 occasionally, so -- but I do not remember any comments
9 from Rambus on IP on DLL inside, which is your
10 question.

11 Q. And do you recall ever seeing anything in the
12 minutes you reviewed of a meeting where Rambus made
13 such a disclosure of technology on on-chip DLL or PLL
14 under the patent policy?

15 A. No.

16 Q. Your answer is?

17 A. No.

18 Q. Okay.

19 A. Sorry.

20 Q. The same question with respect to dual edge
21 clocking, sir. From 1991 through '96, did Rambus at
22 any time, to the best of your knowledge, inform JEDEC
23 that it might have patent claims on dual edge clocking
24 technology?

25 A. No.

1 Q. Were these two technologies, on-chip PLL and
2 dual edge clocking, subsequently adopted in any JEDEC
3 standard?

4 A. Yes, they were.

5 Q. And what standard would that be?

6 A. This would be for the DDR Synchronous DRAM.

7 MR. WEBER: Okay, I think now we're at your
8 break, but I forgot to do one thing, Your Honor, and
9 that is to offer CX -- excuse me, JX-27 into evidence.

10 MR. DETRE: No objection, Your Honor.

11 JUDGE McGUIRE: So entered.

12 (JX Exhibit Number 27 was admitted into
13 evidence.)

14 JUDGE McGUIRE: Okay, let's take a five-minute
15 break, and then we'll come back and complete your line
16 of questioning, Mr. Weber.

17 MR. WEBER: Thank you.

18 (A brief recess was taken.)

19 JUDGE McGUIRE: On the record.

20 At this time, you may proceed, Mr. Weber.

21 BY MR. WEBER:

22 Q. Would you look at the next document, which I
23 believe is JX-57. It says JEDEC Standard Double Data
24 Rate SDRAM Specification and has the acronym JESD79.

25 Do you recognize this document?

1 A. Yes, I do.

2 Q. What is it?

3 A. Okay, this is the standard for the DDR
4 Synchronous DRAM.

5 Q. And if we could turn to page 5, there's a lot
6 of words on this page, but can you tell me whether
7 there's a reference here to dual edge clocking
8 technology?

9 A. Yes, under Features, the first line, two data
10 transfers per clock cycle.

11 Q. And could you turn to page 8, there's a
12 diagram. Do you see a reference to either an on-chip
13 PLL or a DLL just looking at this diagram?

14 A. Yeah, sort of kind of up on the right-hand side
15 in the center of the -- above the center of the square.

16 Q. Let's see if we can highlight that and let us
17 know if we've got the right spot.

18 A. It says clock and then DLL.

19 Q. Have we got the right spot on the computer
20 screen there?

21 A. Yes, sir, you do.

22 Q. Okay. Now, when did JEDEC begin work on the
23 DDR standard?

24 A. Unfortunately, for this one, there's a fuzzy
25 answer for you. Almost from the beginning of the

1 Synchronous DRAM, like I had mentioned before, that
2 Howard Kalter is pushing for the double edge clock, and
3 we're saying, hey, the customer is not ready for it
4 yet. When they are, we'll add it. So, basically
5 features that people are thinking about for
6 synchronous, that the industry is not ready for, are
7 being put in the back of the mind until the next part,
8 because these devices are evolutionary.

9 Q. Actually, you are going to jump ahead to one of
10 my next questions. How would you characterize the
11 change from the SDRAM standard, which you were more
12 involved in, Standard 21-C that we looked at, which I
13 believe is JX-57 -- 56, to the DDR standard, which
14 we're looking at now, which is JX-57?

15 A. Evolutionary.

16 Q. And why do you say that?

17 A. Many of the features of the Synchronous DRAM
18 are part of the double data rate Synchronous DRAM. Key
19 items that we've added is that now the customer base,
20 the user base, has more experience with higher edge
21 clocks. We're using both edges of the clock rather
22 than just a single edge. Now that we're going faster,
23 we've added this DLL/PLL that used to be on the system
24 board for only some of the systems. So, basically
25 we're adding other system-level features that we know

1 about and arguing about adding them into the component.

2 Q. In the 1994 to 1996 time frame, you were
3 attending the JEDEC meetings obviously.

4 A. Yes, sir.

5 Q. In that time frame, was there ongoing JEDEC
6 work that led to the DDR standard?

7 A. Yes.

8 Q. Let me shift gears for a minute.

9 Mr. Sussman, when did you first become aware of
10 a company called Rambus?

11 A. The first time I knew anything really about
12 them was when Billy Garrett gave me documentation on
13 Rambus in Maui --

14 JUDGE MCGUIRE: Now, who is Billy Garrett, for
15 the record?

16 MR. WEBER: I think he identified him on the
17 meeting minutes, but we can follow up on that.

18 THE WITNESS: Yes, there was an earlier meeting
19 minutes from a December meeting in '91 in Maui that he
20 asked about, so that's when I got the -- that's --

21 JUDGE MCGUIRE: But who is Billy Garrett?

22 THE WITNESS: Oh, who is Billy Garrett?

23 JUDGE MCGUIRE: Yes.

24 THE WITNESS: Ah, at that time he had just
25 recently transited from engineer -- he's an engineer,

1 had just transited from NCR to Rambus.

2 JUDGE McGUIRE: Okay.

3 THE WITNESS: So, I had known him in the past
4 in his NCR role.

5 JUDGE McGUIRE: I was just trying to clarify
6 for the record.

7 MR. WEBER: Thank you, Your Honor, and Mr.
8 Garrett is still on respondent's witness list, I'm
9 sure.

10 BY MR. WEBER:

11 Q. Did the Rambus product that Mr. Garrett was
12 telling you about have a name or an acronym?

13 A. I just -- to me, it was just known as the
14 Rambus DRAM or the RDRAM.

15 Q. RDRAM in all caps?

16 A. Yes, sir.

17 Q. Okay. Could you be more specific about what
18 you learned about the Rambus products or Rambus
19 technology from Mr. Garrett?

20 A. The meeting with Billy, he was requesting that
21 we get together for three to four hours. I gave him 15
22 minutes. This was my one open afternoon. So, we went
23 off to his hotel room, and he gave me an
24 inch-and-a-half or two-inch notebook of documentation,
25 and it was the reasonably long presentation on the

1 Rambus DRAM, and he pointed out the -- because we had
2 just limited time, he pointed out the key features of
3 the Rambus DRAM, asked my support in getting NEC to
4 continue or to build the part, saying they were in
5 discussion, and seeing I was inputting into NEC's
6 product direction, would I please review and push.

7 Q. You said he described some key features. Do
8 you recall what the key features were that Mr. Garrett
9 described?

10 A. Yes -- well, there were three key features.
11 One, they were going to use a low voltage CMOS driver.
12 With the low voltage, there would be a faster
13 switching. They were also going to use a packetized
14 approach very similar to what the -- or I'm familiar
15 with it as a -- an I/O protocol for the IBM mainframes
16 of previous era. And the third item that they were
17 going to do was have a -- I don't know what it was
18 called, a turnaround clock. They would send a clock
19 out with the data, and they would regurgitate that
20 clock and send it back with the data out. So, those
21 were the three major items that were key technology.

