UNITED STATES OF AMERICA
BEFORE FEDERAL TRADE COMMISSION

PUBLIC

In the Matter of RAMBUS INCORPORATED, a corporation.	Docket No. 9302

COMPLAINT COUNSEL'S PRETRIAL BRIEF

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I. Introduction

This case presents three fundamental questions for decision: "[1] Whether Respondent engaged in a pattern of deceptive, exclusionary conduct by subverting an open standards process; [2] whether Respondent utilized such conduct to capture a monopoly in technology-related markets; and [3] whether the challenged conduct violates well-established principles of antitrust law." Order Denying Respondent's Motion for Summary Decision at 12 (Apr. 14, 2003). Complaint Counsel will prove at trial that each of these central questions should be answered affirmatively, and that the Respondent, Rambus Inc. ("Rambus"), should therefore be held liable on all three counts stated in the Federal Trade Commission's June 2002 Complaint. In addition, we will demonstrate that the form of remedy outlined by the Notice of Contemplated Relief accompanying the Commission's Complaint is necessary and fully appropriate under the circumstances, and that comparable relief should therefore be entered in this case.

Although the central questions presented here are straightforward, Complaint Counsel will present a great deal of evidence that addresses these questions. Furthermore, considering the

nature of Complaint Counsel's allegations in this case – which relate to a pattern of anticompetitive acts and practices undertaken over the course of roughly a decade – the evidence will necessarily cover a broad time period. As an aid to placing relevant facts in context during a somewhat extended time frame, Complaint Counsel has endeavored to provide in this pretrial brief a reasonably comprehensive, and largely chronological, overview of key facts (Section II, *infra*, beginning at p. 2).

Upon conclusion of this factual discussion, the brief will then address the various legal questions raised by this case, with the discussion being organized as follows: Section III, beginning at p.123, discusses the elements of the antitrust violations alleged, and the burden of proof applicable to Your Honor's assessment of the evidence. Section IV, beginning at p. 138, discusses the conduct of Rambus within the context of established antitrust principles pertaining to a subversion of the standards process as exclusionary and anticompetitive behavior. Section V, beginning at p. ?, discusses the role of Rambus's anticompetitive intent in the antitrust analysis. Section VI, beginning at p. 215, discusses the rule of antitrust causation, and examines the Rambus conduct in light of this rule. Section VII, beginning at p. 235, discusses the relevant antitrust markets impacted by the Rambus conduct and demonstrates that Rambus has achieved monopoly power in the relevant markets. Section VIII, beginning at p. 257, discusses the proposed relief to remedy the anticompetitive effects of Rambus's challenged conduct.

II. Overview of Key Facts.

A. Importance of DRAM Technology Standards.

Competition in the semiconductor industry in general, and the memory industry in particular, has for many years revolved around industry standards. In earlier years, standards in the memory industry – certainly the DRAM industry – were focused more on external design

issues, such as the number and placement of pins and the configuration of modules. But starting in the late 1980s and early 1990s, this changed. It was in this time period that the memory industry began concentrating its efforts on "solving the memory bottleneck" – that is, designing more efficient, high-speed memory devices that could operate at speeds commensurate with those being achieved by increasingly high-performance microprocessor chips. Hence, in this time period DRAM standardization efforts began to focus increasingly on internal DRAM design issues, and on technologies designed to improve DRAM speed and performance. Rambus was founded in this same general time period (i.e., 1990) with the express goal of "solving the memory bottleneck," through a "revolutionary" new DRAM design. *See, e.g.*, Rambus Inc. Business Plan, 1992-1997 (9/28/92) R169923 at 927; *id.* at R169929 [CX0545] ("The Rambus System solves the memory bottleneck.").

To say that technology standards are important in the DRAM industry would be an understatement. Although some non-standardized DRAMs do exist, by and large virtually all DRAMs produced and sold today comply with industry standards, and this has been true for many years.[1] Moreover, at any given time in (at least) the past decade or more, a single DRAM technology standard has been dominant. Theoretically, industry standards could develop in this industry outside of the context of industry standard-setting groups. In reality, however, the technology standards that have achieved dominant acceptance in the DRAM industry have been

[1] Aside from specialized DRAMs sold for limited use applications, there really is very little architectural differentiation from one DRAM vendor's product to another – all manufacturers produce in compliance with widely adopted industry standards. This is why DRAMs are often referred to as "commodity" products. *See* S. Przybylski, *Intel's RDRAM Strategy a Sure Winner*, MICROPROCESSOR REPORT (April 21, 1997) (MR0057650 at 652) [CX2634] (article by former Rambus expert states: "Deviation from the herd is not tolerated by the marketplace. Not since the 1970s have individual DRAM vendors had the power to innovate architecturally.").

set through industry standard-setting collaborations.

As Rambus's co-founder Mike Farmwald once stated, "There is real value in having a world DRAM standard." M. Farmwald, "RamBus Technology Overview" (11/2/89) R115512 at 539 [CX1284]. It would appear that most others involved in this industry would agree. Indeed, substantial evidence shows that DRAM vendors and users alike prefer that there be only a single industry standard at one time – or at a minimum, a single dominant standard, with specialized alternative designs playing a much smaller role in the marketplace. *See, e.g.,* Tate E-Mail (11/3/96) R234880 at 881 [CX0912] (noting, with respect to Samsung, "they want a single high volume standard"). And the reasons for this boil down to simple economics. From the vendor's standpoint, a single standard facilitates large-volume production, which leads to lower costs, and at least the potential for higher profit margins. From the DRAM user's standpoint, a single, dominant industry standard facilitates the additional benefits of interoperability, multiple sourcing, and intense price competition. *See, e.g.*, RAMBUS Inc. 1992-1997 Business Plan (6/18/92) R46394 at 412 [CX0543A] (referring to "Servers and High End Workstations": "In the end, this market will use whatever is in high volume production for desktop computers because it will be cheapest."); Crisp E-Mail (4/9/92) R45724 at 724 [CX1708] ("IBM also really stressed the need for the parts to be pervasively used from laptop to mainframe. If the part wasn't pervasively used, then the price wouldn't ever get right."); Minutes of JC-42.3 Meeting, Attachment P (5/7/92) R65286 at 361 [CX0034A] ("IBM Position Statement on Synchronous DRAM," noting benefits of "Single Industry Standard," including "Maximizes Volume, Plug Compatibility Between Manufacturers, Consistent Spec Terms").

The fact that there tends to be one dominant standard at any given time does not necessarily mean that DRAM manufacturers will only pursue development of a single DRAM

design at one time. On the contrary, particularly in times of transition between one generation of standards to another, DRAM makers sometimes pursue simultaneous development of a variety of different standards. Yet they do so not because they expect many different standards to simultaneously coexist. Rather, they want to make sure that whatever design becomes "THE" standard is one that they are in a position to produce, and at a cost that will make them competitive with other vendors. As Rambus's Richard Crisp wrote in August 1996:

> [W]ith anything that even remotely looks like it can become an important market standard potentially being developed, no one can afford to be left out when fabs cost more than $1B each to build and everyone has one or more new ones either on-line now or planned to be on-line in the near future. It is plain and simple: it is cheap insurance.

Crisp E-Mail (8/26/96) R208394 at 394 [CX0903] (emphasis added). In fact, Rambus used this very sort of reasoning to persuade companies that they should take licenses covering its proprietary RDRAM design. *See* Mooring E-Mail (6/30/92) R233952 at 952 [CX1228] (suggesting that IBM could "justify the investment in Rambus" in part because of "[t]he cost of NOT being an early adopter if Rambus does become the standard – intellectual property in the use of Rambus not developed; economies of scale delayed; less favorable terms; empty fabs etc."); Mooring E-Mail (7/25/93) R233985 at 985 [CX1239] (stating, with respect to Samsung, "they feel they have to sign with us" and "don't feel good about it"; "[i]t will come down to" whether "Dr. Chin emotionally choose[s] he has to take Rambus insurance") (emphasis added); *see also id.* ("There is so much money at stake in the DRAM business that RDRAM licensees from now on will be doing it for defensive reasons.") (emphasis added).

B. Rambus's Evolving Strategy to Dominate DRAM Technology Standards.

As we discuss below, Rambus today holds a monopoly over several key technology

markets relating to the design and architecture of DRAM memory chips. Through its monopoly in these technology markets, Rambus has already collected millions of dollars in license fees and royalties, and it stands to collect a far greater sum in royalties if it is allowed to continue enforcing its patents.[2] What makes Rambus's patents so valuable, however, is not the inherent quality of its technology. Rather, it is the fact that Rambus's patents cover (or so Rambus claims) technology features incorporated into widely adopted industry standards – that is, JEDEC's SDRAM and DDR SDRAM standards, which together account for somewhere on the order of 95% of all commercial DRAM products sold worldwide. While perhaps not true universally, in this industry it is certainly the case – as Rambus's internal business documents acknowledge – that "[t]he most valuable patents are ones that must be used in order to be in compliance with a standard." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903] (emphasis added).

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[2] As Your Honor is aware, the Commission alleged in its complaint, and Complaint Counsel reiterated during the August 2 Scheduling Hearing, that "Rambus's SDRAM-related patent rights could allow Rambus to extract royalty payments well in excess of a billion dollars from the DRAM industry over the life of the patents." Complaint, ¶ 96 (emphasis in original). *See also* Scheduling Hearing Tr. (8/2/02) at 51:12-18. Judging from what others have said in industry trade press and elsewhere, this billion-dollar estimate of the potential value of Rambus's JEDEC-related patents may be quite conservative. *See* S. Fyffe, "Industry to Attack Rambus Patents," ELECTRONIC NEWS, July 17, 2000, WL9580638 ("The royalties could add up to $600 million to $800 million a year if all the companies were found to be violating Rambus' patents") (emphasis added); K. Rajgopal, "Rambus Grabs Golden DRAM," BUSINESS LINE, Oct. 18, 2000, WL27315509 ("The math is simple. . . . Estimates [of total SDRAM market size] range from a bottom of $70 billion to a high of $120 billion. Assuming an average 2 per cent royalty rate, that gives Rambus royalty revenue of $1.4 to $2.4 billion" per year) (emphasis added). *See also* J. Robertson, "DRAM Makers Rally to Thwart IP Threats," ELECTRONIC BUYERS NEWS, Jan. 31, 2000, WL2159264 ("if Rambus' patent claims hold up, . . . 'it could be devastating for the industry'"); W. Wade, "Rambus Wins Royalty Round with Pair of Accords," ELECTRONIC ENGINEERING TIMES, June 26, 2000, WL22239113 ("SDRAM is one of the cornerstones of the high-tech industry. With billions of chips shipping every year, even a tiny percentage royalty fee could generate huge sums of revenue for Rambus'").

From its very inception, Rambus desired to hold patents over pervasive DRAM industry standards. As explained below, however, its strategy for achieving this objective dramatically changed in the early 1990s, after it discovered that JEDEC's work on SDRAM standards was proceeding down a path that Rambus believed was destined to collide with Rambus's intellectual property. From that point forward – indeed, through the present time – Rambus has pursued two parallel strategies for dominating DRAM technology markets. Outwardly, publicly, and very aggressively, Rambus has sought to promote its proprietary RDRAM technology as a standard for DRAM design. Meanwhile, quietly, privately, and (until fairly recently) secretively, Rambus has sought to secure increasingly broad patent rights covering JEDEC-compliant SDRAMs (as well as other competing DRAM architectures). It was not until the late 1990s, when it appeared that Rambus's RDRAM technology was failing in the marketplace, that Rambus decided to go public with its JEDEC-related patents, and began demanding license fees and royalties from makers of SDRAM and DDR SDRAM. In order to understand Rambus's conduct, and to fully appreciate the anticompetitive nature and effects of such conduct, one must first gain an understanding of how Rambus's business strategy evolved throughout the relevant period. In the discussion that follows, we will trace the development of Rambus's strategy, and its strategic conduct, throughout the 1990s.

(1) Rambus Was Founded with the Objective of Achieving Patents Rights Over Widely Adopted DRAM Standards.

Even before Rambus officially came into existence as a corporation, the company's founders knew that establishing their proprietary DRAM technology as a "standard" was the "key to success." Farmwald Notes (9/19/89) R114330 at 330 [CX1750] (emphasis added). Of course, Rambus's founders also understood that it was critical that they obtain patents covering such a

standard. *See* Farmwald Notes (8/28/89) R114340 at 342 [CX1702] ("much depends upon getting a **standard** which depends upon our patents") (double underlining in original); *see also id.* at R114343 (discussing "Making the Rambus a standard"). This concept of securing patent rights over widely adopted DRAM technology standards was more than merely an idea in the minds of Rambus's founders. It was the central driving concept behind Rambus's incorporation.

This is evident, for instance, from the very earliest of Rambus's pre-incorporation business plans, and the documentation that was used by Rambus's founders to generate capital to launch their fledgling business. For instance, early Rambus investors were informed

- that "[t]he primary business of the RamBus Company" would be to license proprietary technology "to manufacturers of DRAM chips and microprocessors";
- that "[t]he DRAM market is . . . highly sensitized to the concept of standardization";
- that Rambus possessed "the ability to set world wide standards for the next generation of DRAM chips and memory subsystems";
- that "the patented RamBus technology . . . has the opportunity to establish a single high performance DRAM standard";
- that in part due to "[t]he DRAM industry's penchant for standardization," once Rambus's technology was licensed to "all major vendors," it would be "extremely unlikely that any potential competitor would be able to gain critical mass enough to challenge" Rambus; and
- that such considerations, including the existence of "strong barriers to entry" by "potential competitors," made Rambus an "exceptionally attractive investment opportunity."

