1   FEDERAL TRADE COMMISSION

2   I N D E X

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4   WITNESS: DIRECT VOIR DIRE CROSS REDIRECT RECROSS

5   NUSBAUM   1484   1534

6   1537   1604

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8   EXHIBITS   MARKED   ADMITTED   WITHDRAWN

9   CX

10   Number 1451   1525

11   Number 1504   1579

12   Number 1502   1595

13   Number 1493   1603

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15   RX

16   Number 2203   1660

17   Number 2211   1660

18   Number 2212   1660

19   Number 2213   1660

20   Number 2214-A   1660

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22   DX

23   Number 14   1505

24   Number 15   1549

25   Number 16   1600

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1   FEDERAL TRADE COMMISSION

2   I N D E X (cont'd)

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4   EXHIBITS   MARKED   ADMITTED   WITHDRAWN

5   DX

6   Number 17   1619

7   Number 18   1619

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1   UNITED STATES OF AMERICA

2   FEDERAL TRADE COMMISSION

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4   In the Matter of:)

5   Rambus, Inc.   ) Docket No. 9302

6   -----------------------------)

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9   Monday, May 12, 2003

10   9:30 a.m.

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13   TRIAL VOLUME 8

14   PART 1

15   PUBLIC RECORD

16

17   BEFORE THE HONORABLE STEPHEN J. McGUIRE

18   Chief Administrative Law Judge

19   Federal Trade Commission

20   600 Pennsylvania Avenue, N.W.

21   Washington, D.C.

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25   Reported by: Sally Jo Bowling

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

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3   JUDGE McGUIRE: This hearing is now in order.

4   Before we get started today, are there any housekeeping

5   tasks we need to concern ourselves with or can we

6   proceed?

7   MR. OLIVER: Not at this time, Your Honor.

8   JUDGE McGUIRE: Mr. Stone, anything on behalf of

9   respondent?

10   MR. STONE: None, Your Honor.

11   JUDGE McGUIRE: Then you may call your next

12   witness.

13   MR. OLIVER: Your Honor, Ms. Suzanne Michel

14   will handle the next witness on behalf of complaint

15   counsel.

16   JUDGE McGUIRE: Okay, thank you. All right, Ms.

17   Michel? And then how is that spelled, Ms. Michel?

18   MS. MICHEL: It's M I C H E L. Your Honor,

19   complaint counsel calls Mr. Mark Nusbaum to the stand.

20   JUDGE McGUIRE: Mr. Nusbaum, please approach and

21   remain standing while you're sworn by the court

22   reporter.

23   Whereupon--

24   MARK E. NUSBAUM

25   a witness, called for examination, having been first

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1   duly sworn, was examined and testified as follows:

2   DIRECT EXAMINATION

3   BY MS. MICHEL:

4   Q.   Good morning, Mr. Nusbaum.

5   A.   Good morning.

6   Q.   Mr. Nusbaum, what kind of work do you do?

7   A.   I am a patent attorney.

8   Q.   Are you prepared to testify about any specific

9   subject matter today?

10   A.   Yes, I am.

11   Q.   Just generally, could you tell us what kind of

12   subject matter you're prepared to testify about?

13   A.   I am prepared to testify about the patent

14   examining process before United States Patent &

15   Trademark Office. I'm prepared to testify about the

16   prosecution histories of certain Rambus patent

17   applications and I'm prepared to testify about the

18   relationship of certain claims in those patent

19   applications to JEDEC Standard Release 4 and to certain

20   JEDEC proposals.

21   Q.   So that the Court will know why you're qualified

22   to express your opinions in these areas, I would like to

23   focus on your background. Could you please tell us

24   about your educational background, beginning following

25   high school.

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1   A.   In 1969, I received a Bachelor of Science degree

2   in electrical engineering from the University of

3   Marylandã.   In 1974, I received a juris doctorate degree

4   from the American University's Washington College of

5   Law.

6   Q.   Did you graduate with honors from the electrical

7   engineering program at the University of Maryland?

8   A.   Yes, I did.

9   Q.   Were you elected to honor societies there?

10   A.   I was elected to the General Engineering Honor

11   Society and the Electrical Engineering Honor Society.

12   MR. STONE: Your Honor, in Ms. Michel would

13   like, we would be happy to stipulate the three topics

14   Mr. Nusbaum has identified in his intended testimony

15   today, we have no objection to his expertise in those

16   particular areas.

17   JUDGE McGUIRE: Ms. Michel?

18   MS. MICHEL: Your Honor, I believe there is a

19   value in understanding exactly what Mr. Nusbaum's

20   experience has been.

21   JUDGE McGUIRE: All right, proceed.

22   BY MS. MICHEL:

23   Q.   Could you generally explain what experience you

24   had relating to the examination of patents?

25   A.   Yes, I served in the United States Patent &

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1   Trademark Office for 17 years in various capacities, and

2   on virtually a daily basis for those 17 years, I was

3   either personally examining or involved in patent

4   examining activities.

5   Q. And when did you first start with the patent

6   office?

7   A. I started with the Patent & Trademark Office in

8   July of 1969.

9   Q. When you did first start at the patent office,

10   were you assigned to examine any particular types of

11   patent applications?

12   A. Yes, I was assigned to examine patent

13   applications in the so-called art unit and was

14   responsible for examining general purpose digital data

15   processing systems related applications and special

16   purpose digital data processing systems patent

17   applications.

18   Q. In what years were you assigned to the art unit

19   that examined those types of applications?

20   A. From 1969 through 1980.

21   Q. What were your duties during that time?

22   A. My duties during that time were essentially to

23   examine patent applications. I would estimate that over

24   that time frame I examined somewhere in the neighborhood

25   of between 700 and a thousand patent applications in

26

1   this art area. Later on during -- in the latter part of

2   that time frame, I was also involved, to some extent, in

3   supervising junior patent examiners.

4   Q. You mentioned that you examined patent

5   applications in the general computer art -- of general

6   computer systems. Could you please just briefly explain

7   what you mean by that, what kind of applications were

8   involved?

9   A. The kind of applications that were involved in

10   terms of general technological subject matter were with

11   respect to the general purpose digital data processing

12   arts. I examined patent applications that related to

13   any particular subsystem of a computer system, such as

14   the central processing unit or the storage subsystem. I

15   examined applications related to multiple computers,

16   so-called multiprocessor systems. In special purpose

17   data processing art, I examined patent applications

18   relating to, for example, display processing systems,

19   printer control systems.

20   I recall having personally examined the very

21   first entire computer that was fabricated on a single

22   semiconductor chip. I also examined a number of the

23   very first microprocessor related patent applications.

24   Q. And how does this general technological subject

25   matter that you examined compare with the subject matter

26

1   of the Rambus patent applications that you've reviewed?

2   A.   The -- in terms of the general technological

3   subject matter, the general technological subject matter

4   was the same. In fact, the very first file Rambus

5   patent application was classified in the special purpose

6   digital data processing art area that I examined.

7   Q.   How would you characterize the complexity of the

8   patent applications that you were examining in this time

9   frame?

10   A.   The average patent application that I examined

11   was extremely complex. It was not unusual for me to

12   examine patent applications that were as many as -- had

13   as many as three to 400 pages in terms of the patent

14   specification, and numerous claims. In terms of

15   complexity studies that were performed over the years,

16   during the time when I was employed by the Patent &

17   Trademark Office, this computer system art area that I

18   examined was judged to be the most technologically

19   complex in the United States Patent & Trademark Office.

20   Q.   Could you please explain what a master's level

21   art level is in the Patent & Trademark Office.

22   A.   A master's level rating in the United States

23   Patent & Trademark Office requires two findings by the

24   patent office. One finding is that in order for the

25   candidate to comprehend the technology that he or she is

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1   examining requires more than an undergraduate level

2   degree of knowledge to understand, and then secondly,

3   after a grilling by a patent office committee, it has to

4   be determined that the particular candidate has mastered

5   that technology.

6   Q. Did you receive a master's level rating in the

7   art area which you examined?

8   A. Yes, I did. That was in early 1975.

9   Q. Could you please explain what a primary examiner

10   is?

11   A. A primary examiner is a patent examiner who has

12   been granted the authority by the Patent & Trademark

13   Office to either finally reject a patent application or

14   to allow a patent application to mature into an issued

15   patent over his or her own signature.

16   Q. Did you become a primary examiner?

17   A. I did. And that would have been somewhere in

18   the vicinity of mid-1975.

19   Q. Did you ever receive the senior examiner rating

20   in the computer art system area which you examined?

21   A. Yes, I did. In 1977.

22   Q. What does that rating mean?

23   A. A senior examiner rating is not necessarily a

24   rating which is awarded to a person who is most senior

25   in a particular art area. In essence, it's an

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1   indication that the examiner's supervisor viewed that

2   particular examiner as being the most knowledgeable

3   patent examiner in that examining art area.

4   Q. Did you at some point become a supervisory

5   patent examiner?

6   A. I did, in 1980.

7   Q. What were the responsibilities of a supervisory

8   patent examiner?

9   A. A supervisory patent examiner is charged with

10   the responsibility of managing an examining art unit

11   which are now referred to as technology centers, but

12   there are a group of 10 to 15 to perhaps as many as 20

13   patent examiners, and the supervisory patent examiner is

14   responsible for making sure that the quality of

15   examination in the art unit remains as high as possible

16   while the examiners achieve their expected productivity.

17   A supervisory patent examiner's job to a large extent

18   involves training new examiners, evaluating examiner

19   work product and answering legal and technical questions

20   either from the examiners in the art unit or the manager

21   of a group of art units.

22   Q. What technological areas did you supervise?

23   A. I supervised the same general purpose and

24   special purpose technological area, that digital data

25   processing art area that I examined in. I also was

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1   responsible for supervising an area that related to a

2   vast array of applications of computers such as patient

3   monitoring, measuring of testing systems, computers used

4   in control systems. I was also responsible to a lesser

5   extent for some multiplex communication technology.

6   Q. What position did you assume in the patent

7   office after being a supervisory patent examiner?

8   A. In 19 -- in 1983, I was appointed to the United

9   States Patent & Trademark Office's Board of Patent

10   Appeals and Interferences.

11   Q. What was your title in that position?

12   A. My title at that time as a member of the Patent

13   Office Board of Appeals and Interferences was examiner

14   in chief. Today, members of the board are referred to

15   as administrative patent judges.

16   Q. What is the Board of Patent Appeals and

17   Interferences?

18   A. The Board of Patent Appeals and Interferences is

19   a quasi judicial body within the Patent & Trademark

20   Office, and the responsibility of the board is to decide

21   appeals by patent applicants who receive two rejections

22   or typically a final rejection from a primary patent

23   examiner.

24   Q. Did you have to write opinions as a member of

25   the board?

26

1   A. Yes, every appeal at the Patent & Trademark

2   Office ends with a written opinion where the board panel

3   either affirms or reverses the examiner's objections.

4   Q. Did any of the cases in which you heard at the

5   board involve computer-related technology?

6   A. Yes. The unofficial segment of the Board of

7   Appeals that I worked in was a group of five or six

8   board members who handled appeals emanating from the

9   electrical -- so-called electrical examining groups.

10   The art area where I examined, the examining group where

11   I examined was one of those groups, and as long as I

12   wasn't personally responsible for any application, it

13   was actually highly likely that I would have been

14   assigned on panels that heard computer systems or

15   storage technology related appeals.

16   Q. What options does a patent applicant have if the

17   board of appeals affirms a patent examiner's final

18   rejection of an application?

19   A. A patent applicant has the option to appeal

20   directly to the Court of Appeals for the Federal Circuit

21   or alternatively to initiate an action in the Federal

22   District Court.

23   Q. And about how many cases were you personally

24   involved in during the three years that you sat on the

25   board?

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1   A.   I would roughly estimate somewhere between 750

2 and a thousand appeals that I was involved in.

3   Q.   And how many opinions did you draft?

4   A.   I drafted somewhere on the order of 200

5 opinions.

6   Q.   Were any of those appealed?

7   A.   To the best of my knowledge, there were five

8 that were appealed.

9   Q.   What was the outcome in those cases?

10   A.   I was fortunate enough to have been affirmed on

11 all five.

12   Q.   Did you receive any awards while you were at the

13 Patent & Trademark Office?

14   A.   Yes, I did. I received awards pretty much every

15 year when I was personally examining patent applications

16 and as supervisor I received quality step increase

17 awards, and I also received the Commerce Department's

18 Silver Medal Award.

19   Q.   What was the basis for that Silver Medal Award?

20   A.   The Silver Medal Award recognized my

21 accomplishments from 1969 to 1979. I was also

22 recognized for my efforts in reclassifying the computer

23 arts, and I believe for training examiners as well.

24   Q.   Did you have any teaching responsibilities

25 within the PTO?

26

1   A.   Yes, I did.

2   Q.   What were they?

3   A.   I taught on a number of occasions a course in

4   the Patent & Trademark Office that was referred to as

5   the patent examiner initial training course, and what

6   this course was designed to do is to take brand new

7   patent examiners who have had no on-the-job experience

8   whatsoever and attempt to give them a solid ground in

9   fundamental aspects of patent law, and patent examining

10   process -- practice, pardon me. I also taught on a

11   couple of occasions an in-house course relating to

12   microprocessor technology.

13   Q.   Mr. Nusbaum, did you ever serve as the chairman

14   of any U.S. Patent Office committees?

15   A.   Yes. I served as chairman of a patent office

16   committee that was responsible for generating patent

17   examining guidelines for determining the eligibility of

18   patent applications that related to either computer

19   programs or mathematical algorithms for patent

20   protection, and I was the principal author of guidelines

21   that were the result of that committee's work.

22   Q.   Were you ever asked by the patent office to

23   speak to members of the bar regarding patent office

24   policy?

25   A.   Yes, I was. I was asked to give lectures at

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1   various symposiums and bar committee meetings relating

2   to the examination of computer-related applications

3   focusing on the eligibility of computer software for

4   patent protection, and adequacy of disclosure issues as

5   well.

6   Q.   When did you leave the patent office?

7   A.   I left the patent office in July of 1986.

8   Q.   And what did you do following that?

9   A.   I joined my present law firm, and have been

10   working there ever since.

11   Q.   Could you please describe your current law

12   practice.

13   A.   I am actively involved in prosecuting patent

14   applications in the high-tech electronics area. I've

15   written numerous original applications. I've drafted

16   responses to communications from the Patent & Trademark

17   Office in hundreds of patent applications. I've been

18   very actively involved in drafting for clients

19   invalidity and noninfringement opinions over the years.

20   And I've also been involved in testifying in numerous

21   patent litigations, pardon me.

22   Q.   About how many patent litigations have you

23   previously testified in?

24   A.   I've testified as a patent expert in I believe

25   11 trials and I've testified by deposition in numerous

26

1   other litigations.

2   Q. Okay, thank you.

3   Your Honor, at this point I would like to ask

4   the Court to recognize Mr. Nusbaum as an expert in

5   patent office practice and in patent law.

6   JUDGE McGUIRE: Mr. Stone, any voir dire?

7   MR. STONE: No, Your Honor. Not as to those two

8   topics.

9   JUDGE McGUIRE: Okay. So noted.

10   BY MS. MICHEL:

11   Q. Mr. Nusbaum, what is a patent?

12   A. A patent is a government grant in the nature of

13   a contract between the patentee and the United States

14   Government. The United States Government gives to the

15   patentee a right to exclude others from making, using,

16   selling or offering to sell a claimed invention for a

17   limited period of time. In return, the patentee gives

18   to the United States public a disclosure of a claimed

19   invention that satisfies the requirements of the patent

20   laws and adds to the United States technological base.

21   Q. What are the main parts of a patent?

22   A. The main parts of a patent include the written

23   description of a claimed invention that's referred to as

24   the patent specification. The patent specification

25   concludes with one or more patent claims and in most

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1   electrical and mechanical patents, there are also almost

2   invariably patent drawings as well.

3   Q.   What's the function of the patent claims?

4   A.   The function of the patent claims is to in a

5   single-sentence, multiparagraph statement define the

6   boundaries of an applicant's right to exclude others

7   from making, using or selling. Much like a fence in

8   regard to a parcel of real estate where the fence is

9   laid down in accordance with a survey of some sort marks

10   the boundaries of a parcel in real estate, the claims

11   mark the boundaries of a claimed invention. And what

12   falls within the bounds of the claim invention, the

13   patentee has the right to exclude the others from

14   making, using or selling or offering to sell, and what

15   falls outside the bounds, the patentee has no such

16   rights.

17   Q.   You analogize the claims to a fence, are there

18   ways in which claim language is not like a fence?

19   A.   Yes. A fence, particularly one as I mentioned

20   that's backed up by a survey, there's typically little

21   question as to the bounds of the parcel of real estate.

22   On the other hand, the words in a claim are written in

23   the English language and patent litigations typically

24   involve controversies as to the meaning of the claim

25   language.

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1   Q. Would you please explain how a patent examiner

2   examines a patent application?

3   A. A patent examiner reads and studies an original

4   patent application disclosure and -- including the

5   claims, and the patent examiner does that in order to

6   make sure that the disclosure satisfies the disclosure

7   requirements of the patent law and to gain an

8   understanding of the claimed invention.

9   The patent examiner then does a search of the

10   prior art that he or she has access to within the Patent

11   & Trademark Office. The patent examiner then compiles

12   all the various objections and rejections that he or she

13   may have in a communication, and that communication is

14   referred to as an official action. The examiner then

15   sends that official action to a patent applicant,

16   typically through the patent applicant's patent

17   attorney.

18   Q. How does the patent applicant typically respond

19   to the office action?

20   A. Well, what the patent applicant does is to

21   respond to each and every objection and rejection that

22   was raised by the patent examiner, either by telling the

23   examiner that, examiner, you're just wrong, for

24   identified legal and technical reasons. The patent

25   applicant may choose to amend, for example, the patent

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1 application claims, and then this response will be sent

2 in to the Patent & Trademark Office for the examiner's

3 consideration.

4 Q. And what will an examiner typically do after

5 receiving that response?

6 A. The examiner may be convinced by the arguments

7 that are presented, and at that point, allow the patent

8 application, if he or she has the requisite authority,

9 or alternatively, the examiner may choose to reject

10 again, which typically is a final rejection, the patent

11 application restating the grounds of rejection.

12 Q. If the examiner finally rejects the patent

13 applications, what options does the patent applicant

14 have at that point?

15 A. The patent applicant has an option of filing a

16 continuing application, an applicant has an option of

17 appealing to the Patent & Trademark Office's Board of

18 Patent Appeals and Interferences, the body that I was a

19 member of.

20 Q. I think we'll talk about continuing applications

21 again a little later. And what is the prosecution

22 history of a patent application?

23 A. The prosecution history of a patent application

24 is the patent office's file that's maintained during the

25 examination process. It includes the original patent

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1 application and it's a compilation of all the

2 communications that are exchanged between the patent

3 examiner and a patent applicant, either leading to the

4 abandonment of that particular patent application, or to

5 the issuance of that patent application.

6   Q. Let's talk a little now about the requirements

7 for patentability. What requirements for patentability

8 does an examiner most commonly rely on when he rejects

9 an application?

10   A. A patent examiner most commonly relies on

11 disclosure, requirements for patentability, adequacy of

12 disclosure, claimed definiteness requirements,

13 requirements for patentability over the prior art, that

14 is to say that patent application claims must be both

15 new and non-obvious variations of the prior art.

16   Q. You mentioned prior art, what is prior art?

17   A. That's actually quite a complicated question to

18 answer fully. Prior art is defined by a section of the

19 patent law 35 USC 102 and the various subparagraphs, and

20 prior art most commonly may include properly dated

21 United States patents or publications. Prior art,

22 though, can also include commercial products that have

23 been offered for sale or in public use more than one

24 year prior to filing a patent application. Prior art

25 can include the prior work of another that has not been

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1 abandoned, suppressed or concealed, but at the risk of

2 oversimplification, prior art may be thought of in

3 general as prior technological developments that are

4 public, that are at least prior to a patent

5 application's filing date.

6   Q. What's the impact on patentability if the prior

7 art subject matter falls within the scope of a patent

8 claim?

9   A. If the prior art falls within the scope of a

10 patent claim, then that claim is invalid. It's

11 fundamental notion of patent law that you can't patent

12 what's old. You can't get a right to exclude others

13 from subject matter that already belongs or exists in

14 the public domain.

15   Q. You also mentioned that examiners consider the

16 adequacy of the disclosure. What are the requirements

17 for the adequacy of the disclosure?

18   A. There are three requirements for adequacy of

19 disclosure. There's a so-called enablement requirement,

20 a written description requirement, and a best mode

21 requirement. With respect to the enablement

22 requirement, it's necessary that a patent application be

23 set forth in such full, clear, concise and exact

24 terminology that a person skilled in the art is enabled

25 to make and use the claimed invention without having to

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1   resort to undue experimentation.

2   With regard to the written description

3   requirement, it's necessary that an original patent

4   application disclosure provide support for later added

5   claims subject matter, and what's meant by that is that

6   it's necessary that the originally filed disclosure

7   evidence that a patent applicant was in possession of

8   the later claimed invention, as of the original filing

9   date.

10   With regard to the best mode requirement, if a

11   patent applicant has a contemplated best way of

12   implementing a claimed invention, that must be disclosed

13   in a patent application.

14   Q.   You also mentioned that examiners consider the

15   definiteness of the claims. What are the requirements

16   for the claims to be definite?

17   A.   Claims are required by statute to particularly

18   point out and distinctly claim the invention. And that

19   requirement is satisfied if the words of a claim

20   circumscribe a particular area with a reasonable degree

21   of precision and particularity such that the bounds of

22   the invention are reasonably precise.

23   Q.   Is it common practice for patent examiners to

24   reject patent application claims as being indefinite?

25   A.   Yes, it's extremely common for patent examiners

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1 in an official action to reject claims based on

2 indefiniteness. I hesitate to indicate a particular

3 percentage, but it wouldn't surprise me if as many as 75

4 to 90 percent of cases where there is a rejection, that

5 there will be an indefiniteness rejection. It's

6 extremely common is the message I'm trying to give.

7   Q. Well, what in your opinion is the significance

8 of this practice in the patent office?

9   A. The significance of this practice is that patent

10 examiners are trained that a patent application is much

11 like a work in progress, where -- with respect to the

12 claims. Where there's originally filed claims, and

13 examiners are claimed to work with patent applicants to

14 ultimately end up with patent application claims that

15 are reasonably precise. And examiners are encouraged to

16 raise issues with respect to indefiniteness of patent

17 application claimed language, and in order to make the

18 claim language more precise. Patent examiners often

19 have their own personal preferences with respect to how

20 they like claim language to read. And they will often

21 raise a rejection as a claim being indefinite in order

22 to get a patent applicant to change claim language in

23 order to include their personal preference.

24   What an examiner's rejection based on

25 indefiniteness does not mean is that a particular patent

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1   application claim is fatally flawed in that it violates

2   this statutory requirement that the claims particularly

3   point out and distinctly claim an invention. It's

4   actually relatively rare, although it does happen, that

5   claims are ultimately found to be indefinite, and

6   invalid because of that.

7   Q. Mr. Nusbaum, do patent examiners operate under

8   any time constraints?

9   A. Yes. Patent examiners do operate under time

10   constraints. Every examiner in the Patent & Trademark

11   Office is assigned a productivity quota defining the

12   average time they have to spend on an average patent

13   application.

14   Q. Did you personally have a productivity quota

15   when you were examining applications in the computer

16   system art?

17   A. Yes, I did.

18   Q. What was that?

19   A. When I was a primary patent examiner, my

20   productivity quota was 23.4 hours, and what that means

21   is that I was responsible for reviewing the patent

22   application and claims, searching the prior art,

23   drafting a first office action, reviewing examiners'

24   responses, all the work that needed to be done, this is

25   for an average patent application, was supposed to be

26

1 done in that period of time.