22 Q. Let me follow up on some of those.

23 You mentioned the second item, the packetized
24 protocol. What do you recall Mr. Garrett telling you
25 about the packetized protocol?

1 A. In the I/O protocol that I'm referring to --
2 I'm showing my age, sorry. In the ancient days before
3 the tape drive was a separate closet that was sitting
4 in the room and the disk drives were at least a meter
5 cube and were sitting across the room and they may or
6 may not be functioning at this moment because their
7 reliability was not quite the best, so IBM basically
8 sent out a packet when they wanted some information off
9 of either the tape memory or the disk drive memory.

10 They said, hey, this is the address, this is
11 the block that we want, this is what we want you to do
12 with it, sent out this long command, and if the
13 component was out there, then the component came back
14 and responded. So, this was the packetized approach.

15 Q. You mentioned in your answer -- I just want to
16 make sure the record is clear. You mentioned in your
17 answer something about what IBM did. What do you
18 recall Mr. Garrett telling you about the Rambus --

19 A. Oh, sorry.

20 Q. -- was using as the packetized protocol?

21 A. Sorry, basically the same.

22 Q. Are you familiar with the term "multiplexed"?

23 A. Ah, yes. His device was an address --

24 JUDGE McGUIRE: Wait a minute, he's not asking
25 you about his device. He's just asking if you know the

1 term "multiplex."

2 THE WITNESS: Multiplex, yes, sorry.

3 JUDGE McGUIRE: All right, next question.

4 BY MR. WEBER:

5 Q. Does that term apply to the Rambus RDRAM that
6 Mr. Garrett described to you in Maui in December '91,
7 and if so, how?

8 A. Yes, it does apply to the device. It was not
9 one of the key features that he gave me which you asked
10 on, depending how -- okay, the Rambus device was --
11 with that protocol -- that packetized bus, address,
12 data in, data out, control, are all sharing some of the
13 same wires. They're all multiplexed onto that same --
14 same wire.

15 Q. And the third item you mentioned was turnaround
16 clock. What did Mr. Garrett tell you, to the best of
17 your recollection, about the turnaround clock feature?

18 A. Existence and a short discussion that now that
19 it did exist, it could be used to minimize -- it could
20 be used to clock the data out, minimizing the skew
21 between the system components and improve the
22 overall -- higher performance of the system.

23 Q. Is what you just described the same thing or
24 something different from dual edge clocking?

25 A. Oh, quite different.

1 Q. Could you explain?

2 A. Dual edge clock is basically a clock using both
3 the rise and the fall of the clock. In this case --
4 excuse me a sec -- you're taking the clock and data and
5 sending them out like from here to the other end of the
6 room together, and when the data comes back from the
7 other end of the room, you're regenerating the clock
8 and sending it back with the data, so the relationship
9 of the return clock and the return data is reasonably
10 close. Nothing -- quite different from double edge
11 clocking.

12 Q. So, to go back to your prior answer when I
13 asked you what Mr. Garrett told you about turnaround
14 clock, I think you mentioned minimizing clock skew?

15 A. It's the clock-to-data skew.

16 Q. Okay. And is what Mr. Garrett was referring
17 you to when he talked about minimizing clock skew, is
18 that the same thing or something different than an
19 on-chip PLL or an on-chip DLL?

20 A. Again, quite different.

21 Q. Could you explain?

22 A. Basically all that he's doing is taking the
23 clock that is out there and regenerating the clock when
24 it comes time to generate the data. DLLs, phase lock
25 loops, may be used for better accuracy of a clock, but

1 this is a clock-data relationship that's quite
2 different from a phase lock loop.

3 Q. In his presentation of the Rambus technology to
4 you in December 1991, did Mr. Garrett tell you anything
5 about delay lock loops or phase lock loops?

6 A. They were not key features of the Rambus part,
7 so if there was, it was not mentioned.

8 Q. Do you recall as you sit here today it being
9 mentioned at all?

10 A. No. I do not -- that was a negative.

11 Q. Okay. Did Mr. Garrett, to the best of your
12 recollection, tell you anything about a programmable
13 mode register feature on the Rambus RDRAM?

14 A. No.

15 Q. Did Mr. Garrett tell you anything about a
16 programmable CAS latency feature on the Rambus RDRAM,
17 going back to December of '91?

18 A. No.

19 Q. Did Mr. Garrett tell you anything about a
20 programmable burst length feature in the Rambus RDRAM?

21 A. No.

22 Q. Did Mr. Garrett tell you anything about a dual
23 edge clock feature, as we've been discussing that term
24 here today, on the Rambus RDRAM?

25 A. It was not a key feature of the device. It may

1 have used a dual edge clock, but that's in retrospect.
2 Billy focused on this is the new technology, and those
3 were the three items that I gave you.

4 Q. So, as you sit here today, can you recall Mr.
5 Garrett telling you anything about a dual edge clock
6 feature back in December of '91?

7 A. No.

8 Q. Do you recall Mr. Garrett telling you anything
9 in describing the Rambus technology back in December of
10 '91 about a double data rate feature?

11 A. No.

12 Q. Okay. Now, other than this meeting with Mr.
13 Garrett, going ahead from December of '91 on into '92
14 and '93, did you read anything or learn any more
15 information about Rambus and its technology?

16 A. That I did. I did pass the Rambus stuff back
17 in to NEC, and later learned that NEC was considering
18 designing such a part. There was also a presentation
19 by an NEC engineer back in -- traveling to Boston,
20 giving us an update on NEC's Rambus design, eventually
21 finding other things in the trade press.

22 Q. Based on that information, did you develop an
23 understanding of the architecture that was used in the
24 RDRAM as described by Mr. Garrett?

25 A. Yes, I did.

1 Q. And I take it you were also familiar with the
2 architecture of the SDRAM since you were involved in
3 the SDRAM work at JEDEC?

4 A. Yes.

5 Q. And could you compare the RDRAM concept, as you
6 understood it, with the SDRAM concept?

7 Your Honor, I think we might have a
8 demonstrative at this point we would like to introduce.
9 I don't know how to do this, but I believe the next
10 number is DX-13?

11 JUDGE McGUIRE: Yes.

12 MR. WEBER: And do we have some copies?

13 (DX Exhibit Number 13 was marked for
14 identification.)