RamBus Business Plan (6/26/89) R114628 at 636 [CX0533] (emphasis added).[3]

[3] *See also id*. at R114630 ("The assumption of a 50% penetration of the established DRAM market within five years is not unrealistic in view of the standardized, 'cookie cutter' approach in that industry. DRAM's made by different vendors all share a common interface, and new technologies generally are either adopted by everyone in the industry or by no one.")

Of course, Rambus's ultimate objective was not merely to secure patent rights over widely adopted DRAM industry standards, but to "Make A Lot Of Money At The Same Time." RamBus Business Overview (8/18/89) R115156 at 160 [CX1282]. Rambus intended to achieve this objective through charging royalties and license fees for the use of its technology. *See id.* at R115177 ("Nearly All Income in Form of Royalties"). Yet Rambus's founders recognized that this plan was not without risks. Two "Risks" in particular were identified early on:

- Need to Establish RamBus as a standard . . .
- Income Depends Mostly on Royalties

Id. at R115182.

In regard to the former, Rambus's founders understood that they faced a sort of chicken-and-egg problem – namely, "Most computer companies will want to wait until RamBus DRAMs are easily available," whereas "DRAM and CPU companies need to be convinced that computer builders will use it." *Id.* As to the issue of royalties, Rambus anticipated that the company might encounter (as it later did) industry resistance to its desired royalty rates. *See id.* (posing the question, "Will DRAM and CPU manufacturers pay 2-3%"). Indeed, Rambus worried that if its royalty demands were perceived as unreasonable, this might motivate potential licensees to "work around" Rambus's patents, in order to evade paying royalties. *See* Rambus Business Plan (11/1/90) R170065 at 66 [CX0535] (expressing concern that license fees and royalty rates not be set "so high as to create high motivation to work around them") (emphasis added). *See also* RamBus Business Plan (6/26/89) R114628 at 636 [CX0533] (expressing concern to avoid situation in which "DRAM and CPU vendors" would find it "worth their time and effort to

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(emphasis added).

attempt to circumvent . . . the patents") (emphasis added). In the end, however, Rambus recognized that, despite certain obvious risks to their business model, financial success was virtually certain to follow if they could achieve the goal of making their patented (or soon to be patented) technology an industry standard. Thus, the company's chief objective was clear: "RamBus must be established as a standard to effect large royalty payments." *Id.* at R114646 (emphasis added).[4]

(2) JEDEC's Work on SDRAM Standards Posed a Serious Threat to Rambus's Goal of Having Its Proprietary RDRAM Technology Adopted as the Next DRAM Standard.

These basic strategies were all established by Rambus's founders before the company was even officially incorporated in 1990, and before the company hired its first (and to date only) CEO – Geoffrey Tate – who joined Rambus in May 1990.[5] In transitioning into his new role at Rambus, one of Mr. Tate's first official acts was to set forth on paper some of his own strategic thinking for the company, which echoed very closely the strategies that had previously been outlined by Rambus's founders. Mr. Tate recorded, among others, each of the following thoughts:

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[4] Another recognized risk to Rambus's business plan was the possibility that its pending patents would not issue, or would not issue with claims sufficiently broad in scope to block others. *See id.* ("Potential Risks and Problems . . . Will patent be enforceable and broad enough to stop imitators."). Yet this risk was of less concern to Rambus's founders, who from very early on – based on input from their attorneys – possessed a high degree of confidence in the likelihood of the patents issuing "largely as filed." Rambus Business Plan (11/1/90) R170065 at 67 [CX0535] ("The base patent was filed in April of 1990. It has been reviewed by all partners who've signed and several others and found to be a strong, broad patent with high odds of being issued largely as filed."). *See also* Farmwald Notes (8/28/89) R114340 at 342 [CX1702] (recording comments of patent attorney Roger Borovoy: "Borovoy says 'he takes adequate patent coverage as a given' & says that if we do the job right it will be very hard to get around").

[5] *See* Rambus Inc. Business Plan, 1992-1997 (9/28/92) R169923 at 927 [CX0545].

- "RAMBUS has a potential for a very strong value-added in a large number of high-volume systems applications combined with a strong barrier-to-entry in the form of a broad patent";
- "There are always ways to get around any patent is the assumption that we should make";
- "If RAMBUS can be seen as a standard . . . it may be very difficult for second solution to develop critical mass in the marketplace"; and
- a "high priority" for RAMBUS should be "to avoid a contending standard from developing."

"RAMBUS Business Plan: Plans, Ideas, Issues" (4/00/90) R193874 at 876 [CX0569] (emphasis added).

Geoffrey Tate and his team remained committed to these same core strategies throughout the 1990s. In August 1992, for instance, after Mr. Tate had completed more than two years as CEO, he continued to view the goal of "establish[ing] the Rambus system as the new standard" as the company's foremost strategic "objective." Rambus Inc. Business Plan, 1992-1997 (8/15/92) R46361 at 371 [CX1302] (emphasis added).[6] By this time, however, another risk to Rambus's business had materialized – the "Competitive Risk" posed by "Synchronous DRAMs." *Id.* at R46378 (emphasis added).

By late 1991, the competitive threat posed by Synchronous DRAMs, or "SDRAMs," was clearly a source of concern within Rambus. *See* Tate E-Mail (12/16/91) R233940 [CX1224] ("everyone knows Rambus has to compete with Synchronous DRAMs"). *See also* Tate E-Mail (2/23/91) R233945 at 945 [CX1225] (listing only two "High performance" DRAM options: "Synchronous" and "Rambus"). What made the threat particularly potent was the fact that the

[6] *See also* Tate E-Mail (2/27/92) R233947 [CX1226] ("Rambus is on track to the goals set in 1990 . . . Rambus is going to be a standard") (emphasis added).

specifications for this competing, new-generation DRAM architecture were being developed through a broad consortium of, among others, all major DRAM manufacturers and users, under the auspices of a standards development organization known as JEDEC. JEDEC is a non-profit corporation that is prominently known throughout the world as a developer of industry standards relating to various types of semiconductor devices, including memory. But there is something else that JEDEC is known for – namely, its commitment to developing "open" standards, which are free to be used by anyone and, wherever possible, steer clear of royalty-bearing patents. As Richard Crisp wrote, "The job of JEDEC is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903].

For Rambus, the "openness" of JEDEC's standardization process had its pros and its cons. In terms of "cons," Rambus surely recognized that an "open," non-proprietary standard developed through broad participation of all major DRAM makers and users could present formidable competition for a small, start-up technology company whose business model critically depended on the ability to charge royalties for its proprietary technology, and whose goal was to charge "large royalt[ies]." RamBus Business Plan (6/26/89) R114628 at 646 [CX0533] (emphasis added). On the other hand, one benefit to Rambus of JEDEC's "open" process was that it welcomed participation by any company that wished to be involved – even a company, like Rambus, that was working to develop a competing, proprietary standard. Rambus thus took the opportunity to join JEDEC, in late 1991, just as the organization's work on Synchronous DRAM standards was beginning to take focus.

(3) In Late 1991, Rambus Joined JEDEC and Discovered That JEDEC's Emerging SDRAM Standards Were on a Collision Course for Rambus's Patents.

Rambus's initial reasons for joining JEDEC were mixed. For a brief period of time, it appears that Rambus had in mind the idea of possibly presenting its proprietary RDRAM design to JEDEC for consideration as a standard. *See* Tate E-Mail (12/18/91) R233943 at 943 [CX0671] ("referring to "developing] a plan . . . to take Rambus to JEDEC"); Roberts Notes (12/18/91) R32641 at 670 [CX1705] ("JEDEC submission. talk to Richard about creating a plan for JEDEC"). Yet, according to Rambus co-founder Mike Farmwald, Rambus abandoned this idea after learning that JEDEC perceived RDRAM as being "too big a leap" from earlier-generation DRAM standards. *See* Farmwald, *In the Matter of Rambus* Dep. Tr. (1/7/03) at 73 [CX2106] ("[The main feedback was that it was considered too big a leap. That it was too revolutionary. That they wanted evolutionary approaches, and that SDRAMs were perfectly fine for the next generation.").[7]

[7] It is not surprising that JEDEC and its members might shy away from an unproven, "revolutionary" technology like RDRAM. As explained in an article written by one of Rambus's own expert witnesses in the *Infineon* litigation – Dr. Steven Przybylski – "a revolutionary system inherently has a greater barrier to overcome due to a perception of greater risk and general unease with the unknown." S. Przybylski, *DRAMs for New Memory Systems (Part 2)*, MICROPROCESSOR REPORT (Mar. 5, 1993) MR0058188 at 190 [CX2630]. As Richard Crisp observed after attending JEDEC meetings for over two years, far from seeking to develop "revolutionary" standards with all the uncertainties and risks that might entail, JEDEC was interested in providing "a smooth transition" from one generation of DRAM standards to the next. Crisp E-Mail (9/16/94) R69511 at 552 [CX0711] (emphasis added). Rambus confronted similar attitudes outside of JEDEC, when it sought to license its RDRAM technology to individual DRAM vendors. *See* Performance vs. 1/94 Strategic Plan (10/12/94) R46505 at 508 [CX1312] ("Rambus still perceived as risky; chicken vs. egg") (emphasis in original). *See also* M. Horowitz, Merged DRAM/Logic (1996) MR0072786 at 800 [CX1323] (presentation by Rambus co-founder Mark Horowitz; notes that DRAM industry's "unwillingness to take risks" was a "serious" obstacle to Rambus in marketing RDRAM; "People don't choose the 'best' solution . . . They choose the least risk solution that meets their needs").

There were other reasons, however, why Rambus found it worthwhile to participate in JEDEC, wholly unrelated to any thought of openly advancing Rambus's own technology for consideration as a JEDEC standard. Chief among these reasons was the ability to observe first-hand the work of Rambus's competition – that is, the process through which JEDEC, starting in the early 1990s, went about developing what it intended to be "open" standards for Synchronous DRAMs.[8] The first Rambus employee to attend a JEDEC meeting on behalf of the company was Billy Garrett. As reflected in Mr. Garrett's "Trip Report" from the first JEDEC meeting he attended – in early December 1991 – simply observing the JEDEC process at work provided Rambus with a wealth of information. Among other things, based on what he learned at that December 1991 meeting, Mr. Garrett reported back to his colleagues that

- "[t]here were several synchronous DRAM presentations (most for the second time)";
- prominent JEDEC members, including "NEC . . . HP, Samsung, TI, IBM, Toshiba, Intel and the like" seemed to be in substantial agreement on "the definition of synchronous DRAMs" – that is, the technical features that they hoped to see reflected in JEDEC's future SDRAM standard;
- the list of features encompassed by this emerging definition included, among other things, both programmable CAS "[l]atency" and programmable "[b]urst sequence and wrap length"; and
- "[e]veryone seems to be very RAS/CAS centered in their thinking," and hence "[m]ost proposals are incremental additions to existing DRAMs."[9]

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[8] *See, e.g.*, Crisp E-Mail (9/23/95) R233837 at 837 [CX0837] ("At the time we began attending JEDEC we did so to learn what the competition was working on and what sort of performance systems using that technology would be able to achieve and what sorts of issues would arise when designing with the devices (primarily SDRAM/SGRAM).").

[9] This last comment is significant in that it helps to establish a fundamental allegation in the Commission's Complaint. Paragraph 42 of the Complaint alleges,

Shortly after becoming involved in JEDEC, it became apparent to Rambus that

Garrett E-Mail (12/4/91) R200468 at 468 [CX0670]. Rambus plainly found value in obtaining information of this sort, as evidenced by the fact that, within days of returning from this, his first, JEDEC meeting, Billy Garrett submitted, on Rambus's behalf, an official membership application to JEDEC and paid the company's membership dues. *See* EIA/JEDEC Membership Documents (12/10/91) I140015-26 [CX0602]. Although Rambus ultimately attended meetings of other JEDEC committees as well, on its membership application, Mr. Garrett noted that Rambus "agree[d] to participate in the activities of" only one committee – the JC-42.3 Subcommittee, which was charged with overseeing the development of JEDEC's Synchronous DRAM standards. *Id.* at I140016.

Roughly two months later, in late February 1992, Mr. Garrett attended a second JEDEC meeting – a JC-42.3 meeting held in Seattle – and again reported to his colleagues regarding JEDEC's work on SDRAMs. In terms of the status of JEDEC's work, Mr. Garrett's report was mixed. On the one hand, he suggested that "[t]he expectation is that people are moving rapidly

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> JC-42.3 was committed to developing SDRAM standards based on the traditional wide-bus, non-packetized DRAM architecture, relying to the extent possible on non-proprietary technologies. In other words, it was highly unlikely JC-42.3 would be interested in standardizing RDRAM, an architecture that was both proprietary and distinctly non-traditional.