2 Q. We're going to turn now to the Rambus patent

3 tree. We have both a blow-up exhibit to set on an

4 easel, and also smaller copies for everyone to follow.

5 I think we will mark it as a demonstrative. What are we

6 up to?

7 JUDGE McGUIRE: I believe it will be DX-14 if

8 I'm not mistaken.

9 MR. STONE: I believe that's right, Your Honor.

10 MS. MICHEL: Your Honor, may I approach and hand

11 you a copy of the exhibit, also?

12 JUDGE McGUIRE: Please.

13 (DX Exhibit Number 14 was marked for

14 identification.)

15 MS. MICHEL: Your Honor, do you have any

16 preference as to where we place an easel with a blow-up

17 on it? We are going to have several such demonstratives

18 today.

19 JUDGE McGUIRE: Maybe right over here where I

20 can see it and it can also be seen by opposing counsel.

21 MS. MICHEL: Thank you. Well, we have to make

22 sure he can see it as well, and the witness.

23 MS. MICHEL: Yes.

24 BY MS. MICHEL:

25 Q. Well, luckily we all have small ones of DX-14.

26

1   So, I think that we will also be able to refer to those,

2   Mr. Nusbaum, as we talk about this. Mr. Nusbaum, I

3   would like you to now look at this family tree. Do you

4   recognize this exhibit which has been designated as

5   DX-14?

6   A. I do recognize this exhibit, but I have to

7   confess that I have great difficulty reading it.

8   JUDGE McGUIRE: You aren't the only one.

9   THE WITNESS: The interior of the blocks here.

10   MR. STONE: We can stipulate to that.

11   JUDGE McGUIRE: But we'll just do what we have

12   to do, go ahead and proceed and --

13   MS. MICHEL: Your Honor, I think we actually

14   won't need to read the smaller numbers on there, it's

15   more to get the lay of the land.

16   JUDGE McGUIRE: All right, go ahead.

17   BY MS. MICHEL:

18   Q. So, I will proceed as-is, and if it becomes an

19   issue, then we'll work it out then.

20   Mr. Nusbaum, how do you recognize this exhibit?

21   A. I received what I believe to be a substantively

22   identical version of this Rambus patent tree from

23   various employees at the FTC, together with materials

24   that enabled me to verify its accuracy.

25   MS. MICHEL: Your Honor, I understand that the

26

1   parties have stipulated to the accuracy of the tree.

2   JUDGE McGUIRE: Mr. Stone, is that correct?

3   MR. STONE: Yes, Your Honor.

4   JUDGE McGUIRE: Okay, so noted.

5   BY MS. MICHEL:

6   Q. Mr. Nusbaum, please describe just very generally

7   what the exhibit shows.

8   A. It may help if I can approach the exhibit.

9   JUDGE McGUIRE: Yeah, go ahead.

10   THE WITNESS: What this Rambus tree shows is in

11   the upper left-hand corner of the tree, the very first

12   filed Rambus patent application is designated which is

13   application 07/510,898. This application was filed on

14   April 18th, 1990. Every patent application and issued

15   patent that's represented on this chart flows from this

16   single first filed patent application.

17   On the right-hand -- along the right-hand margin

18   of the exhibit is the year 1990, which is lined up with

19   the filing -- the year of filing of the originally filed

20   Rambus application, and then down the right-hand margin,

21   the various years are indicated through 2003.

22   All the patent applications that -- well, first

23   of all, the patent applications are indicated in this

24   chart, if you take a look at the key, in blue. The

25   patents, on the other hand, which matured from patent

26

1   applications to which they are linked on this tree are

2   indicated in yellow, by a yellow rectangle, and the

3   patents that have been asserted by Rambus in patent

4   litigation are indicated by yellow rectangles

5   circumscribed by red.

6   In the middle of this chart is a date indicating

7   June '96 with a red dotted line, and this is the date

8   that the FTC is alleging that Rambus ceased becoming a

9   member of JEDEC.

10   BY MS. MICHEL:

11   Q. Mr. Nusbaum, I believe you said the patent

12   applications shown on the chart flow from the '898

13   application. Can you explain what you meant by that?

14   A. Yes. Each of these applications is either

15   what's referred to as a continuation application or a

16   divisional application of the originally filed patent

17   application.

18   Q. Okay, thank you. You can have a seat, please.

19   You just mentioned continuation application.

20   What is a continuation application?

21   A. A continuation application is a patent

22   application that names one or more of the inventors of a

23   prior patent application that was filed during the

24   pendency of the prior application. What I mean by

25   pendency is while the prior application was pending

26

1   before the Patent & Trademark Office, that is to say,

2   before the prior application was abandoned or that it

3   became a patent, typically -- oftentimes a continuation

4   application is generated by copying the originally filed

5   application, because a continuation application is not

6   permitted to add any so-called new matter to the patent

7   application.

8   Q.   What is the significance with regard to the

9   filing date of a patent application for the fact that it

10   is a continuing application?

11   A.   Presuming that the requirements of a particular

12   statute are satisfied, a continuing application will be

13   able to gain the benefit of the filing date of the

14   parent application. So, with respect to the later filed

15   applications, to the extent that a debtor receiving the

16   filing date of the parent application, they will be

17   accorded a filing date of April 18th, 1990.

18   Q.   What is a divisional application?

19   A.   A divisional application is much like a

20   continuation application in that it's an application

21   which names one or more of the inventors of an

22   identified prior application adds no new matter to the

23   disclosure of the parent application, but in the case of

24   the continuation or divisional application, what a

25   divisional application does is it carves out certain

26

1   claims subject matter that is present in the current

2   application, and that subject matter is filed with the

3   divisional application.

4   JUDGE McGUIRE: Now I'm confused, again, just so

5   I'm clear as to these two types of applications, you

6   know, what's the chief distinction between the two that

7   you have just testified on?

8   THE WITNESS: The chief distinction is that a

9   divisional application will typically arise when a

10   patent examiner looks at a parent application and

11   decides that there's multiple inventions, multiple

12   claimed inventions. And what the examiner does is sends

13   a communication to the patent applicant that's called

14   the restriction requirement, and requires the applicant

15   to elect one of these groups of inventions. The

16   applicant will prosecute in the original parent

17   application the chosen or elected group of inventions.

18   To those groups of inventions that aren't elected, the

19   applicant may choose to file divisional applications

20   which are directed to these different groups of claimed

21   inventions that were not elected, or not chosen.

22   JUDGE McGUIRE: Is it fair to say that they are

23   in their own right claims that emanate, you know, from a

24   founding application? Are they claims within

25   themselves?

26

1   THE WITNESS: Yes. That's correct. For

2   example, an examiner may say that in an original

3   application their claims 1 to 5 define one group of

4   inventions and 6 to 10 define an independent and

5   distinct group of inventions, and the examiner may --

6   the applicant may choose to prosecute in the original

7   case claims 1 to 5, the applicant would then later file

8   a divisional application that would be restricted to

9   claims 6 to 10.

10   JUDGE McGUIRE: Okay. All right, go ahead.

11   BY MS. MICHEL:

12   Q. Did Rambus receive a restriction requirement

13   during prosecution of the '898 application?

14   A. Yes. Rambus during the prosecution of the first

15   filed application received an 11-way restriction

16   requirement.

17   Q. And just very generally, what was Rambus'

18   response to that restriction requirement?

19   A. Rambus chose to prosecute one of those 11 groups

20   of claims in the originally filed '898 application, and

21   then Rambus on I believe it was March 5th, 1992, filed

22   10 divisional applications. And if you see the first --

23   the line of 10 applications that are aligned by 1992,

24   those are the 10 divisional applications that were filed

25   on March 5th, 1992.

26

1   Q.   In terms of identifying prior art, what's the

2 significance that the applications on the Rambus patent

3 tree are continuations on divisionals?

4   A.   Presuming that the original application

5 satisfies the disclosure requirements that I identified,

6 the three disclosure requirements, and then if, for

7 example, we're dealing with a patent application that

8 unfortunately I can't identify specific applications due

9 to my inability to read this, but let's just presume

10 that a patent application, and there were some here that

11 were filed in 1995. So, the individual filing date for

12 that application, the actual filing date for that

13 application is some time in 1995.

14   And then let's presume that there was a

15 publication that arose of that exact same claimed

16 invention in 1993. Let's presume it was an

17 applicant's -- the applicant's own publication, or it

18 could have been somebody else's publication, any kind of

19 disclosure.

20   The examiner would not be able to rely on that

21 prior art disclosure as being prior art, presuming that

22 the application was entitled to the benefit of the

23 original filing date, what the examiner would have to

24 find would be a prior art publication that at least

25 predated what I believe to be April 18th, 1990.

26

1   Q. Okay, why would an applicant typically file a

2   continuation application?

3   A. A patent applicant would file a continuing

4   application for a number of different reasons. A patent

5   applicant might receive a final rejection from a patent

6   examiner, and decide that rather than appealing the

7   final rejection to the board of appeals, that they would

8   be better served by submitting further arguments to this

9   same patent examiner. That could be done by filing a

10   continuation application, paying a new government filing

11   fee, and starting a process anew.

12   Also, continuing applications are filed to

13   permit an original application to issue into a patent,

14   and to seek claims that are of a different scope than

15   the prior application. And in this fashion, build up a

16   patent portfolio.

17   Q. Can events in the prosecution of a parent patent

18   application impact a continuing application?

19   A. Yes. They surely can. With respect to commonly

20   disclosed subject matter between a parent application

21   and a continuing application, and in the case of the

22   continuation application, there's an exact

23   correspondence between the two specifications,

24   typically, that the parent application and continuation

25   application prosecution is treated as being a continuous

26

1   transaction before the Patent & Trademark Office.

2   So, the parent application prosecution may well

3   be used, for example, to continue the claims of the

4   continuing application.

5   Q. I would like to turn now to CX-1451, and it's

6   the '898 patent application. Mr. Nusbaum, do you

7   recognize this exhibit?

8   A. Yes, I do.

9   Q. And what is it?

10   A. This exhibit is the -- is a copy of the

11 originally filed Rambus patent application that I

12 pointed to that was in the upper left-hand corner of the

13 Rambus patent tree, through which all the other patent

14 applications flowed.

15   MS. MICHEL: Your Honor, we're going to

16 distribute copies. Would you like a full copy of this

17 exhibit?

18   JUDGE McGUIRE: Is it going to be on the ELMO?

19 When you say copies, of what?

20   MS. MICHEL: The application itself is about 150

21 pages. We'll be looking at some specific pages.

22   JUDGE McGUIRE: No, I do not need a specific

23 set. I can just view it off the ELMO.

24   MS. MICHEL: I think we will, however,

25 distribute copies to opposing counsel, if they wish.

26

1   JUDGE McGUIRE: Yes, they would like that.

2   BY MS. MICHEL:

3   Q. Mr. Nusbaum, how many original claims were

4 submitted with this application?

5   A. There were 150 original claims submitted with

6 this patent.

7   Q. All right, and where are they located in the

8 document?

9   A. Patent application claims are always towards the

10 end or at the end of the patent specification, and in

11 this case, if you look at page 63, the typewritten 63,

12 which denotes page 63 of the specification, through page

13 124, are the original claims, the 150 original claims.

14   Q. Okay, I would like to start by looking at claim

15 1. With reference to claim 1, could you just explain to

16 us the different components of a patent application.

17   A. You mean the different components of a patent

18 application claim?

19   Q. Oh, I'm sorry, yes, excuse me. Could you just

20 please give us a general explanation of the different

21 components of a patent claim and use claim 1 as an

22 example to illustrate the point.

23   A. Yes. Claim 1 is an example of a claim, and it

24 begins -- it's a single sentence, it begins with a

25 capital letter and ends with a period. The portions of

26

1   a claim include the claim preamble, which is oftentimes

2   very easy to spot in a claim, because there's a

3   transition word "comprising" that denotes the end of the

4   preamble, and in this case, the preamble is "a memory

5   subsystem comprising." This sets -- the claim preamble

6   sets forth the environment of the claim. It typically

7   is considered to be a limitation of the claim to the

8   extent that it breathes life and meaning into the claim,

9   which it will if it's linked with elements in the body

10 of the claim.

11   The term "comprising" is a transitional term

12 that is referred to as being open-ended. That means

13 that in order to be covered by this claim, you need to

14 have the elements that are recited in the claim, but you

15 can have untold other elements as well, because the term

16 "comprising" is open-ended.

17   The remainder of the claim that begins with "two

18 memory devices connected in parallel to a bus," through

19 the period, is referred to as the body of the claim,

20 setting forth the various elements and indications of

21 the claim.

22   Q.   Thank you. Now, may we please see claims 1 and

23 2 up on the screen. Mr. Nusbaum, please explain the

24 difference between independent claims and dependent

25 claims.

26

1   A.   Claim 1 is an example of an independent claim.

2   It stands on its own, it doesn't refer to any other

3   claim. It's independent. On the other hand, claim 2 is

4   a typical example of a dependent claim. It reads, "The

5   memory subsystem of claim 1," and what that means is

6   that you can treat claim 2 as if all the limitations of

7   claim 1 were physically incorporated into claim 2, but

8   claim 2 is dependent upon claim 1, and therefore it's

9   referred to as a dependent claim.

10   Q.   How are patent examiners trained that claims

11   should be interpreted with respect to the patent

12   application?

13   A.   Patent examiners are trained that claims are not

14   to be read in a vacuum, but rather that they must be

15   interpreted in light of the patent specification. At

16   the same time, patent examiners are also trained that

17   they are not to import limitations from the patent

18   specification into the claim that are not otherwise

19   present in the claim.

20   Q.   Is there a claim interpretation standard that

21   patent examiners are required to use?

22   A.   Yes, there certainly is. The claim

23   interpretation standard that patent examiners are

24   required to use is the broadest reasonable

25   interpretation consistent with the specification.

26

1   Q. Could you please explain for us what that means?

2   A. Yes. The broadest reasonable interpretation

3 standard that examiners are required to employ means

4 that examiners are to view claimed terminology as

5 broadly as they reasonably can view the terminology.

6 For example, if there's a claim limitation that calls

7 for a plurality of devices, and in the patent

8 specification there are ten devices shown, the broadest

9 interpretation of that terminology would be two or more.

10 The examiner is trained not to be focused on the fact

11 that the specification talks about 10. Similarly, with

12 the term "memory device," the specification may describe

13 certain types of memory devices, such as DRAMs or

14 SDRAMs, but an examiner in interpreting memory device

15 would look far more broadly at the term "memory device,"

16 and be trained to keep in mind to be looking for any

17 type of memory device.

18   Q. Why is this claim interpretation approach used

19 in the PTO?

20   A. This claim interpretation approach is used in

21 the Patent & Trademark Office because it's very

22 important that once a patent issues, and is asserted in

23 a litigation, that a patentee doesn't assert an

24 interpretation of a claim that's actually broader than

25 what the patent examiner was using when he was searching

26

1   for the prior art in determining patentability with

2   respect to the prior art.

3   If this standard were not employed, then, and

4   examiners were viewing claims too narrowly and an

5   applicant or patentee were to follow and interpret the

6   claim broadly, what really may happen is that a patentee

7   may be asserting a claim that an examiner, if he had a

8   broader view, would recognize would be unpatentable over

9   the prior art.

10   Q.   Switching gears, are there any limitations of

11   claim 1 that are essentially repeated in the majority of

12   the 150 claims?

13   A.   Yes, there definitely are.

14   Q.   With reference to claim 1, what are those

15   limitations?

16   A.   In the context of referring to a bus, that

17   carries substantially all address, data and control

18   information, there's a limitation that said bus

19   containing substantially fewer bus lines than the number

20   of bits in a single address, and said bus carrying

21   device-select information, without the need for separate

22   device-select lines, connected directly to individual

23   memory devices.

24   Q.   Which of the 150 claims contain those

25   limitations? Generally.

26

1   A.   There are 20 independent claims among the 150

2 claims in this application. Eighteen of those 20 claims

3 include at least one of these two what I'll refer to as

4 multiplex bus limitations. Of those 18 independent

5 claims, 16 of the independent claims include both those

6 limitations.

7   Q.   Do you recall which claims do not contain those

8 limitations?

9   A.   Yes. Claims 73 to 81 do not contain those

10 limitations, and claims 91 to 94. There's two

11 independent claims in those groupings, claim 73 is an

12 independent claim, and claim 91 is an independent claim.

13   Q.   Let's come back to that. First, looking at the

14 limitation of claim 1, which recites, "Said bus

15 containing substantially fewer bus lines than the number

16 of bits in a single address," does the '898 patent

17 specification describe that phrase?

18   A.   Yes, it does.

19   Q.   And do you recall where? Or can you give us an

20 example?

21   A.   Yes. If one turns to the summary of the

22 invention. In the context of describing the present

23 invention as opposed to an exemplary implementation,

24 this is on page 7 of the specification, the summary of

25 the invention.

26

1   Q. Okay.

2   A. It's stated that "The present invention includes

3   a memory subsystem," and there's a discussion of the bus

4   carrying substantially all address, data and control

5   information. And then it's stated in lines 16 and 17,

6   that "the bus has substantially fewer bus lines than the

7   number of bits in a single address." Additionally, with

8   respect to characterizing the buses having very few

9   lines, towards the end of page 7, there's an indication

10 that, "The new bus," going over to the next page,

11 "Includes clock signals, power and multiplexed address,

12 data and control signals." And then it's stated, "In a

13 preferred implementation, 8 bus data lanes and an

14 address valid bus line carry address, data and control

15 information for memory addresses up to 40 bits wide."

16   So, there is an example there of the bus lines

17 being substantially less than the number of lines in a

18 single address.

19   Q. Does the detailed description of the invention

20 section of this patent application provide any examples

21 describing the phrase "substantially fewer bus lines

22 than the number of bits in a single address?"

23   A. Yes. If one turns to the very first sentence of

24 the detailed description of page 11 of the

25 specification.

26

1   Q.   And I believe that's page 13 in the exhibit.

2   A.   There's an indication that "The present

3   invention is designed to provide a high-speed

4   multiplexed bus for communication." There is an

5   indication in lines 22 to 23 that, "The bus consists of

6   a relatively small number of lines," once again this

7   theme of small number of lines connected in parallel to

8   the bus. And then, at page 14 of the exhibit, at page

9   12 of the spec, there's a further example where it's

10   indicated that, "Using the organization described

11   herein, very large addresses (40 bits in the preferred

12   implementation) and large data blocks (1024 bites) can

13   be sent over a small number of bus lines (8 plus one

14   control line in the preferred implementation.)"

15   BY MS. MICHEL:

16   Q.   Now turning to the other implementation of claim

17   1, which you identified, which I believe you said stated

18   the bus carrying device-select information without the

19   need for device-select lines, does the '898 patent

20   specification describe that phrase?

21   A.   Yes, it does. Once again, at page 9 of the

22   exhibit, and the summary of the invention, and once

23   again in the context of describing the present invention

24   as opposed to an exemplary implementation, the present

25   invention is described as including, and this is in line

26

1   17 through 19, that, "The bus carries device-select

2   information without the need for separate device-select

3   lines connected directly to individual devices."

4   Q. Does the detailed description section of the

5   application also mention this phrase?

6   A. Yes, it does. At page 14 of the exhibit or page

7   12 of the specification. There's an indication that

8   "there is no need for separate device-select lines,

9   since device-select information for each device on the

10   bus is carried over the bus."

11   Q. Let's go back to claim 73. And I believe that's

12   at page 89 of the exhibit. Mr. Nusbaum, I believe you

13   stated that claim 73 does not contain either of the two

14   limitations that we've been discussing. What,

15   generally, does that claim cover?

16   A. Claim 73 covers a bus subsystem that is directed

17   to a so-called loop clocking system and it specifically

18   states that there is a clock generator that's connected

19   to the first end of a bus clock line to generate early

20   clock signals, and then in the next paragraph, there's

21   an indication that there is a signal return means at the

22   second end of said bus clock line to return said early

23   bus clock signals to said first end of said bus as

24   corresponding late bus clock signals.

25   And this -- there is a dependent claim that

26

1   indicates more specifically what this system covers in a

2   dependent claim context, and that is claim 78, which

3   indicates that "A semiconductor device has an internal

4   device clock generating means to derive the midpoint

5   time between set early and corresponding late bus clock

6   signals and to generate an internal device clock

7   synchronized to said midpoint in time." So, the result

8   is that there is an average clock signal that is

9   generated.

10   Q. If you will now please turn to claim 91. You

11   mentioned that this claim also does not contain the two

12   limitations that we discussed. What generally does this

13   claim cover?

14   A. Claim 91, as indicated, in the claim preamble,

15   is directed to a package, the package contains a

16   semiconductor die, and the next paragraph there's an

17   indication that the package comprises a plurality of bus

18   connecting means for connecting to a plurality of

19   external bus lines. There are some other limitations,

20   but at the end of the claim there's the requirement that

21   "each of the external bus lines can be connected to said

22   corresponding connecting area on the semiconductor die

23   by bus connection means that are positioned along a

24   single side of the package."

25   MS. MICHEL: Your Honor, I would like to request

26

1   at this time that CX-1451 be entered into evidence.

2   JUDGE McGUIRE: It won't be entered, just

3   marked. I mean, if you want to make it a CX exhibit, I

4   would consider entering it, but as a DX, I'm not

5   entering those, they're just -- they're part of the

6   record, but they're not entered into evidence.

7   MS. MICHEL: I understand, Your Honor. I'm

8   actually referring to the '898 patent specification.

9   JUDGE McGUIRE: I'm sorry, I thought you said

10   the DX.

11   MR. STONE: No objection.

12   JUDGE McGUIRE: No objection, so entered, I

13   apologize.

14   MS. MICHEL: And that's CX-1451.

15   (CX Exhibit Number 1451 was admitted into

16   evidence.)

17   JUDGE McGUIRE: Okay.

18   BY MS. MICHEL:

19   Q. Mr. Nusbaum, have you become familiar with JEDEC

20   SDRAM standard release 4 work?

21   A. Yes, I have.

22   Q. How has that occurred?

23   A. I received from various employees at the FTC a

24   copy of the JEDEC standard configurations for solid

25   state memories, JEDEC standard number 21C, Release 4,

26

1   that was published in November of 1993, that's marked

2   JX-56-001. And I studied this document focusing on the

3   SDRAM features. I discussed these features with Dr.

4   Jacob, the FTC's technical expert. I also received

5   various documents relating to JEDEC proposals relating

6   to phase locked loop PLL features and dual edge clocking

7   features. And I also discussed those with Dr. Jacob.

8   I also heard testimony from Mr. Rhoden regarding

9   both the standard and the proposals. I read testimony

10 by Mr. Williams relating to a block diagram, I think

11 it's identified as DX-4, that relates to casting of

12 latency in a mode register.

13   Q. Based on that review and your understanding of

14 patent law, do you believe that any of the original 150

15 claims in the '898 patent application cover JEDEC-

16 compliant SDRAMs?

17   A. No, I don't believe any of the original claims

18 cover JEDEC-compliant SDRAMs.

19   MR. STONE: Your Honor, this is the subject of a

20 stipulation that we've already entered into. I'm not

21 sure if Ms. Michel feels the need to put into evidence

22 as to things we've stipulated to already or not.

23   MS. MICHEL: Your Honor, I think the

24 explanation, especially with regard to the original 150

25 claims, is particularly helpful and important to

26

1   complaint counsel's case.

2   JUDGE McGUIRE: All right, then I'll entertain.

3   MR. STONE: Your Honor, my point is it's not in

4   dispute.

5   JUDGE McGUIRE: It's not in dispute, but as an

6   aid to the court, I will entertain the answer. Go

7   ahead.

8   BY MS. MICHEL:

9   Q. Thank you.

10   Mr. Nusbaum, could you explain, please, the

11   basis for your belief that the original 150 claims do

12   not cover JEDEC-compliant SDRAMs?