15 MR. WEBER: Your Honor, I also --

16 JUDGE McGUIRE: I don't need it. I have it on
17 the screen here.

18 THE WITNESS: I have got it on the screen.

19 BY MR. WEBER:

20 Q. Okay, I believe it's also up on the screen, so
21 maybe people don't need the hard copies.

22 Referring to DX-13, which is also up on the
23 screen, sir, can you tell us what's depicted in this
24 slide?

25 A. Yeah, it's -- on the left side is a Rambus

1 memory -- memory controller and the bus, such as I
2 would use it, in a system, and on the right side is the
3 same for the Synchronous DRAM.

4 MR. WEBER: Just so the record is clear, Your
5 Honor, these slides were created from a longer
6 presentation with many slides that I believe was used
7 with an earlier witness, Mr. Rhoden.

8 Is that right?

9 MR. OLIVER: Yeah.

10 MR. WEBER: And so they have been furnished to
11 respondent.

12 MR. STONE: Can we just be clear then, Your
13 Honor, that these were documents prepared by Hynix?

14 MR. WEBER: My co-counsel can I think confirm
15 that.

16 MR. OLIVER: That is correct.

17 MR. STONE: Thank you, Your Honor.

18 JUDGE McGUIRE: Okay, proceed.

19 BY MR. WEBER:

20 Q. So, the one on the left is the RDRAM and the
21 one on the right is the SDRAM?

22 A. Correct.

23 Q. Have I got that right? Okay.

24 Could you then compare -- and is the drawing on
25 the left, the RDRAM, is that consistent with the

1 information you were shown by Mr. Garrett in December
2 of '91 and other information you learned about Rambus
3 in the '92-'93 time period?

4 A. Yes, it is.

5 Q. Okay. Based on that -- and is the SDRAM on the
6 right, is that a consistent depiction of the SDRAM that
7 was eventually -- became a JEDEC standard in 1993, that
8 architecture?

9 A. That is correct.

10 Q. Okay, based on that understanding, could you
11 then compare and contrast the two architectures,
12 please?

13 A. The Rambus part -- this says it's got eight bus
14 lines for address, data and control, so that says that
15 those wires are used for each of those functions at a
16 different point in time. The Synchronous DRAM has a
17 separate set, I guess in the colors over here, the
18 bottom 64, it appears to be in green, you have got some
19 address in purple, a couple of control bits up there on
20 the top in yellow. So, the Rambus part has a much
21 narrower bus in implementation than on the Synchronous
22 DRAM.

23 For bandwidth, which is one of the items that
24 Billy was pushing, the high performance per pin, this
25 is an advantage of the Rambus DRAM, but on a system

1 level, I have options. If I talk about bandwidth, this
2 is the number of bits per second that I would transfer.
3 I could have one device running eight times as fast or
4 eight devices running one-eighth as fast, and that's
5 basically what this two diagrams here shows.

6 So, some of the systems, if I needed just a
7 small quantity of memory, the Rambus part works very
8 well, because it's a single device, and it runs
9 exceptionally fast, but if I'm doing -- if I need more
10 memory capacity and I need eight devices, then the
11 Synchronous DRAM in this right-hand thing with a much
12 wider bus, many more wires, would allow me to do the
13 same function. So, they're alternates.

14 Which one would I choose depends on how much --

15 JUDGE McGUIRE: I don't think that's the
16 question.

17 THE WITNESS: Okay, sorry.

18 JUDGE McGUIRE: Go ahead, Mr. Weber.

19 BY MR. WEBER:

20 Q. Okay. Mr. Sussman, in your experience at
21 Sanyo, have you had opportunity to make presentations
22 to customers and make recommendations on what types of
23 memory devices customers should design into their
24 systems?

25 A. Yes, I have.

1 Q. Okay. Have you ever recommended the SDRAM, for
2 example, for some applications?

3 A. Yes, I have.

4 Q. Have you ever recommended the RDRAM for some
5 applications?

6 A. Occasionally, unfortunately, yes. NEC made
7 both parts, so the customer would use NEC silicon, so
8 yes.

9 Q. Are there particular applications the RDRAM
10 might be well suited for as opposed to the SDRAM you
11 can think of?

12 A. Yeah.

13 Q. What might those be?

14 A. As I said a few minutes ago, if I only needed a
15 small amount of very high-performance memory, but the
16 quantity of memory I needed was small, the Rambus part
17 would be more economical than buying eight parts and
18 wasting seven-eighths of them.

19 Q. How about -- what applications have you
20 recommended or would you recommend the SDRAM for?

21 A. Larger main memory.

22 Q. When you say "main memory," what are you
23 referring to?

24 A. If we take actually the main memory off of one
25 of these PCs, the Synchronous DRAM works very well on.

1 There are some other applications where the speed is
2 not quite as important. They are slower-running
3 systems. So, in that case, one memory device might
4 work, but I don't need the higher performance of the
5 Rambus per pin. I can use the slower Synchronous DRAM
6 and get the same system performance at a lower -- lower
7 cost.

8 Q. Why not recommend the RDRAM for PC main memory?

9 A. From my opinion, this PC requires more storage
10 than what a single device normally would give me. The
11 Rambus part, as published, has a much larger die size
12 than the synchronous DRAM, so that says I get fewer of
13 them per wafer, so my per area cost of the Synchronous
14 DRAM is less than the Rambus part, so for equivalent
15 memory, my manufacturing cost is lower.

16 Q. Before we move off this demonstrative, DX-13,
17 looking on the left-hand, the RDRAM, could you point
18 out where the -- you mentioned earlier it had a
19 multiplex bus. Could you point that out, where you
20 would see that?

21 A. Yeah, that's these multicolored things between
22 their two clocks, and so it's a combination of address,
23 data and control. My guess is the address, data and
24 control are all color-coded to the terms
25 address/data/control, and the same thing on the right.

1 JUDGE McGUIRE: Okay, that's fine, that answers
2 that question. Go ahead, Mr. Weber. I'm sorry, I
3 don't mean to cut you off, sir, I just want to --

4 THE WITNESS: Move it on?

5 JUDGE McGUIRE: I just want to stay on the
6 question so we can move on, yes.

7 BY MR. WEBER:

8 Q. And is there anything in this illustration that
9 shows the packetized protocol, which I think was the
10 second thing that Mr. Garrett described to you?

11 A. Nothing here that shows the packet and the
12 packet definition.

13 Q. Where would the packet be located in the RDRAM?

14 A. Where would the packet be located? Basically
15 you would need some additional logic in the RDRAM to
16 recognize the information coming towards you. So, it
17 would still be on the same address/data/control lines.

18 Q. And comparing these two products, the RDRAM and
19 the SDRAM, which was more widely used in the
20 marketplace from 1993 to today?

21 A. The Synchronous DRAM.

22 Q. And let me move on to something else.

23 At any point in time between late 1991, when
24 you had this meeting with Mr. Garrett, to mid-1996, did
25 you review any Rambus patents or patent applications?

1 A. Yes, I did.

2 Q. Could you explain what you reviewed?

3 A. Okay, in side discussion at one of the JEDEC
4 meetings, Joel Karp and I were just chatting, and he
5 ended up saying that he had a copy of the Rambus patent
6 application. I went, huh? I thought the patent
7 applications were submitted and not -- not released.