Complaint, ¶ 42. Billy Garrett's statement above, while using the term "RAS/CAS," as opposed to "wide bus," essentially amounts to an observation that JEDEC's work on Synchronous DRAMs, by comparison to Rambus's proprietary RDRAM design, was progressing down a very different, far more conventional, and far more evolutionary technology path. *See* Rambus Inc. Business Plan, 1992-1997 (8/15/92) R46361 at 367 [CX1302] (emphasizing that RDRAM is "radically different from the 1970's RAS/CAS DRAM interface") (emphasis added). This fits with the testimony of Mr. Farmwald noted above to the effect that JEDEC considered RDRAM to be "too big a leap," in the sense that it "was too revolutionary" and JEDEC "wanted evolutionary approaches . . . for the next generation." Farmwald, *In the Matter of Rambus* Dep. Tr. (1/7/03) at 73 [CX2106].

toward a consensus on SDRAMs" and that "[t]he committee is very interested in getting a GOOD standard as soon as possible." Garrett E-Mail (2/27/92) R200470 at 470 [CX0672]. On the other hand, he also expressed doubts about how quickly a consensus could be reached: "No idea yet if everyone will/can agree on the details"; some information indicates "that detail specifications on Sync DRAMs will be a long way off." *Id.* at R200471. Mr. Garrett's bottom-line assessment, however, was clear: "SDRAMs will happen," he wrote. *Id.* (emphasis added). Moreover, he added, "They may happen sooner than we want, and they may become quite standardized and highly multi-sourced." *Id.* (emphasis added). Hence, what Mr. Garrett observed in the course of attending only two JEDEC meetings seems to have convinced him that Rambus's earlier assessments were correct: in its effort to promote RDRAM as the next industry standard, Rambus was going to have "to compete with Synchronous DRAMs." Tate E-Mail (12/16/91) R233940 [CX1224].

Two other aspects of Mr. Garrett's February 1992 JEDEC trip report are worthy of noting. First, at this meeting of the JC-42.3 Subcommittee, Mr. Garrett witnessed JEDEC's patent disclosure policy in practice, and seems to have gained an understanding that the policy extended not only to issued patents, but to patent applications as well. As he wrote to his Rambus colleagues, commenting on significant events that occurred during the meeting:

> Fujitsu indicated that they do have patents applied for, but that they will comply with the JEDEC requirements to make it a standard!!!

Garrett E-Mail (2/27/92) R200470 at 470 [CX0672] (emphasis added).[10]

[10] Other Rambus representatives, at later JEDEC meetings, would also have occasion to witness the disclosure of pending patent applications by JEDEC members. *See, e.g.*, Mooring E-Mail (12/11/92) R155815 [CX0685] (noting that, during a JC-42.3 meeting, IBM had commented that some "JEDEC attendees have patents pending on SDRAMs that they have not made the committee aware of" and suggested that they (IBM) would "come to the next meting

Another notable comment in Mr. Garrett's February 1992 trip report related to the possibility that Rambus might be in a position to assert patent claims over aspects of JEDEC's work on SDRAM standards. In Mr. Garrett's words:

> We could influence the voltage standard if we want, or we could use our patents to keep current-mode interfaces off of DRAMs (assuming that is what we patented . . . and that is what we want to do).

Id. (emphasis added). This is, apparently, the first recorded observation that Rambus patents might cover SDRAMs.

By late March 1992, Rambus had begun to consult with its outside patent attorney, Lester Vincent, of the firm Blakely, Sokoloff, Taylor & Zafman, to explore further the possibility of Rambus asserting patents over SDRAMs. The first such meeting took place on March 25, 1992. It was a teleconference between Lester Vincent and Rambus's Vice President of Engineering, Allen Roberts. Based on Mr. Vincent's handwritten notes of the teleconference, it is clear that they not only discussed Rambus plans to assert patents over SDRAMs, but also the potential legal implications of such a strategy, considering that Rambus by this time was a dues-paying member of JEDEC. Among other things, Mr. Vincent's notes record the following:

> Jedec
>
> – said need pre planning before accuse others of infringement
>
> – Jedec Committee =>

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with a list of offenders") (emphasis added); Crisp E-Mail (9/12/95) R69511 at 679 [CX0711] ("Fujitsu stated yesterday that they have patents pending on SSTL") (emphasis added); Crisp E-Mail (12/6/95) R69511 at 702 [CX0711] ("Foss also presented information from a survey ballot about DLLs and PLLs on SDRAMs. He stated that MOSAID has a pending patent application for PLL/DLL on SDRAMs . . . [and that] they will be compliance with the JEDEC patent policy.") (emphasis added).

Standard for DRAM's

– Advising JEDEC of patent applications . . .

– Allen will get JEDEC bylaws re patents

Vincent Notes (3/25/92) R203251 at 251 [CX1941] (emphasis in original). Thus, by late March 1992, Rambus was already "planning" to "accuse others of infringement" in connection with JEDEC's "Standard for DRAM's." *Id.* (final emphasis in original). It also appears that Rambus, by this point in time, was concerned about the issue of "Advising JEDEC of patent applications" and, in that connection, was in the process of obtaining "JEDEC bylaws re patents." *Id.* (emphasis in original).

Mr. Vincent's notes from a follow-up conference, held two days later, on March 27, 1992 – with both Allen Roberts and Richard Crisp – help to complete the picture, and also reveal the nature of his initial legal advice to Rambus.

– Rambus is a member of JEDEC

– Allen [Roberts] is ordering JEDEC bylaws

– Rambus attended meeting w/ 100 others where JEDEC's proposal to establish std for . . . synch DRAM was discussed

– Rambus did not speak

– Rambus has not asked JEDEC to adopt the std

– No vote has been taken on the std, but Rambus may be asked to vote

– I said there could be equitable estoppel problem if Rambus creates impression on JEDEC that it would not enforce its patents or patent appln

=> strongest case of equitable estoppel is when you say you will not enforce your patent

=> less clear cut if Rambus is merely silent

– But cannot mislead JEDEC into thinking that Rambus will not enforce its patent

Vincent Notes (3/27/92) R203254 [CX1942] (emphasis in original).[11] As Mr. Vincent's notes show, the bottom line of his legal opinion was clear: With regard to patents, Rambus "cannot mislead JEDEC"; were it to do so, this could result in such patents being rendered unenforceable under the doctrine of "equitable estoppel." *Id.* (emphasis added). In the same time period, Mr. Vincent also advised Mr. Crisp and Mr. Roberts that he "didn't think it was a good idea" for Rambus to continue participating in JEDEC, given the "downside risk" associated with potential equitable estoppel claims.[12]

Despite Lester Vincent's clear words of caution to Rambus about the potential legal risks of continued JEDEC participation, Rambus remained a member of JEDEC for another four-plus years (withdrawing in June 1996). Meanwhile, Rambus forged ahead with its "planning" to "accuse others of infringement" in connection with JEDEC's "Standard for DRAM's." Vincent Notes (3/25/92) R203251 at 251 [CX1941] (emphasis in original). For instance, Mr. Vincent's notes indicate that on April 1, 1992, Richard Crisp contacted Mr. Vincent requesting that he "Fax

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[11] It is interesting to note that Mr. Vincent makes not one, but two references to the fact that Allen Roberts was in the process of obtaining a copy of the "JEDEC bylaws re patents." Vincent Notes (3/25/92) R203251 at 251 [CX1941]. It is also interesting to note that disclosure of patent applications was a specific focus of concern for Rambus at this time, which makes sense, considering that Rambus did not yet have any issued patents. *See id.* ("Advising JEDEC of patent applications") (emphasis in original).

[12] *See* testimony of Complaint Counsel's hearing witness Mr. Vincent, *Rambus v. Infineon* Dep. Tr. (4/11/01) 320:6-321:4 ("Q. Did you tell Richard Crisp and Allen Roberts that at this March 27th, 1992 meeting, that they should not participate in JEDEC? . . . A. . . . I believe at some point early on . . . I believe I said I didn't think it was a good idea"; "Q. The downside risk was that someone was going to raise the issue of equitable estoppel if Rambus attended JEDEC? A. Right. . . .").

Abstracts of Patent Applications." Vincent Notes (4/1/92) R203253 [CX1944]. Mr. Vincent complied with this request only a few days later. *See* Vincent Faxed Letter (4/7/92) R202986 at 986) [CX1945] ("In response to your request, we have attached the abstracts of the following Rambus patent applications that have thus far been filed"; listing 15 Rambus patent applications).

Within days of receiving Mr. Vincent's fax, Richard Crisp – who by this time had become Rambus's primary JEDEC representative, Billy Garrett remaining his alternate – attended his first JEDEC meeting, a Synchronous DRAM Task Group meeting in Dallas, Texas. Mr. Crisp's e-mailed summary of observations from this early April 1992 JEDEC meeting contains a number of interesting revelations about JEDEC's process, and about Rambus's developing plan to secure patent rights over the JEDEC standards. To start with, as is evident from the following observations in his notes, Mr. Crisp clearly understood the nature of what JEDEC was seeking to do – that is, to develop a low-cost, open standard for the next generation of DRAMs that could quickly replace the existing DRAM designs and become a pervasive industry standard:

- "IBM . . . really stressed the need for the parts to be pervasively used from laptop to mainframe. If the part wasn't pervasively used, then the price wouldn't ever get right."
- "Compaq . . . like the others, stressed that price was the major concern for all of their systems. They didn't particularly seem to care if the SDRAMs had 1 or two banks so long as they didn't cost any more than conventional DRAMs."
- "Sun echoed the concerns about low cost. They really hammered on the point."

Crisp E-Mail (4/9/92) R45724 at 725 [CX1708].[13]

It is also clear from Mr. Crisp's notes of this April 1992 meeting that he understood (as Mr. Garrett had observed two months earlier) that JEDEC's members were becoming increasingly committed to a basic technology path for SDRAMs, and that the approach most JEDEC members seemed to favor was distinctly different from, and far more conventional than, Rambus's proprietary RDRAM architecture:

> It really looks like there is a lot of momentum against us in the main memory arena. It seems like the group is pretty set on using the SDRAMs for memory. The things they seem most concerned about (price, latencies, and power) are all things we don't really do well. It seems that we will always lose in the latency area; we simply have the overhead of the packet than the synch parts do from the perspective of the component.

Id. at R45726.[14]

Mr. Crisp also observed that the intense focus of JEDEC's members on minimizing the

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[13] The official report from this April 1992 SDRAM Task Group meeting confirmed that it was the "consensus view" of all participants that "[t]o be cost effective sync DRAM must cost no more than 5% over conventional DRAMs." Minutes of JC-42.3 Meeting (5/7/92) R65286 at 287 [CX0034A] (reporting on "Dallas Task Force Conclusions"). *See id.*, Attachment E (at R65300-302) ("USERS AGREE THAT SDRAM COST MUST BE KEPT TO WITHIN 5% OF DRAM COST!!!!," referring to consensus views of, among others, IBM, HP, and Sun; also noting TI's view that "LOW COST is the key issue"). Mr. Crisp's notes from later JC-42.3 meetings similarly observed the intensity with which JEDEC's members were seeking to minimize SDRAM-related costs. *See* Crisp E-Mail (10/5/93) R155825 at 825 [CX0710] ("Desi [Rhoden] added that if the SDRAM doesn't cost less than 5% more than the standard DRAM they will not be used.").

[14] This would not be the last time that Richard Crisp and others within Rambus would acknowledge certain "unavoidable" drawbacks to Rambus's RDRAM design, by comparison to SDRAM. *See* Crisp E-Mail (10/25/94) R234245 [CX0763] (noting that if "SDRAMs . . . run at Rambus like speeds, then . . . why would anyone want to use Rambus?"; further stating, "Our latency is an unavoidable attribute of our design, and it stems from using the cumbersome protocol based access technique we use."). *See also* Tate E-Mail (11/2/94) R131933 at 933 [CX1246] ("the #1, #2, #3 bitch at every customer I meet is our latency . . . our disadvantage is latency").

costs associated with SDRAMs seemed to be affecting a great deal of their thinking, and would likely result in SDRAMs being significantly lower-priced items as compared to RDRAM devices.[15] It is particularly notable that Mr. Crisp attributed this price difference, in large degree, to the fact that makers of RDRAMs would be forced to pay license fees and royalties to Rambus:

> The price thing was addressed . . . . It is clear that until the volumes get large, the pricing will be at a volume limiting price. It seems unlikely that we are going to be able to do better on price than SDRAMs (license fees in need of recapture, royalties to be paid, bigger die size).

Id. (emphasis added).[16] Such observations seem to have caused Mr. Crisp to conclude that Rambus should initially market its RDRAM product as a specialized, or "niche," product for high-end applications – where price was less of an issue – as opposed to a commodity DRAM for use in more standard applications, like PC main memory. *See id.* ("As a result, I think we really need to focus our efforts in the graphics are[a] as our first beachhead.").[17]

It is clear from Mr. Crisp's April 1992 JEDEC notes that he understood something else about the process by which JEDEC developed its SDRAM standards – something that Rambus's

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[15] It is well known that DRAM vendors and their customers do care intensely about the costs of these devices. As was explained in an article written by one of Rambus's expert witnesses in the *Infineon* litigation, "Cost is such an important issue that DRAM vendors must dispel any hint of added cost in their products," especially in the "cost-sensitive PC arena." S. Przybylski, *DRAMs for New Memory Systems (Part 2)*, MICROPROCESSOR REPORT (Mar. 5, 1993) MR0058188 at 190 [CX2630]. Hence, if a given DRAM technology or design adds cost, this can easily "inhibit market acceptance." *Id.*

[16] Certainly to the extent that license fees are imposed uniformly across DRAM makers, it is common to see such fees passed through in the form of higher prices for DRAM consumers. *See, e.g.,* Crisp E-Mail (10/10/95) R234538 at 539 [CX0839] (noting statement by Hyundai "that they pass on license fees and royalties to their customers").