13   A. Yes. With respect to the 18 out of the 20

14   independent claims, that is all claims except for 73 to

15   81, and 91 to 94, as I testified, there are claim

16   limitations of one out of the two multiplex bus related

17   limitations that I identified. More particularly,

18   there's a limitation in the context of a bus that

19   carries substantially all address data and control

20   information, that that bus contain substantially fewer

21   bus lines than the number of bits in a single address.

22   Looking at Mr. Rhoden's presentation, one could

23   see a wide bus that did not have substantially fewer bus

24   lines than the number of bits in a single address.

25   Additionally, with respect to the second so-called

26

1   multiplex bus limitation, there's a requirement that the

2   bus carrying device-select information, without the need

3   for separate device-select lines that are connected

4   directly to individual memory devices. Well, as we saw

5   in the JEDEC presentations by Mr. Rhoden and also by Mr.

6   Williams, that there's chip select lines that are

7   involved in a JEDEC-compliant SDRAM that are indeed

8   connected directly to individual memory devices.

9   So, with respect to 18 out of the 20 independent

10   claims, in all claims but 73 to 81 and 91 to 94, those

11   limitations form a basis for why they cannot cover a

12   JEDEC-compliant SDRAM.

13   Turning to claim 73 to 81, these claims are

14   directed to this looped clocking scheme which result in

15   the generation of an average clock signal, an imaginary

16   clock signal, and it's my understanding that that

17   clocking scheme is not employed in a JEDEC-compliant

18   SDRAM.

19   Claims 91 to 94, the only remaining claims, are

20   directed to, as I just testified, a package where the

21   connection means positioned along a single side of the

22   package. These claims claim a package which are

23   possible by virtue of the narrow bus that is disclosed

24   in the Rambus patent application. For example, at page

25   42 of the specification, it's indicated that by using a

26

1   narrow bus, the pin count for an arbitrarily large

2   memory device can be kept quite small, and then it's

3   indicated that as a result of this, off device

4   connections can be implemented on one single edge of the

5   memory device, and that's -- that is what's claimed in

6   91 to 94, and it's my understanding that that packaging

7   is not utilized in any JEDEC Release 4 compliant SDRAM.

8   Q. Would a reasonable patent attorney prior to

9   filing and drafting a patent application having 150

10   original claims be expected to have conferred with the

11   inventors of the application?

12   MR. STONE: Your Honor, there's no basis for

13   testimony about what a reasonable patent attorney would

14   have done in terms of conferring with the inventors.

15   It's not an issue in this case, it's not a proper

16   subject for expert testimony. There either were or

17   there were not such conversations. If they bear on this

18   case, they can certainly ask the inventors or ask the

19   attorneys. There's no basis for someone to come in and

20   say whether an attorney would or would not confer with

21   the inventor. It's not an issue in the case and it's

22   not a proper subject for testimony.

23   JUDGE McGUIRE: Ms. Michel?

24   MS. MICHEL: Your Honor, I would like to

25   respond. Actually, Rambus has made as part of its case

26

1   what a reasonable patent attorney or engineer would have

2   understood about the original patent application, which

3   was public as of 1993 or earlier. And I believe that

4   testimony from an expert like Mr. Nusbaum about how a

5   reasonable patent attorney would have viewed that patent

6   application is, in fact, relevant to that issue.

7   MR. STONE: Your Honor, that's not the issue

8   we've put in the case, but even if it were the issue

9   that we put in the case, that doesn't go to the question

10 of whether inventors would confer with their patent

11 attorney, and that's the question pending. And in this

12 case, it's a matter of fact. They either did confer or

13 they didn't confer, there will be opportunities for them

14 to inquire, they have inquired, it's in the depositions

15 that they've designated.

16   JUDGE McGUIRE: Are you saying that this inquiry

17 is along two lines, one is whether the inventor, you

18 know, should be conferring with the patent attorney, and

19 whether a reasonable -- we're talking about two

20 different things here, I want to be sure.

21   MR. STONE: I think Ms. Michel -- my objection

22 to the pending question is that the witness was asked

23 would a reasonable patent attorney confer with the

24 inventor, in the course of preparing the application.

25 And as to that, this is not a case about whether the

26

1   lawyers did or did not carry out what they're required

2   to do by whatever the standard of care is, and in this

3   case, if they did confer or didn't confer, that would be

4   a matter of fact. There's no purpose for having opinion

5   testimony as to whether an attorney should or should not

6   talk to the inventors.

7   MS. MICHEL: Your Honor, perhaps I can rephrase

8   the question in a way that alleviates the objection.

9   JUDGE McGUIRE: Okay, go ahead.

10   BY MS. MICHEL:

11   Q.   Mr. Nusbaum, would a reasonable patent attorney

12   reading the '898 application and the original 150 claims

13   have expected the patent attorney involved in the

14   application to have conferred with the inventors?

15   MR. STONE: Your Honor, there are two part

16   objections. I mean, first, there's still no reason for

17   whether somebody would assume that you have conferred

18   with the inventors or not. Secondly, this witness does

19   not have expertise, and I do request an opportunity to

20   voir dire him. He has not been established as an expert

21   on what attorneys would do upon reading patent

22   applications. And what they would think. He testified

23   at his deposition that he has never been asked, that he

24   can remember to look at a patent application and

25   conclude from that the scope of claims that might

26

1   ultimately issue.

2   JUDGE McGUIRE: Well, now he has been qualified

3   as an expert in two areas, patent law practice and

4   patent law. So, I would assume that under either of

5   those criteria, he should be allowed to answer that

6   inquiry.

7   MR. STONE: No, because this is neither a

8   question of patent law, this is not an issue of patent

9   law, he has talked about the law, this is an issue about

10   what people would do upon seeing an application.

11   JUDGE McGUIRE: How about patent law in the

12   practice?

13   MR. STONE: No, this is not the practice of

14   patent law. This is something that most often is done

15   as the facts will bear out by engineers. It's not the

16   practice of patent law. He doesn't as part of his

17   practice conduct investigations where he looks at

18   published patent applications and tries to advise people

19   on the ultimate scope of claims that may issue. And he

20   was asked this at his deposition, he says I can't

21   remember ever having done it. So there's no --

22   MS. MICHEL: Your Honor --

23   JUDGE McGUIRE: I'll give you a chance, Ms.

24   Michel, let him finish.

25   MR. STONE: So, there is no basis in his

26

1   expertise or his experience to offer this opinion.

2   JUDGE McGUIRE: All right, Ms. Michel?

3   MS. MICHEL: Your Honor, I think Mr. Stone's

4   reading much more into the question than actually

5   exists. I am not asking Mr. Nusbaum to testify to

6   anything about claims that might come out of the

7   specification, and nor will I in the following

8   questions. The question was simply directed towards how

9   a patent attorney seeing the original '898

10   specification, which was public at one point, would

11   understand about a consultation. I think that the

12   follow-up question will go to that.

13   JUDGE McGUIRE: I will entertain the objection,

14   I will overrule the objection. You can take it up on

15   cross examination, if you please.

16   MS. MICHEL: Could I ask the court reporter to

17   read back the question I asked.

18   (The record was read as follows:)

19   "QUESTION: Mr. Nusbaum, would a reasonable

20   patent attorney reading the '898 application and the

21   original 150 claims have expected the patent attorney

22   involved in the application to have conferred with the

23   inventors?"

24   THE WITNESS: Yes. I --

25   MR. STONE: Your Honor, all he's been asked to

26

1   do is answer that yes or no. He has not been asked to

2   give an explanation, and I move to strike if he goes

3   beyond that. I think he should be limited in this area

4   to carefully answer the questions as posed.

5   JUDGE McGUIRE: Sustained. Go ahead, Ms.

6   Michel.

7   BY MS. MICHEL:

8   Q. Why is that?

9   MR. STONE: Your Honor, again, he's now giving

10   us his opinion that you would expect the inventor would

11   have talked to his lawyer. Fine. He has no basis for

12   expressing an opinion as to why nothing in his

13   experience suggests that. It's not something he's ever

14   done. He has never made a study. He has no -- he's

15   never made a study of how many times --

16   JUDGE McGUIRE: Well, maybe at this point you

17   should conduct any voir dire and let's see what's in his

18   experience.

19   MR. STONE: Okay, I appreciate that, Your Honor.

20   JUDGE McGUIRE: So we can avoid having to

21   continue on this line. I think this is a good time to

22   do that and then maybe we can establish some facts.

23   VOIR DIRE EXAMINATION

24   BY MR. STONE:

25   Q. Mr. Nusbaum, have you ever conducted a

26

1   statistical study to determine how many inventors confer

2   with their attorneys before patent applications are

3   filed?

4   A.   No, I have never conducted any such statistical

5   study, nor am I aware that any exists.

6   Q.   Is there any requirement of the patent office

7   that a patent attorney certify amount of time he has

8   spent talking to the inventor before he files an

9   application on his behalf?

10   A.   Of course not.

11   Q.   Can a patent attorney write an application and

12   submit it to the patent office consistent with the rules

13   of conduct, without meeting and conferring with all the

14   inventors?

15   A.   It is possible, yes.

16   Q.   And in your experience, have you ever set up two

17   stacks of patent applications, those that have been

18   written without conferring with the inventors and those

19   that have been written after conferring with the

20   inventors and performed some sort of study that lets you

21   look at those applications and determine from their

22   content whether the attorney did or did not confer with

23   the inventors?

24   A.   No, I have never set up such a stack or made

25   such a study.

26

1   Q. And in your practice, you've always conferred

2 with the inventors before filing, have you not?

3   A. Where I've drafted original applications, I have

4 conferred with the inventors when they were available.

5   Q. Have you ever seen an application, an original

6 application, where you knew it had been drafted without

7 any consultation with the inventors?

8   A. When you say without any consultation with the

9 inventors, I'm not quite sure what you mean.

10 Consultation by whom?

11   Q. By the attorney. Have you ever seen an original

12 patent application where you knew it had been drafted by

13 the patent attorney who filed it, without any

14 consultation with the inventors?

15   A. That happens from time to time.

16   Q. And can you tell by looking at that application

17 whether the consultation had or had not occurred?

18   A. There's no way of knowing just based on that

19 information.

20   MR. STONE: Thank you.

21   JUDGE McGUIRE: All right, Mr. Stone, did you

22 want to do any follow-up argument, having conducted voir

23 dire?

24   MR. STONE: Yeah, I think, Your Honor, the final

25 question was, there's no way by telling by looking at

26

1   the application whether the inventor had consulted with

2   the lawyer who prepared it or not. He says there's no

3   way of knowing. And I think that establishes that

4   there's no basis for him to express an opinion by

5   looking at the '898 application as to whether you would

6   assume that there had or had not been such consultation.

7   JUDGE McGUIRE: Again, I am going to let you

8   take that up on any cross examination. I think that's

9   where that ought to lie. Go ahead, Ms. Michel.

10   FURTHER DIRECT EXAMINATION

11   BY MS. MICHEL:

12   Q. Mr. Nusbaum, why is it that a reasonable patent

13   attorney reading the '898 application and 150 claims

14   would assume that the attorney drafting those 150 claims

15   had conferred with the inventors?

16   A. If one takes a look at the '898 patent

17   application, the written specification tracks from page

18   1 to 62, and that written specification is the written

19   specification that resulted in all of the other

20   specifications on that patent tree. The claims that

21   were drafted in this case go from pages 63 to 124. So,

22   there was approximately 60 typewritten pages of claims

23   as well. A massive effort went into drafting those

24   claims. And as a matter of patent practice, a patent

25   attorney is obliged to gain the best understanding that

26

1   he or she can in order to make sure that claims are

2   formulated that give an applicant the protection that

3   the applicant merits when considered in light of the

4   prior art that the patent -- that the inventor is aware

5   of, as well as the patent counsel.

6   And in light of the massive effort that was

7   undertaken, it's at least my presumption that a

8   reasonable patent practitioner would have conferred with

9   the inventors to get the benefit of the inventors'

10   insight as to what the unique aspects were of the

11   invention, in light of the prior art.

12   Q. Does the '898 patent application provide any

13   indication to a reasonable patent attorney reading that

14   application that the claims were drafted with prior art

15   in mind?

16   A. Yes. At page 3 of the specification, that's the

17   typewritten 3, there's a section called Comparison with

18   Prior Art, and there is a discussion of somewhere on the

19   order of 14 patents from pages 3 through the top of page

20   6 of the specification.

21   Q. In your view, would a reasonable patent

22   practitioner reviewing the '898 patent application have

23   presumed that the original claims included unnecessary

24   limitations?

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

26

1   is a topic of which this witness has never expressed any

2   experience or expertise as to whether looking at someone

3   else's application you could draw inferences as to what

4   the lawyer drafting the application had in mind. He

5   never testified that that's something that he's done in

6   his experience, it's outside his area of expertise.

7   JUDGE McGUIRE: I think that's your same

8   opposition that you just made, Mr. Stone, that was

9   overruled. So, I'm going to overrule this one as well.

10   BY MS. MICHEL:

11   Q. Would you like the question read back?

12   A. I think I have it. In my opinion, a reasonable

13   practitioner would not have presumed in this particular

14   case that there were unnecessary limitations in the

15   original claims. The original claims are permeated, as

16   I previously testified, by two multiplex bus limitations

17   that we went over that appear in 18 out of the 20

18   independent claims. In wrestling with when those

19   limitations are likely to be unnecessary limitations, in

20   the summary of the invention, those two limitations in

21   the very first paragraph of the summary of the invention

22   are characterized as being the present invention and are

23   identified expressly, those two limitations. They're

24   not characterized as merely being exemplary

25   implementations.

26

1   So, they are featured limitations that I don't

2   believe would be regarded or be presumed to be

3   unnecessary that could be eliminated. Additionally,

4   because of the very large number of claims, 150 claims,

5   and the associated massive effort that would have been

6   presumed to have gone into those claims, including the

7   analyzing the prior art, in my view, a reasonable

8   practitioner would not have presumed that there were

9   unnecessary limitations.

10   Q. Have you formed opinions about certain of those

11 applications that were pending before the patent office

12 prior to June 1996?

13   A. Yes, I have.

14   Q. Please just generally state your opinion with

15 regard to those applications.

16   JUDGE McGUIRE: All right, I'm going to ask you

17 to -- that question is a little too broad. I want you

18 to be more detailed in the question. I don't want a

19 long narrative answer here to such a broad question.

20   BY MS. MICHEL:

21   Q. I'll withdraw that question.

22   Mr. Nusbaum, have you identified any Rambus

23 patent applications that in your opinion contain claims

24 covering the programmable burst length and programmable

25 cast latency features of JEDEC-compliant SDRAMs, and

26

1   I'll limit that question to Rambus patent applications

2   pending prior to June 1996.

3   A. Yes, I have.

4   Q. Which patent applications have you identified as

5   such?

6   A. I have identified application 847,961 as an

7   application that includes claims that cover cast

8   latency -- programmable cast latency and burst length,

9   and I have identified application 469,490 as including

10   claims that cover programmable cast latency.

11   Q. Do you see on the screen the first page of

12   Exhibit CX-1504.

13   A. Would it be possible if I could take a short

14   break?

15   JUDGE McGUIRE: Sure, let's take a five-minute

16   break.

17   (Whereupon, there was a brief pause in the

18   proceedings.)

19   JUDGE McGUIRE: This hearing is now in order.

20   Counsel, you may proceed.

21   BY MS. MICHEL:

22   Q. Mr. Nusbaum, I would like to ask you to refer to

23   Exhibit CX-1504, which is a prosecution history, and the

24   first page of it is up on the screen.

25   Do you recognize this exhibit?

26

1   A. Yes, I do.

2   Q. Will you please just generally describe what it

3   is?

4   A. This is the prosecution history of Rambus U.S.

5   serial number 08/910,810, and it includes within it the

6   prosecution history of the applications that I

7   identified, application 847,961, and application

8   469,490.

9   Q. When was the '961 application filed?

10   A. The '961 application was one of the ten

11   divisional applications that I identified, and it was

12   filed on March 5th, 1992.

13   Q. And what is the relationship between the '961

14   and the '898 applications?

15   A. As I indicated, the '961 application is a

16   divisional application of the parent '898 application.

17   Q. Did the original claims of the '961 application

18   cover SDRAMs that were compliant with JEDEC Release 4

19   standard?

20   A. No, they did not.

21   Q. Could you please explain why they did not.

22   A. The original claims in the '961 application were

23   claims 95 through 104 of the original claims, and as I

24   previously testified, claim 95, for example, included

25   the two multiplex bus limitations that I identified, and

26

1   that is to say that the bus has substantially fewer bus

2   lines than the number of bits in a single address and

3   without the single direct line connected to individual

4   semiconductor devices, and then in addition claim 95

5   required that there be at least one modifiable

6   identification register that uniquely identifies a

7   device, and that is in addition a limitation that's not

8   required by JEDEC-compliant SDRAM.

9   Q. And turning to claim 103, why is it that claim

10 103 did not carry a JEDEC-compliant SDRAM?

11   A. Claim 103 in the context of referring to a bus

12 that carries substantially all address, data and control

13 information, includes one of those two multiplex bus

14 limitations that I referred to previously, that the bus

15 has substantially fewer bus lines than the number of

16 bits in a single address.

17   Q. Did Rambus replace these original claims at some

18 point?

19   A. Yes, Rambus did.

20   Q. When was that?

21   A. In a January 6, 1995 amendment, those claims

22 were replaced.

23   Q. And I believe that's at page 216 of the exhibit.

24   JUDGE McGUIRE: Is that a term of art in patent

25 law or should I just construe that in its every-day

26

1   meaning when you say a claim has been replaced?

2   THE WITNESS: Actually the original claims were

3   cancelled and the term of art replaced is used in its

4   ordinary sense, they were replaced with other claims.

5   JUDGE McGUIRE: All right.

6   BY MS. MICHEL:

7   Q. Since filing the '961 application in March 1992,

8   had Rambus made any changes to the application prior to

9   this January 1995 amendment?

10   A. No, there had been no prior changes to the

11   claims before this January 6, 1995 amendment.

12   Q. Does the amendment itself give any indication of

13   what prompted Rambus to file it?

14   A. On the face of the amendment, the first page,

15   there is an indication that this amendment is -- in the

16   very first line -- "In response to the office action,"

17   that is an office action from the Patent & Trademark

18   Office, "mailed September 6, 1994."

19   Q. Was that the first office action issued by the

20   examiner in the '961 application?

21   A. Yes, it was.

22   Q. In your opinion, which of the claims added in

23   the January 6, 1995 amendment covered JEDEC-compliant

24   SDRAMs?

25   A. Claim 160 and claim 164, as well as claims 151,

26

1   159, 165 and 168.

2   Q. Let's start by looking at claim 160. I believe

3   that's at page 221 of the exhibit. How does claim 160

4   compare to original claim 103?

5   A. Claim 103, as I just testified to, had the

6   limitation of -- well, I better turn to 103 so I don't

7   misquote the language. Had the limitation of "a bus

8   that has substantially fewer bus lines than the number

9   of bits in a single address."

10   If one looks through claim 160, there's no such

11   limitation that the claim had been broadened in that

12   regard, and that the limitation with respect to the bus

13   just indicates that it's a memory storage system

14   including a bus, there's no such narrow bus limitation.

15   In addition, claim 103 referred to an access

16   time register. The claim 160 was broadened so as not to

17   be limited to an access time register, but as one can

18   see, beginning at line 5, "At least one register that's

19   operative to store information, specifying a manner in

20   which the semiconductor device is to respond."

21   Q. You also mentioned claim 164, what's the

22   relationship between claim 164 and claim 160?

23   A. Claim 164 is a dependent claim, and it is -- it

24   is dependent upon claim 160, and as I previously

25   testified, it should be treated as if all the

26

1   limitations of 160 are incorporated into 164.

2   Q.   Mr. Nusbaum, I would now like to ask you to turn

3   to JEDEC Release 4, it's been previously marked as

4   JX-56. And in particular, if you will turn to the

5   exhibit page 114 that's Bates 7793.

6   What's your understanding of what is shown here?

7   A.   What's shown on this page, as indicated by the

8   title of the page, is the SDRAM Mode Register

9   aspect/feature of the JEDEC Release 4, and there's a

10   number of characteristics of this mode register that are

11   specifically enumerated. One is that the register is

12   located on the SDRAM chip, and it's indicated -- there

13   is an indication that its purpose is to store mode of

14   operation data, so it determines what mode the SDRAM is

15   operating in. There's an indication that the data is

16   written after power-on and before normal operation, so

17   my understanding is that this register is permitted to

18   be programmed, and that it is written and it's

19   programmed during a configuration time period to

20   determine the mode of operation.

21   And then more specifically there is an

22   indication of what the data in this mode register

23   relates to, and then it's listed as burst length, burst

24   type, and cast latency. And there is an indication that

25   while operating in one mode, and for example burst of

26

1   four in sequential addresses, it can change to burst of

2   eight in interleaved address modes, so that indicates

3   the matters in which the SDRAM may respond to requests.

4   With respect to the writing of data, there's an

5   indication two pages further in this Release 4 that

6   indicates that data is written via the address bus.

7   MS. MICHEL: Your Honor, we're going to be using

8   several demonstratives in the coming testimony, and I

9   would like to hand our copies of the demonstratives to

10   both you and opposing counsel.

11   JUDGE McGUIRE: Go ahead.

12   MS. MICHEL: Thank you.

13   BY MS. MICHEL:

14   Q.   Mr. Nusbaum, let's turn to block diagram

15   demonstrative previously been marked as DX-4.

16   Your Honor, I think it should be the first one

17   in the stack of block diagrams that I gave you.

18   JUDGE McGUIRE: I'm sorry, it's been marked as

19   what, DX-4?

20   MS. MICHEL: It had been previously marked

21   during Mr. Williams' testimony as DX-4.

22   JUDGE McGUIRE: Okay.

23   BY MS. MICHEL:

24   Q.   Mr. Nusbaum, please explain your understanding

25   of what DX-4 shows.

26

1   A. DX-4 is a block diagram that I prepared, and

2   whose accuracy was confirmed by Dr. Jacob, who did make

3   some minor labeling changes with respect to certain of

4   the buses that are shown. And the bottom portion of

5   this figure was extracted from Dr. Jacob's expert report

6   that just shows a JEDEC Release 4 style SDRAM memory

7   system, and it shows a memory controller that's

8   communicating with two DRAM modules through an

9   address/command bus, a data bus, and a chip select bus,

10   indicating that it's chip select 1 and 2, where the chip

11   select lines will select one of the modules and the

12   DRAMs in that module for operation.

13   The block diagram also indicates by the address

14   or command bus that various fields in a mode register

15   are written to and there's a quote, "After power-on and

16   before normal operation." That's from the mode register

17   page we just looked at from Release 4, and as I also

18   testified, Release 4 also indicates that the data is

19   transmitted over the address bus.

20   The exploded view from DRAM 1 was intended to be

21   a replication of the programmable SDRAM mode register

22   from JX-56-0114, and if one looks about a third of the

23   way down the page of JX-56-0114, one can see the mode

24   register that has these burst length, burst type, and

25   latency mode fields that have been labeled respectively

26

1   as specifying burst length for read and write requests,

2   specifying burst type for read and write commands, and

3   specifying the timing of DRAM array response to a read

4   command in regard to the latency.

5   Q. Now, Mr. Nusbaum, I would like you to explain

6   the basis for your opinion that claims 160 and 164 cover

7   SDRAMs compliant with the JEDEC Release 4 standard.

8   A. I have prepared a claim chart that may be

9   helpful in my demonstrating that.

10   MS. MICHEL: Your Honor, I will put the chart on

11   the board, but also everyone has a smaller size of it.

12   JUDGE McGUIRE: Do we have a copy of that up

13   here?

14   MS. MICHEL: Yes, it should be the top chart.

15   JUDGE McGUIRE: We will label that as DX-15.

16   MS. MICHEL: Yes, thank you.

17   (DX Exhibit Number 15 was marked for

18   identification.)