8 JUDGE MCGUIRE: Now, again, so I'm clear, who
9 is Joel Karp?

10 THE WITNESS: Ah, sorry.

11 JUDGE MCGUIRE: Just for the record.

12 THE WITNESS: Joel Karp -- I thought I had
13 mentioned him before. I --

14 JUDGE MCGUIRE: You perhaps did. I just want
15 to clarify it here.

16 THE WITNESS: Got you. Joel Karp at that time
17 was an employee of Samsung and one of the
18 representatives that Samsung would send to the JEDEC
19 meeting.

20 JUDGE MCGUIRE: Okay, thank you.

21 BY MR. WEBER:

22 Q. All right, did you finish your last answer
23 before you identified Mr. Karp?

24 A. No, not quite.

25 Q. Have you got anything to add?

1 A. Joel informed me that in Europe, that the
2 patent applications were published, and if I was
3 curious, he would send me a copy. And yes, I'm
4 curious, so he did.

5 Q. What's your best estimate of what time frame
6 this occurred?

7 A. Actually, it has to be after Billy Garrett,
8 because we had nothing -- I would suspect sometime '92,
9 perhaps even as late as '93. I can't remember if I was
10 still at NEC or if I had now transited to Sanyo.

11 Q. Now, when you reviewed the Rambus European
12 patent application, did you find anything in there that
13 related to the work ongoing at JEDEC?

14 A. No. As I flipped through it, I didn't see the
15 key items that Billy was talking about, and then put it
16 aside.

17 Q. I think we might be down to the last document
18 in your pile. Could you look and see if you have
19 CX-1454 there?

20 A. Okay.

21 Q. Do you recognize this document, CX-1454?

22 A. Yes, this is the European application we were
23 just talking about.

24 Q. Can we pull up the figure at the bottom half of
25 the first page, please?

1 Does this figure that's in the Rambus European
2 patent application on the first page look anything like
3 the SDRAM you were working on at JEDEC?

4 A. No, it does not.

5 Q. What's your understanding of what's depicted in
6 the left-hand side of the figure where there's a bunch
7 of bars, if we could sort of put the highlighter over
8 that?

9 A. Yeah, these are Rambus DRAMs plugging in on
10 their side onto a -- onto a module, and from Bill 84,
11 I've learned that this is a maximum of ten centimeters.

12 Q. And what's depicted, that black thing in the
13 middle?

14 A. That would be the address/data/control bus that
15 we were just talking about.

16 Q. And what would be the -- what's the --

17 A. And that's the --

18 Q. On the right -- excuse me, let me finish the
19 question.

20 What would be depicted on -- had you finished
21 your answer on the bus?

22 A. I finished my answer, sorry.

23 Q. Okay. The next question, what's depicted on
24 the right, the sort of small square that's in 3D?

25 A. That would be the memory controller that was on

1 the previous drawing.

2 Q. Could you turn the pages -- okay, again, going
3 back to the -- the rectangles on the left, you said
4 this doesn't look like an SDRAM. If we were looking at
5 the SDRAM, the same kind of view of an SDRAM chip, how
6 would the chips be attached on an SDRAM?

7 A. Okay, the -- the SDRAM that we were proposing
8 and the one that has become standardized has pins
9 coming out on both sides of the chip, and they would go
10 out in that manner onto a printed circuit board. Some
11 of the designs actually did have bonding pads on both
12 edges, like so. The Rambus part is one that had pins
13 only like so, right here on the bottom, and would stack
14 vertically rather than horizontally. There was a
15 similar concept that eventually came --

16 Q. I couldn't quite see how you were motioning
17 your fingers.

18 A. Sorry.

19 Q. Is one of them vertical and one horizontal, is
20 that what you were depicting?

21 A. Yes, the Rambus is vertical; the Synchronous
22 DRAM is horizontal.

23 Q. Okay.

24 Before we move into this patent application, I
25 forgot to ask if Your Honor had any more questions on

1 the demonstrative, DX-13.

2 JUDGE McGUIRE: No, I did not.

3 BY MR. WEBER:

4 Q. Okay. If you look at pages 128 through 136 --
5 let me see if I can start on the right page. There's a
6 series of drawings. Actually, the first one is at page
7 127, and it continues through, what, page -- the last
8 drawing is at 137 of this document, and there's a
9 series of drawings, if you could -- my question just
10 generally is on this series of drawings from page 127
11 through 137 of this, did you look at these drawings
12 when you looked at the application back in 1992 or '93?

13 A. Yes, I did.

14 Q. Okay. Let me ask you about some of them.
15 Let's start with Figure 2 on page 128, if we can get
16 that up on the screen. If we could turn it around.
17 Okay, great, blow it up a little bit.

18 When you reviewed this back in 1992 or '93, did
19 you see anything in this figure that looked like what
20 you were standardizing at JEDEC?

21 A. No.

22 MR. DETRE: Objection, Your Honor, the witness
23 hasn't said that he reviewed each figure carefully; in
24 fact, he said he just flipped through it, so I want to
25 make sure that we're limited to what he understood at

1 the time that he reviewed these.

2 MR. WEBER: That was my question, Your Honor.

3 JUDGE McGUIRE: Well, then, that's sustained.
4 Let's state it, because I don't think I was clear on
5 that either, so that objection is sustained.

6 BY MR. WEBER:

7 Q. Okay, let me restate the question.

8 When you reviewed this Figure 2 at page 128 of
9 CX-1454 back in 1992 or '93, did you see anything in
10 this figure that looked like what you were
11 standardizing at JEDEC?

12 A. It's memory, but not any of the memories that
13 we were standardizing.

14 Q. Would you turn to Figure 4 on the next page,
15 which is page 129, and if we could blow -- why don't we
16 look at both Figures 4 and 5 together, if we can.

17 Again, when you reviewed this document back in
18 1992 and '93, did you see anything here that looked
19 like what you were standardizing at JEDEC?

20 A. No, this is the I/O protocol.

21 Q. When you looked at this in '92 and '93, did you
22 see anything here to put you on notice that Rambus
23 might have IP on either programmable CAS latency or
24 programmable burst length?

25 A. No.

1 Q. Could you go to Figure 6 on the next page, page
2 130. Do you have it, sir?

3 When you looked at this figure back in 1992 and
4 '93, did you see anything here in this figure that
5 looked like what you were standardizing at JEDEC?

6 MR. DETRE: Your Honor, all of these questions
7 assume that the witness looked at each figure, and he
8 testified he just flipped through this, so it would
9 help me if Mr. Weber would just make sure that he
10 actually looked at these figures back in that time
11 frame before he asks the question.