[17] In the same time frame, some of Rambus's customers, or potential customers, were drawing similar conclusions. *See* Tate E-Mail (4/28/92) R233949 [CX1227] (reporting that Samsung VP for Product Planning "sees Rambus as very good technology but for specialty applications," as opposed to "commodity" applications).

lawyers seem to want to ignore. Rambus would like Your Honor to believe that JEDEC's SDRAM standards – and in particular the four technologies at issue here[18] – were essentially chosen by acclamation, without discussion or dissent, as if the entire membership of JEDEC's JC-24.3 Subcommittee simply recognized from the very outset that these four technologies were fundamentally essential and must be included. This is far from an accurate image, either with respect to JEDEC's decision to use these four technologies, or with respect to JEDEC's process more generally. Indeed, what one sees, in studying how JEDEC's existing SDRAM standards were developed, is that the process leading to their development is characterized more often by spirited debate and dissension than by preexisting consensus.

Billy Garrett's report from the February 1992 JC-42.3 meeting he attended hints at the lack of unanimity that often typified JEDEC's process in the relevant time period, as the subcommittee worked toward a specification that substantially all members could agree upon. *See* Garrett E-Mail (2/27/92) R200470 at 471 [CX0672] ("No idea yet if everyone will/can agree on the details"; "detail specifications on Sync DRAMs will be a long way off").[19] Yet Richard Crisp's written observations from the April 1992 SDRAM Task Group meeting really drive home the point that JEDEC's process often brought to the surface significant differences of opinion:

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[18] Those technologies are (1) "programmable CAS latency"; (2) "programmable burst length" – sometimes referred to by the term "wrap length"; (3) "on-chip PLL/DLL"; and (4) "dual edge clock."

[19] Mr. Garrett's notes from a September 1992 JC-42.3 meeting were even clearer in pointing out the level of active debate that occurred as JEDEC proceeded with its efforts to develop SDRAM standards. *See* Garrett E-Mail (9/21/92) R155812 at 812 [CX0680] ("My opinion is that the committee, for the first time, is over the 50% point in finalizing a SDRAM standard. . . . <u>This is not to say that there are not active, heated discussions on features and functionality. There are</u>.") (emphasis added).

> The IBM folks . . . really contributed heavily to the discussion. [William] Hardell from Austin had a proposal for what was basically an asynchronous DRAM with a dual edge trigger output register. Desi Rhoden of HP really tried to shut down the discussion as it was clearly indicating a strong preference inside IBM for something other than what was being proposed to he committee! He wasn't successful.

Crisp E-Mail (4/9/92) R45724 at 724 [CX1708] (emphasis added).[20] In the same e-mail in which he reported on this debate between IBM and HP, Mr. Crisp drafted a longer discussion under the heading, "Dissension in the JC42 meeting," in which he recounted the following:

> Betty Prince (TI), Steve Shaffer (SUN) and Jeff Mailloux (Micron) expressed extreme frustration over the way the standard is evolving. The user feedback yesterday was overwhelmingly against the 2 bank SDRAM, yet the vendors insisted on pursuing it. As a result these folks have formed another working group as a protest to develop a single bank simple SDRAM (the KISS group). . . . They have been joined by Apple and DEC as well as the word got around to the various sstem representatives.
>
> SUN and Apple (Pearson) were overheard saying that they would not use the devices the way the standard is evolving because they are going to have higher price than they want and the ASICs will have to be more complex due to all of the bells and whistles being proposed. Compaq also agreed with this assessment. . . .

Id. at R45728 (emphasis added).

As these observations show, and as can easily be confirmed by reviewing the minutes from virtually any JC-42.3 meeting in the relevant time period, there were often substantial

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[20] Even after the SDRAM standard was completed, JC-42.3 members observed that the standard had been developed in an environment of conflicting agendas and comprise, leading to inclusion of various features that were unneeded. In fact, this was one of the central motivations for JEDEC's later consideration of an "SDRAM Lite" standard – that is, an alternative standard that stripped away many of these unneeded features in order to pare the standard down to the most essential functions and thereby reduce the cost of SDRAMs. *See, e.g.*, Minutes of JC-42.3 Meeting (9/11/95) R66450 at 456 [CX0091A] (noting that "SDRAM lite was pursued because . . . [t]here were too many conflicting agendas when the SDRAM spec was created so there were a lot of features added").

disagreements among JEDEC members in terms of the particular shape that JEDEC's SDRAM standards should take. Moreover, as reflected here, the most heated debates often had less to do with the level of performance that could be achieved by inclusion of a given technology in the standard, and more to so with what amount of additional cost might result from a decision to go with one technological feature over another. Though it would be a significant overstatement to say that JEDEC's members were indifferent to the technical details, the fact is that, for many of the most influential JC-42.3 members, cost-related concerns were paramount, causing them often to have an attitude of indifference between one technology over another, provided that the choice did not create the potential for added costs. *See id.* at R45725 ("Compaq . . . didn't particularly seem to care if the SDRAMs had 1 or two banks so long as they didn't cost any more than conventional DRAMs"); *id.* at R45728 (TI, Sun, Micron, Apple, and DEC, for cost reasons, wanted to keep it "simple"); *id.* (Sun and Apple, for cost reasons, protested "bells and whistles").[21]

In his notes from this same April 1992 JEDEC meeting, Richard Crisp initiated a practice that he would follow at times throughout the remaining four years of his involvement with JEDEC – that is, offering candid observations, in his reports back to Rambus, on the intelligence, technical competency, and influence of various individual JEDEC participants, many of whom will be called as witnesses by Complaint Counsel. For instance, Mr. Crisp's notes from this meeting make the following observation about one of Complaint Counsel's witnesses, Mark

[21] *See* M. Horowitz, Merged DRAM/Logic (1996) MR0072786 at 800 [CX1323] (presentation by Rambus co-founder Mark Horowitz, noting that in choosing technologies, DRAM vendors want to end up with something that is "cheap enough to be competitive," and for this reason do not necessarily choose "the 'best' solution," but rather "the least risk solution that meets their needs").

Kellogg, and his colleagues from IBM: "very sharp technical guys." Crisp E-Mail (4/9/92) R45724 at 724 [CX1708]. Mr. Crisp's notes also refer to another of Complaint Counsel's witnesses – Gordon Kelley – as "the elder statesman from IBM." *Id.*[22]

Another practice first seen in Mr. Crisp's April 1992 JEDEC notes, but reflected in much of what he did and said in the following four-plus years as Rambus's official JEDEC representative, is far more troubling – namely, his willingness, even propensity, to propose and take actions fundamentally at odds with the organization's interests, actions that can only fairly be characterized as exhibiting bad faith. This is reflected in Mr. Crisp's April 1992 JEDEC notes in the manner in which he proposed that Rambus should respond to the "Dissension in the . . . meeting" discussed above:

> I think we should make sure this gets leaked to the press. Something like "RIFT forms in JEDEC SDRAM working group: major system houses now leaning away from JC42 committee recommendation.
>
> Now if we can get this on the front page of EE Times and the next issue of Nikkei Electronics, this should help our air war. One downside is that the discussions are confidential and if it was learned that the story came from us we would certainly be censured by JEDEC if we weren't tossed out. On the other hand this sort of story could be very useful to us in print. I suspect our buddy, Osamu Kobayashi of Nikkei Electronics would be willing to help. I also know a guy with Electronic Buyers News that would probably be willing to publish this story. Let's talk about it on Monday.

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[22] *See also* Crisp E-Mail (12/7/94) R69511 at 553 [CX0711] (describing "Mark Kellogg of IBM" as "a really key JEDEC attendee"); *id.* (noting that "Reese Brown" was "a longtime JEDEC consultant"); Crisp E-Mail (6/17/93) R69511 at 515 [CX0711] (referring to the amount "influence" carried by Desi Rhoden); Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (noting that Howard Sussman "is a long time JEDEC leader" and that Desi Rhoden "is a long time JEDEC veteran and chair of SDRAM group").

Id. at R45728-729.[23]

In early May 1992, within weeks of the April 1992 SDRAM Task Group meeting, Rambus was once again consulting with its outside patent counsel, Lester Vincent, in pursuit of ongoing "planning" to "accuse others of infringement" in connection with JEDEC's "Standard for DRAM's." Vincent Notes (3/25/92) R203251 at 251 [CX1941] (emphasis in original). The process was fairly straightforward. Based in large part (if not wholly) on what Rambus's representatives had gleaned through attendance of JEDEC meetings about the emerging definition of JEDEC's SDRAM specifications, Rambus and its patent attorney reviewed the company's filed patent applications – the same applications for which Mr. Crisp, a month earlier, had requested abstracts – and decided which claims could and should be amended to better nail down Rambus's SDRAM-related patent rights. Thus, in his notes from a May 2, 1992, teleconference with Rambus's VP of Engineer, Allen Roberts, Mr. Vincent wrote:

> – Richard Crisp wants to add claims to the original application =>
>
> Add claims to
> mode register
> to control latency
> output timing
> depending upon clock cycle
>
> – check whether original application has blocks (?)

[23] Mr. Crisp was not mistaken in his understanding that this type of conduct could result in Rambus being "censured" or "tossed out" of JEDEC. *Id.* At a minimum, it is clear that statements of this sort to the press commenting upon JEDEC's internal process were seriously frowned upon and, indeed, violated JEDEC's rules. *See, e.g.,* Minutes of JC-42.3 Meeting (2/27/92) (R65189 at 191) [CX0031A] (noting that "[t]he JEDEC Council had discussed the issue" of members speaking to the press about internal JEDEC business and that "such action violated JEDEC's press policies") (emphasis added). *See also id.*, Attachment H (at R65206) ("The material presented at a JEDEC meeting may not be disclosed to the public except by the JEDEC office.") (emphasis added).

Vincent Notes (5/2/92) R202989 [CX1946]. Notably, each one of the items mentioned here, on which Mr. Crisp desired to add new patent claims, had, by this point in time, been proposed for inclusion in the SDRAM specifications during JEDEC meetings attended by both Mr. Garrett and Mr. Crisp.[24]

Within days of this Vincent-Roberts teleconference, Richard Crisp found himself again attending a JEDEC meeting on SDRAMs, and hurriedly drafting e-mails back to Rambus headquarters reporting on the very latest developments. The following e-mail was drafted and sent by Mr. Crisp while the May 1992 JEDEC meeting was still in progress.

> Quick news flash from JEDEC 5/6/92 1. Pulsed RAS is in, Level RAS is out. Only Samsung is proposing level RAS. 2. 2 banks appear to still be the route the suppliers are leaning, although Samsung has joined the ranks of the 1 bankers (TI, Micron). Group sill needs to work issue. 3. Siemens expressed concern over potential Rambus Patents covering 2 bank designs. Gordon Kelly of IBM asked me if we would comment which I declined. Kelly then made the observation that Rambus attends but does not present. He was wondering if our reason was that we felt that the committee was going to be incapable of developing a standard. He said he was not convinced that our approach would not in fact be the one that works and that it will be interesting to look back three or four years from now to see if Rambus was right in adopting our approach. 4. In response to the patent issue, Sussman stated that our patent application is available from foreign patent offices, that he has a copy, and has noted many, many claims that we make that are anticipated by prior art. He also stated the Motorola patent predated ours (not the filing date!) and it too was anticipated by prior art. . . . Let make one thing clear, Howard did not offer to

[24] *See, e.g.*, Garrett E-Mail (12/4/91) R200468 at 468 [CX0670] (describing "the definition of synchronous DRAMs" as including the following, among other features: "Fully Synchronous DRAM with all signals referenced to a single (positive) clock edge. . . . Latency should be Programmable. . . . Burst sequence and wrap length should be programmable."); Minutes JC-42.3 Meeting, Attachment E (5/7/92) R65286 at 300-303 [CX0034A] (Highlights of April 1992 SDRAM Task Group meeting; discussing, among other features, "programmable wrap," "mode register," and "fully synchronous to positive clock edge"). Note that the term "blocks," as used by Rambus, refers to a concept similar to "burst length" or "wrap length."

> give the patent application out, he just mentioned that he has it and that it is available through foreign patent offices. 4. Philips also stated that they were very worried about Rambus patents as well and stated the discussion about whether 4% adders are required for the 2 versus 1 bank design was an irrelevant question if there is infringement of a Rambus patent. The Europeans are apparently worried about getting into trouble with our patent portfolio. . . . I have to run back downstairs now, but wanted to get this out now as it may be the only chance today. More will follow when I get the chance.

Crisp E-Mail (5/6/92) R200474 [CX0673] (emphasis added).

As this e-mail shows, by May of 1992 there plainly were concerns within JC-42.3 about the potential for Rambus patents to interfere with JEDEC's work on SDRAM standards. The fact that there were such concerns is not remarkable. Indeed, it merely serves to underscore certain key factual assertions relevant to Complaint Counsel's case, including that JEDEC – and most definitely the JC-42.3 Subcommittee – sought to avoid where possible developing standards that might be subject to royalty-bearing patents.