19   MS. MICHEL: Your Honor, is this location

20   acceptable?

21   JUDGE McGUIRE: That's fine, and I've got it

22   here, too.

23   BY MS. MICHEL:

24   Q. Mr. Nusbaum, if you would like to please explain

25   your opinion with reference to the claim chart.

26

1   A.   May I step down and --

2   JUDGE McGUIRE: Yeah, go ahead. All right, now,

3   again, I am going to ask you to clarify that I have a

4   question when you say please explain your opinion, what

5   opinion are you asking him to express as to the claims

6   that you have otherwise mentioned, I believe 160 and

7   164.

8   BY MS. MICHEL:

9   Q.   At this time, I ask Mr. Nusbaum to only explain

10   his opinion with regard to claims 160 and 164, and in

11   particular, why those claims cover an SDRAM compliant

12   with the JEDEC Release 4 standard.

13   JUDGE McGUIRE: Okay, Mr. Nusbaum, you may

14   proceed.

15   THE WITNESS: What this claim chart shows is in

16   left-hand column, the limitations of claim 160 from the

17   patent office amendment that we were just looking at.

18   And 164, that's in the left-hand column.

19   In the right-hand column, is labeled JEDEC

20   Standard Release 4, which is short for an SDRAM that's

21   compliant with JEDEC Standard Release 4.

22   One determines or demonstrates that a claim

23   literally covers a product by demonstrating that every

24   limitation in the claim finds a counterpart in some

25   aspect of the product. Now, the product can have a

26

1   multitude of other features, but if the claim has this

2   open-ended language comprising it, but there must be

3   each feature that's claimed in the product in question.

4   Now, I've given this claim language its broadest

5   reasonable interpretation as must be done for

6   application claims in the Patent & Trademark Office.

7   Starting with "in a memory storage system," the JEDEC

8   Release 4 standard talks about, "Configurations for

9   solid-state memories," focusing on SDRAMs, and it may be

10   handy to have the block diagram in front of you as well

11   to reference in this analysis, but it's clear that we're

12   dealing with a plurality of DRAMs, or systems with the

13   plurality of DRAMs.

14   And so clearly there's a memory storage system.

15   That system includes a bus. If one looks at the JEDEC

16   standard, there is various indications of address, data

17   and control lines in the various DRAM block diagrams.

18   One can look at DX-4, the block diagram, and see a

19   number of different buses all to claim what requires of

20   a bus, we have that.

21   The next limitation is a semiconductor device.

22   The semiconductor device corresponds as indicated in the

23   chart, to any one of the SDRAMs in a standard, they're

24   semiconductor devices. Also, because each module

25   contains a number of DRAMs which are semiconductor

26

1   devices, the modules are semiconductor, or may be viewed

2   as semiconductor devices as well.

3   The device has to be configurable by a device

4   that's external to the semiconductor device, and the

5   standard provides for changing the modes of operation by

6   virtue of changing a mode of operation, and further in

7   this case by changing the mode of operation before

8   normal operation, the device is being configured.

9   Then we get to the body of the claim. The body

10   of the claim requires at least one pin for coupling the

11   semiconductor device to the bus. One can look at any of

12   the many DRAM block diagrams that are in the standard

13   and the SDRAMs or DRAMs have pins which makes it

14   possible for them to be connected to the address, data

15   and control bus.

16   Now we come to at least one register. That at

17   least one register, giving that claim language its

18   broadest reasonable interpretation, that one means at

19   least one or more. That's met by one. If you've got

20   one register that satisfies these limitations, you've

21   got this one-to-one mapping that's required. And for

22   the counterpart to this, at least one register, I have

23   identified the SDRAM mode register.

24   Now, the SD -- the limitation of at least one

25   register, what it has to do by virtue of this claim is

26

1   that it has to store information that specifies the

2   manner in which the semiconductor device is to respond.

3   Now, that's broad -- that's broad language, broader than

4   the original claim 103 that just referred to access time

5   register.

6   And in the mode register, as one can see in the

7   block diagram, and as also one can see from the standard

8   itself, that the register stores burst length, burst

9   type, or latency information. In order to satisfy this

10   limitation, all that is necessary is to have one manner

11   of responding.

12   So, if we were to presume that all this mode

13   register had was burst length, there would be

14   correspondence that would cover the register that -- and

15   that's really all that needs to be shown. In this

16   particular case, there are three distinct manners of

17   responding, any one of which would establish that there

18   is the requisite correspondence that I believe there is.

19   And what this information has to do is specify

20   the manner in which the semiconductor device responds to

21   the transaction request. We saw in the animation that

22   depending upon how the cast latency field was set, that

23   the semiconductor device responds in the fashion staying

24   with the burst length field.

25   Then what's required is that the information has

26

1   to be received by the semiconductor device from the bus

2   when the semiconductor device is configured. That

3   information by virtue of the standard is indicated as

4   being the latency mode burst type, burst length

5   information is transmitted over the address bus, so it's

6   received from the bus and it's received, and this is a

7   quote from JX-56-114, the mode register page we looked

8   at, that "Data is written after power-on, but before

9   normal operation." So, it was during the configuration

10   time period.

11   The semiconductor device stores the information

12   received from the bus lines in the register during

13   configuration. We know that's the case, that's the

14   purpose of the information being written, so that it may

15   be stored in the mode register.

16   And then, finally, the semiconductor device has

17   to respond to transaction requests in the manner

18   specified by the information stored in the register.

19   Again, during the animation, and we saw that depending

20   upon how the cast latency bits were set, there would be

21   a number of clock cycles that one would wait before

22   information was transmitted, but beyond that, in the --

23   in Release 4 itself there is an indication that

24   depending upon the setting of bits in the register that

25   the burst of four, or in sequential addresses a burst of

26

1   8, in an interleaved mode are examples of responses that

2   follow.

3   Now, claim 164 is dependent upon claim 160, so

4   it includes all these limitations, but what it adds, it

5   gets more specific. And it says, now, the register

6   doesn't merely specify a manner in which the

7   semiconductor device is to respond, it gets more

8   specific, and identifies what that manner is. It

9   expressly says that the register is an access-time

10   register and the information is a value indicative of

11   the access time for the semiconductor device, where the

12   access time -- where the semiconductor device being

13   operative to wait for the access time before using the

14   bus in response to a transaction request specifying the

15   semiconductor device.

16   So, this now more particularly just zones in on

17   the cast latency field where the field of -- the latency

18   field of the SDRAM mode register defines values which

19   are indicative of the programmable access time and, as

20   we saw in the animation, causes the SDRAM to wait for

21   the access time before using the bus in response to a

22   read request.

23   BY MS. MICHEL:

24   Q. Okay, thank you. If you would like to take a

25   seat, unless Your Honor has any questions.

26

1   JUDGE McGUIRE: No, I do not have any questions.

2   BY MS. MICHEL:

3   Q. If you would like to take your seat, Mr.

4   Nusbaum, also, as you walk back there, if you could

5   please take a pen and indicate the location of the '961

6   application on the patent tree in back of you.

7   A. I have no pen.

8   Q. I'm sorry, there are markers right in back of

9   your seat.

10   A. (Witness complied.)

11   Q. That's fine, thank you. And Mr. Nusbaum, could

12   you please tell us which application you've just

13   circled.

14   A. I don't know if anybody can see the circle.

15   Q. That's all right. Make another color, great.

16   A. This is application serial number 07/847,961.

17   Q. Referring again to claim 160, and if you would

18   like to refer to --

19   JUDGE McGUIRE: You are just now getting those

20   out, huh?

21   MR. STONE: I've been getting by without reading

22   this chart, up until now.

23   JUDGE McGUIRE: Better than I am. I'm sorry,

24   Ms. Michel, go ahead.

25   BY MS. MICHEL:

26

1   Q. Mr. Nusbaum, referring to claim 160, that claim

2   contains the phrase "a semiconductor device having that

3   is," do you see that phrase?

4   A. Yes, I do.

5   Q. What approach did you take in interpreting that

6   phrase?

7   A. In my view, the language "having" is a result of

8   a typographical or word processing error where the

9   drafter did not delete that terminology, that the -- in

10   my opinion, this phrase should be read as if the claim

11   were amended to connect that typographical/word

12   processing type error, so that the language reads, "A

13   semiconductor device that is configurable by a device

14   that is external to the semiconductor device," and there

15   is precedent to support interpreting the claim as if it

16   were amended to correct such a typographical -- such an

17   apparent typographical word processing type error.

18   Additionally, with respect to the language

19   "having," it may be viewed as introducing the

20   characteristic that the semiconductor device has, such

21   that the semiconductor device has the characteristic

22   that it is configurable by a device. The terminology

23   does not add any verbiage that defines any limitation,

24   and to the extent that it would be argued that it leaves

25   the claim open-ended, the very nature of the term

26

1   "comprising," as I testified, is open-ended terminology,

2   which means that if an accused product has all the

3   features required by the claim, it could have a

4   multitude of other features, and it matters not.

5   Q. You said there was precedent, could you explain

6   what you meant by that?

7   A. There is a court of customs and patent appeals

8   case in re: Herman, in which the court followed the

9   board of appeals lead and treated certain language in a

10   claim that was believed to be an obvious typographical

11   error as if it were amended to correct that. There is

12   also a District Court case out of Kentucky that I'm

13   aware of, the name escapes me, but it is a case in which

14   a claim included by what was believed to be an obvious

15   typographical error the word "into," and the court chose

16   to interpret that language as "to," instead of "into."

17   Q. In interpreting claim 160, how did you interpret

18   the terminology "transaction request?"

19   A. I interpreted "transaction request,"

20   consistent -- first of all, I gave that language its

21   broadest reasonable interpretation, which is the

22   framework that one must operate in, and I have given

23   that interpretation an interpretation that is consistent

24   with the interpretation that Rambus interpreted that

25   language in the Rambus v. Infineon litigation. And also

26

1   it's consistent with the interpretation -- the

2   interpretation that I've used -- is consistent with the

3   interpretation that the court of appeals used in its

4   Rambus appeal.

5   Q. If we could look at the interpretation from the

6   brief, please, it's CX-1877. Mr. Nusbaum, is this the

7   definition to which you referred?

8   A. Yes, it is.

9   Q. And how did you interpret the phrase

10   "transaction request specifying the semiconductor

11   device," which is the last raised in claim 164? I

12   apologize if I cut you off.

13   A. Well, first of all, as a preface to explaining

14   that, the interpretation of "transaction request" that I

15   have given is a transaction request is an instruction to

16   perform one of a set of possible memory operations, such

17   as writing data to or reading data from specified memory

18   cells of the memory."

19   JUDGE McGUIRE: All right, that's fine, go

20   ahead.

21   BY MS. MICHEL:

22   Q. And then let me re-ask, how did you interpret

23   the phrase "a transaction request specifying the

24   semiconductor device," which is the last phrase in claim

25   164?

26

1   A.   Again, I interpreted "transaction request

2 specifying the semiconductor device" giving that

3 language its broadest reasonable interpretation. At the

4 end of the day, we know that a semiconductor device is

5 specified somehow, because it would be impossible to

6 read from or write to a DRAM unless it was specified. I

7 have interpreted transaction request specifying the

8 semiconductor device as being broad enough to cover the

9 JEDEC-compliant SDRAM Release 4 whether a transaction

10 request is interpreted so as to include within the

11 request itself a chip select signal that in the JEDEC

12 memory system identifies a semiconductor device such as

13 a module with the DRAMs in there, or alternatively, even

14 if one were not to interpret transaction request as

15 including the chip select line, but alternatively

16 interpreted the chip select line as being something

17 separate, because the transaction request such as a read

18 request is issued at a precise point in time with

19 respect to a chip select signal that specifies a

20 particular module.

21   By virtue of the fact that the transaction

22 request has this precise relationship in time with the

23 chip select signal, that by virtue of the transaction

24 request being issued at the same time, that also is an

25 example of a transaction request specifying a

26

1   semiconductor device by virtue of the time of appearance

2   of the transaction request, which coincides with the

3   chip select line being in a state enabling a particular

4   module.

5   Q. I would like to refer again to claim 160, it

6   might be easiest to look at the claim chart. Does that

7   claim require a device identifier?

8   A. No, it does not. There is nothing in claim 160

9   whatsoever that either calls -- that calls for any kind

10   of device identifier. There is a limitation that at

11   least one register is operative to store information

12   specifying a matter in which the semiconductor device is

13   to respond.

14   Q. Are you aware that the Federal Circuit has

15   stated that claims in the '961 application were limited

16   to device identifier features?

17   A. Yes.

18   Q. Do you believe that the court would have based

19   that statement on the claims made by claim 160?

20   MR. STONE: Excuse me, Your Honor, I don't

21   believe this witness has the basis for opining what the

22   basis -- I don't believe he has a basis for determining

23   what the court based that on.

24   JUDGE McGUIRE: Sustained.

25   BY MS. MICHEL:

26

1   Q. Does claim 164 require a device identifier

2   feature?

3   A. No, it does not.

4   Q. Do any of the claims added in the January 1995

5   amendment recite device identifier features?

6   A. Yes, they do, there are claims that recite

7   device identifier features. In, for example, claim 161.

8   This is a claim that's dependent upon claim 160, which

9   requires that the register is an identification

10   register, and the information is an identification

11   number that uniquely identifies the semiconductor

12   device. So, that's an example of a claim that claims an

13   identification feature.

14   Q. Does the fact that the claim 161 contained this

15   feature suggest anything about the interpretation of

16   claim 160?

17   A. Yes. It suggests that claim 160 should not be

18   interpreted to include a limitation that is included

19   independently. It should not be interpreted to cover or

20   be directed to what is set forth in claim 161.

21   Q. Mr. Nusbaum, I believe you also stated that

22   claims -- that claim 151 would cover an SDRAM used in

23   compliance with JEDEC SDRAM -- JEDEC Release Standard 4.

24   Is that right?

25   A. That's correct.

26

1   Q. And could you please explain your basis for that

2   opinion that claim 151 would cover SDRAM compliant with

3   Release 4? I believe we have a demonstrative to use

4   with this explanation, which we don't have the blow-up,

5   but I think we're going to get it on the screen. The

6   demonstrative claim for claim chart 161.

7   JUDGE McGUIRE: Do you have that as well for

8   hard copy purposes?

9   MS. MICHEL: Yes, I believe that should be on

10   the second page of the hand-out I handed out.

11   JUDGE McGUIRE: Has that already been marked,

12   the one you're talking about?

13   MS. MICHEL: No, Your Honor, I believe we should

14   mark this exhibit as DX-16.

15   JUDGE McGUIRE: DX-16, and perhaps you could

16   tell us again what that depicts for the record.

17   MS. MICHEL: DX-16 is a claim chart.

18   JUDGE McGUIRE: It's the same claim chart that

19   we had before that we marked as DX-15?

20   MS. MICHEL: DX-16 is a claim chart for claim

21   151 of application number 847,961.

22   JUDGE McGUIRE: I've got you now.

23   MS. MICHEL: I believe it may have been the

24   third sheet.

25   JUDGE McGUIRE: I would be happy just to mark

26

1   this whole thing as DX-15 instead of every page. I

2   mean, that's going to get out of bounds by the time we

3   conclude this trial.

4   MS. MICHEL: Yes, Your Honor, that would be

5   fine. We also have blow-ups of some of the charts, and

6   as long as that doesn't cause --

7   JUDGE McGUIRE: Well, that's fine. It seems to

8   me it's part of this overall package. Do you have any

9   comment on this, Mr. Stone?

10   MR. STONE: No, Your Honor, I have four pages,

11   five pages, I'm sorry, of claim charts, and if we mark

12   the five pages of claim charts as DX-15, I think that's

13   fine.

14   JUDGE McGUIRE: Right.

15   MR. STONE: And then the block diagrams, the

16   first one was marked as DX-4, but I believe there's

17   going to be three more block diagrams.

18   JUDGE McGUIRE: Three pages of DX-4.

19   MR. STONE: This we could possibly mark as

20   DX-16.

21   JUDGE McGUIRE: It's already been marked as

22   DX-15, and now you are referring to page 2 of DX-15,

23   correct, for claim 151?

24   MS. MICHEL: That's right, Your Honor, I believe

25   it may be page 3 on my copy.

26

1   JUDGE McGUIRE: Page 3, okay. All right, page

2   3.

3   MS. MICHEL: Your Honor, may I approach the

4   witness and hand him more water?

5   JUDGE McGUIRE: Yes, please.

6   THE WITNESS: Thank you.

7   JUDGE McGUIRE: I hope that's only water you're

8   giving him.

9   BY MS. MICHEL:

10   Q. All right, Mr. Nusbaum, if you could please

11   explain for us with reference to the claim chart

12   previously marked DX-15, your opinion that claim 151 of

13   the '961 application would cover an SDRAM compliant with

14   the JEDEC Release 4.

15   A. Yes. Once again, what we have in this claim

16   chart is in the left-hand column, claim 151 of

17   application 847,961, and it's important to get the right

18   application, because there are a lot of claim 151s in

19   these various applications.

20   In the right-hand column of this chart is JEDEC

21   Standard Release 4, which relates to SDRAMs that are

22   compliant with JEDEC's Standard Release 4. And in order

23   to demonstrate that this claim covers the

24   JEDEC-compliant SDRAM or SDRAM system, it's necessary to

25   show that each and every limitation in the claim on the

26

1   left-hand side finds a counterpart in such a system on

2   the right-hand part of the chart.

3   And for this purpose, it is helpful to have a

4   visual aid of the block diagram DX-4 in front of you,

5   because it does show a system that it's important to

6   focus on.

7   With regard to the computer system that is

8   recited in claim 151, this system is formed by the

9   combination of JEDEC-compliant DRAM modules such as

10   module 1 and module 2 that's shown in the block diagram,

11   together with the memory controller that's shown in the

12   block diagram, or alternatively, you could take the

13   system in the block diagram and put it into its typical

14   PC context, where the memory controller would be coupled

15   to the central processing unit of a personal computer.

16   Either way, you have a computer system.

17   What follows from that is a limitation that the

18   bus includes bus lines for carrying data. It's clear

19   that this feature is met, we have address data control

20   lines, certainly there is data lines that carry data in

21   the JEDEC counterpart.

22   We have then a bus master that's coupled to the

23   bus. Well, if one looks at the block diagram, as was

24   explained in or by Mr. Rhoden, we've got a memory

25   controller that is the sole interface between let's say

26

1   a central processor and a PC, and these DRAM modules.

2   The memory controller is that which controls the bus

3   between the memory controller and the DRAMs, and it is a

4   bus master, it seizes control of this bus.

5   Then what's required are plurality of

6   semiconductor devices that are coupled to the bus, and

7   in this instance, any one of -- any of the SDRAMs in the

8   standard is a semiconductor device. Such DRAMs are

9   typically used in a module, and each of these modules,

10   as I testified before, may also be viewed as a

11   semiconductor device. So, we clearly have a plurality

12   of semiconductor devices.

13   Then we have each semiconductor devices

14   comprising, and then what follows are limitations with

15   respect to at least one register operative to store

16   information specifying a manner in which the

17   semiconductor device is to respond, and from that point

18   in the claim, through the end of the claim, the language

19   is certainly -- it's not identical, but it's very

20   similar to claim 160.

21   The only difference is that the -- in terms of

22   what's being configured, there's a reference to, "By

23   virtue of the register being set that the bus is

24   configured." And the counterpart to this bus being

25   configured is that by virtue of the various modes that

26

1   are defined by the SDRAM mode register, the time at

2   which information is transmitted over the bus changes.

3   So, as we saw in the animation, depending upon how the

4   cast latency field is set, the timing of information

5   being transmitted over the bus changes.

6   And so the communication protocol for the bus is

7   changed or configured. And other than that

8   characterization, the limitations are very similar, and

9   for the reasons that I explained with respect to claim

10   60, these limitations are satisfied as well.

11   There's a counterpart to each and every

12   limitation in this claim, in the system that I've

13   described.

14   Q. I believe you also mentioned claim 159. Is that

15   right?

16   A. Yes.

17   Q. And if we could look at claim 159, which is at

18   CX-1504 at page 221.

19   MR. STONE: Your Honor, I believe claims 159 and

20   168 that were mentioned by the witness as claims that he

21   has opinions on today were not discussed in either his

22   report or his rebuttal report. I think we can probably

23   deal with them here today, but it's possible if he

24   raises things that we couldn't have anticipated, we may

25   find a need for either a further deposition of the

26

1   witness or a possible delay in questioning him on these,

2   because for some reason, I didn't find those in either

3   of his reports. But I'm prepared to go forward on this

4   with the caveat that I may want to ask you for leave if

5   it turns out we're surprised.

6   JUDGE McGUIRE: I'll give you that opportunity,

7   Mr. Stone.

8   MR. STONE: Thank you, Your Honor.

9   MS. MICHEL: Your Honor, both the claims that we

10   are mentioned, 159 and 168, are in Mr. Nusbaum's

11   rebuttal report at pages 10 and 11, and there was

12   deposition testimony on both claims.

13   JUDGE McGUIRE: Do you want to take a break?

14   MR. STONE: Then I missed them, Your Honor.

15   JUDGE McGUIRE: Do you want to take a break?

16   MR. STONE: No, I'm fine.

17   JUDGE McGUIRE: Then you may proceed, Ms.

18   Michel.

19   BY MS. MICHEL:

20   Q. Mr. Nusbaum, I believe you see on the screen in

21   front of you claim 159 from the '961 application. Could

22   you please just very briefly explain your opinion that

23   this claim would cover a JEDEC-compliant SDRAM.

24   A. Yes. This claim, if one looks at the

25   limitations, they're reminiscent of what we've already

26

1   talked about in claim 164, except now we're talking

2   about in the context of the computer system of 151. So,

3   this is a dependent claim on 151, and what's added is

4   the register is an access time register operative to

5   store value indicative of an access time for the

6   semiconductor device. The semiconductor device being

7   operative to wait for the access time before using the

8   bus. This is precisely what I already went over with

9   respect to claim 164, and it clearly finds a counterpart

10   in the JEDEC system relying on the latency mode field of

11   the mode register, as I have in the past.

12   Q. Do claims 151 and 159 cover SDRAMs themselves?

13   A. Claims 151 and 159 are -- actually they cover a

14   range of devices, including SDRAMs in a computer system

15   context.

16   Q. I believe you also mentioned claim 165, if we

17   could see that, please. Could you please briefly

18   explain what this claim covers and how it relates to

19   JEDEC-compliant SDRAM.

20   A. Claim 161 defines a method for configuring

21   operation of a semiconductor device in a computer

22   system, and what it is is it defines the inherent method

23   of operating the system that I described in great detail

24   with respect to claim 151, that is the computer system.

25   And what it requires, there's two steps that are

26

1   required, outputting the value through the bus by a bus

2   master that is coupled with a bus, where the value

3   specifies the manner in which the semiconductor device

4   is to respond to transaction requests, after the

5   semiconductor device is configured.

6   I have explained how there's a -- in accordance

7   with the JEDEC standard, there is a value that's placed

8   on the address bus that -- which is ultimately stored in

9   the mode register, and there are multiple manners in

10   which the semiconductor device, that is in this case the

11   SDRAM, is to respond. Those values, as per the second

12   step, are written to the SDRAM mode register, thereby

13   conforming with the step of writing the value to a

14   register in a semiconductor device.

15   Q. And if we could please look at claim 168. Mr.

16   Nusbaum, could you please explain your opinion regarding

17   the relationship of claim 168 with JEDEC-compliant

18   SDRAM.

19   A. Yes, claim 168 is dependent upon the method of

20   claim 165, and it is, again, analogous, although not

21   identical, to the claim 164 that we looked at, but this

22   time in method format. Claim 168 requires that the

23   value specifies an access time for the semiconductor

24   device, the method comprising the further step of the

25   semiconductor device waiting for the access time before

26

1   waiting to respond to the access bus that requires the

2   semiconductor device.