12 MR. WEBER: I think there's been testimony that
13 he --

14 JUDGE MCGUIRE: Well, then, let's clarify.
15 Let's clarify as to exactly what he did. Did he -- he
16 said that he's reviewed it. Counsel says the testimony
17 was that he flipped through it. So, let's lay a
18 premise.

19 What did you do when you reviewed these items,
20 Mr. Sussman?

21 THE WITNESS: Yes, sir. The document is
22 reasonably thick. I would read part of the document,
23 and I can't say that I have read every word of the
24 document, but then -- so, I would flip through this.
25 Then I would come back to the figures, and I would look

1 at each of these figures, because what are they doing?
2 And say yeah, yep, this sounds like what Billy has
3 done. So, I can say that yes, I have looked at each of
4 the figures. I cannot say that I've looked at each of
5 the words.

6 JUDGE McGUIRE: Okay. Well, then, based on
7 that testimony, let's lay a premise regarding what the
8 standard was of his review and then ask questions based
9 on that understanding of that review. So, ask your
10 question so we don't have to keep going into this.

11 MR. WEBER: Okay.

12 JUDGE McGUIRE: I mean, the Court now knows how
13 or the efforts he took to review this application, so
14 let's premise our questions on his understanding of his
15 review.

16 MR. WEBER: Fine, Your Honor. Do I need to go
17 back to the other figures and re-ask the questions or
18 is the record clear that I can go on?

19 JUDGE McGUIRE: No, you don't need to go back,
20 only from this point forward.

21 MR. WEBER: Okay.

22 BY MR. WEBER:

23 Q. Okay, Figure 6 at page 130, based on your
24 review of these figures at the time, in 1992 and '93,
25 did you see anything in this Figure 6 that looked like

1 work you were standardizing at JEDEC?

2 A. The answer to that is no.

3 Q. Again, based on your review of these figures in
4 1992 and '93, did you see anything here to put you on
5 notice that Rambus might have intellectual property on
6 either programmable CAS latency or programmable burst
7 length?

8 A. No, I looked through these and did not see
9 anything different from the key items that Billy
10 Garrett had told me about.

11 Q. Okay. Specifically with respect to Figure 6,
12 based on your review of Figure 6 in the 1992-'93 time
13 frame, that's what you've described, did you see
14 anything in Figure 6 to put you on notice that Rambus
15 might have IP on programmable CAS latency or
16 programmable burst length?

17 A. No.

18 Q. We won't need to do every one of these, Your
19 Honor.

20 Could you turn to Figure 10 at the top of page
21 134, Mr. Sussman.

22 JUDGE McGUIRE: How many items do you intend to
23 inquire about here?

24 MR. WEBER: I only have about three more after
25 this.

1 JUDGE McGUIRE: Go ahead.

2 BY MR. WEBER:

3 Q. Based upon your review as you've described in
4 1992 to '93, did you see anything in Figure 10 that
5 looked like what you were standardizing at JEDEC in
6 either the SDRAM or the DDR SDRAM?

7 A. This looks like it has a differential clock.
8 No.

9 Q. Okay. And again, based on your review back in
10 1992 and '93, did you see anything in Figure 10 at page
11 134 of CX-1454 that put you on notice that Rambus might
12 have intellectual property on dual edge clocking
13 technology?

14 A. No.

15 Q. Would you turn to Figure 12, please. We might
16 have to turn this one around. It's at page 135.

17 Do you have it, sir?

18 A. Yes, I do.

19 Q. Based on your review back in the 1992 and '93
20 time frame, did you see anything in Figure 12 that
21 looked like what you were standardizing at JEDEC?

22 A. No, sir.

23 Q. Based on your review in the '92-'93 time frame,
24 did you see anything here that would put you on notice
25 that Rambus might have intellectual property on either

1 on-chip PLL or on-chip DLL technology?

2 A. No, sir.

3 Q. Could you turn to the next page, page 136 --

4 JUDGE McGUIRE: Okay, I thought you said you
5 only had two or three more.

6 MR. WEBER: This is the last one, Your Honor.

7 JUDGE McGUIRE: All right, it's a good thing.

8 BY MR. WEBER:

9 Q. Why don't we do 13 and 14 together, then. Did
10 you see anything in these two figures on page 136 based
11 on your review in '92-93 that looked like what you were
12 standardizing at JEDEC?

13 A. The answer to that one is no, and the data --
14 I'm sorry, the Figure 14, the clock and the data that
15 they're showing looks like it's only changing on one
16 edge of the clock, not DDR.

17 Q. And again, based on your review of Figure 13
18 and Figure 14, as you described, back in 1992 and '93,
19 do you see anything in either of these two figures to
20 put you on notice that Rambus might have IP on dual
21 edge clocking technology?

22 A. No, sir.

23 Q. Your Honor, we are through with the document.
24 I have got a few more questions, though.

25 Did anyone from Rambus ever suggest to you that

1 the SDRAM that you were standardizing at JEDEC used
2 Rambus proprietary technology?

3 A. No.

4 Q. When did you first learn that Rambus was taking
5 the position that its technology covered products
6 outside a narrow bus multiplexed packetized protocol,
7 i.e., RDRAM architecture?

8 A. Not until late '99 when some of the litigation
9 started to show up in the trade press.

10 Q. Prior to 1999, did anyone from Rambus ever
11 suggest to you that its proprietary technology -- well,
12 I asked that. No, I haven't asked that. It's a
13 different question. Strike that.

14 Prior to 1991 -- 1999, did anyone from Rambus
15 ever suggest to you that its proprietary technology
16 extended to products outside of the RDRAM architecture?

17 A. No, they did not.

18 Q. Just so the record is clear, did anyone from
19 Rambus ever make any disclosures of any pending patent
20 applications while Rambus was at JEDEC, to the best of
21 your knowledge?

22 A. No.

23 Q. Prior to 1999, did anyone from Rambus do
24 anything that put you on notice that Rambus had
25 intellectual property that might relate to either the

1 SDRAM or DDR standard?

2 A. No.

3 Q. Prior to 1999, did anyone from Rambus do
4 anything that put you on notice that Rambus had
5 intellectual property that might relate or cover the
6 concepts of programmable CAS latency or programmable
7 burst length?

8 MR. DETRE: Objection, leading, Your Honor.

9 JUDGE McGUIRE: Sustained.

10 BY MR. WEBER:

11 Q. Going back to JX-27, and if we could pull up
12 Mr. Crisp's letter, page 26 from that document. We
13 don't need the whole thing.

14 You'll recall that we discussed this earlier,
15 this letter that Mr. Crisp submitted at the September
16 '95 meeting?

17 A. Yes.

18 Q. Suppose instead of this letter Mr. Crisp had
19 got up at the meeting and said, Rambus has IP on
20 programmable CAS latency, programmable burst length, as
21 well as dual edge clock and on-chip PLL/DLL. Based on
22 that knowledge, what would you have recommended to the
23 committee at this time?