By this point in time, certainly many of the committee's members had some familiarity with Rambus's proprietary RDRAM technology, either through meetings with Rambus relating to its efforts to recruit licensees for the technology, or through various public reports about Rambus in the industry trade press. What no one knew for sure, however, was whether Rambus might hold patents, or have filed patent applications, that could possibly extend so far as to cover elements of what JEDEC was seeking to achieve through the development of specifications for Synchronous DRAMs. Considering that Rambus itself (as noted above) was seeking to "[c]reate a clear impression in the mind of decision makers at IC companies, Systems companies and major users" that Rambus's narrow-bus, packetized technology was a "revolutionary" departure from more conventional DRAM designs, JEDEC's participants (which included representatives

of each of these groups) had every reason to understand that Rambus's technology was distinctly different from the SDRAM specification they were defining. Rambus Business Plan (11/1/90) R170065 at 66 [CX0535] (emphasis added). It would have been natural, therefore, to presume that any patents held by Rambus were limited to the peculiar Rambus design, which Rambus itself knew to be "radically different" from the more conventional type of "RAS/CAS DRAM interface" that JEDEC was developing. Rambus Inc. Business Plan, 1992-1997 (8/15/92) R46361 at 367 [CX1302] (emphasis added).

To their credit, however, many JEDEC members were not content simply to operate on assumptions about the distinct nature of Rambus's technology. Some JEDEC members, as reflected in Mr. Crisp's notes, continued to be concerned "about getting into trouble with [Rambus's] patent portfolio" – in part, because of apparently false industry rumors that were circulating in that time period about Rambus demanding royalties on SDRAMs. Crisp E-Mail (5/6/92) R200474 [CX0673]. And it was due to these very concerns, fueled by industry rumors, that the Chair of the JC-42.3 Subcommittee, Gordon Kelley of IBM, publicly confronted Richard Crisp during the May 1992 meeting with a pointed question: Did Rambus have something to disclose in connection with the issue then being discussed – i.e., use of multiple banks on a DRAM? As his own notes indicate, Mr. Crisp "declined" to "comment." *Id.*[25]

Mr. Crisp's refusal to provide any comment in response to Gordon Kelley's question was the beginning of a series of affirmatively misleading actions and statements through which Rambus, both before and after it withdrew from JEDEC, conveyed to JEDEC's members the false impression that by proceeding down the path they were already on and developing SDRAM

[25] Although others witnesses have slightly different recollections of this episode, the differences in accounts are not important here.

standards incorporating the technologies that were already under consideration, JEDEC had no reason to fear that its standards would intersect with Rambus's patents.[26] In other words, as explained more fully elsewhere in this brief, the deceptive nature of Rambus's JEDEC participation stems not just from its failure to make material, patent-related disclosures – as required by JEDEC's process and its rules – but also by conveying affirmatively misleading messages through the company's actions and statements, and indeed through its very presence in the room during JEDEC meetings.

As for Richard Crisp, the fact that he was asked point blank by a committee chairman to comment on Rambus patents and yet declined to do so seems to have left him unfazed.[27] In late May 1992, he was again in communication with Lester Vincent about further proposed amendments to Rambus's pending patent applications. *See* Vincent Notes (5/29/92) R202990 [CX1947] (notes from teleconference with Richard Crisp: "Richard has claims for cases we have filed plus claims for divisionals").

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[26] It is interesting to note that slightly more than a month after this incident – in late June 1992 – Rambus representatives had a meeting with IBM, during which IBM's representatives apparently indicated that "[t]hey did not see anything" in Rambus's patent application "which concerned them." Mooring E-Mail (6/30/92) R233952 at 952 [CX1228]. According to Rambus's summary, in the same meeting IBM explained its "biggest concerns" relating to Rambus, neither of which related in any way to the potential of Rambus patents covering SDRAMs. *Id.* at R233953. It is not difficult to imagine that this June 1992 IBM-Rambus meeting would have gone very differently had Richard Crisp revealed to JEDEC in May 1992 that Rambus believed its patents did extend to cover certain features that had been proposed for inclusion in JEDEC's standards.

[27] Note that, in its Motion for Summary Decision, Rambus itself has argued that this action by Richard Crisp – that is, his refusal to comment when asked to do so by a JEDEC committee chairman – amounts to a violation of JEDEC's rules. *See* Memorandum in Support of Respondent Rambus Inc.'s Motion for Summary Decision at 40-41 & n.19 (citing various testimony to the effect that such conduct would violate JEDEC's rules).

(4) Rambus Amends Its Strategy to Incorporate an Alternative Plan for Obtaining Patents Over Widely Adopted DRAM Standards.

Throughout the early 1990s, Rambus's ultimate business objective remain unchanged. Knowing that its technology "must be established as a standard to effect large royalty payments," Rambus strived to achieve the goal of having its patented technology established as a DRAM industry standard. RamBus Business Plan (6/26/89) R114628 at 646 [CX0533]. What did change during the early 1990s, however, were the methods by which Rambus would seek to achieve this objective.

Via a cover letter dated June 18, 1992, Rambus CEO Geoffrey Tate transmitted to Rambus's Board of Directors a comprehensive five-year business plan, which, he explained, reflected a "complete re-write" of prior Rambus business plans based on "inputs from all of the executives." Tate, Memo to Members of Rambus Board, attaching RAMBUS Inc. 1992-1997 Business Plan (6/18/92) R46394 at 394 [CX0543A]. Mr. Tate closed his letter by requesting that Rambus's Board members "[p]lease read" the new business plan "before the Board Meeting," *id.*, and it appears from the minutes of the Board's June 25, 1992 meeting that this "5-Year Business Plan" was indeed discussed. Minutes of Rambus Board Meeting (6/25/92) RF0141365 at 366 [CX0604] ("Mr. Tate led discussion of strategies and projections for the five-year plan.").

As reflected in the "Executive Summary" of Rambus's June 1992 Business Plan, the company's central goals and objectives had not changed. Rambus remain committed to

- "establish[ing] strong intellectual property barriers";
- "establish[ing] Rambus as the new interface standard"; and
- "establish[ing] a very high profit stream of technology royalties."

RAMBUS Inc. 1992-1997 Business Plan (6/18/92) R46394 at 396 [CX0543A]. As relates to the

first of these goals, Mr. Tate's new business plan reported that Rambus was making good progress in obtaining patents over its inventions:

> Rambus Technology is currently covered by 18 [filed] patents, with over 300 claims, filed in the United States. Most of the patents have been or will be filed in other major countries in Europe and Asia.
>
> Because Rambus Technology represents such an innovative and unique way to provide high bandwidth logic-to-memory interconnect, the patents are extensive and fundamental. It is Rambus' opinion that the patents will largely be issued as filed and that companies will not be able to develop Rambus-compatible technology or Rambus-like technology without infringing on multiple fundamental claims of the patents.

Id. at R46398. Thus, by June 1992 Rambus appeared to be well on its way to "establish[ing] strong intellectual property barriers" over its technology. *Id.* at R46396.

When it came to achieving the other two key goals – i.e., "establish[ing] Rambus as the new interface standard" and "establish[ing] very high profit stream of technology royalties" (*id.*) – the June 1992 Business Plan acknowledged that Rambus faced two principal impediments: "Resistance to Business Model" and "Competitive Solutions." *Id.* at R46407. Regarding the former, Mr. Tate reported:

> A few systems companies and IC companies have had <u>a very negative reaction</u> to our business model. Some believe that it is not "fair" that we are wanting to charge a royalty on ICs that incorporate our technology. Others believe that our royalty will make ICs incorporating our technology "too expensive." Two specific examples are Sun and Tseng.

Id. (emphasis added). Mr. Tate went on to explain that these two issues – "Resistance to Business Model" and "Competitive Solutions" – were closely intertwined, in that competitive solutions, like SDRAM, did not suffer from the same "price negative and risk negative associated with Rambus." *Id.* at R46410.

The principal competitive threat to RDRAM at this time continued to be JEDEC's emerging standards for "Synchronous DRAMs." Thus, in the June 1992 Business Plan, Mr. Tate took the opportunity to outline in some detail his assessment of the threat posed by SDRAMs, as well as Rambus's strategies for dealing with the threat. At the outset, Mr. Tate reported on the nature of what JEDEC was seeking to accomplish through the development of SDRAM standards:

> For about 2+ years a JEDEC committee has been working on the specifications for a Synchronous DRAM. No standard has yet been approved by JEDEC. Our expectation is a standard will not be reached until end of 1992 at the earliest. . . .
>
> Sync DRAMs are an incremental improvement on the 20 year old RAS/CAS interface.[28] The old interface is "running out of gas" – but all customers are familiar with it and understand it, so there will be a tendency to try the Sync DRAM approach to see if it will meet their needs rather than moving to a completely new interface (Rambus) with the need to have to do a lot of learning and re-architecting of their system/chip.

Id. at R46409. Mr. Tate then added (echoing earlier comments by Richard Crisp) that "many system customers perceive . . . that Sync DRAMs will be sourced more broadly and more quickly," and hence "will be much cheaper," than RDRAMs. *Id.*

Having summarized the competitive threat posed by Synchronous DRAMs, Mr. Tate shifted to outlining Rambus's strategies for responding to the threat. "Our #1 strategy to counter Sync DRAMs," Mr. Tate explained, "is to get our parts proven and in the market." *Id.* In addition, Mr. Tate explained that Rambus would seek "to gain momentum rapidly in non-main-

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[28] Again, this statement is an acknowledgement that RDRAM and SDRAM were fundamentally different and distinct, inasmuch as SDRAM was "an incremental improvement on the 20 year old RAS/CAS interface" (*id.*), whereas RDRAM was "radically different from the 1970's RAS/CAS DRAM interface." Rambus Inc. Business Plan, 1992-1997 (8/15/92) R46361 at 367 [CX1302] (emphasis added). *See, supra,* note 9.

memory markets were Sync DRAMs are NOT an issue." *Id.* at R46410. It was at this point that Mr. Tate unveiled Rambus's new, patent-based strategy for competing against SDRAMs:

> Finally, we believe that Sync DRAMs infringe on some claims in our filed patents; and that there are additional claims we can file for our patents that cover features of Sync DRAMs. Then we will be in a position to request patent licensing (fees and royalties) from any manufacturer of Sync DRAMs. Our action plan is to determine the exact claims and file the additional claims by the end of Q3/92. Then to advise Sync DRAM manufacturers in Q4/92.

Id.[29] Hence, by June 1992 Rambus not only had concluded that it could successfully secure patent rights over SDRAMs, but it had developed an "action plan" pursuant to which – as part of a broader "strategy to counter Sync DRAMs" – it would continue to solidify its patent coverage over SDRAMs (by filing "additional claims") and then begin requesting "patent licensing (fees and royalties) from any manufacturer of Sync DRAMs." *Id.* (emphasis added).

As noted in the Commision's Complaint, "In actuality, events unfolded somewhat differently than Rambus's CEO envisioned in these statements, in a manner that affected the timing, but not the core substance, of Rambus's scheme." Complaint, ¶ 45. For strategic reasons discussed below, Rambus waited until some years later before actually taking the step of demanding royalties and license fees from manufacturers of SDRAMs. It is interesting to consider, however, the precise nature of what was entailed by Rambus's June 1992 "action plan" relating to SDRAMs. As clearly described above, the plan involved two steps: (1) filing "additional claims" as needed to "cover features of Sync DRAMs"; and (2) then requesting "patent licensing (fees and royalties)" from Sync DRAM manufacturers. RAMBUS Inc. 1992-

[29] *See also* Rambus Inc. Business Plan, 1992-1997 (9/28/92) R169923 at 924 [CX0545] ("Sync DRAMs infringe claims in Rambus' filed patents and other claims that Rambus will file in updates later in 1992.").

1997 Business Plan (6/18/92) R46394 at 410 [CX0543A]. The timing in which Rambus contemplated completing these two steps is of particular interest. As Mr. Tate's plan explained, the idea was "to determine the exact claims and file the additional claims by the end of Q3/92," and "[t]hen to advise Sync DRAM manufacturers" within a matter of months thereafter, "in Q4/92." *Id.* (emphasis added). This suggests that Rambus's June 1992 "action plan" entailed requesting "fees and royalties" from SDRAM manufacturers based not on issued patents (Rambus had no issued patents at this stage,[30] nor does it appear that it expected to have any by Q4/92), but rather filed patents – that is, patent applications.

Why would Rambus have contemplated the possibility of seeking to obtain licenses based on pending patent applications covering SDRAMs, as opposed to waiting until actual patents were issued by the patent office? To start with, one must bear in mind that by mid-1992 Rambus had already entered into a number of RDRAM-related licenses, and each of these licenses covered only two things: (1) Rambus's still-pending patent applications; and (2) future patents that may be issued based on such applications. *See id.* at R46416 (describing Rambus's standard "IC license" as "cover[ing] future patents developed by Rambus applying to the current interface.") (emphasis added); *id.* at R46417-421 (reporting the amounts that Rambus had collected to date in license fees and pre-paid royalties under existing licenses). *See also* Rambus Inc. Business Plan, 1992-1997 (9/28/92) R169923 at 924 [CX0545] ("Rambus licenses its patent-pending Rambus System technology to . . . IC companies in return for license and implementation fees and long term royalties") (emphasis added). Thus, when Mr. Tate, in June

[30] *See* Crisp, *Rambus v. Infineon* Trial Tr. Vol. 9 (5/2/01) at 126:8-9 [CX2092] ("We didn't have any patents at the time," referring to May 1992); *id.* at 80:3 (explaining that the '703 patent – issued by the PTO in latter half of 1993 – was "the first patent . . . issued" to Rambus).