3   So, this step will inherently flow from the

4   result of loading the cast latency field, and we saw on

5   the animation the waiting of the access time before

6   using the bus.

7   Q. Okay, Mr. Nusbaum, have you identified any other

8   Rambus patent applications pending prior to June 1996

9   that in your opinion contain claims covering the

10   programmable cast latency feature of JEDEC-compliant

11   SDRAMs?

12   A. Yes. Application serial number 469,490.

13   Q. When was the '490 application filed?

14   A. The '490 application was filed on June 6th,

15   1995.

16   Q. What's the relationship between the '490

17   application and the '961 application that we just talked

18   about?

19   A. The '490 application is a continuation

20   application of the '961 application.

21   Q. Did Rambus file claims in the '490 application

22   which are similar to claims in the '961 application?

23   A. Yes, Rambus did.

24   Q. And which claims were those?

25   A. Those claims are claims 183 to 185.

26

1   Q. And did Rambus file those claims in the June

2   23rd, 1995 amendment?

3   A. Yes, Rambus did.

4   Q. Is the amendment -- is the document on the

5   screen the amendment to which you just referred?

6   A. Yes, it is. I referred to the date of the

7   amendment by virtue of the certificate of mailing date

8   that's June 23rd, 1995.

9   Q. In your opinion, do claims 183 to 185 that you

10   mentioned also cover the use of a SDRAM compliant with

11   JEDEC Release 4?

12   A. Yes, I believe they do.

13   Q. Could you please explain the basis for your

14   opinion with regard to how claim 184 of those three

15   covers a JEDEC-compliant SDRAM.

16   A. Yes, I would be glad to do that. I've prepared

17   a blow-up exhibit, which will aid in that demonstration.

18   Q. All right, we will be using a claim chart in the

19   demonstrative previously marked DX-15. I believe it's

20   at page 4 in my package.

21   Mr. Nusbaum, Your Honor, may Mr. Nusbaum step

22   down and approach the board?

23   JUDGE McGUIRE: Yes, go ahead, Mr. Nusbaum.

24   BY MS. MICHEL:

25   Q. Thank you.

26

1   A.   Once again, in order to demonstrate that a claim

2   covers a JEDEC-compliant SDRAM or any other product

3   that's necessary to -- after giving claim in this case

4   its broadest reasonable interpretation, find that there

5   is a counterpart in the product you're comparing for

6   each and every limitation in the claim. In order to

7   demonstrate that the claim literally covers the product.

8   With respect to a semiconductor device having an

9   access time that's programmable, the SDRAMs in the

10   Release 4 are semiconductor devices, and the

11   programmable cast latency field provides that they have

12   an access time that's programmable.

13   Then what is required is at least one pin for

14   coupling the semiconductor device to a bus, that must be

15   present, it can be seen from many of the DRAM block

16   diagrams in Release 4, I've identified one in this

17   chart, and there are various DRAM pins that are coupled

18   to address, data and control bus lines.

19   Then what we have is in the final claim

20   paragraph, at least one access time register was

21   operative to store a value indicative of the access time

22   for the semiconductor device. And this language, in

23   this paragraph, is very reminiscent of what we looked at

24   before, and this access time register finds

25   correspondence in the SDRAM mode register, particularly

26

1   noting the information that's stored there defining

2   latency.

3   The value has to be received by the memory

4   device from the bus. This chart reads form the bus, but

5   I believe that to be a typographical error that probably

6   occurred on my end. The semiconductor device storing

7   the value and in the access time register, the

8   semiconductor device thereafter being operative to wait

9   for the access time before using the bus in response to

10   a request, specifying the semiconductor device. And

11   once again, the values are stored in this cast latency

12   field indicative of programmable access time that causes

13   the SDRAM to wait for the access time before using the

14   bus in response to a request, as we saw in the animation

15   during Mr. Rhoden's testimony.

16   Q. Thank you. You can have a seat.

17   Will you please circle the '490 application on

18   the Rambus patent tree.

19   A. (Witness complied.)

20   Q. If we could please show on the screen claim 183

21   from CX-1504. I believe it's approximately page 264 of

22   the exhibit. Mr. Nusbaum, will you please just briefly

23   explain your understanding -- your opinion regarding the

24   relationship between claim 183 here and a

25   JEDEC-compliant SDRAM.

26

1   A. Yes. Claim 183, as opposed to being directed to

2   a semiconductor device, puts that semiconductor device

3   into a system context, and what's claimed is a computer

4   system that comprises a bus, a semiconductor device that

5   includes an access time register, that stores a value

6   indicative of an access time for the semiconductor

7   device, and then a bus master that stores the value,

8   again, of the access time ratio.

9   Q. And if we could turn next to claim 185. If you

10   could please briefly explain your opinion regarding the

11   relationship of claim 185 to JEDEC-compliant SDRAM.

12   A. Claim 185 defines a method for programming an

13   access time of a semiconductor device, and claim 185

14   would define the inherent method of operating such a

15   JEDEC-compliant device. For very much the same reasons

16   that I've testified about previously, there's in the

17   JEDEC-compliant operation, there's a value that is put

18   on a bus, as I indicated, the address bus, by a bus

19   master, which is the memory controller, and the value

20   specifies an access time for the semiconductor device.

21   The SDRAM is the semiconductor device, that value is

22   received in the mode register of the SDRAM, that value

23   as per the writing step is written to the mode register

24   latency field, this is with respect to the access time

25   information, and as we saw in the animation, the

26

1   semiconductor device, which in this case is the

2   JEDEC-compliant Release 4 SDRAM, responds to requests

3   that specify the semiconductor device by waiting the

4   particular number of clock cycles before using the bus.

5   Q. And how did you interpret the phrase "a request

6   specifying the semiconductor device" that appears in

7   claim 184?

8   A. Precisely the same way that I interpreted that

9   language in claim 164, that that language in terms of

10   looking for correspondence in a JEDEC system is broad

11   enough to cover a request or transaction request where a

12   chip select signal is considered part of the transaction

13   request, or whether it's not considered part, but rather

14   by virtue of the chip select signals appearance on the

15   chip select bus at a precise point in time with respect

16   to a read request, that concurrence in time -- the

17   appearance at that particular time of the request

18   specifies the semiconductor device.

19   Q. Did Rambus make any representations to the

20   patent office as to what claims 183 to 185 covered?

21   A. In the amendment in which claims 183 to 185 were

22   presented to the Patent & Trademark Office, at page 12,

23   there's an indication that, "Finally, new claim 183

24   claims the structural cooperation of computer system in

25   which a bus master may program the access time of a

26

1   semiconductor device coupled to the bus. A new claim

2   184 claims a semiconductor device having the

3   programmable access time and new claim 185 claims a

4   method whereby a bus master programs the access time of

5   a semiconductor device coupled to the bus."

6   Q. All right, and is the portion on the screen in

7   front of you now the portion that you just read?

8   A. That's correct.

9   Q. What was the examiner's response to the June '95

10   amendment that contained claims 183 to 185?

11   A. The examiner issued on November 27th, 1995, a

12   restriction requirement, and what the examiner did in

13   the restriction requirement is that he identified claims

14   169 to 175 as being drawn to a system and method of

15   configuring devices by identification, and identified a

16   group 3 which were claims 183 to 185 that were drawn to

17   a system and method of configuring devices by access

18   time.

19   Q. Is the page of CX-1504 on the screen the first

20   page of the office action issued by the examiner that

21   you just referred to?

22   A. Yes, it is.

23   MS. MICHEL: Your Honor, we request that

24   CX-1504, which is the prosecution history that we've

25   just been discussing, be entered into evidence.

26

1   JUDGE McGUIRE: Any objection?

2   MR. STONE: No objection.

3   JUDGE McGUIRE: So entered.

4   (CX Exhibit Number 1504 was admitted into

5   evidence.)

6   MS. MICHEL: Your Honor, we are about to admit

7   to a new topic, we have approximately 45 minutes left at

8   this point.

9   JUDGE McGUIRE: Would you like to take a break

10   now or just go ahead and conclude with this witness on

11   direct? I have no preference.

12   MS. MICHEL: Mr. Nusbaum would like to take a

13   break, Your Honor.

14   JUDGE McGUIRE: Okay, well then he controls.

15   Then let's say 12:30, why don't we break until 1:45, and

16   then we'll be back in at that time and you can continue

17   inquiring. Hearing adjourned.

18   (Whereupon, at 12:30 p.m., a lunch recess was

19   taken.)

20

21

22

23

24

25

26

1   AFTERNOON SESSION

2   (1:50 p.m.)

3   JUDGE McGUIRE: This hearing is now in order.

4   At this time complaint counsel may proceed with its

5   questioning of the witness, and there he is, okay. All

6   right, Mr. Nusbaum, you're still under oath, so would

7   you have a seat, please.

8   BY MS. MICHEL:

9   Q. Your Honor, I would like to clean up one point

10   from this morning. In particular, I would like to ask

11   the witness to refer to Exhibit 183 of the '490

12   application, which is currently on the screen.

13   Mr. Nusbaum, could you please explain why it is

14   your opinion that this claim covers a JEDEC-compliant

15   SDRAM?

16   JUDGE McGUIRE: All right, now before you go

17   into that, I'm not sure what you mean when you say a

18   183, is that in CX-183 or it's claim 183, right?

19   MS. MICHEL: Your Honor, what is shown on the

20   screen is claim 183 of the '490 patent application,

21   which is CX -- which can be found in CX-1504.

22   JUDGE McGUIRE: Okay.

23   BY MS. MICHEL:

24   Q. Mr. Nusbaum, if you could please explain your

25   opinion regarding the relationship of this claim to a

26

1   JEDEC-compliant SDRAM.

2   A.   Claim number 183, for reasons that I went into

3   in great detail this morning, covers a JEDEC Release 4

4   compliant SDRAM for a system for which it was designed

5   to operate as -- and I'll just explain very briefly, as

6   per the block diagram that I was using, DX-4, the

7   computer system would indeed include a bus. The

8   semiconductor device is the -- would correspond to the

9   SDRAM. The semiconductor device comprising an access

10   time register, for the reasons I went into in great

11   detail this morning, there's a mode register which

12   includes a latency field that corresponds to the access

13   time register operative to store a value, and the bus

14   master would correspond to the memory controller. The

15   other limitations that are in the claim closely parallel

16   limitations that I have testified about previously.

17   There is a one-to-one correspondence between elements in

18   this claim and a computer system using a JEDEC-compliant

19   SDRAM.

20   Q.   And one other clean-up point, Your Honor, I

21   would like to enter into evidence Exhibit CX-1877, that

22   is the Markman brief by Rambus in the Rambus versus

23   Infineon litigation to which Mr. Nusbaum relied on the

24   definition of transaction request in that exhibit.

25   JUDGE McGUIRE: Objection?

26

1   MR. STONE: Your Honor, yes, I don't believe

2   briefs properly should be admitted into evidence in that

3   fashion. The court should take judicial notice of

4   filings that are made in other proceedings, but I don't

5   think there's any basis for introducing briefs into

6   evidence as such.

7   JUDGE McGUIRE: I agree, sustained. I'll take

8   any notice of it, but I'm not going to enter it into

9   evidence.

10   BY MS. MICHEL:

11   Q. Mr. Nusbaum, have you identified any Rambus

12   patent application pending before June 1996 which

13   contains claims that in your opinion cover a phase

14   locked loop related JEDEC proposal for SDRAM?

15   A. Yes, I have.

16   Q. Which patent application was that?

17   A. It's patent application serial number 847,692.

18   Q. What's the relationship between the '692

19   application and the original '898 application?

20   A. The '692 application is a divisional application

21   of the original '898 application.

22   Q. When was the '692 application filed?

23   A. I believe it was filed March 5th, 1992, although

24   I can't read on my copy of the first page of the

25   prosecution history.

26

1   Q.   All right, I would like to ask you to refer now

2   to the document on the screen, which is CX-1502. Do you

3   recognize this exhibit?

4   A.   Yes, I do.

5   Q.   What is it?

6   A.   This exhibit is a copy of the prosecution

7   history before the United States Patent & Trademark

8   Office of Rambus U.S. Patent 5657481 which includes the

9   prosecution history of the application I just

10   identified, application 847,692.

11   Q.   Did the original claims in the '692 application

12   cover a phase looped lock proposal for a JEDEC-compliant

13   SDRAM?

14   A.   No, they did not.

15   Q.   Could you please explain why not.

16   A.   The original claims in application 847,692

17   included claims 73 through 81. Those claims I've

18   commented on before and expressed the opinion before

19   that they did not cover a JEDEC-compliant SDRAM, and

20   what's defined in claim 73 is a bus subsystem in which

21   there's a clock generator that's connected to the first

22   end of a bus clock line to generate early clock signals,

23   and signal return means at the second end of said bus

24   clock line to returns at early bus clock signals to said

25   first end of said bus as corresponding late bus clock

26

1   signals, and this is the loop clock system that I've

2   testified that it is not utilized in a JEDEC-compliant

3   system.

4   Q.   Did Rambus at some point cancel the original

5   claims and replace them?

6   A.   Yes.

7   Q.   And do you recall approximately when that was?

8   A.   That occurred on June 28th, 1993.

9   Q.   And did that occur in a preliminary amendment

10   which I believe is at page 208 of the Exhibit 1502?

11   A.   Yes, it did. On page 4 of the preliminary

12   amendment, to be specific.

13   Q.   In your opinion, do any of these claims in this

14   preliminary amendment cover a PLL proposal for SDRAMs?

15   A.   Yes.

16   Q.   And which claim, in your opinion, meets that

17   criteria?

18   A.   Claims 151 and 152, 166 and 167.

19   Q.   Is the claim 151 to which you just referred the

20   claim now shown on the screen?

21   A.   That is correct. Actually, I better back up a

22   second, the claims I identified, 151 and 167, were

23   introduced in a subsequent amendment. I did intend to

24   identify them, but not in the context of this amendment.

25   Q.   In what way does claim 151, now on the screen,

26

1   differ from original claim 73?

2   A. Claim 151 differs from claim 73 in a lot of

3   ways, all the limitations relating to the early clock

4   signal and the signal return means have been eliminated.

5   There's a completely different device that's claimed

6   that's unrelated to claim 73. And when one can see part

7   of the accommodation that's required is a phase locked

8   loop, and then the acronym for the phase locked loop,

9   PLL is defined as being part of the memory device.

10   Q. Was claim 151 as shown on the screen amended at

11   some point?

12   A. Yes, it was. It was amended in October of '95.

13   Q. Okay, let's take a look at that amended version

14   of claim 151. Excuse me one moment.

15   Just generally, when an applicant amends a claim

16   in an amendment submitted to the patent office, what is

17   the significance in the fact that some lines in the

18   amended claim are underlined?

19   A. The underlining of words in a claim and

20   amendment -- in an amendment, are an indication that

21   those words have been added to the claim.

22   Q. And what is the significance to the fact that

23   some words may be bracketed in an amended claim?

24   A. The bracketed terminology is claim terminology

25   that appeared in the earlier version of the claim that

26

1   has been deleted.

2   Q.   And is the version of claim 151 now on the

3   screen the amended version to which you just referred?

4   A.   Yes.

5   Q.   How does it differ from the earlier version of

6   claim 151?

7   A.   Well, it differs in a number of respects. The

8   terminology at the very end of the claim, wherein the

9   memory array, the clock signal receiving circuit, and

10   the PLL, all reside on a single semiconductor chip has

11   been added, and there have been other changes that have

12   been made as well, such as the language performing has

13   been -- performing memory operations has been changed to

14   controlling memory operations.

15   Q.   Mr. Nusbaum, I would now like to ask you to

16   refer to exhibit previously marked JX-21, it is a set of

17   JEDEC minutes. Do you recognize that exhibit, JX-21?

18   A.   I can't say that I can read what's on the

19   screen, but --

20   Q.   There you go.

21   A.   Yes, these are JEDEC minutes of meeting number

22   72, the meeting took place on September 13th, 1994, and

23   this exhibit includes an attachment that's designated

24   attachment AA that includes a phase locked loop related

25   presentation by NEC.

26

1   Q.   Did you review that proposal relating to phase

2   locked loop?

3   A.   Yes, I did.

4   Q.   In particular, with regards to the page of the

5   proposal now shown on the screen, what's your

6   understanding of what's shown here?

7   A.   The proposal that's shown here, just to put it

8   in context, two pages earlier in the proposal, at least

9   I believe it's two pages earlier, there is a -- there is

10   a mode register shown for an SDRAM, so that we know that

11   the proposal relates to SDRAM. This particular mode

12   register has got a bit in position 11 that is a PLL

13   enabler. And going back to the page that you directed

14   my attention to, this page shows the details of the

15   operation of the PLL enabled mode. There is an

16   indication that this PLL is on-chip, because it says,

17   "on-chip-PLL." There is a block diagram that shows

18   SDRAM operation without PLL and then with PLL. And with

19   respect to the operation with PLL, what's shown is an

20   external clock signal that's coming in on the left-hand

21   side, and there is an internal clock that's generated

22   that's labeled ICLK. That's output from the PLL, as

23   shown, and the PLL, phase locked loop, operates, as you

24   can see, in the timing diagram, to synchronize in time

25   the external clock signal that's shown with the internal

26

1   clock, and it does that by variably delaying the

2   internal clock, and you can see the delay in the

3   internal clock by comparing the two timing diagrams.

4   Q. All right, and now I would like to ask you to

5   turn to a demonstrative, which we've previously marked

6   DX-16, and it has the -- it is the first page of DX-16,

7   and it has the title Phase Locked Loop Proposal for

8   JEDEC-Style SDRAM Memory System. Mr. Nusbaum, could you

9   please explain your understanding of this exhibit?

10   A.   Yes. I generated this block diagram exhibit and

11   had its accuracy confirmed by Dr. Jacob, the FTC's

12   technical expert. The bottom of the block diagram is

13   essentially the same as the block diagram in DX-4, I

14   believe it was, that we talked about with respect to

15   cast latency and the mode register.

16   And as I explained previously, this -- the

17   bottom of the block diagram which shows the memory

18   controller and the DRAM modules was taken from Dr.

19   Jacob's expert report for showing a typical JEDEC-style

20   SDRAM memory system. The blow-up of the DRAM that's

21   shown on the top portion of the diagram, if one looks at

22   both the mode register page that we talked about

23   earlier, there is an indication of that mode register

24   from the NEC proposal at the very top of the block

25   diagram, and then the PLL proposal that's shown on the

26

1   page PLL Enabled Mode, that block diagram was extracted

2   and placed in the bottom portion of this exploded view,

3   and the only difference really is the memory array which

4   was represented in the NEC diagram as a long, skinny

5   rectangle, the shape of the rectangle has changed and

6   there's cross-hatching to indicate the memory array.

7   But substantively, it's identical.

8   Q. Now, I would like to ask you to please explain

9   your opinion that claim 151 of the '692 application

10   covers this PLL proposal.

11   A. I have prepared a blow-up exhibit claim chart

12   that will be an aid in demonstrating that.

13   MS. MICHEL: Your Honor, we would like to use

14   one of the claim charts which have been previously

15   designated part of DX-15.

16   JUDGE McGUIRE: All right, go ahead.

17   MS. MICHEL: Your Honor, may Mr. Nusbaum

18   approach the chart?

19   JUDGE McGUIRE: Yes, go ahead, Mr. Nusbaum.

20   BY MS. MICHEL:

21   Q. Now, Mr. Nusbaum, is this the version of claim

22   151 as it was amended in October of I believe it's 1995?

23   A. I believe it to be, yes. Once again, in order

24   to show that a claim covers certain subject matter such

25   as in this JEDEC PLL proposal, it is necessary to look

26

1   at every word in the claim and this is to see whether it

2   literally covers and see if there is a counterpart in

3   the product that you're comparing it with.

4   With respect to a memory device, the first three

5   words of the claim, there's no question about it, but

6   the proposal relates to a memory device, the page we

7   looked at with respect to the mode register identifies

8   it as an SDRAM mode register, and SDRAM contains a

9   memory bus.

10   Then moving to the next limitation, a memory

11   array that stores data at addresses, if one looks at the

12   NEC proposal, there is a block that's labeled memory

13   array. And it does store data at addresses.

14   A clock signal receiving circuit is the next

15   limitation, that's got to be coupled to receive an

16   external clock signal. The clock signal receiving

17   circuit generating a local clock signal for controlling

18   memory operations with respect to the memory array. The

19   PLL proposal from NEC has a triangular block that's

20   shown, and it's labeled receiver in the NEC proposal.

21   It is coupled to receive an external clock signal, CLK,

22   and it generates or passes on the internal clock signal,

23   ICLK, as its output.

24   The next limitation that's required is a phase

25   locked loop, and that phase locked loop is shown in the

26

1 NEC proposal. According to the claim, that a phase

2 locked loop has got to be coupled to the clock receiving

3 circuit, which we can see in the NEC proposal, if one

4 looks at the proposal, the PLL there is coupled to the

5 component labeled receiver, and in terms of being

6 coupled, giving this terminology its broadest reasonable

7 interpretation, in terms of being coupled could be

8 either actually physically coupled or operatively

9 coupled.

10   With respect to the phase locked loop in the NEC

11 proposal, the PLL is coupled to this -- to the output

12 buffer of the memory array that's represented by a

13 little triangle in the PLL proposal. This controls the

14 reading of data from the memory array to the data bus

15 that's indicated by the DQ. The PLL is required to

16 provide a variable delay to the local plot system such

17 that the delay clock signal is synchronized with the

18 external clock signal, the signal received by the clock

19 signal receiving circuit.

20   The PLL will provide a variable delay, that can

21 be -- the delay can be seen, as I mentioned, by

22 comparing the timing diagram with PLL and without PLL,

23 and the external clock signal is synchronized with the

24 internal clock, you can see the two timing diagrams

25 lining up precisely in phase.

26

1   Lastly, the memory, the memory array, the clock

2   signal receiving circuit and the PLL all reside on a

3   single semiconductor substrate. The PLL in the proposal

4   is identified as on-chip. The receiver and the memory

5   array are on-chip as well, they all reside on a single

6   substrate.

7   With respect to the claim 152, this is a

8   dependent claim, it incorporates all of the limitations

9   of claim 151, what it adds is that the memory array is a

10 DRAM, we know that in the JEDEC proposal, that what

11 we're dealing with is an SDRAM, which is a type of DRAM.

12   Q. Okay, thank you. Mr. Nusbaum, could I ask you

13 to circle, please, the '692 application on the Rambus

14 patent tree.

15   A. (Witness complied.)

16   Q. I would like to look for a moment at JX-21, that

17 is the NEC proposal, and particularly exhibit page 91.

18 Mr. Nusbaum, you mentioned that claim 151 has a

19 limitation, the delay local clock system is synchronized

20 with the external clock signal. Could you point out on

21 Exhibit JX-21, page 91, where you believe that

22 limitation is indicated.

23   A. The external clock signal, CLK, there's a timing

24 diagram that's shown in the very bottom of the with PLL.

25 The internal clock signal that's shown at the output of

26

1   the PLL is designated by ICLK, and you can see how

2   these -- the clock signal and the external clock and the

3   internal clock are lined up together, they're

4   synchronized.

5   Q. Now, Mr. Nusbaum, when you analyzed claim 151

6   from October of '95, in your opinion, was there an

7   earlier version of claim 151 that was introduced in the

8   language that was also covered under the NEC claims?

9   A. Yes, it does.

10   Q. Can you explain briefly why?

11   A. Yes, the earlier version of claim 151 did not

12   include the limitations wherein the receiver circuit and

13   the PLL and the memory array were together under a

14   single semiconductor substrate. I can't see the exact

15   language, but that -- so, claim 151 was just a broader

16   version, had less limitations than the October '95

17   version of the same claim. There were some other

18   relatively minor changes that were made, but there's

19   correspondence with those as well.