24 MR. DETRE: Objection, Your Honor, improper
25 hypothetical.

1 JUDGE McGUIRE: Sustained.

2 BY MR. WEBER:

3 Q. During the entire time Rambus was at JEDEC, to
4 the best of your knowledge, did Rambus ever provide --
5 well, strike that.

6 You are familiar with the reasonable and
7 nondiscriminatory licensing that I think you discussed
8 earlier?

9 A. Yes, that terminology.

10 Q. And you are familiar that from time to time
11 companies have submitted assurances or letters on
12 willingness to license technology on reasonable and
13 nondiscriminatory terms?

14 A. Correct.

15 Q. During your entire time at JEDEC, to the best
16 of your knowledge, did Rambus ever submit a letter
17 saying it would license its technology on reasonable
18 and nondiscriminatory terms?

19 A. I don't ever remember such a Rambus letter.

20 Q. Let's fast forward from this date of this
21 letter in 1995 to 199 --

22 JUDGE McGUIRE: That's a good term, by the way,
23 fast forward?

24 MR. WEBER: Yes, Your Honor.

25 JUDGE McGUIRE: How much more time do you plan

1 on taking?

2 MR. WEBER: Probably about five minutes.

3 JUDGE McGUIRE: Okay, we are going to give you
4 five minutes, and then we are going to break.

5 MR. WEBER: Okay.

6 BY MR. WEBER:

7 Q. Fast forward to the November 1999 time frame.
8 That's when you said you first learned of the Hitachi
9 lawsuit?

10 A. Correct.

11 Q. And you mentioned that earlier, in earlier
12 instances when technologies had been discovered late in
13 the process, patent rights, sometimes JEDEC would
14 either rescind the standard or consider alternatives.
15 Do you recall that testimony?

16 A. Yes, I do.

17 Q. If we're in November 1999 and you first learn
18 of the Hitachi lawsuit, based on your experience, was
19 JEDEC in the same position to consider alternatives as
20 it would have been back in September of '9 -- '95 had
21 Rambus disclosed its IP?

22 MR. DETRE: Objection, Your Honor, calls for a
23 hypothetical.

24 JUDGE McGUIRE: Sustained.

25 MR. WEBER: That will make it even shorter,

1 Your Honor.

2 BY MR. WEBER:

3 Q. Finally, let's go back to CX-204 for a minute.
4 Do you recall our discussion of the good faith
5 requirement? Bring up page 5 of this document on the
6 screen.

7 A. Okay.

8 Q. Again, if we could blow up the left-hand side,
9 Section C, point 1.

10 Do you recall we discussed this probably a
11 couple hours ago?

12 A. Okay.

13 Q. The good faith requirement.

14 Based on your years of experience at JEDEC, Mr.
15 Sussman, is it acting in good faith for a company to
16 attend JEDEC meetings, observe standardization work and
17 then amend patent claims to cover standardization work
18 and not tell other JEDEC members until years later when
19 it was seeking to enforce those patents?

20 MR. DETRE: Objection, Your Honor, leading.

21 JUDGE MCGUIRE: Sustained.

22 BY MR. WEBER:

23 Q. Let me break it down -- well, let me ask it
24 this way.

25 Based on your observations, personal

1 observations at JEDEC in the 1991 to '96 time frame,
2 based on what you know now about Rambus' asserting
3 the -- well, are you aware of what technologies Rambus
4 has asserted in these lawsuits?

5 A. A little bit. They have over a hundred
6 patents, multiple claims, and as I glanced at the
7 Infineon, the Micron, the Hyundai one, they seem to be
8 different patents, different claims. So, I can't say
9 that I know exactly this one. Generically, yes.

10 Q. Okay. Based on, then, your observations and
11 knowledge and experience at JEDEC and any other
12 knowledge you have, has Rambus complied with the good
13 faith requirements set forth in item 1 on page 5 of
14 CX-204?

15 MR. DETRE: Objection, Your Honor, it lacks
16 foundation. The witness has apparently very little
17 knowledge about Rambus' IP claims.

18 JUDGE McGUIRE: Overruled.

19 THE WITNESS: I'm going to say on this one the
20 answer is --

21 JUDGE McGUIRE: And this answer, as any answer,
22 goes to the extent of his own personal knowledge or
23 observation.

24 THE WITNESS: Yeah, the answer to that one is
25 no.

1 BY MR. WEBER:

2 Q. Why do you say no?

3 A. That they did not act in good faith, and Your
4 Honor, can I embellish or --

5 JUDGE MCGUIRE: No, you cannot.

6 THE WITNESS: Okay.

7 BY MR. WEBER:

8 Q. Going back a minute to the JEDEC SDRAM standard
9 you were involved in, when you were doing your work
10 developing the JEDEC SDRAM standard, sir, did you steal
11 any features from Rambus technology and incorporate
12 them in the JEDEC standard?

13 A. I'm sorry for the laughter. The answer to that
14 one is no.

15 Q. Did anyone from Rambus ever suggest to you that
16 you stole their technology?

17 A. No, sir.

18 Q. To the best of your knowledge, did JEDEC
19 knowingly incorporate Rambus proprietary technology
20 years later when it adopted the DDR SDRAM standard?

21 A. I do not think so.

22 MR. WEBER: Your Honor, I have no further
23 questions. I would like to offer CX-1454 into
24 evidence, and I don't know what we're doing with the
25 demonstratives --

1 JUDGE McGUIRE: We are just having them marked,
2 that's all.

3 Any objection?

4 MR. DETRE: Which document is that?

5 MR. WEBER: CX-1454, the patent.

6 MR. DETRE: No objection.

7 JUDGE McGUIRE: So entered.

8 (CX Exhibit Number 1454 was admitted into
9 evidence.)

10 JUDGE McGUIRE: Does that conclude your
11 examination?

12 MR. WEBER: Yes, Your Honor.

13 JUDGE McGUIRE: Okay, we will take break at
14 1:00. We will reconvene at 2:15 or do the parties want
15 2:30, because I don't want to go too late in the
16 afternoon.

17 MR. DETRE: 2:15 is fine, Your Honor.

18 JUDGE McGUIRE: Okay, 2:15, we will reconvene.
19 The hearing is adjourned.

20 (Whereupon, at 1:00 p.m., a lunch recess was
21 taken.)

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1 AFTERNOON SESSION

2 (2:15 p.m.)

3 JUDGE MCGUIRE: This hearing is now in order
4 and convened at 2:15.

5 At this time we will entertain the cross
6 examination of the witness, Mr. Detre.

7 MR. DETRE: Thank you, Your Honor.

8 CROSS EXAMINATION

9 BY MR. DETRE:

10 Q. Good afternoon, Mr. Sussman.

11 At the very end of Mr. Weber's examination, Mr.
12 Weber asked you whether to the best of your knowledge,
13 you knew that JEDEC -- Mr. Weber asked you the question
14 to the best of your knowledge, did JEDEC knowingly
15 incorporate Rambus proprietary technology when it
16 adopted the DDR SDRAM standard.