1992, proposed an "action plan" that would have involved Rambus negotiating licenses that covered only patent applications and future patents, there was already precedent within the company for doing exactly that.

Rambus's business plans suggest at least two additional reasons why Rambus would consider pursuing such a licensing strategy in connection with SDRAMs. First, as Geoffrey Tate wrote in 1990, it was a "high priority" for Rambus "to avoid a contending standard from developing." RAMBUS Business Plan: Plans, Ideas, Issues (4/00/90) R193874 at 876 [CX0569]. Although it is unlikely that an announcement by Rambus in 1992 that it believed it possessed patent rights over features of being considered for JEDEC's SDRAM standard would have altogether prevented such a standard from developing, it certainly could have delayed the completion of JEDEC's work on SDRAM standards. This, in turn, would have inured to Rambus's benefit, insofar as its efforts to promote RDRAM were concerned. Recall, in this regard, Billy Garrett's comments from February 1992: "SDRAMs will happen" and "[t]hey may happen sooner than we want, and they may become quite standardized and highly multi-sourced." Garrett E-Mail (2/27/92) R200470 at 470 [CX0672] (emphasis added).

Secondly, the truth of the matter is that in mid-1992 Rambus could have benefited from the near-term cash infusions that might have resulted had it been able to secure licenses from SDRAM manufacturers based on the company's pending patents.[31] Indeed, Rambus's June 1992

[31] Rambus's need for cash in this time frame is evidenced in part by the fact that, in the early 1990s, Rambus exercised its option to buy back shares from Intel at an agreed-upon low price and then resold them to venture capitalists. *See Carpe DRAM – Is Asia's dominance a memory?*, OEM MAGAZINE (2/5/97) MR0130137 at 137 [CX2800] (quoting Rambus co-founder Mike Farmwald as saying, "When we look back on that now, it was a pretty stupid thing to do . . . but we had only a few million dollars and we wanted to use those shares to raise cash from the venture-capital backers.").

Business Plan expressly addressed this and other options for May 27, 2003"generat[ing] cash," in the context of outlining the company's "Six Quarter Cash Flow Projection":

> There are many potential deals we can do with current and future licensees to generate cash if we had a significant need – for example, we could offer "options" on Rambus Technology Licenses, but with no engineering effort committed on our part, to people who are interested but who are not willing to make the full commitment yet – this approach would hurt our longer term cash revenues but is an option for short term cash if needed. If Intel does not engage in a revised contract with us we believe we have legal grounds to ask them to negotiate a cash settement for non-performance on their part of the original contract – this would cause a definitie relationship problem but is an option if we need cash. As a final example, we could approach manufacturers of Sync DRAMs with our patent portfolio and negotiate for a cash license payment.

RAMBUS Inc. 1992-1997 Business Plan (6/18/92) R46394 at 435 [CX0543A] (emphasis added).[32]

(5) Throughout the Duration of Its Membership in JEDEC, Rambus Continued to Pursue a Patent Strategy "to Counter SDRAMs."

As the above discussion makes clear, based on information concerning the overall nature and direction of JEDEC's SDRAM standardization efforts that it discovered in roughly the first six months of its JEDEC participation, Rambus made a significant amendment to its business

[32] This discussion draws attention to an instance in which the clear statements in Rambus's internal business records stand in marked contrast to the positions being taken in this litigation by Rambus lawyers, and in this particular instance, one of its testifying economist as well. Despite the fact that Rambus has a record of negotiating licenses covering patent applications, as opposed to issued patents, and despite the fact that in 1992 Rambus expressly contemplated licensing its portfolio of SDRAM-related applications in order to address short-term cash considerations, one of Rambus's economic experts – Professor David Teece – has boldly opined that licenses covering patent applications do not and cannot exist. For instance, in his deposition in this case, Professor Teece testified, "The . . . notion of negotiating around patent applications is either an oxymoron or it's so fraught with ambiguity and contractual hazards that, you know, it just doesn't happen and really can't happen." Teece, *In the Matter of Rambus* Dep. Tr. (3/13/03) at 190:14-20 [CX2118].

strategy. Without question, Rambus continued to focus on the potential of making RDRAM the industry's new standard.[33] In fact, Rambus doggedly pursued this objective, in an open and well-publicized manner, by aggressively marketing the RDRAM design to all relevant industry players, and by working hard to negotiate terms on which other companies would agree to take RDRAM licenses. By the spring of 1992, however, Rambus was also actively pursuing a second strategy, aimed not at making its patented technology an industry standard – but rather positioning itself, through amendments to pending patent applications, to cover an alternative DRAM industry standard being developed by JEDEC. By contrast to Rambus's efforts to publicly extol the virtues of the RDRAM design, this alternative patent strategy did not involve an openly competitive process. It did not involve efforts to persuade others of the merits of Rambus's inventions, by comparison to alternatives. Rather, it involved the far more secretive process outlined above, a process whereby Rambus would carefully observe JEDEC proceedings and then, in close consultation with patent lawyers, methodically tweak the claims of various pending patent applications, with the goal of broadening such claims to cover features included in JEDEC's SDRAM standards.

Throughout the duration of its membership in JEDEC, from December 1991 through June 1996, Rambus continued to pursue these two parallel tracks. At no point, however, did Rambus disclose to JEDEC the fact that it possessed patent applications that related to JEDEC's ongoing work, or that covered, or were being amended to cover, features (including programmable CAS latency and burst length, on-chip PLL/DLL, and dual edge clock) that JEDEC was considering

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[33] *See also* Rambus Inc. Business Plan, 1992-1997 (9/28/92) R169923 at 924 [CX0545] ("Rambus's strategies are to . . . establish the Rambus System as an instant industry standard . . . .") (emphasis added).

for inclusion in the SDRAM standards. Nor did Rambus ever alert JEDEC to the fact that the final SDRAM specification, which was published in November 1993 – more than two and a half years before Rambus withdrew from the organization – contained technical features (including programmable CAS latency and programmable burst length) that Rambus and its lawyers had sought to cover through recently filed amendments to pending patent applications. On the other hand, the only patent-related information that Rambus did disclose to JEDEC before withdrawing in June 1996 – i.e., the fact that it had obtained its first issued patent, U.S. Patent No. 5,423,703 (hereinafter, "the '703 patent") – did nothing to overcome these non-disclosures, as that patent did not in fact relate to JEDEC's work.

During this same time period, additional competitive threats to RDRAM would emerge as well. Though Rambus was somewhat more forthcoming about the extent to which it believed these competitive DRAM designs would infringe upon its patents, it continued to withhold such information from JEDEC, and the misleading nature and effect of these JEDEC-related non-disclosures was further exacerbated by certain affirmatively misleading actions and statements by Rambus's representatives.

a. Rambus's Senior Executives Were Well Informed About JEDEC's Activities.

Rambus's JEDEC representatives – Richard Crisp and Billy Garrett – cannot alone be faulted for the fact that, even after determining that it could cover JEDEC's work through already pending patent applications (or amendments thereto), Rambus continued to participate in JEDEC without disclosing. As various documents and e-mails discussed in this brief plainly show, Rambus's most senior executives were kept well informed of JEDEC's activities and had every reason to appreciate the nature of what Rambus was doing, as well as the legal risks – such as

"equitable estoppel" – that this entailed. In fact, on one occasion, David Mooring, then Rambus's Vice President or Marketing and Sales, and currently the President of Rambus, attended a JEDEC meeting in person. In reporting back to his Rambus colleagues (including Rambus CEO Geoffrey Tate) regarding that meeting – the December 1992 JC-42.3 meeting – Mooring made two important observations. First, he noted that "[t]he SDRAM features have almost consolidated" and that he expected a "consensus" to be reached by "March 1993" and a final specification of the SDRAM standard by "June." Mooring E-Mail (12/11/92) R155815 [CX0685] (emphasis added). Second, Mooring noted that during the meeting IBM had commented that some "JEDEC attendees have patents pending on SDRAMs that they have not made the committee aware of" and suggested that they (IBM) would "come to the next meting with a list of offenders." *Id.* (emphasis added).

b. A Second Competitive Threat to RDRAM: Ramlink.

By the latter part of 1992, a new competitive threat to RDRAM – then known as Ramlink – was beginning to emerge. Like SDRAM, Ramlink was a synchronous DRAM architecture that was being developed through an open industry consortium, sponsored by the IEEE organization. Many of the same companies that participated in JEDEC's SDRAM standardization efforts also were involved in the IEEE-Ramlink discussions. In fact, as reflected in Billy Garrett's notes from a September 1992 JC-42.3 meeting, the Ramlink discussions were sometimes mentioned within JEDEC's own meetings. *See* Garrett E-Mail (9/21/92) R155812 at 813 [CX0680] ("An upcoming Ramlink meeting was announced."). It appears that by this time period – i.e., September 1992 – Ramlink had definitely hit Rambus's radar screen.

Rambus's initial strategy for dealing with Ramlink was quite similar to its strategy for dealing with SDRAM. By September of 1992, Rambus was working with its patent lawyers to

develop patent claims covering both of these competitive DRAM designs. Again, this is clear from notes taken by Lester Vincent, including the following notes from a September 25, 1992 conference between Mr. Vincent and Mr. Crisp:

> – <u>What to include in divisional applications:</u>
>
> 1) DRAM – multiple open row address
>
> 2) DRAM – programmable latency via control reg
>
> 3) DRAM – packet oriented comm. . . .
>
> => so cause problem with w/ synch DRAM & Ramlink
>
> 4) Using phase lock loops on DRAM to control delays inside & outside DRAM
>
> Ramlink – spec – created
> part of IEEE
> – No license / royalties . . . .
>
> Richard =>
> will get me copy of
> the Ramlink spec &
> synch DRAM spec.

Vincent Notes (9/25/92) R203940 at 940, 943 [CX1949] (emphasis in original).

Richard Crisp was not the only one within Rambus who was concerned about the threat posed by Ramlink. Mr. Crisp's boss, David Mooring, was also quite concerned, as shown by the following e-mail, which Mooring sent to Rambus co-founder Mike Farmwald in late October 1992, regarding an upcoming Ramlink meeting scheduled for November 12:

> Before 11/12 our decision options are
>
> (1) Decide they are the enemy and do one or more of:
>
> (a) Kill them ourselves
>
> (b) Convince them to kill themselves

(c) Convince their management to kill them

(2) Ignore it and hope it goes away

(3) Cooperate in some manner with them

Option 1 is current plan. . . .

Mooring E-Mail (10/23/92) R156911 [CX0681] (emphasis added).

By the fall of 1992, concerns about the dual competitive threats posed to Rambus by JEDEC's work on Synchronous DRAM standards, and IEEE's work on Ramlink, had again risen to the highest level's within the company. At the September 1992 meeting of Rambus's Board of Directors, for instance, David Mooring "reported on potential competition from the JEDEC/Sync DRAM." Minutes of Rambus Board of Directors Meeting (9/17/92) R28110 at 110 [CX0605]. At the Board's October 1992 meeting, similar presentations were made by both Richard Crisp and David Mooring. Specifically, Mr. Crisp reported to the Board on "the SDRAM status at JEDEC," and "the Rambus patent strategy" as it related to "SDRAMs." Minutes of Rambus Board of Directors Meeting (10/22/92) R28106 at 107 [CX0606]. Mr. Mooring, on the other hand, reported to the Board on "competition from . . . IEEE Ramlink." *Id.*

Meanwhile, Lester Vincent and his colleagues, in consultation with Richard Crisp and others at Rambus, continued the process of reviewing the claims in Rambus's pending patent applications and drafting and filing amendments to better cover technological features proposed to be included in JEDEC's SDRAM standards and IEEE's Ramlink standard. Their progress in this regard was recorded in an internal Rambus e-mail – the subject line of which read "Patent Claim Status" – sent by engineer Fred Ware to Richard Crisp and others at Rambus:

> I spoke with Lester Vincent and Tom Lee . . . on the phone yesterday. The current status of the additional claims that we want to file on the original (P001) patent follows. . . .

(1) Writable configuration register permitting programmable CAS latency
. . . This is directed at SDRAMs.

(2) DRAM communication using a packet-oriented protocol
. . . This is directed against RamLink.

(3) DRAM with PLL clock generation
. . . This is directed against **future SDRAMs** and RamLink.

(4) DRAM with multiple open rows
. . . This is directed against SDRAMs.

Ware E-Mail (6/18/93) R202996 [CX1959] (emphasis added).[34]

c. PLLs on "Future SDRAMs."