20   Q. Turning back to CX-1502, which is the

21   prosecution hear, have you reviewed claims 166 and 167

22   which were also submitted in the October 1995 amendment?

23   A. Yes, I have.

24   Q. Do you have any opinion as to whether these

25   claims cover a computer system using an

26

1   SDRAM-incorporated PLL proposal that we just looked at?

2   A.   Yes, these claims do.

3   Q.   Could you please explain the basis for that

4   opinion?

5   A.   Yes, if you take the entirety of claim 151, and

6   I can't see too well from here, but I've seen it many

7   times before, and you look at paragraph (C) of claim

8   166.   Claim 151, as I previously explained the

9   correspondence, is embodied in the memory device of

10   paragraph (C) with respect to the limitations that are

11   set forth, including the memory array, the clock signal

12   receiving circuit and the phased lock loop. So, for all

13   the reasons that I just went through in detail, those

14   features are present that are in claim 166.

15   The two features that are added, or the features

16   that are added, this claim is in a computer system

17   context, if one looks at the demonstrative I was just

18   utilizing with the PLL, for the reasons that I stated

19   before, the combination of a memory controller and the

20   DRAM modules can be viewed as being a computer system as

21   well as a memory controller and the modules when used in

22   its typical PC context, is a computer system.

23   Then the only other two limitations are a bus,

24   which we clearly have, and the bus master would

25   correspond to the memory controller. So, there's a

26

1   counterpart for each and every element in claim 166 as

2   well.

3   Q. And do you have an opinion with regard to claim

4   167 and its relationship to an SDRAM incorporated in the

5   PLL proposal?

6   A. Yes, I do.

7   Q. And what is that opinion?

8   A. Claim 167 just merely adds that the memory array

9   is a DRAM, and it clearly is, I've demonstrated that.

10   MS. MICHEL: Your Honor, at this time we request

11   that CX-1502, which is the prosecution history that we

12   have just been discussing, be entered into evidence.

13   MR. STONE: No objection.

14   JUDGE McGUIRE: So entered.

15   (CX Exhibit Number 1502 was admitted into

16   evidence.)

17   BY MS. MICHEL:

18   Q. Turning now to another topic, Mr. Nusbaum, have

19   you identified any Rambus patent application that in

20   your opinion contains claims covering a dual edge clock

21   proposal for JEDEC SDRAMs?

22   A. Yes, I have.

23   Q. And what is that application?

24   A. It's application 222,646.

25   Q. What do you mean when you refer to a dual edge

26

1   clock proposal for SDRAM?

2   A.   What I mean is by dual edge clock proposal, it

3   is a proposal for controlling memory operations in an

4   SDRAM -- read and write operations in response to both

5   the rising edge and falling edge of the clock server.

6   Q.   I would like to ask you to refer to CX-1493,

7   which is the prosecution history of the '327 patent.

8   Mr. Nusbaum, have you reviewed this exhibit?

9   A.   Yes, I have.

10   Q.   And what is it?

11   A.   This is the prosecution history of the '327

12   patent, and actually U.S. patent 5,513,327, which

13   contains the prosecution history of the application that

14   I just identified 222,646.

15   Q.   When was the '646 application filed?

16   A.   The '646 application was filed on March 31st,

17   1994.

18   Q.   What's the relationship between the '646

19   application and the original '898 application?

20   A.   The '646 application is a continuation of an

21   application 954,945, which in turn is a continuation of

22   the very first originally filed patent application

23   510,898.

24   Q.   Did any of the original claims in the '646

25   application cover a dual edge clock related JEDEC

26

1   proposal for SDRAMs?

2   A.   No, they did not.

3   Q.   Will you please explain your opinion on that.

4   A.   The original claims in application 222,646 were

5   the same 150 original claims that we have seen before,

6   you know, there was just no claim in there that covered

7   a dual edge clock proposal.

8   Q.   In your opinion, when was the claim first filed

9   in the patent office in the '646 application which

10   covered an SDRAM having a dual edge clocking feature?

11   A.   In a preliminary amendment dated September 6,

12   1994.

13   Q.   Let's take a look at that preliminary amendment.

14   And in particular, which claims of this amendment in

15   your opinion covered an SDRAM having a dual edge

16   clocking feature?

17   A.   Claim 151.

18   Q.   Well, let's take a look at that. And which

19   limitation of claim 151 is in your opinion directed to a

20   dual edge clocking feature?

21   A.   The limitation relating to a receiver circuit

22   coupled to the conductor and the first circuit, and then

23   one can see that the circuit latches information

24   received from the conductor in response to a rising edge

25   of the clock signal and a falling edge of the clock

26

1   signal.

2   Q. Mr. Nusbaum, are you aware of any JEDEC

3   proposals relating to dual edge clocking for SDRAMs made

4   prior to June 1996?

5   A. Yes, I'm aware of a March 1996 JEDEC proposal.

6   I'm aware of surveys prior to June of '96, and I'm aware

7   of a May 1992 dual edge clock proposal.

8   Q. Let's look at JX-31, please, which should be

9   JEDEC minutes from March of '96. Mr. Nusbaum, have you

10   reviewed any portion of this exhibit?

11   A. Yes.

12   Q. And which portions have you reviewed?

13   A. I have reviewed the portion of this exhibit that

14   is identified by attachment U and is a proposal for

15   future SDRAM by Samsung.

16   JUDGE McGUIRE: Let's go off the record for a

17   moment.

18   (Whereupon, there was a brief pause in the

19   proceedings.)

20   BY MS. MICHEL:

21   Q. Mr. Nusbaum, what's your understanding of the

22   proposal shown on the screen?

23   A. The proposal shown on the screen, as it

24   indicates, is for a future SDRAM proposal, more

25   specifically to a proposed clocking scheme, and there's

26

1   an indication in the proposed clocking scheme on -- I'm

2   not sure if we can accurately call this a bullet point,

3   but the fourth point is, "Data in sampled at both edge

4   of clock into memory." So, that's a dual edge clock

5   proposal.

6   Q. Okay, next I would like to direct your attention

7   to a demonstrative previously marked DX-16, and it's the

8   second page of DX-16.

9   JUDGE McGUIRE: I'm sorry, is it DX-15 or 16?

10   MS. MICHEL: Sixteen, Your Honor.

11   JUDGE McGUIRE: Okay, right, got you. No, wait

12   a minute, I'm still confused, I had DX-4, and then the

13   previous was DX -- I'm not sure what you're talking

14   about when you say DX-16.

15   MS. MICHEL: Yes.

16   JUDGE McGUIRE: I don't recall that being

17   marked.

18   MS. MICHEL: All right, what happened, Your

19   Honor, was there are three block diagrams, one of them

20   had been previously designated with Mr. Williams' DX-4.

21   JUDGE McGUIRE: Right.

22   MS. MICHEL: We have then called the set of

23   claim charts DX-15. We had previously discussed calling

24   the other two block diagrams together DX-16, but I may

25   have failed to request that they be marked.

26

1   JUDGE McGUIRE: I don't think we did that.

2   MR. STONE: We talked about doing it, Your

3   Honor.

4   JUDGE McGUIRE: Okay, then so marked at this

5   time, DX-16, I just want to keep it straight for the

6   record.

7   (DX Exhibit Number 16 was marked for

8   identification.)

9   JUDGE McGUIRE: All right, go ahead.

10   BY MS. MICHEL:

11   Q.   Mr. Nusbaum, I would like to direct your

12   attention to the second block diagram of DX-16, which

13   bears the title Dual Edge Clock Proposal for JEDEC-Style

14   SDRAM Memory System. Do you have that?

15   A.   Yes, I do.

16   Q.   What's your understanding of what's shown in

17   this block diagram?

18   A.   This is a block diagram that I prepared in

19   concert with Dr. Jacob. The bottom portion of the block

20   diagram I extracted from Dr. Jacob's expert report that

21   shows a typical JEDEC-style SDRAM memory system. With

22   respect to the exploded view of a DRAM, this exploded

23   view was generated by Dr. Jacob and what it shows are

24   the structural components that are inherent in data

25   that's in sample -- of data in that's sampled at both

26

1   edges of the clock into memory, where the data is coming

2   in at the right through this data pin, as represented by

3   the data pin DQ, the memory of the data is being stored

4   in the memory array that we've seen before. The clock

5   signal is coming in through this pin CLK, and there's a

6   quote, "Data in sampled at both edges of clock into

7   memory" from the Samsung proposal, and what's shown as a

8   dual edge latching circuit is the circuit that responds

9   to the rising edge and falling edge of the clock, and in

10   response the information is stored in the memory array.

11   Q. Mr. Nusbaum, could you please explain your

12   opinion that claim 151 of the '646 application covers

13   this JEDEC dual edge clock-related proposal?

14   A. Yes, I have one last blow-up exhibit that

15   demonstrates my opinion.

16   Q. All right, let me set that up for you, that will

17   be one of the claim charts of DX-15.

18   JUDGE McGUIRE: Go ahead.

19   MS. MICHEL: Your Honor, may Mr. Nusbaum

20   approach the claim chart?

21   JUDGE McGUIRE: Yeah, go ahead, Mr. Nusbaum.

22   THE WITNESS: On the left-hand side of the

23   chart, there's claim 151 of application 222,646 that we

24   just took a look at. And the right-hand portion of the

25   chart represents the proposed JEDEC dual edge clock

26

1   standard of Samsung. In order to demonstrate that this

2   claim literally covers this proposal, it's necessary to

3   show at each level what's set forth in the claim and a

4   counterpart in the proposal. The claim calls for a

5   dynamic random access memory or DRAM that's capable of

6   being coupled to a bus. The proposal is for an SDRAM,

7   which is a type of DRAM, we know it's coupled through a

8   bus.

9   A first circuit for providing a clock signal,

10 and an SDRAM inherently will receive an external clock

11 signal and it will do that through a circuit that will

12 provide an internal clock, so the internal clock

13 representation of the external clock that corresponds to

14 the first circuit that provides a clock signal, and is

15 indicated by a receiver triangular block of the nature

16 that we saw in the NEC proposal, even without PLL.

17   The next limitation is that there's a conductor

18 for coupling the DRAM to the bus. An SDRAM will have

19 pins that couple to the bus. The Samsung and other dual

20 edge clock proposals will inherently require connection

21 of the SDRAM to various different buses.

22   Then the final limitation is that the receiver

23 circuit is coupled to the conductor and the first

24 circuit, and the receiver op circuit operates the

25 latching information received from the conductor in

26

1   response to the rising edge of the clock signal and the

2   falling edge of the clock signal. While the proposal of

3   Samsung states that the data that's coming in is sampled

4   at both edges of the clock into memory and this requires

5   latching of the information from the data lines at the

6   rising edge and falling edge of the clock signal, as

7   I've indicated, Dr. Jacob has stated that the latching

8   circuit must inherently be present in order to implement

9   the Samsung or similar dual edge clock proposals. It's

10   necessary to sample the data at a precise period of time

11   where the data is at a one level or a zero level and not

12   some random point in between. And that data is latched

13   at the precise time.

14   Q. Okay, thank you. And could you please circle

15   the '646 application on the Rambus patent tree.

16   A. (Witness complied.)

17   MS. MICHEL: Your Honor, I would like to offer

18   CX-1493 into evidence, that's the prosecution history

19   we've just been discussing.

20   MR. STONE: No objection.

21   JUDGE McGUIRE: So entered.

22   (CX Exhibit Number 1493 was admitted into

23   evidence.)

24   MS. MICHEL: I have no further questions on

25   direct.

26

1   JUDGE McGUIRE: Would you like to take a short

2   break, Mr. Stone?

3   MR. STONE: No, I'm fine.

4   JUDGE McGUIRE: Then proceed with cross

5   examination.

6   CROSS EXAMINATION

7   BY MR. STONE:

8   Q. Good afternoon, Mr. Nusbaum.

9   A. Good afternoon, sir.

10   Q. Could we bring up the stipulations? Paragraphs

11 9 and 10. I would like you to take a look, if you

12 would, at the stipulations that are on the screen in

13 front of you, Mr. Nusbaum. And take a look first at

14 paragraph 9. It talks about prior to the adoption of

15 the JEDEC SDRAM standard in 1993. You're familiar with

16 rev 4, correct, of that standard? That's been your

17 testimony today?

18   A. Release 4, yes.

19   Q. And when was Release 4 published?

20   A. It's my understanding that it was published in

21 November of 1993.

22   Q. So, prior to November of 1993, do you agree that

23 Rambus had no claims in any pending patent application

24 that if issued would have necessarily been infringed by

25 the manufacture or use of any device manufactured in

26

1   accordance with the 1993 JEDEC SDRAM standard?

2   A. I can't testify as to any pending patent

3   application, I am not familiar with the entirety of

4   Rambus's patent applications. I can say that of the

5   patent applications that I've looked at, I'm not aware

6   of any pending application that had claims that would

7   have necessarily been infringed.

8   Q. Okay. And you looked only at patent

9   applications that were shown to you by complaint

10   counsel?

11   A. That's correct. I had no knowledge of those

12   applications prior to this case.

13   Q. And so, someone else made the selection of what

14   you should or should not look at? Is that fair?

15   A. Employees of the FTC did, indeed, forward me

16   certain patent applications.

17   Q. Okay. And then if you would look at paragraph

18   10 of the stipulations. Do you agree that based at

19   least on the extent of things you have looked at, that

20   as of January of 1996, Rambus had no issued U.S. patents

21   that were essential to the manufacture or use of any

22   device manufactured in compliance with any JEDEC

23   standard?

24   A. I am not aware of any issued patents that I have

25   knowledge of that were essential to the manufacture or

26

1   use of any device. I've testified about these four

2   patent applications, and that's the extent of my

3   knowledge.

4   Q. Are there any patents that issued to Rambus

5   prior to June of 1996 that would be essential to the

6   manufacture or use of any device manufactured in

7   compliance with any JEDEC standard as of that date?

8   A. My focus has been on these four patent

9   applications. If you could present me with a patent

10   that I could analyze, if given enough time, I would be

11   happy to express my opinion with respect to that

12   particular patent. As I testified, I am not aware of

13   any patents that fall into -- that are embraced by your

14   question.

15   Q. Let me ask it this way: Are there any Rambus

16   patents that you're aware of that would be infringed by

17   -- necessarily infringed by a product that was

18   manufactured in compliance with the SDRAM standard?

19   A. I'm not aware of any such patent that I have

20   reviewed.

21   Q. If we look at the patent tree behind you, as of

22   June of 1996, am I correct that if we count these up,

23   Rambus had four issued patents -- I mean, six issued

24   patents?

25   A. That appears to be correct.

26

1   Q. And you've checked this chart?

2   A. I have.

3   Q. Okay. As to any of those six patents that had

4   issued to Rambus prior to June of 1996, are any of those

5   patents necessarily infringed by the manufacture of a

6   JEDEC-compliant SDRAM part?

7   A. Are you talking about with respect to Release 4?

8   Q. Let me ask you first about Release 4, yes.

9   A. I'm not aware of any patent that falls within

10   your question, but please keep in mind that I have

11   looked at four patent applications, I have not studied

12   the claims in any of these patents, but I'm not aware of

13   any patent that falls within your question.

14   Q. And have you looked at other versions of any

15   SDRAM standards other than Release 4?

16   A. I have not.

17   Q. Now, you've testified earlier today about a

18   standard that you applied from time to time which was

19   interpreting the claims as broadly as their terms

20   reasonably allow. Is that a fair paraphrasing of your

21   testimony?

22   A. The claim interpretations standard that I was

23   referring to is the broadest reasonable interpretation

24   standard, that's what I was referring to.

25   Q. And was that the standard that you understand

26

1   that is applied by patent examiners during the

2   prosecution?

3   A.   That is correct, as a matter of law.

4   Q.   And is it -- am I not correct that the patent

5   examiners are trained and told that they should "apply

6   the following standard: During examination, the claims

7   must be interpreted as broadly as their terms reasonably

8   allow. This means that the words of the claim must be

9   given their plain meaning, unless applicant has provided

10 a clear definition in the specification." And I'm

11 quoting from the manual, which I know you're way more

12 familiar with than I am. Is that a correct statement of

13 the standard?

14   A.   I believe it is, yes.

15   Q.   Okay. And is it also correct that the meaning

16 of claims of issued patents are to be interpreted in

17 light of the specification prosecution history, prior

18 art and other claims, and that is different than the

19 mode of claim interpretation to be applied during

20 prosecution?

21   A.   There are -- they are two different claim

22 interpretations standards.

23   Q.   So, when I asked you earlier about whether

24 something necessarily infringes, you would apply the

25 claim interpretation that you would apply to an issued

26

1   patent in responding to that question, correct?

2   A. Well, we're dealing with patent application

3   claims. I can tell you that with respect to the

4   analysis that I undertook, the result would be the same

5   with respect to these claims.

6   Q. The claims in the applications you looked at?

7   A. The claims in the -- if I were to presume that

8   they were issued claims, I would have the same opinion.

9   Q. Now, with respect to the patent tree that you

10   had up earlier, there's a large number, or a fairly

11   large number of patents that issued from that original

12   '898 application, correct?

13   A. That is correct.

14   Q. And is the number of patents that issued from

15   that particular application unusual in your experience?

16   A. Could you be a little more specific in your

17   question? I'm not quite sure what you mean by unusual.

18   Are you talking about unusual in the context that they

19   all emanated from just one 62-page specification and the

20   same set of drawings, or -- I'm not sure I understand

21   the scope of your question.

22   Q. Let me try to break it down. Would a reasonable

23   patent attorney, aware of the existence of at least 11

24   separate inventions, file those as a single application?

25   A. Well, when you say file those, what are you

26

1   referring to?

2   Q.   Those 11 inventions.

3   A.   One file is patent applications, one includes

4   claims -- a claimed invention in patent applications,

5   I'm not quite sure if I appreciate your question.

6   Q.   Sure. The original '898 application was subject

7   to a restriction that required it to be ultimately

8   divided into 11 separate applications, correct?

9   A.   That is correct.

10   Q.   And the reason for the restriction was that the

11   examiner thought there were at least 11 separate

12   inventions?

13   A.   The examiner did indicate that in his view there

14   were 11 independent distinct inventions.

15   Q.   Now, and an attorney had filed that application,

16   correct?

17   A.   That is correct.

18   Q.   And you talked earlier about a reasonably

19   prudent patent attorney, do I have the language right

20   that you used?

21   A.   I'm not sure if those were my exact words.

22   JUDGE McGUIRE: Close enough, Mr. Stone.

23   BY MR. STONE:

24   Q.   Okay. Would a reasonably prudent patent

25   attorney aware of the existence of 11 separate

26

1   inventions decide to include them all on a single

2   application, in your opinion?

3   A.   It's not at all unusual for a prudent patent

4   attorney to file a single comprehensive patent

5   application that includes a lot of identifiably

6   different kind of inventions.

7   Q.   Knowing that there's going to be a restriction

8   imposed?

9   A.   Suspecting strongly. There are certainly those

10   instances where clients prefer not to have to pay for a

11   number of different -- many different divisional

12   applications.

13   Q.   And when you do that, when you file them all as

14   part of a single application, then as they are

15   subsequently subject to restriction, and divisions

16   result, each of those divisions is going to be based on

17   the same written description as the original

18   application. Is that also correct?

19   A.   That is correct.

20   Q.   Okay. And when there's a continuation of a

21   patent, that continuation application also is based on

22   the specification and written description of the

23   original application?

24   A.   It is not allowed to contain any new matter.

25   Q.   Okay. And so, the patent tree that you have

26

1   behind you, it has on it -- do you know how many issued

2   patents?

3   A. I do not.

4   Q. In the neighborhood of 43, would that be an

5   approximation?

6   A. It wouldn't surprise me.

7   Q. Okay. Each of the claims, in each of those

8   issued patents, is based on the original written

9   description and specification filed on April 18th of

10   1990 in the '898 application, correct?

11   A. When you say it is based, are you -- I presume

12   that you're just saying did the -- were those claims

13   filed in an application that had the same disclosure.

14   Q. No, that's okay, let me lay a little more

15   foundation here. It's a requirement, is it not, of the

16   patent laws that the written description must describe

17   the invention in full, clear, concise and exact terms?

18   A. That is part of 35 USC 112.

19   Q. And 35 USC 112 then goes on to say, "It must

20   describe the invention in such full, clear, concise and

21   exact terms as to enable any person skilled in the art

22   to which it pertains to make and use the invention,"

23   correct?

24   A. It does say that, and that is the enablement

25   requirement that I testified to.

26

1   Q.   And a person skilled in the art is whom?

2   A.   A person skilled in the art is a hypothetical

3   person and who precisely that person is, or his

4   characteristics will vary from case to case.

5   Q.   But not a patent attorney?

6   A.   That's correct.

7   Q.   It's a -- in this context of DRAMs, it would be

8   someone with an engineering background with knowledge of

9   electrical engineering and knowledge of computer systems

10 or random access memory, in that field, correct?

11   A.   I will not disagree with you with respect to

12 that.

13   Q.   And I didn't mean to give the perfect or

14 complete definition either, so --

15   A.   That was my understanding as well.

16   Q.   In a general sense, it's not going to be a

17 patent attorney, it's going to be someone who practices

18 in the field that would be pertinent to that particular

19 invention.

20   A.   I agree.

21   Q.   Okay. And each of the claims has to claim an

22 invention that is described in the original written

23 description, correct?

24   A.   There has to be basis, adequate support in the

25 original description for later added claims, such that

26

it's clear from reviewing the original specification
that the inventors were in possession of that later
claimed subject matter.

Q. So, the fundamental factual inquiry is for the
examiner to determine that the specification conveys
with reasonable clarity to those skilled in the art that
as of the filing date sought, the applicant was in
possession of the invention that is now described in a
claim, correct?

A. That is part of what needs to be considered,
it's certainly what a patent examiner would consider.

Q. And it's a necessary element, I mean, they have
to have that, as well as other things?

A. Correct.

Q. So, in each of the claims, in each of the
patents that has issued from the original '898
application, was determined by a patent examiner to
claim an invention that was described with reasonable
clarity to those skilled in the art in the written
description that was filed in April of 1990, correct?

A. That's correct, but it should be borne in mind
that over time the legal standard changed and a
determination that may have been made by a patent
examiner let's say in 1997 may not have been in accord
with the legal standard that prevails today.

1   Q. What you're saying is the standard today is

2   somewhat different than the standard at the time that

3   most of the patents on your patent tree were being

4   prosecuted?

5   A. I'm not sure that the standard necessarily

6   changed, but the applicability of standards that were

7   heretofore applied in chemical type cases relating to

8   claims having undue breadth, there was cases which made

9   that -- those concepts applicable in electrical cases.

10   Q. Okay. Let me now talk about some of the

11   applications you have been describing. Well, with

12   respect to the patent tree, before I do this, with

13   respect to the patent tree, is it unusual to see 43

14   patents result from a single application?

15   A. It's certainly not commonplace. It happens from

16   time to time. There are instances where there may even

17   be more patents that flow. I can think of one.

18   Q. I'm sorry, in your experience, you've seen more

19   than 43 resulting from the same application?

20   A. I am thinking of one example.

21   Q. In your experience, is it -- have you

22   encountered situations where the claims during the

23   course of prosecution have been broadened from the

24   claims that were filed originally?

25   A. Yes.

26

1   Q.   And some of the things you've described to us

2 today, some of the claims that you said were later

3 amended or added, sometimes your description of those

4 claims was that they broadened the claim coverage from

5 what had been in the application earlier. Is that fair?

6   A.   Yes, I did indeed state that.

7   Q.   Now, can we just go back to the last one that

8 you told us about, that was the '646 application, and I

9 just want to make sure that we have some basic facts in

10 the record as to this particular application. The claim

11 that you said related to a DDR presentation, that's a

12 dual edge clock presentation, that claim was first added

13 to the application when?