17 Do you recall that question?

18 A. Yes, I do.

19 Q. And you answered, "I do not think so."

20 Do you recall that?

21 A. Yes, I do.

22 Q. Now, Micron was a JEDEC member during the
23 period that JEDEC was standardizing the DDR SDRAM
24 standard, correct?

25 A. Correct.

1 Q. I want to show you Exhibit 9 -- RX-920, which
2 are some emails sent to and from Terry Walther, Terry
3 Lee, Kevin Ryan and others at Micron. Could we pull
4 that up, please? Let me hand you a copy of this, Mr.
5 Sussman.

6 A. Thank you.

7 Q. And if I could direct your attention to the
8 third email down in this email stream, do you see there
9 that Mr. Walther writes, "does Rambus believe they have
10 a patent on changing data on both edges of the clock?"

11 Do you see that?

12 A. Yes.

13 Q. And then Mr. Weinstock replies to Mr. Walther,
14 and Mr. Lee and Mr. Ryan are copied there, and says,
15 "Terry: Yes, Rambus feels DDR for any memory is under
16 their patent coverage."

17 Do you see that?

18 A. Yes, I do.

19 Q. And the date on that email is April 17th, 1997,
20 correct?

21 A. Correct.

22 Q. Now, did anyone from Micron tell you in 1997 or
23 1998 that they had heard that Rambus believed they had
24 intellectual property covering DDR on any memory
25 device?

1 A. Not to my knowledge.

2 Q. Now, if you could find in your stack Exhibit
3 CX-1454. That's the international patent application
4 that you said you flipped through.

5 A. Okay, um-hum.

6 Q. And if you could turn to one of the figures
7 that Mr. Weber was asking you about, and it's on page
8 134, and it's Figure Number 10 at the top of the page.

9 A. Okay.

10 Q. Now, I believe you testified that when you
11 looked at the figure, you understood that the clock --
12 the symbol CLK, standing for clock, and then the symbol
13 CLK with a bar on top of it standing I think usually
14 for clock bar, represented a differential clock. Is
15 that right?

16 A. It could.

17 Q. And -- well, that's the way clock and clock bar
18 are used in, for example, the DDR SDRAM standard,
19 correct?

20 A. Yes.

21 Q. And -- and you see that there are two input
22 receivers, right?

23 A. It says so, yes, two blocks.

24 Q. Okay. And did you -- did you understand when
25 you were looking at this back in 1992 or 1993 that one

1 of those input receivers was governed by clock and the
2 other input receiver was governed by clock bar?

3 A. The input is clock and the input is clock bar;
4 it doesn't say it's governed by.

5 Q. There is -- the clock symbol is going into one
6 input receiver, and the clock bar is going into the
7 other input receiver. Did you see that back in 1992
8 and 1993?

9 A. I'm sure I did.

10 Q. Now, if this represented a differential clock,
11 then you would have understood at the time that the
12 rising edge of the clock would have corresponded to the
13 falling edge of the clock bar. Is that right?

14 MR. WEBER: Objection, hypothetical.

15 MR. DETRE: Let me rephrase it, Your Honor.

16 JUDGE McGUIRE: Sustained.

17 BY MR. DETRE:

18 Q. Did you understand back at the time you were
19 looking at this in 1992 and 1993 that the rising edge
20 of the signal clock would correspond to the falling
21 edge of its complement, the signal clock bar?

22 A. In this case, I would assume normally that
23 clock and clock bar are the true and complement of the
24 same. A little bit later in this same document you're
25 showing like bus clocks that are offset from each

1 other. So, it may or may not be exactly one to one,
2 this same signal and the inverse of that same signal.
3 It doesn't have to be. It doesn't say. It can be. It
4 could be.

5 Q. And when you looked at Figure 13, if we could
6 go two pages further down to 136, you saw that those
7 clock signals in Figure 10 are identified as internal
8 clock and internal clock complement?

9 A. That is correct.

10 Q. And did -- and at that point, of course, you
11 understood, since the figure shows it, that the rising
12 edge of internal clock corresponds to the falling edge
13 of internal clock complement, correct?

14 A. They are related. They may not still be
15 identical, but continue, please.

16 Q. They were lined up on this figure. You saw
17 that, right?

18 A. They were lined up on this figure.

19 Q. Now, if we stay on that figure and we look at
20 the very bottom row there, do you see, marked Input
21 Sample?

22 A. Input Sample? Ah, okay.

23 Q. At the time that you were reviewing this in
24 1992 and 1993, did you notice that there were two
25 samples being input there for each clock cycle?

1 A. Ah --

2 Q. See input sample 127, then input sample 125 are
3 both being input on the same clock cycle? Did you
4 notice that back when you were looking at this in 1992
5 and 1993?

6 A. I don't know for '92-'93, but that is what the
7 document shows, yes.

8 Q. And that's double data rate, isn't it?

9 A. That is input being sampled on the high and low
10 edge of the clock.

11 Q. And at least for inputs, that's what the DDR
12 SDRAM standard refers to as a double data rate input,
13 correct?

14 A. As a double data rate input, correct.

15 Q. Now, you testified, Mr. Sussman, that you first
16 started thinking about Synchronous DRAMs in 1988,
17 correct?

18 A. Correct.

19 Q. And you were prompted to begin this
20 investigation because clock speeds were increasing, and
21 you felt that developing a Synchronous DRAM would be a
22 way for memory to keep up with those increasing clock
23 speeds. Is that right?

24 A. That is correct. We used to have clock
25 memories a couple generations prior, and it was time to

1 pick it up again.

2 Q. Now -- and the memories I believe you also
3 testified in use at the time, fast page mode and EDO,
4 they were asynchronous memories, right?

5 A. This is before the fast page mode and EDO. The
6 first part I worked on was using a four-phase clock.
7 Everything was running off that clock.

8 Q. No, I'm sorry, at that time --

9 A. So, this is a takeoff on things we had before,
10 and it is time to pick it up again.

11 Q. In the 1988-1989 time frame when you were
12 developing your Synchronous DRAM, isn't it the case
13 that the type of memories in common use at the time,
14 the fast page mode and EDO, were asynchronous?

15 A. That is correct.

16 Q. And at that time, you also considered ways in
17 which you might improve those asynchronous memories to
18 keep up with faster clock speeds, correct?

19 A. That is true.

20 Q. But you ultimately decided that the better way
21 to go was simply to move to a synchronous memory,
22 correct?

23 A. Let me take your question, which I think -- can
24 I expand on what you've asked, because you've made some
25 statements I don't 100 percent agree on, but you're

1 close.

2 Q. Why don't you go ahead.

3 A. Thank you.

4 The original fast -- page mode or fast page
5 mode part, we put a register on the output of it. That
6 register is internally clocked or clocked by CAS, as
7 the case be. There's some parts that have been
8 recommended for one, the other one was standard, so we
9 are going from totally asynchronous to something that
10 is more synchronous.