By the time this June 1993 e-mail was written, JC-42.3 had already completed its work on JEDEC's SDRAM specification and had submitted the final SDRAM standard proposal to the JEDEC Council for approval.[35] Of course, JEDEC's work on SDRAM standards did not end there. On the contrary, during the same May 1993 JC-42.3 meeting during which – as Richard

[34] Though the Rambus employees who were most often involved in consulting with Lester Vincent and his colleagues about these various amendments included engineers such as Richard Crisp, Allen Roberts, and Fred Ware, other senior executives – including Rambus's CEO, Geoffrey Tate – were kept well informed about the process, and the nature of the claims that were being added. Indeed, Mr. Tate at times appears to have been involved in coordinating the work that was being done to secure broader patent rights over competitive DRAM designs, such as SDRAM and Ramlink. *See, e.g.*, Tate E-Mail (10/25/93) R233757 [CX0713] (inquiring about "the extra claims we have added . . . for low swing I/O on dram, etc"); Vincent Notes (1/10/94) R203314 [CX1970] (reporting on conference with Mr. Tate and others concerning "Enforcement: Sync DRAMs") (emphasis added); Tate Notes (7/21/94) R33831 [CX1720] ("SDRAM . . . CLAIMS – Allen gave Lester a list of claims we need"); Tate E-Mail (4/8/94) R233765 [CX0728] (with reference to amendments to patent applications, "please call lester today re 2 action items from allen"); Tate E-Mail (5/2/94) R233770 [CX0731] (stating, "In your mailbox is an update of the listing of our U.S. patent filings," and providing further detailed information on issued and pending patents).

[35] The SDRAM standard was formally published as JEDEC Standard No. 21-C, Release 4, in November 1993.

Crisp reported – all of the final SDRAM ballots were "passed . . . and sent along to to council," JEDEC members were already discussing a "next generation standard" and "future generation SDRAMs."[36] Crisp E-Mail (5/21/93) R155822-823 [CX0700] (emphasis added).[37]

Roughly a month later, Fred Ware sent the e-mail excerpted above, observing that Rambus's patent attorneys were writing claims "directed against **future SDRAMs**" – specifically, the use of a "PLL," or "phase lock loop," in JEDEC's next-generation SDRAM standard. Ware E-Mail (6/18/93) R202996 [CX1959] (emphasis added). Other Rambus documents from the same time frame refer to "high speed SDRAM." Mooring E-Mail (9/16/93) R233995 [CX0708]. It appears that Rambus had in mind the same thing by both terms – a future version of SDRAM that, like the DDR SDRAM standard JEDEC ultimately adopted, would incorporate, among other technical features, "PLL on a DRAM," over which Rambus believed it could secure patent rights. *Id.*

In subsequent JEDEC meetings during Rambus's tenure, the idea of including PLLs on future generation SDRAMs was openly discussed.[38] For instance, in September 1994, Mr. Crisp sent an e-mail to his Rambus colleagues, the subject line of which read, "NEC PROPOSES PLL

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[36] This same May 1993 e-mail made reference to JEDEC's "decision to let a survey ballot be sent to determine what the user community wants" in terms of the "next generation [SDRAM] standard." *Id.* Though Rambus has argued in other forums, and here as well, that JEDEC's official work on what ultimately became DDR SDRAM did not start until late 1996, this e-mail and other evidence discussed herein tell a distinctly different story. The fact is that work on what in the end became labeled "DDR SDRAM" began as early as the spring of 1993.

[37] As an indication of how closely Rambus CEO Geoffrey Tate followed JEDEC-related events, note that he responded to Mr. Crisp's May 21, 1993, e-mail, asking Mr. Crisp to "arrange to debrief" him on JEDEC's "activities." Tate E-Mail (6/17/93) R69511 at 518 [CX0711].

[38] *See, e.g.*, Crisp E-Mail (5/24/94) R69511 at 534 [CX0711] (noting that "[c]omments about PLLs . . . were heard in abundance" during JEDEC meeting on DRAM modules) (emphasis added).

ON SDRAM!!!" Crisp E-Mail (9/14/94) R69511 at 546 [CX0711]. He followed up by noting, "The big news here" – referring to NEC's presentation – "is the inclusion of a PLL enable mode option." *Id.* Continuing, Mr. Crisp stated:

> They plan on putting a PLL on board their SDRAMs to improve the output delay by about 2 ns [nanoseconds]. They want to put the PLL on every chip and let the user use it or not depending on whether they need it. The disadvantages cited are the power and the lock time. . . . Fujitsu objected to the test cost being applied on all chips as the PLL would have to be tested. . . .
>
> ****I believe that we have now seen that others are seriously planning inclusion of PLLs on board SDRAMs. Proebsting of Hyundai told me that he can put one on-board too and that he doubted any claim we may have made would be valid if challenged. What is the exact status of the patent with the PLL claim?****

Id. at R69547 (emphasis added).

Several aspects of this e-mail merit comment. First, it is again noteworthy that, at this time – i.e., in September 1994, a full year and a half before Rambus withdrew from JEDEC – Rambus was observing proposals focused on including PLLs on a DRAM chip, in the next generation of high-speed SDRAM devices. The label "DDR" had not yet been invented, but it is undeniable that these discussions were part of a broader universe of "official" JEDEC work, occurring during Rambus's tenure, that led up to JEDEC's adoption of the DDR SDRAM standard – a standard that, of course, encompassed the "on-chip PLL" feature. In fact, in March of 1995, Mr. Crisp noted the comment of another JEDEC participant (Hans Wiggers of Hewlett-Packard), who "bluntly" stated that "JEDEC has been working for over two years to standardize a high speed interface and has not yet reached consensus." Crisp E-Mail (3/14/95) R69511 at 564 [CX0711] (emphasis added). This statement squares with the evidence cited above, which shows that JEDEC's work on "future SDRAMs," ultimately culminating in a standard labelled

"DDR SDRAM," began in the spring of 1993, just as the JC-42.3 subcomittee was finalizing ballots on the first SDRAM standard.[39]

Second, it is unmistakably clear that Richard Crisp (and the group to whom he sent the e-mail excerpted above, including Rambus CEO Geoffrey Tate) knew that Rambus was working to obtain patent coverage over use of this specific product feature – i.e., PLLs – as used in future SDRAMs. *See* Ware E-Mail (6/18/93) R202996 [CX1959] (noting that Rambus's patent amendments involving "DRAM with PLL clock generation" were in part "directed against future SDRAMs"). In fact, Crisp not only knew that Rambus was amending existing claims to cover this feature of future SDRAMs, but fully expected that Rambus would sue other companies if

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[39] While this point is fully evident from review of the evidence, it is also true that JEDEC's work on "future SDRAMs" did not proceed on the fastest of schedules, nor did it proceed without interruption. For instance, part of the early work on future SDRAMs involved surveying vendors and users to determine what features they desired to see in the next generation of SDRAM standards. *See, e.g.*, Crisp E-Mail (5/21/93) R155822 at 823 [CX0700] ("The decision was to let a survey ballot be sent to see what the user community wants" from "a next generation standard"). *See also* Committee Survey Ballot on Future Synchronous DRAM (SDRAM) Features (10/30/95) R128150 at 150 [CX0260]. As reflected by Hans Wiggers's statement quoted above, it took the committee a while to reach "consensus" on a new generation, "high speed interface," and this caused some JEDEC members, including apparently Mr. Wiggers, to grow frustrated. Crisp E-Mail (3/14/95) R69511 at 564 [CX0711] (emphasis added). As discussed below, even after finalizing the first SDRAM standard, the JC-42.3 Subcommittee spent a significant amount of time considering whether to revise the standard, creating a scaled-down "SDRAM Lite," in hopes that this would speed market adoption of SDRAMs by lowering their costs. It was only as this project was coming to an end that the majority of JC-42.3's members seem to have grown committed to moving forward more aggressively to finalize the "future SDRAM" work that the committee had started in the spring of 1993. It appears that JC-42.3 may have reached this turning point in December 1995, during the last JEDEC meeting that Rambus attended, as reflected in Richard Crisp's notes from that meeting. *See* Crisp E-Mail (12/5/95) R69511 at 702 [CX0711] ("The momentum is building for getting a new SDRAM standard kicked of. Kelly of IBM is saying that they need to do it right, do it to stand the test of time. He admits that current [SDRAM] devices will not run over 100 mhz. They all say it must change."); *id.* at R69703 ("HP (Wiggers) presented an appeal to the group for a plan to attack the high speed SDRAM problem more effectively than they did last time."). Crisp's notes from this same December 1995 meeting also mention that a "special meeting" had been scheduled for "the end of January" to address "advanced SDRAM (next generation)." *Id.* (emphasis added).

they were to develop future generation SDRAMs incorporating an on-chip PLL. For instance, in an October 1994 e-mail to Allen Roberts and other senior Rambus executives, Mr. Crisp commented repeatedly on the future prospect of suing DRAM makers "for using a PLL on an SDRAM." Crisp E-Mail (10/25/94) R234245 [CX0763] ("can't we sue"; "I would hope we would sue other companies") (emphasis added). The very next day, in an e-mail to Geoffrey Tate, Mr. Crisp again commented about "opportunities to sue" DRAM makers who use "PLLs/Dlls on SDRAMs." Crisp E-Mail (10/26/94) R234250 [CX0766] (emphasis added). *See also id.* ("I . . . want to make sure we keep the proper perspective . . . when we engage with others") (emphasis added). Referring to the same issue, Allan Roberts emphatically stated in another e-mail, "[I]f we want to fight this one (after the claim is issued), we better stock up our legal warchest." Crisp E-Mail (9/14/94) R233785 at 785 [CX0757] (emphasis in original).[40]

Finally, Mr. Crisp's September 1994 e-mail, along with other evidence, suggests that there were JEDEC members, in this time period, who harbored suspicions that Rambus might have claims affecting aspects of JEDEC's work. *See* Crisp E-Mail (9/14/94) R69511 at 546 [CX0711] ("Proebsting of Hyundai told me that he can put one on-board too and that he doubted any claim we may have made would be valid if challenged."). Moreover, the e-mail suggests – as does other evidence – that there were some JEDEC members who questioned whether,

[40] On-chip PLL is by no means the only technology that Mr. Crisp observed being presented at JEDEC over which he believed Rambus could assert patent rights, based on already pending patent applications. *See, e.g.*, Crisp E-Mail (3/14/95) R69511 at 564 [CX0711] (referring to Fujitsu presentation on STBUS, "I would say that the proposal may well infringe our work.") (emphasis added); Crisp E-Mail (5/27/94) R69511 at 537 [CX0711] (referring to externally supplied reference voltage, "I believe we have a claim we added to cover this.") (emphasis added); Crisp E-Mail (3/15/95) R69511 at 568 [CX0711] (referring to Fujitsu's suggestion that it may use source synchronous clocking, "Of course they may get into patent trouble if they do this!") (emphasis added).

assuming Rambus might have such patents, those patents would be upheld as valid by the courts, in light of possible prior art. Evidence that some JEDEC members may have, at times, possessed such doubts and suspicions is neither surprising, nor terribly significant. What is significant, on the other hand, is that when such doubts and suspicions gave rise to questions – including questions asked during JEDEC meetings – Rambus avoided making any statements that might have confirmed any member's fear that JEDEC's work could end up intersecting with Rambus patent rights.[41] On the contrary, Rambus's participation in JEDEC (through a combination of affirmative actions and omissions) served to convey quite the opposite impression – i.e., that JEDEC had nothing to fear from Rambus patents.

d. PLLs and Samsung's "Other Use" Clause.

During this same general time period – roughly, late 1994 – Rambus CEO Geoffrey Tate was in the process of negotiating with Samsung over their initial RDRAM license. In the course of those negotiations, questions arose having to do with the potential that Samsung, even inadvertently, might use Rambus technology in non-Rambus memory products, such as SDRAMs. Samsung was concerned that, if this were to happen, it might be sued by Rambus for patent infringement, and Samsung desired to mitigate such possible legal risks through the terms of the license. In response, Mr. Tate negotiated a provision in the Samsung license that provided Samsung protection against suit, provided that Samsung did not "intentionally" use Rambus technology in a non-compatible DRAM device, such as SDRAM. Tate E-Mail (10/25/94)

[41] For instance, there does not appear to be any evidence that Mr. Proebsting's suspicions were ever confirmed, even privately, through disclosures by Rambus. In fact, Mr. Crisp later informed his colleagues at Rambus that he had refused to tell Proebsting anything about Rambus's intellectual property. *See* Crisp E-Mail (2/26/95) R234377 at 378 [CX0783] ("I had lunch with him about 6 months ago. Of course I would not tell him anything regarding our IP portfolio . . . .") (emphasis added).

R234242 [CX0762] (emphasis added). In explaining this "other use" provision to his Rambus colleagues, Mr. Tate stated in an e-mail, purely by way of example, "So if they put for example a PLL on an SDRAM we can't sue them." *Id.* On the other hand, Mr. Tate explained, if Samsung were intentionally to use Rambus technology for non-compatible DRAM products, Rambus could "sue them." *Id.*[42]

This approach to the Samsung license was met with strong reactions from others at Rambus. Richard Crisp, for instance, responded to Mr. Tate's e-mail in part as follows:

> I've felt for some time that we need to hold this [i.e., on-chip PLL] as one of our key technology patents. If it is allowed, we need to be able to collect on it. . . . I would hope we would sue other companies, in particular those that are not licensed.

Crisp E-Mail (10/25/94) R234245 [CX0763]. In response to Crisp, Geoffrey Tate offered the following additional views:

> we cannot get a samsung deal without something like the IP compromise we gave them. . . . I don't like the compromise but it's what we can get. . . . my other thinking is that no one else has these rights – so if samsung tries to use our technology on sdrams, there will have to be 2nd sources for customers to be interested. we can block the 2nd sources or make money off of them.