14   A.   In a preliminary amendment that was dated

15 September 6, 1994.

16   Q.   Okay. And that was claim 151?

17   A.   Yes, sir.

18   Q.   And then you used a version for your claim chart

19 that was amended and modified somewhat later, correct?

20   A.   I don't believe so.

21   Q.   I thought you used a version that was --

22   A.   I think you're confusing my PLL analysis.

23   Q.   Oh, I might be, but -- okay, in any event, it's

24 claim 151 of the '646, correct?

25   A.   That's correct.

26

1   Q. And this ultimately issued as what?

2   A. The '327 patent.

3   Q. And did the '327 patent have that claim in it?

4   A. It did not.

5   Q. Okay. Now, does the SDRAM standard that you've

6   looked at, that's Revision 4? It's Release 4, I keep

7   saying that, which one is it?

8   A. I believe it's Release 4.

9   Q. Okay, Release 4. Does Release 4 of the SDRAM

10   standard have in it any features that would necessarily

11   infringe claim 151 of the '646 application?

12   A. Not that I'm aware of.

13   Q. Okay. Can we fairly write that dual edge

14   clocking is not in release 4 of SDRAM standard?

15   A. Yes.

16   Q. Okay. And so what you showed us a relationship

17   between was not the SDRAM standard, you showed us the

18   relationship with a particular presentation, correct, on

19   your claim chart?

20   A. I showed a relationship with a particular

21   Samsung presentation and indicated other presentations,

22   some of which were dated -- one of which identified as

23   being dated May of '92.

24   Q. Right. And let me just focus on your claim

25   chart for the moment. In your claim chart, you were

26

1   using a Samsung proposal.

2   A.   Yes, sir.

3   Q.   Or presentation.

4   A.   Yes, sir.

5   Q.   Was there ever a second showing of that

6   presentation?

7   A.   I have no idea.

8   Q.   Was it ever valid?

9   A.   I do not know.

10   Q.   That was the March 1996 meeting of JEDEC that

11   you pulled that proposal from, was it not?

12   A.   That is correct.

13   Q.   And was anybody from Rambus in attendance at

14   that meeting?

15   A.   I have no knowledge of that.

16   Q.   Why don't you look at the first page of the

17   exhibit that you showed us.

18   A.   Maybe use your set, I'm not quite sure where I

19   put it.

20   JUDGE McGUIRE: Take your time.

21   BY MR. STONE:

22   Q.   We can bring it up, it's JX-31.

23   A.   I've got it.

24   Q.   You've got it?

25   A.   Yes, sir.

26

1   Q.   And just take a look at the cover page, you'll

2   see how the companies are listed in alphabetical order.

3   And you'll note, won't you, that there's no entry for

4   anybody from Rambus being in attendance on the first

5   page.

6   A.   I don't see Rambus identified on this page.

7   Q.   And then if you go to the second page where it

8   shows others present, you will note that there's also

9   again no entry for Rambus, correct?

10   A.   That's correct.

11   Q.   Now, you have not as part of the work that

12   you've performed, you have not done an analysis with

13   respect to the DDR SDRAM standard that was adopted by

14   JEDEC some time after June of 1996, have you?

15   A.   I have not.

16   Q.   Okay. Let's go back, then, to another one of

17   your presentations. Let me do the PLL one, if I can. I

18   guess, let me mark this first chart that I wrote on as

19   DX-17?

20   JUDGE McGUIRE: Yeah, 17.

21   (DX Exhibit Number 17 was marked for

22   identification.)

23   MR. STONE: Let me turn to another clean sheet

24   and I will mark that DX-18.

25   (DX Exhibit Number 18 was marked for

26

1   identification.)

2   BY MR. STONE:

3   Q. And which application was it that you related to

4   PLL?

5   A. Application 847,692.

6   Q. So, if I call that the '692 application, when

7   were claims first added to the '692 application that you

8   felt in some way described the PLL?

9   A. June 28th, 1993 was one of the two amendments

10 that I refer to in this application. That was the first

11 one.

12   Q. And what happened to -- and those claims, can

13 you give us those numbers again?

14   A. Claims 151 and 152.

15   Q. And what happened to those claims?

16   A. Those claims were amended in October '95

17 amendment.

18   Q. October '95?

19   A. Yes, sir.

20   Q. And then what happened to them after that?

21   A. Those claims were rejected and amended in

22 various regards, and ultimately the application was

23 allowed, including claims 151 to 153, and that was on --

24 in August of 1996.

25   Q. And did you look at those allowed claims?

26

1   A. I did at one time.

2   Q. And did you make a determination as to whether

3 in your opinion there was a relationship between those

4 allowed claims and the PLL presentation by NEC that I

5 think you used in your claim chart?

6   A. I don't recall reviewing those claims with that

7 in mind, seeing that there was an amendment after July

8 of 1996, and my analysis stopped at the June '96 point

9 in time where the FTC is alleging that Rambus was no

10 longer a JEDEC committee member.

11   Q. Okay. So, you don't know, I guess, whether from

12 this '692 application, claims ultimately issued which

13 would still have had a particular relationship to the

14 PLL presentation that you referred to earlier?

15   A. I do not know one way or the other.

16   Q. Now, this particular application, the '692

17 application, this was argued by Infineon in the Infineon

18 case to have been something that Rambus should have

19 disclosed to JEDEC, correct?

20   A. I can't say that sitting here today I'm entirely

21 familiar with the arguments that Infineon made.

22   Q. Did the Federal Circuit consider an argument in

23 its opinion as to whether the '692 application should

24 have been disclosed by Rambus to JEDEC?

25   A. I don't recall whether the '692 application was

26

1   specifically identified by the Federal Circuit.

2   Q.   Okay, but I guess we can go back and look at

3   that opinion and see one way or the other?

4   A.   We could.

5   Q.   And the PLL presentation that you used in your

6   claim chart was a presentation by NEC in September of

7   1994?

8   A.   That's correct.

9   Q.   And was PLL -- is PLL required by the 1993

10   Release 4 JEDEC SDRAM standard?

11   A.   I do not believe that it is required.

12   Q.   Okay. So, would it be correct to say Release 4

13   of SDRAM standard does not require use of PLL?

14   A.   That's my understanding.

15   Q.   Okay. So, with respect to the two that we've

16   just done, and let me ask you a question, a background

17   question about infringement. Standards themselves don't

18   infringe patents, do they?

19   A.   They do not.

20   Q.   Products.

21   A.   It's a product that's built in compliance with

22   the standard.

23   Q.   Okay. And you could build a product in

24   compliance with a standard and then add a few other

25   features and maybe those few other features would

26

1   infringe, that's one scenario, correct? That's a

2   background question.

3   A.   The product --

4   Q.   Let me back up. I'm trying to ask a background

5   question, let me make it simpler.

6   A.   It is possible to manufacture a product in

7   compliance with a standard, and then add some other

8   features that the standard doesn't prohibit. Correct?

9   MS. MICHEL: Objection, outside the scope of

10   direct. Mr. Nusbaum --

11   JUDGE McGUIRE: How is that outside the scope of

12   direct?

13   MS. MICHEL: Mr. Nusbaum has not talked about

14   what's possible to or what kind of products could

15   possibly be built and still comply with the standard.

16   MR. STONE: Let me go at it another way, Your

17   Honor, I'm not trying to turn him into an expert in this

18   field.

19   JUDGE McGUIRE: Sustained.

20   BY MR. STONE:

21   Q.   Earlier when I asked you about a patent that

22   might necessarily be infringed by the manufacturer of a

23   product in compliance with a standard, did you

24   understand that if the standard required you to include

25   certain features and if those features that you were

26

1 required to include would infringe, then the product

2 would necessarily infringe as a result of its

3 compliance? Is that worse?

4   A. It doesn't glimmer with clarity to me. I think

5 I know what you mean.

6   Q. Then let me just violate that number one rule of

7 cross examination, okay? Just explain to me what it is

8 that a -- what the criteria are for a product

9 manufactured in compliance with a standard to

10 necessarily infringe a patent because of compliance with

11 that standard.

12   A. As I went through with my claim charts many

13 times, if one looks at each and every element of a

14 claim, and there is a counterpart in a product that is

15 built in compliance with a standard with each and every

16 element of that claim, then that product would literally

17 infringe the claim.

18   Q. And if I could take --

19   A. That product being one that is compliant with

20 the standard.

21   Q. Okay. And let me see if I can just take you one

22 step further. It is possible to build products in

23 compliance with a standard that don't infringe, if the

24 features you have to put in there don't result in

25 infringement, correct?

26

1   A.   If there are limitations in the claim that are

2   not found in a compliant product, then there would not

3   be infringement.

4   Q.   Okay. And are we in agreement that the '646

5   application claims that you referred to earlier, had

6   they issued as ultimately issued claims in an issued

7   patent, would not have been necessarily infringed by a

8   product manufactured in compliance with the SDRAM

9   standard as described in Release 4?

10   A.   Because I was not talking about an SDRAM in

11   compliance with Release 4, but rather a proposal, you're

12   absolutely correct.

13   Q.   Are there products manufactured today, if you

14   know, that because of their compliance with an SDRAM

15   standard promulgated by JEDEC are necessarily infringed

16   by any claims that issued from the '646 application?

17   A.   Could you read that back for me, please.

18   (The record was read as follows:)

19   "QUESTION: Are there products manufactured

20   today, if you know, that because of their compliance

21   with an SDRAM standard promulgated by JEDEC are

22   necessarily infringed by any claims that issued from the

23   '646 application?"

24   BY MR. STONE:

25   Q.   And I misspoke. I misspoke. I didn't mean are

26

1   necessarily infringed by, I meant necessarily infringed

2   the claims. Did you understand that? Let me try it

3   again.

4   A. I wasn't quite sure what you were asking.

5   Q. Let me try it again, Mr. Nusbaum. Are there any

6   claims that have issued from the '646 application that

7   in your opinion are necessarily infringed by the

8   manufacture of an SDRAM in compliance with any JEDEC

9   promulgated standard?

10   A. I'm not familiar with any JEDEC promulgated

11   standard other than Release 4. I can't answer that

12   question.

13   Q. Okay. And as to Release 4, is your answer no?

14   A. I'm not aware that any claim in that application

15   covers a Release 4 compliant product.

16   Q. Let me go start another chart that will be

17   DX-19.

18   (DX Exhibit Number 19 was marked for

19   identification.)

20   BY MR. STONE:

21   Q. And one of the other applications that you

22   talked about was the '961 application, correct?

23   A. That is correct.

24   Q. And there were certain claims in the '961

25   application that you felt, had they issued, would have

26

1   been infringed by products manufactured in compliance

2   with Release 4?

3   A.   That's correct.

4   Q.   And what are those claims?

5   A.   If we focus on the January 6, 1995 amendment,

6   it's claim 160, 164, claims 151, 159, 165 and 168.

7   Q.   And those claims were all introduced into this

8   application in did you say January of '95?

9   A.   January 6, 1995.

10   Q.   And we're comparing these claims to the November

11   1993 Release 4 SDRAM standard, correct?

12   A.   That is correct.

13   Q.   Now, is it your opinion that had these claims

14   issued, a manufacturer of a product in compliance with

15   Release 4 of the SDRAM standard would necessarily have

16   had to take a license under the patent that included

17   these claims in order to avoid infringement?

18   A.   I believe that to be the case.

19   Q.   And the Federal Circuit had before it the '961

20   application when it decided the appeal involving

21   Infineon, did it not?

22   A.   The Federal Circuit did, but I don't believe

23   that the Federal Circuit was considering that -- these

24   claims, they could not have.

25   Q.   And the Federal Circuit said in its opinion,

26

1   didn't it, that licenses under the claims of the '961

2   application would not be necessary to practice the SDRAM

3   standard?

4   A. They said that because there was a device

5   identification feature that they --

6   Q. Mr. Nusbaum, Mr. Nusbaum, earlier today I

7   objected to you opining why the court did something,

8   okay, I don't want you to volunteer in response to my

9   question, and I didn't -- I don't think I asked for it,

10   I don't want you to volunteer your speculation on the

11   reasoning of the court, if we could. My question is

12   simply what they said in their opinion was that you

13   don't need a license under the claims of the '961

14   application in order to manufacture SDRAM that complies

15   with Release 4, correct?

16   A. I would like to see the Federal Circuit opinion

17   and I would like to consider what they said in the

18   context of the entire paragraph.

19   JUDGE McGUIRE: If you can answer, you can

20   answer. If you can't answer, you can't answer.

21   THE WITNESS: I don't recall that exact language

22   at all from the opinion.

23   JUDGE McGUIRE: All right, Ms. Michel?

24   MS. MICHEL: Your Honor, I object to Mr. Stone

25   cutting off Mr. Nusbaum on this point. The Federal

26

1   Circuit opinion speaks for itself, he doesn't need --

2   JUDGE McGUIRE: It does speak for itself, so I

3   don't think we need to get into it.

4   MS. MICHEL: To the extent that Mr. Stone does

5   get into what the Federal Circuit opinion said, I think

6   Mr. Nusbaum ought to be able to explain his disagreement

7   with the decision.

8   JUDGE McGUIRE: Well, we'll see, but is there

9   any point in continuing this line of inquiry, Mr. Stone?

10   MR. STONE: No, I will let it speak for itself,

11   Your Honor.

12   JUDGE McGUIRE: Good, thank you.

13   BY MR. STONE:

14   Q.   Let me move to the -- there's one other

15   application, then, that you described for us today, am I

16   right?

17   A.   Yes.

18   Q.   And which one is that?

19   A.   Application serial number 469,490.

20   Q.   I'll mark this as DX-20 for identification.

21   (DX Exhibit Number 20 was marked for

22   identification.)

23   BY MR. STONE:

24   Q.   And this will be the '490 application. And the

25   claims of the '490 application that you talked about

26

1   earlier were which?

2   A.   Claims 183 to 185.

3   Q.   And you described these as substantially similar

4   to the claims that you also discussed from the '961

5   application, did you not?

6   A.   There was a great deal of commonality, yes.

7   Q.   Did claims 183, 184 or 185 of the '490

8   application ever issue?

9   A.   I don't believe they did.

10   Q.   Okay. And to your knowledge, have those claims,

11   183, 184, 185 of the '490 application ever been asserted

12   against any JEDEC-compliant SDRAM part?

13   A.   I can't say that I've reviewed the claims in the

14   patents that have been asserted to check to see whether

15   claims which either were identical or substantially

16   identical were asserted, but I'm not aware of any such

17   claims that have been asserted.

18   Q.   Okay. Could we bring up what we call NUS-004.

19   This was earlier marked as part of DX-16, Mr. Nusbaum.

20   Do you recognize it?

21   A.   Yes, I do.

22   Q.   If we look at the upper box, where we have CLK

23   and a round circle.

24   A.   Yes.

25   Q.   That's the clock, correct?

26

1   A.   That's an external clock, yes.

2   Q.   Now, is there also a clock that relates to the

3   information going from the memory controller into the

4   DRAMs?

5   A.   That was intended to be an indication of that --

6   of the clock signal that was coming from the memory

7   controller.

8   Q.   So, what you're describing on this portion of

9   DX-16, the clock that you show in the upper box would be

10   the same clock that would control the address command

11   bus and data bus. Is that right?

12   A.   It would be a clock signal that would be found

13   on a line in it's not a single bus that's shown here,

14   but it's just a conceptual representation of a number of

15   buses, one of which would carry this clock signal.

16   Q.   And my question, just to make sure, and I think

17   you've answered it, is for each of these different bus

18   signals, your understanding is that as depicted on this

19   particular exhibit, DX-16, the same clock that we see at

20   the top would be the clock that operated each of the bus

21   lines?

22   A.   Yes, sir.

23   Q.   Okay. And let's go, then, to -- and it's also

24   clear, is it not, that the data here that you show being

25   sampled at both edges of the clock is just the data in

26

1   and not the data out?

2   A.   It's only -- what is represented is the data

3   coming in in this particular diagram, in accordance with

4   the proposal.

5   Q.   And then let's look at NUS-003, if we could.

6   And you recognize this as being another one of the DX-16

7   charts?

8   A.   Yes, this is a block diagram that I testified

9   that I generated.

10   Q.   And talking again about the upper box, we see a

11   triangle that is labeled receiver.

12   A.   That's correct.

13   Q.   And what's that mean, receiver?

14   A.   That was the label that NEC gave to a device

15   that receives the external clock signal and that

16   produces a signal which is the internal clock signal.

17   It's my understanding that there's amplification of the

18   signal that's occurring there.

19   Q.   And then if we look down, we see another

20   triangle in the same upper box that isn't labeled but

21   that lies on the line between memory array and DQ. Do

22   you see that?

23   A.   Yes.

24   Q.   Is that triangle also a receiver?

25   A.   That's an output buffer.

26

1   Q. So, and an output buffer means that information

2   is collected in that buffer from the memory array and

3   then released?

4   A. Timed by the ICLK signal.

5   Q. And does the ICLK signal run into the buffer and

6   then run back to the left into the memory array?

7   A. This is a proposal by NEC, and it just shows

8   what it shows. It's indicated as just being an internal

9   clock that drives that output buffer.

10   Q. As you understand this, is that internal clock,

11   ICLK that runs into the output buffer, does it then go

12   run into the memory array and cause anything inside the

13   memory array to occur?

14   A. What it does, that internal clock is -- that

15   that internal clock is necessary in order to -- for the

16   critical memory operation of reading information out of

17   the memory. It clocks the -- it drives the output

18   buffer and the data from the memory array to the data

19   bus. That's what NEC proposed, what else NEC had in

20   mind by that proposal, I have no idea.

21   Q. You could only go on what you can read from the

22   documents, right? And what Dr. Jacob has told you?

23   A. Exactly so.

24   Q. Based on your reading of the documents and what

25   Dr. Jacob told you, because I'm not asking you to guess

26

1   about what was in anyone else's mind, does ICLK, ICLK,

2   control when information goes from the memory array into

3   the output buffer?

4   A. I'm not aware that it does, but it -- but for

5   that ICLK, you would not have any data being read out of

6   the memory array.

7   Q. But for that ICLK, you wouldn't have any memory

8   being read out of the output buffer, correct, that's

9   where it reads it out of.

10   A. Yeah, but the output buffer is the element that

11   receives the data from the memory array.

12   Q. But ICLK does not control when or if the memory

13   array sends data to the output buffer, does it?

14   A. No, but it controls the read operation, which is

15   one of two -- the two fundamental memory operations.

16   MR. STONE: Your Honor, if you wanted to take a

17   break, I'm going to switch topics now.

18   JUDGE McGUIRE: Let's take a break for ten

19   minutes.

20   MR. STONE: That will be fine, Your Honor, thank

21   you.

22   JUDGE McGUIRE: And then we'll reconvene.

23   (Whereupon, there was a brief recess in the

24   proceedings.)

25   JUDGE McGUIRE: Back on the record. You may

26

1   proceed, Mr. Stone, cross examination.

2   BY MR. STONE:

3   Q. Thank you.

4   Mr. Nusbaum, you earlier described sort of the

5   patent system and claims as a piece of property with

6   fences. Do you recall that?

7   A. I do, yes.

8   Q. And if -- let me see if I can just carry through

9   that metaphor properly right to the edge of its

10   usefulness, but if we draw on what I'm going to mark as

11   DX-21 a large parcel, and let's just say that's our

12   parcel of land, or an inventor's invention, can you

13   accept that as consistent with your earlier description?

14   A. A claimed invention.

15   (DX Exhibit Number 21 was marked for

16   identification.)

17   BY MR. STONE:

18   Q.   A claimed invention? And then the claims

19   themselves divide up a little piece of this, correct?

20   So, we could go and fence off part of it and say that's

21   claim 1?

22   A. I was talking about a claim. Once you start

23   talking about multiple claims, it becomes hopelessly

24   confusing.

25   Q. Because inside an independent claim you're going

26

1   to have a bunch of dependent claims, correct?

2   A.   That certainly can be, yes.

3   Q.   And some of which will overlap with each other,

4   correct?

5   A.   I'm not quite sure what you mean by overlap.

6   Q.   Well, if we were to -- I was just trying to

7   understand your analogy, if you will, to a piece of

8   property and a fence is when you think of a patent in

9   its totality, and the total number of claims in a

10   patent, many of those claims, because some are

11   independent and some are dependent, will overlap with

12   each other, or fall inside of each other, won't they?

13   A.   That's true. Each claim we need to consider

14   individually.

15   Q.   And it becomes a very complicated picture if we

16   were to put -- try to put all the claims of one of these

17   patents on a board and draw fences around each claim and

18   see how they related to each other?

19   A.   I wouldn't want to do it.

20   Q.   Okay. If you want to understand the inventor's

21   description of what they understood their invention to

22   be, one place to look is the written description that we

23   talked about earlier, right?

24   A.   That's correct. And I did look to the written

25   description on a number of occasions.

26

1   Q. And the written description for the original

2   '898 patent application does talk about variable burst

3   length, does it not?

4   A. I'm not sure that that's entirely true.

5   Q. And does it talk about programmable cast latency

6   in the written description?

7   A. I don't believe that's entirely true for the --

8   a reason I have in mind.

9   Q. Does it talk about dual edge clock?

10   A. I am not sure whether it talks about dual edge

11   clock or not. I believe that it does.

12   Q. And does it talk about PLL?

13   A. I don't believe it talks about PLL at all.

14   Q. Does it talk about DLL?

15   A. It may talk about DLL.

16   Q. And in your mind, are those separate and

17   distinct, PLL and DLL, or are they one and the same?

18   A. I understand that the terminologies may be used

19   in terms of their functional result differently, but a

20   phase locked loop is typically a device that's got a

21   variable oscillator and a phase comparator and a delay

22   locked loop does not necessarily have such components.

23   Q. And a phased lock loop, does it produce its own

24   clocking system rather than either delay or speed up

25   another clock signal?

26

1   A.   The phase locked loop operates to synchronize an

2   external clock signal with another clock signal.

3   Q.   And it does that by generating the clock signal,

4   correct?

5   A.   It does that through the use of a verbal

6   oscillator and a phase comparator.

7   Q.   Okay. You were asked a question earlier as to

8   whether a reasonable patent attorney would have presumed

9   that there were unnecessary limitations in the claims,

10   in the original application. Do you recall that?

11   A.   Yes.

12   Q.   And when you used the phrase "unnecessary

13   limitations," you meant were the claims limited in some

14   way that they didn't need to be.

15   A.   That's correct.

16   Q.   And so another way to say that is, would

17   somebody looking at the original '898 application, a

18   reasonable patent attorney looking at it, would they

19   have presumed that the broadest possible claims were

20   included in that application, correct?

21   A.   No.   That's not correct. What I testified to is

22   that a reasonable patent practitioner viewing the '898

23   patent application claims would have not -- would not

24   have looked at those claims and presumed that there were

25   unnecessary limitations that didn't need to be there.

26

1   Q. But a reasonable and conservative patent

2   attorney looking at those claims would have understood

3   because he or she would have experienced it, that the

4   claims might be broadened during the course of

5   prosecution, correct?

6   A. To answer that question it's necessarily to view

7   the specification in context, and the present or the

8   invention, the present invention is described as

9   including certain features that are repeated in a lot of

10   the claims. With that being said, your question was

11   couched in terms of would it be possible that the claims

12   could be broadened and it's true, there's a possibility.

13   Q. So, a conservative and prudent lawyer if asked

14   about that application would say, I can't tell you

15   whether claims that ultimately issue from this would be

16   broader than the claims we see in the original

17   application or not, but they could be? Correct?

18   A. You want me to presume that the reasonable

19   practitioner was asked a question as to whether it would

20   be possible that the claims could be broadened?

21   Q. Okay, let's ask the reasonable and prudent

22   practitioner that question.

23   A. In -- I've given you reasons why I think that

24   there would have been a presumption of unnecessary

25   limitations, but it's always possible that, like

26

1   anything else, that that kind of -- that that event

2   could happen, they could be broadened.