11 Within the device, within these old page mode
12 parts, we had a number of clock drivers, and I think
13 some of the documentation that you've gotten from
14 previous from me, as I emptied my file cabinet, is
15 talking on some of these old Mostek parts that very
16 clearly shows the internal clock drivers on the parts.
17 So, clocks are not new in memory. We are just moving
18 forward one more thing.

19 Q. And you decided that the -- after having
20 considered improving the asynchronous memories of that
21 time, you decided to develop your synchronous memory,
22 correct?

23 A. Correct.

24 Q. Now, you testified about a presentation at the
25 December 1991 JEDEC meeting of IBM's high-speed toggle

1 mode. Do you recall that?

2 A. December?

3 Q. 1991.

4 A. '91, HST, okay.

5 Q. Do you recall that?

6 And that was the proposal for an asynchronous
7 type of memory, correct?

8 A. That's a hybrid. The -- the initial turning on
9 of the memory is asynchronous, and then data is
10 synchronous with their -- I'm calling it a clock, but
11 basically both on the rise and the falling edge of
12 their input signal, whatever we are going to call it, I
13 have data.

14 Q. The control signals going to IBM's high-speed
15 toggle DRAM are asynchronous, correct?

16 A. No. They are both. I have an asynchronous, an
17 asynchronous first CAS, and then I'm taking data out
18 synchronously with CAS. That's the high-speed toggle
19 mode. And in our history, there's nothing that says
20 the clock is always free running, that a clock is
21 always equal periods. This is basically a -- to me a
22 hybrid part.

23 Q. If -- you've been handed a copy of your
24 deposition in this case, I believe.

25 A. Yes, sir.

1 Q. Could you turn to page 92 of that deposition.
2 Are you there, Mr. Sussman?

3 A. Yes, I am.

4 Q. And you were asked at that time, beginning at
5 line 7 --

6 MR. WEBER: Do we have a line -- okay.

7 BY MR. DETRE:

8 Q. -- beginning at line 7:

9 "QUESTION: Now, IBM's toggle mode was a
10 proposal for an asynchronous type of memory. Is that
11 right?

12 "ANSWER: That is correct."

13 Did I read that correctly?

14 A. You did read it correctly.

15 Q. Now, isn't it the case that you killed the idea
16 of using both edges of the clock in your Synchronous
17 DRAM device at the non-JEDEC meeting in Boxborough in
18 August of 1991?

19 A. It was -- to me, yes, but it was still proposed
20 in some of the other documents that have been shown
21 here this morning. For instance, the IBM Austin
22 gentleman is still asking for a RAS/CAS with the
23 synchronous data.

24 Q. And that's --

25 A. So, it's not killed. It's still under

1 discussion.

2 Q. -- that's the high-speed toggle mode that you
3 described as an asynchronous memory in your deposition,
4 correct?

5 A. That is true.

6 MR. DETRE: I have no further questions, Your
7 Honor.

8 JUDGE McGUIRE: Okay, thank you, Mr. Detre.
9 Any further redirect?

10 MR. WEBER: Nothing further, Your Honor.

11 JUDGE McGUIRE: If not, sir, you are excused
12 from your testimony. Thank you very much for appearing
13 today.

14 Does complaint counsel intend to call anyone
15 else this afternoon?

16 MR. OLIVER: I'm sorry, Your Honor, could --

17 JUDGE McGUIRE: Does complaint counsel intend
18 to call anyone else this afternoon?

19 MR. OLIVER: No, Your Honor, we -- we do not.
20 That was actually quite a bit faster than we had
21 expected.

22 JUDGE McGUIRE: Okay, then I guess that takes
23 care of our hearing for today. As counsel also knows,
24 we will not be having hearing on Friday. So, then, we
25 will convene again at 9:30 on Monday morning, okay?

1 Is there anything else we need to talk about in
2 the meantime?

3 MR. STONE: I don't believe so, Your Honor.
4 Thank you.

5 JUDGE McGUIRE: Then if not, everyone have a
6 good weekend -- I'm sorry, Mr. Oliver?

7 MR. OLIVER: If you would like, I was about to
8 give you an idea of what we have scheduled for next
9 week.

10 JUDGE McGUIRE: Okay, please.

11 MR. OLIVER: On Monday, we have Mr. Mark
12 Nussbaum. He is an expert witness on patent law.

13 JUDGE McGUIRE: Okay.

14 MR. OLIVER: On Tuesday, we have Tom Landgraf
15 of Hewlett Packard, also attended 42.3 committee
16 meetings.

17 JUDGE McGUIRE: Now, don't forget when I
18 advised you on the side that we would convene on
19 Tuesday an hour and a half after our normal time, so
20 keep that in mind.

21 MR. OLIVER: Yes, Your Honor.

22 JUDGE McGUIRE: Thank you.

23 MR. OLIVER: And we have Mr. John Kelly, the
24 president and general counsel of JEDEC, scheduled for
25 Wednesday and Thursday of next week.

1 JUDGE McGUIRE: Okay.

2 MR. OLIVER: And then we have Anthony
3 Diepenbrock, former in-house counsel at Rambus,
4 scheduled for Friday.

5 JUDGE McGUIRE: Okay, very good.

6 MR. OLIVER: I should also mention that Mr.
7 Landgraf on Tuesday will be relatively short, and it
8 could be that Mr. Kelly does not take up the entire day
9 on Thursday. We have been trying to see if we could
10 schedule another short witness, but with little lead
11 time, it's been difficult.

12 JUDGE McGUIRE: Well, we will see what we can
13 do on that, then.

14 MR. OLIVER: Excuse me?

15 JUDGE McGUIRE: Right, I will give you that
16 opportunity, and if you can't do it, I guess you can't
17 do it, but we will see how it plays out during the
18 week.

19 MR. OLIVER: Okay. And then we also expect
20 that we'll have certain videotaped depositions that
21 we'll be prepared to use, and if time permits either
22 Tuesday or Thursday, we may be in a position to play
23 those.

24 JUDGE McGUIRE: Okay, very good, Counsel. Have
25 a good weekend.

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MR. STONE: Thank you, Your Honor.

(Whereupon, at 2:30 p.m., the hearing was
adjourned.)

1 C E R T I F I C A T I O N O F R E P O R T E R

2 DOCKET NUMBER: 9302

3 CASE TITLE: RAMBUS, INC.

4 DATE: MAY 8, 2003

5

6 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: 5/9/03

13

14

15

16 SUSANNE BERGLING, RMR

17

18 C E R T I F I C A T I O N O F P R O O F R E A D E R

19

20 I HEREBY CERTIFY that I proofread the
21 transcript for accuracy in spelling, hyphenation,
22 punctuation and format.

23

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