3   Q. Now, the European equivalent, the PCT

4   application that's the equivalent of the '898

5   application did become publicly available in 1992,

6   didn't it?

7   A. I'm not sure of the exact --

8   Q. '91, I'm sorry. In October of '91.

9   A. I'm not sure of the exact period of time that it

10   became public, but it's my understanding that it did.

11   Q. And as part of your thinking about what a

12   prudent patent attorney would have thought about that

13   application if they had seen it and been asked about it,

14   did you inquire whether at the time, '91, '92, '93, any

15   reasonable patent attorneys looked at the application

16   and formed views on it one way or the other?

17   A. I can't say that I recall inquiring as to that

18   precise question.

19   Q. Have you seen evidence, testimony or documents

20   in the course of your work in this case which indicate

21   that persons did look at that PCT application and form

22   views about its potential scope?

23   A. I don't recall anything specific in that regard.

24   I have no reason to doubt what you're saying, but I just

25   don't recall anything specific.

26

1   Q. Did you ask -- in an effort to confirm your

2   opinion that a reasonable attorney would not presume

3   unnecessary limitations in the claims, did you ask to

4   see -- is there any evidence that suggests that when

5   people looked at this, they came to the conclusion that

6   the claims were unnecessarily limited and might well be

7   broadened during the course of prosecution?

8   A. I had no need to inquire, in my view, about that

9   presumption for the many reasons that I gave during my

10 direct testimony. I did not so inquire.

11   Q. Well, have you in the course of your work as a

12 patent examiner and as a patent practitioner, has anyone

13 come to you with a published patent application and

14 said, I would like you to look at this and advise me as

15 to what potential impact it might have on our future

16 product development plans down the road?

17   A. It's possible that I may have, but I cannot say

18 that I have any present recollection of having done so.

19   Q. Do you have an opinion at all as to what a

20 reasonable -- let me describe it this way: Do you have

21 any view at all, one way or the other, as to whether a

22 person of ordinary skill in the art looking at the

23 original '898 application or the European PCT

24 application would have thought was the potential scope

25 of claims that might ultimately issue from that

26

1   application?

2   A.   There is so much sheer speculation involved in

3   looking at an application, and projecting what may

4   happen three or four years down the road that I can't

5   say that I engage in that speculation, but I may have --

6   could you read back the question, because I want to make

7   sure that I'm responding precisely to what you're

8   asking.

9   (The record was read as follows:)

10   "QUESTION: Do you have an opinion at all as to

11   what a reasonable -- let me describe it this way: Do

12   you have any view at all, one way or the other, as to

13   whether a person of ordinary skill in the art looking at

14   the original '898 application or the European PCT

15   application would have thought was the potential scope

16   of claims that might ultimately issue from that

17   application?"

18   THE WITNESS: I do have an opinion, and that

19   opinion is that based on the original patent application

20   specification, and in light of the fact that in the

21   summary of the invention, the invention is characterized

22   in terms of a bus carrying substantially all data,

23   address and control signals, and that with respect to

24   the summary of or with respect to the present invention,

25   that the bus of the present invention has substantially

26

1   fewer lines than are required in a single address, and

2   the -- with respect to the present invention, the bus

3   does not have a chip select line, in so many words, in

4   view of the prior art that was cited in the background

5   of the invention, and the fact that there were 150, 160

6   pages of original claims, the vast majority of which

7   were limited to this multiplex bus, that in my view

8   somebody skilled in the art reading that patent

9   application specification would have predicted, and

10   there's some speculation involved in this, that the

11   result would have been claims that were limited to a

12   multiplex bus, and certainly not one that would cover

13   the JEDEC-compliant SDRAM that has a chip select line

14   which is the antithesis of what was stated in the first

15   sentence of the present invention not requiring such.

16   Q. And I guess one way we could test the accuracy

17   of your speculation would be to go back in time and talk

18   to anyone who at the time looked at the application and

19   formed their own views, correct?

20   A. I'm not quite sure if that would be a test of my

21   view, it would be someone else's opinion.

22   Q. When you say multiplex bus, let me just make

23   sure I understand. Do you mean a bus where necessarily

24   either data, address or control information is

25   multiplexed with something else, such as data being

26

1   multiplexed with address or address being multiplexed

2   with control?

3   A. No, sir, I meant the limitations --

4   Q. Mr. Nusbaum, if the answer is no, sir, that's

5   great, that's all I needed, we don't need to take any

6   more time. Because I want to go to this issue of others

7   looking at the application, and I want to bring up

8   2214-A, if we can, RX-2214-A.

9   This is a translation, maybe we can enlarge it a

10   little bit on the screen, this is a translation of a

11   document originally written in Japanese, Mr. Nusbaum,

12   and did you in developing your view as to what a patent

13   attorney, a reasonable patent attorney or engineer would

14   think upon looking at the original '898 application, did

15   you consider the fact that at Mitsubishi, they, in fact,

16   asked someone, or a group of people, to consider that

17   very application?

18   A. I've never seen this document before, I

19   certainly didn't consider that, no.

20   Q. Okay, I want you to take a look at it, and do

21   you see under guideline, which is halfway down the page,

22   it says, "Do not discuss Rambus interface." Do you see

23   that?

24   A. Yes.

25   Q. Do you understand Rambus interface to be the bus

26

1   that you talked about earlier with me?

2   A. I can't say that I have an absolutely clear

3   picture of precisely what this author meant when he used

4   that term. I could speculate.

5   Q. Look at number 2 under guidelines, where it

6   says, "Determine whether or not any other areas contain

7   technologies that will be important in increasing memory

8   speed in the future." Now, as it turns out, the '898

9   application ultimately resulted in patents that were not

10   limited to what you've described as a multiplex bus,

11   correct?

12   A. I certainly identified some claims such as the

13   loop clocking claim that I believe resulted in a patent.

14   Q. Let me -- it's also true, is it not, that from

15   the original '898 application, that patents have

16   resulted today which cover, for example, dual edge

17   clocking, not limited to a narrow bus?

18   A. I can comment on the four applications that I

19   reviewed, I can't comment on the nature of claims that I

20   haven't looked at.

21   Q. Okay. Then you understand, let me draw your

22   attention up to the very first full paragraph, where it

23   says, "A need has arisen to evaluate in detail all of

24   the claims in a patent being applied for by Rambus (1

25   patent, a total number of claims is 150)." Do you see

26

1   that?

2   A. Yes.

3   Q. That's a description consistent at least with

4   the original '898 application or the PCT application,

5   one application, 150 claims, correct?

6   A. It's consistent with that, yes.

7   Q. I want to go to RX-2212, if we could. Now, this

8   is in Japanese and I want to draw your attention to it

9   in this fashion first and then to the translation

10   because it's not all in translation, as you'll see in a

11   minute. If you can enlarge it.

12   Now, you see how there's a box in the upper left

13   corner with a number written in it, do you see number

14   103?

15   A. I do see 103, yes.

16   Q. And then do you see two boxes over to the right

17   there's a letter A written?

18   A. Yes.

19   Q. Now, are you familiar with a practice of going

20   through claims claim by claim and grading them by giving

21   them a letter or a numerical grade as to their strength,

22   breadth, importance to your business?

23   A. I am totally unfamiliar with any such a grading

24   system.

25   Q. Okay. Let's go to page 3. And I take it this

26

1   is a document that you were not shown by complaint

2   counsel before you came to your view as to what somebody

3   seeing the original '898 application would think,

4   correct?

5   A. This is a document that I don't recall having

6   seen before.

7   Q. Let's go to page 3. This is a translation of

8   the document. And I want to draw your attention, we've

9   talked about the number 103 earlier on the Japanese

10   version, I want to draw your attention to 103, and then

11   the content that goes below it, and you'll see in the

12   lower right section, it starts, "Adjust access time in

13   the access time register that can be adjusted by bus."

14   Do you see that?

15   A. I do see it.

16   Q. And do you know whether that's a description of

17   adjusting latency through the use of the register that

18   you talked about earlier?

19   MS. MICHEL: Objection, Your Honor. Mr. Nusbaum

20   stated he's never seen this document before and he's

21   being asked questions about what it means.

22   JUDGE McGUIRE: Well, I think an adequate and a

23   connection has been shown. If you can't answer the

24   question, sir, don't hesitate to say I don't know, but

25   I'll otherwise give counsel here some leeway on this

26

1   line of questioning.

2   BY MR. STONE:

3   Q. And I will not belabor it, I hope, Your Honor.

4   Just one more point on this document, Mr.

5   Nusbaum. Do you see over below 103, it says, "Access

6   adjustment," and then it says, "Important content."

7   A. I see that, yes.

8   Q. Do you know whether in 1993 someone looking at

9   the original '898 application, not someone speculating,

10   but either a prudent patent attorney or a person of

11   ordinary skill in the art looking at that application

12   would have thought, this idea of adjusting latency

13   through the storing of values in a register is something

14   important that we should think about?

15   A. Could you read that back, please.

16   (The record was read as follows:)

17   "QUESTION: Do you know whether in 1993 someone

18   looking at the original '898 application, not someone

19   speculating, but either a prudent patent attorney or a

20   person of ordinary skill in the art looking at that

21   application would have thought, this idea of adjusting

22   latency through the storing of values in a register is

23   something important that we should think about?"

24   THE WITNESS: I don't know that to be the case,

25   claim 103 is limited to a multiplex bus context and I

26

1   don't know whether this document is taking that into

2   account or not.

3   BY MR. STONE:

4   Q. Do you know whether a person of ordinary skill

5   in the art in 1991 or '92 or '93 would have understood

6   that the inventions described in the '898 application

7   were not necessarily limited to use in conjunction with

8   a narrow bus?

9   A. I've given my opinion on how the information is

10   presented in the patent specification with an emphasis

11   on narrow bus, but I can't speak to that question.

12   Q. Because you do know, don't you, based on the

13   testimony you've given us earlier today and the work

14   you've done, you do know that you can use a programmable

15   cast latency with a bus that is not narrow?

16   A. First of all, with respect to programmable cast

17   latency, you certainly can use programmable cast latency

18   without a narrow bus, as I've testified with respect to

19   Release 4. I guess the confusion in your question is to

20   the extent that it's saying that there's programmable

21   cast latency, per se, described in the application, I

22   can't speak to that.

23   Q. No, I know you can't. I know, I understand you

24   can't. I understand you're -- that you've limited

25   yourself with respect to what you can speak to about the

26

1   application, I didn't have application in my question,

2   so let me put it to you again. I'm trying to stay in

3   the areas where I think you've said that you have the

4   ability to express opinions. So, let me try it again

5   and see if we can't.

6   Isn't it correct that programmable cast latency,

7   as you've testified earlier today, can be utilized in

8   SDRAMs that do not have narrow buses?

9   A. Yes.

10   Q. And can't you also use dual edge clocking

11   without the presence of the narrow bus?

12   A. Yes.

13   Q. And you can use PLL without the presence of a

14   narrow bus?

15   A. Yes.

16   Q. And you can use variable burst length without

17   the presence of a narrow bus?

18   A. Yes.

19   Q. Now, let's go to 2213, if we can.

20   JUDGE McGUIRE: RX?

21   BY MR. STONE:

22   Q. RX-2213, I need that reminder. And the document

23   is in Japanese, and we're going to go to page 4. Go

24   back, if you would. Go back to the Japanese. 2213,

25   page 1, my fault. This is the same document we looked

26

1   at earlier, if you'll accept my representation on that,

2   Mr. Nusbaum, except someone has added comments up along

3   side claim 103 in the right-hand margin where they've

4   written, "Latency, SDRAM," and then something that I

5   think is in Japanese.

6   So, we have that additional comment to look at,

7   and we're going to go to the translation, which is page

8   4. And you'll see, "New marginal note: Between latency

9   and SDFAM," as opposed to SDRAM. "New marginal note:

10   Between latency and SDFAM," except when I read it it was

11   an R instead of an F. So, we have that comment added.

12   And what I want to know is whether you think as

13   part of your opinion is it inconsistent with your

14   opinion that someone in 1993 looking at the application

15   would see a relationship between latency and SDRAM in

16   claim 103 of the original '898 application. Is that

17   consistent with or inconsistent with your opinion that

18   you expressed earlier about what you would expect?

19   A. I've expressed an opinion that claim 103 is

20   unequivocally limited to a bus that carries

21   substantially all address, data and control signals, and

22   has substantially fewer lines than are contained in a

23   single address. But that's not to say that it's

24   impossible for someone to look at that claim and see

25   some connection.

26

1   Q. So, if someone looked at the claim and saw a

2   connection between latency and SDRAM, that would be

3   something other than what you would have expected based

4   on your analysis and what you've testified to earlier,

5   correct?

6   A. What I testified to earlier that someone would

7   not have presumed that there were unnecessary

8   limitations. Somebody could see a relationship and make

9   a connection, and yet I believe because there were 14

10   U.S. patents cited in the background of the invention,

11   that whoever drafted that claim felt that it was

12   certainly necessary to have that limitation in there to

13   make the claim patentable.

14   Q. Let's look at RX-2211, page 1. Most of this is

15   in Japanese, as you'll see, but I want you to blow up,

16   if you could, the right-hand column. And I want you to

17   take a look two-thirds of the way down where it says,

18   "Modifiable register." Do you see that? That part you

19   can read, right?

20   A. Yes, I can.

21   Q. And then below that it says, "Access time

22   approximately equal to SDRAM latency." Do you see that?

23   A. Yes.

24   Q. Do you understand that to be a reference to the

25   variable latency or programmable latency feature that

26

1   you've talked about earlier in SDRAM?

2   MS. MICHEL: Objection, Your Honor. We don't

3   know anything else that was on the front page of that

4   document, and Mr. Nusbaum is being asked to take a

5   couple of words completely out of context, for all he

6   knows.

7   JUDGE McGUIRE: Mr. Stone, response?

8   MR. STONE: I think that you don't need anymore

9   words than this. We could give the whole translation,

10   but all I want to refer to is "access time is

11   approximately equal to SDRAM latency." That's the

12   point.

13   JUDGE McGUIRE: Overruled. I'll hear it. You

14   can go into it again on any redirect.

15   BY MR. STONE:

16   Q.   Do you have the question in mind, Mr. Nusbaum?

17   A.   Could you repeat it, please?

18   Q.   Sure. Do you understand this phrase, "Access

19   time approximately equal to SDRAM latency" to be a

20   reference to the programmable latency feature of SDRAM

21   that we talked about earlier today or that you testified

22   to earlier today?

23   A.   I could speculate, and I would be happy to, if

24   you would like me to, but I don't know for sure --

25   JUDGE McGUIRE: The court does not wish to hear,

26

1   you know, anymore speculation at this point. If you

2   want to ask a question that you can have answered, I'll

3   give you that opportunity. But it's not giving the

4   court any good at this point to hear any further

5   speculation.

6   BY MR. STONE:

7   Q. Let me go to one other document, if I can, Your

8   Honor. RX-2203, page 3. Again, this is a translation.

9   I want to draw your attention to the date, first, in the

10   right-hand corner, 13 July 1993, Mr. Nusbaum.

11   A. I see that.

12   Q. And then I want you to go down with me, if you

13   would, to the conclusions. Is it consistent with your

14   opinion expressed earlier that in July of 1993 someone

15   looking at the '898 application would have concluded

16   that based on the specifications of the DRAM on the

17   Rambus, that there are many different kinds of

18   development and that the patent will be one that is

19   separate from the bus? Do you see all that discussion

20   there? Is that consistent or inconsistent with what you

21   presumed a reasonable patent attorney would have

22   concluded?

23   A. I haven't had an opportunity to digest paragraph

24   2, if you would give me a minute, please. I have no

25   idea what -- precisely what this translation, which is

26

1   not in very good English, means.

2   Q. Did you as part of your preparation to testify

3   read the opening statements?

4   A. I read part of the opening statement.

5   Q. You probably read Mr. Royall's and Mr. Oliver's

6   and not mine, but did you, as part of that review of the

7   opening statements, or any of the work you did, look at

8   the Siemens and IBM documents that I talked about in my

9   opening?

10   A. I don't believe so. And I don't know what

11   documents you're referring to, so I don't think I read

12   them.

13   JUDGE McGUIRE: Well then that answers the

14   question.

15   BY MR. STONE:

16   Q. Did you make an effort to determine whether in

17   the 1995 time frame companies were examining the patents

18   that had issued to Rambus and the applications that were

19   available that Rambus had filed in an effort to

20   determine the ultimate possible scope of claims that

21   might be issued to Rambus?

22   A. No, I did not.

23   Q. Have you formed any opinion as to whether in

24   1995 someone looking at the issued Rambus patents and

25   the available Rambus applications would have concluded

26

1   that Rambus might get claims which read on SDRAM and

2   DDR?

3   A. You're asking me a question whether someone

4   might conclude? That's what you asked.

5   Q. Fine, let me narrow it down. Would a reasonably

6   prudent patent attorney or a person of ordinary skill in

7   the art in 1995 looking at the patents which had issued

8   to Rambus and the applications Rambus had filed which

9   were then publicly available have concluded that Rambus

10   was likely to ultimately obtain patent coverage for

11   SDRAM and DDR SDRAM?

12   A. I haven't reviewed the claims in the issued

13   patents to take those into account which are part of

14   your question.

15   Q. Okay. You testified earlier in terms of your

16   background that one of the things that you have done is

17   written hundreds of infringement opinions and invalidity

18   opinions?

19   A. I did not testify to that earlier.

20   Q. Not to hundreds, am I wrong about that?

21   A. I testified that I wrote responses to hundreds

22   of communications from the Patent & Trademark Office in

23   the form of patent amendments. I have written numerous

24   invalidity and noninfringement opinions. I don't

25   believe I gave a number.

26

1   Q. It is a common practice for patent attorneys to

2   write opinions on whether a patent in their opinion is

3   valid or invalid, correct?

4   A. That's correct, it is common.

5   Q. And it is also common for patent attorneys to

6   write an opinion as to whether a particular product

7   infringes an identified patent?

8   A. It's common for a patent attorney to write an

9   opinion that a product does not infringe a particular

10   patent. It's not so common to write an opinion that the

11   patent does infringe.

12   Q. Because if you conclude it does infringe, then

13   it probably doesn't make sense to go ahead and write up

14   the opinion?

15   A. It doesn't best serve the client to do that.

16   Q. Okay. In your experience, and I'm not limiting

17   this now to opinions you've written, but in your

18   experience, is it common that companies will obtain

19   opinions from patent lawyers and on the basis of those

20   opinions continue with conduct which they know might

21   result in them being accused of infringement?

22   A. Yes, that's common.

23   Q. And sometimes they do that because they've

24   gotten an opinion that the patent is likely to be held

25   invalid?

26

1   A.   That's correct.

2   Q.   And sometimes they do it because they have an

3   opinion which says, well, there's a strong argument to

4   be made that they don't infringe, correct?

5   A.   That's correct.

6   Q.   And in your experience, sometimes the companies

7   which proceed on the basis of those opinions prevail in

8   the litigation and sometimes they lose?

9   A.   That is correct.

10   Q.   And when someone has been put on notice about

11   possible infringement, and they proceed with the

12   conduct, they may sometimes be found to be what is

13   referred to as a willful infringer, correct?

14   A.   That happens from time to time.

15   Q.   Have you formed any opinion in connection with

16   your work in this case as to whether or not the

17   manufacture of a JEDEC-compliant SDRAM today is being

18   done by companies that are aware that they face possible

19   infringement of Rambus intellectual property or Rambus

20   patent rights?

21   A.   I have no opinion to offer with respect to that

22   specifically.

23   MR. STONE: No further questions, Your Honor,

24   thank you.

25   JUDGE McGUIRE: Thank you, Mr. Stone.   Does

26

1   complaint counsel wish to engage in further redirect?

2   MS. MICHEL: No redirect, Your Honor.

3   JUDGE McGUIRE: Okay, thank you, Mr. Nusbaum,

4   you are excused.

5   THE WITNESS: Thank you.

6   JUDGE McGUIRE: Thank you for your testimony. I

7   assume that that concludes the presentation for today.

8   Is that correct?

9   MR. OLIVER: Yes, it does, Your Honor.

10   MR. STONE: May I just move in exhibits, they

11   are RX -- they are all RXs, 2214-A.

12   JUDGE McGUIRE: One at a time.

13   MR. STONE: Sure. 2214-A.

14   MS. MICHEL: We would object to all of the

15   documents which were shown to Mr. Nusbaum, all of the

16   RXs on the basis that no foundation has been laid with

17   this witness or another as to these documents as to what

18   they are.

19   MR. STONE: Well, the foundation for these

20   documents, Your Honor, is one of the things that we

21   tried to cover with our stipulation, and if need be, as

22   you know, these are Mitsubishi documents which Judge

23   Timony ordered produced.

24   JUDGE McGUIRE: Overruled. They're entered. At

25   least that one is entered. Is it the same objection for

26

1   all of them? If so, I am going to enter all of them.

2   MS. MICHEL: Yes, Your Honor, it would be the

3   same objection for each of the RXs.

4   JUDGE McGUIRE: Then you are overruled, they're

5   entered. If you can just go back and state what they

6   are.

7   MR. STONE: Yes, Your Honor, 2214-A, 2212, 2213,

8   2211, and 2203.

9   JUDGE McGUIRE: Okay, entered at this time.

10   (RX Exhibit Numbers 2203, 2211, 2212, 2213,

11   2214-A were admitted into evidence.)

12   JUDGE McGUIRE: Anything else?

13   MR. STONE: Your Honor, no, although we probably

14   should alert you, tomorrow we're probably going to get

15   to deposition testimony, I believe, that complaint

16   counsel want to offer.

17   JUDGE McGUIRE: Are we talking about the taped

18   deposition by Dr. Oh, is that what we're talking about?

19   MR. OLIVER: Your Honor, it's depending upon the

20   timing. Either Dr. Oh or a Mr. Reece Brown.

21   JUDGE McGUIRE: Well, we're not going to

22   entertain his testimony until I have had a chance to

23   reach the order on the opposition that's been raised.

24   I'm glad we brought this up. How soon can I anticipate

25   a response to that objection on the issue of the -- I

26

1   think Dr. Oh's testimony?

2   MR. OLIVER: Either by 5:00 today or by first

3   thing tomorrow morning.

4   JUDGE McGUIRE: Okay. Well, I at this point,

5   I'm not going to allow any testimony by Dr. Oh, and I

6   keep wanting to say Dr. No, because of my James Bond

7   mode, until I've had the chance to issue any order. So,

8   let's not intend on going into that on Tuesday. Now, is

9   there something else we need to talk about?

10   MR. STONE: I think they are then prepared to go

11   with deposition testimony from Reese Brown and we're

12   prepared to read our responsive portions of that. I

13   think part of that is video and part of that is going to

14   be ten minutes or so of what was not videoed.

15   JUDGE McGUIRE: Don't forget we're starting at

16   11:00.

17   MR. STONE: Starting at 11:00.

18   JUDGE McGUIRE: Are we clear on everything? See

19   you in the morning, hearing adjourned.

20   (Whereupon, at 4:07 p.m., the hearing was

21   adjourned.)

22

23

24

25

26

1   C E R T I F I C A T E   O F   R E P O R T E R

2

3   DOCKET/FILE NUMBER: 9302

4   CASE TITLE: RAMBUS, INC.

5   HEARING DATE: MAY 12, 2003

6

7   I HEREBY CERTIFY that the transcript contained

8   herein is a full and accurate transcript of the notes

9   taken by me at the hearing on the above cause before the

10   FEDERAL TRADE COMMISSION to the best of my knowledge and

11   belief.

12

13   DATED: 5/13/03

14

15

16   Sally Jo Bowling

17

18   C E R T I F I C A T E   O F   P R O O F R E A D E R

19

20   I HEREBY CERTIFY that I proofread the transcript

21   for accuracy in spelling, hyphenation, punctuation and

22   format.

23

24

25   Sara J. Vance

26