Tate E-Mail (10/25/94) R234248-249 [CX0765] (emphasis added). This line of thinking appears to have persuaded Mr. Crisp of the merits of Mr. Tate's approach. "In a way it is good having Samsung licensed to do it as they will pull the market along that direction," Mr. Crisp wrote.

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[42] *See also* Tate E-Mail (10/25/94) R234248 at 248 [CX0765] ("my thinking is that the agreement wording only gives them the non-suit rights if they are applying continuing best efforts on rambus drams and only if they don't intentionally use our technology to compete with us"). Note that this version of the Rambus-Samsung RDRAM license was superseded with a new license, with a narrower scope of use, in late 1996. *See* Tate E-Mail (12/9/96) R234953 [CX0914] (reporting an "agreement on a much narrower deal," pursuant to which Samsung was forbidden to use Rambus IP for any "competitive DRAMs").

Crisp E-Mail (10/26/94) R234250 [CX0766] (emphasis added). He then added, "As others that we have not made the covenant not to sue follow, we get opportunities to sue them." *Id.* (emphasis added).

Thus, it appears that one of the reasons Rambus ultimately did agree to grant Samsung (at the time, the world's largest DRAM manufacturer[43]) rights, under very limited circumstances, to use Rambus technology in non-compatible products was that it hoped, by doing so, it might lead other companies (lacking such contractual protections) to do the same, making them easy targets for patent infringement suits. This certainly suggests that Rambus had no reason to believe that the "others" Mr. Crisp spoke of suing – and that Mr. Tate spoke of "blocking" or "making money off of" – would have known of Rambus patent claims extending to PLLs on an SDRAM.

Nor for that matter would it appear that Samsung, at this stage – if ever – was made aware of such Rambus patent claims. In fact, within a few weeks of the e-mail exchanges summarized above, Allen Roberts – Rambus's VP of Engineering – inquired with Gary Harmon, the CFO, whether he should "write a letter to Samsung . . . explaining that we consider the idea of clock compensation on a DRAM [in apparent reference to PLL technology] . . . is a Rambus 'invention.'" Roberts and Harmon E-Mails (11/10/94) R234281 [CX0770]. Harmon's response is particularly noteworthy:

> My instant response is let's not rock the boat until the money is in the bank. Your concern, I suspect, is that we must deliver an implementation package which lets the cat out of the bag 10 days after the effective date which is before the money is due . . . .
>
> I think the best we can do is sometime early next year put them on notice with a letter in which the PLL is just one of several items in

[43] *See* Crisp E-Mail (4/9/92) R45724 at 730 [CX1708] ("Samsung is now the largest supplier of DRAM (passed Toshiba)").

> a general "we consider these things to be part of the proprietary Rambus technology" claim which references the contract's non-assertion clause.

Id. (emphasis added).

e. A Third Competitive Threat to RDRAM: Mosys.

During 1994, another competitive threat to RDRAM emerged – a "Multi-Bank DRAM" being developed by a company called Mosys, or MOST. *See* Rambus Strategic Plan, 1995-1999 (12/17/94) R46520 at 523 [CX0548] (listing "mosys" under heading "Competition") (emphasis in original). As Rambus had done with respect to "countering" the SDRAM and Ramlink threats, the company initially dealt with the Mosys threat by working with its attorneys to develop a "patent defense." *See, e.g.*, Roberts Note attaching Correspondence from Lester Vincent (8/1/94) R204436 [CX0746] ("This is Lester's attempt to work [up] claims for the MOST/SDRAM defense. Please comment.").

It appears that Rambus's work on the "MOSYS Defense" may have been the impetus for a new idea, in terms of features in competitive DRAM designs that could be covered through amendments to pending Rambus patent applications. The idea was to write claims designed to cover a technology feature known as "auto-precharge." In a June 1994 e-mail – the subject line of which read, "an overlooked patent claim?" – John Dillon wrote:

> Several sync DRAMs and the MOST DRAM include the auto-precharge feature. In this, the DRAM is automatically precharged after a red or write column operation. I believe we might be able to

> claim this idea. . . .
>
> The original Rambus patent application clearly describes this feature on page 27 of the teachings. Today, the claim on this is part of divisional P008, which is pending.
>
> Claim 89 actually claims this feature. However, claim 89 is deopendent on the much narrower claim 82 of a DRAM with internal select decoding. We may be able to make a broader claim on auto-precharge for "any" DRAM and therefore gain leverage over SDRAM and MOST.
>
> For SDRAMs, auto-precharge is mostly a convenience. It is not fundamental to the performance or usefulness of SDRAM or MOST. <u>But patenting this feature would have high harassmant value</u>, especially to the extent that third-party SDRAM controllers depend on it.

Dillon E-Mail (6/16/94) R233773 [CX0738] (emphasis added).[44]

There is at least some evidence that – by contrast to its strategy to avoid disclosing SDRAM-related patents – Rambus was somewhat more willing to volunteer to customers that it believed the MOST product would infringe Rambus's intellectual property. For instance, in an April 1994 e-mail, Geoffrey Tate reported the following discussion with Toshiba representatives in Japan:

> MOST – Saito asked at lunch. I said we didn't know much but thought we beat them whenever we competed; that customers tell us we're credible and cheapest solution' and that they <u>probably violate our patent claims</u>. He seemed satisfied. I said that SDRAM's are still our real competition. I don't think he's heard much about MOST.

[44] As further evidence of how closely Rambus CEO Geoffrey Tate followed such issues, note that in April 1995 – nearly <u>a year after</u> this e-mail was sent – Mr. Tate responded, inquiring, "[W]hat did we end up doing about this idea?" Tate E-mail (4/3/95) R233810 [CX0791].

Tate E-mail (4/21/94) R234090 at 93-94 [CX1241] (emphasis added).[45]

f. Continued Focus on "IP Maximization."

Rambus's "IP maximization strategy" – targeted at SDRAMs and other competitive DRAM devices – continued to be a high priority throughout 1994 and 1995. Mooring E-Mail (3/15/94) R233764 [CX0726]. *See, e.g.*, Roberts E-Mail (1/14/94) R233758 [CX0718] ("I have scheduled Lester to come and talk about patent strategies"); Vincent Notes (1/10/94) R203314 [CX1970] (under the heading "Enforcement: Sync DRAMs," refers to claims regarding "low swing signals" "config[urable] registers," "programmable latency," and "PLLs") (emphasis added).

Far from being complacent about securing patent claims over features in SDRAMs and other competitive designs, Rambus continued to ride herd over it patents lawyers to ensure that these matters were being handled appropriately. This is evident, for instance, from a May 1994 letter that Allen Roberts sent to Lester Vincent, in which he stated as follows:

> We have reviewed the teachings of the original Rambus patent application and feel we can enhance our claim coverage. We like you to consider the following areas as inclusion into the current divisional patents . . . or potentially a new divisional(s). It is possible that some of these enhancements are already in the existing applications , but we would like to re-assess the strength of those claims.
>
> Could you please review these enhancements and propose how

[45] By January of 1996, Rambus had concluded that the Mosys design raised a variety "Potential Intellectual Property Issues" relating to Rambus patents (or pending patents) – including, but not limited to, Mosys's use of "Dual edge transport" and "DLL/PLL timed Data transport." Mosys Competitive Summary (1/19/96) R43942 at 947 [CX1316]. Of course, these are two of the same features that, as used by JEDEC's DDR SDRAM standards, Rambus claims to infringe its patents. By March of 1996, Rambus views on Mosys infringement appear to have strengthened. *See* Mosys Competitive Summary (3/29/96) R43963 at 971 [CX1319] (adding additional language referring to "Infringement on Rambus Intellectual Property").

> would be best to incorporate these ideas? The following is the list of enhancements:
>
> 1.0 Use of both edges of the clock for transmission of address, commands, or data (or any combination) on DRAM device to increase effective bandwidth/pin. . . .
>
> 2.0 Multiple and independently controlled and addressed internal DRAM memory reions (banks). . . .
>
> 6.0 Use control registers to to contain values which control RAS and CAS access timing.
>
> 7.0 Use of multiplexed address and data pins on a DRAM to reduce the total number of I/Os on a DRAM

Roberts Letter (5/5/94) R202763-764 [CX0734]. Other evidence shows that Mr. Vincent followed up on this request by drafting additional amendments addressing these points. Roberts Note attaching Correspondence from Lester Vincent (8/1/94) R204436 [CX0746] ("This is Lester's attempt to work [up] claims for the MOST/SDRAM defense. Please comment.") (emphasis added).[46]

To say that Rambus CEO Geoffrey Tate was aware of this effort to "enhance" Rambus's "claim coverage" over competitive DRAM devices would be an understatement. On the contrary, it appears that he was closely involved in monitoring the status of this work. For instance, in June 1994, Mr. Tate drafted an e-mail to Allen Roberts, with the subject line, "sdram and most patent claims." Tate E-Mail (6/17/94) R233775 [CX0740]. In the e-mail, Mr. Tate admonished Mr. Roberts of the importance of broadening Rambus's patents, and also made clear that he intended to personally monitor the work that Roberts was doing in this regard, along with

[46] Maria Sobrino, one of Rambus's outside patent attorneys, recording a meeting with one of the recipients of this note, Rick Barth, made a note in February 1995 referring to "claims to prevent Sync DRAM mftgrs" in connection with use of "PLL/DLL on DRAMs." Notes (2/2/95) R203055 [CX1978] (emphasis added).

Lester Vincent. In Mr. Tate's words, "this stuff is real critical – I'd like a list of which claims we are making that read directly on current planned sdrams and on what most might be, so i can track progress from lester's periodic status lists." *Id.* (emphasis added). In January 1995, Mr. Tate made further inquiries with Mr. Roberts on the status of certain claims: "do we have a patent/claim on a dram with 2 different clock inputs? multiple banks on a dram? when we were looking at pll on a dram claim there were a couple conflicting pieces of paper and you said something about claim 80 eliminating all the rest, etc – is everything ok and clear?" Tate E-Mail (1/27/95) R234357-358 [CX1242].

g. SyncLink.

In September 1993, Richard Crisp reported that the IEEE-Ramlink discussions were being rechanneled in support of "an alternate, more Rambus like scheme, called SyncLink." Crisp E-Mail (9/29/93) R155824 [CX0709]. One of SyncLink's most active supporters was the Korean company Hyundai, which was also an active participant in JEDEC, as were many other SyncLink supporters. On the other hand, it was well-known that SyncLink – by contrast to SDRAM – bore some close resemblances to the Rambus design. *See, e.g.,* September 11, 1995 Letter from Rambus Inc., Attachment C to Minutes of JC-42.3 Meeting (9/11/95) R66450 at 462 [CX0091A] (noting that "the SyncLink DRAM proposal bears a strong resemblance to Rambus DRAMs"). For instance, like Rambus, SyncLink was a "narrow-bus," "packetized" architecture.

Even though SyncLink was the project of a separate standards organization, in May, Hyundai's JEDEC representative – Farhad Tabrizi – made a presentation to JEDEC's JC-42.3 Subcommittee regard SyncLink. As Mr. Crisp's notes from that meeting indicate, the "[b]asic motivation" behind SyncLink was "to develop [a] high density low pincount high bandwidth device that is presumably free of royalties." Crisp E-Mail (5/24/95) R155869 at 872 [CX0794].

"The operative assumption," in other words, was "that there [were] no patents." *Id.* Mr. Crisp's notes from the May 1995 JC-42.3 meeting also indicate that the commitee Chair, Gordon Kelley, "asked whether or not any companies have patent issues" relating to the SyncLink "material," to which Hewlett-Packard's representative apparently responded, "everything is public domain." *Id.* Mr. Crisp's notes then recount the following:

> Sam Calvin (Intel) asked whether or not there were Rambus patents covering it. . . . Kelley asked us to state whether or not Rambus knows of any patents especially ones we have that may read on SyncLink. Wiggers specifically mentioned that I have attended all of the SynchLink meetings and therefore should know exactly what will and will not be a Rambus patent issue.

Id. at R155872-873. Mr. Crisp's notes further mention that, as he was leaving the meeting, he was asked by Intel's representatives "about the intellectual property issue," and that he responded as follows:

> [M]y personal opinion was that it would be virtually impossible for them to not infringe some aspect of what we had done. I re-emphasized this was my personal opinion and was not to be taken as a definitive statement.

Id. at R155873.

At this point, Mr. Crisp's notes shift to a discussion of strategy – both in terms of Rambus's strategy with respect to covering SyncLink through further amendments to Rambus patent applications, and a strategy for dealing with patent-related disclosures:

> As far as intellectual property issues go here are a few ideas:
>
> 1. DRAM on a packet oriented bus
> 2. DRAM with low swing signalling
> 3. DRAM with a two wire initialization system
> 4. DRAM with programmable access latency
> 5. DRAM with on chip address space decoding
>
> I think it makes sense to review our current issued patents and see

> what we have that may work against them. If it is something really key, then we may want to mention it to Hyundai in our attempts to get the negotiation underway again. If it is not a really key issue, such as the initialization issue, then I think it makes no sense to alert them to a potential problem they can easily work around.
>
> We may want to walk into the next JEDEC meeting and simply provide a list of patent numbers which have issued and say "we are not lawyers, we will pass no judgment of infringement or non-infringement, but here are our issued patent numbers, you decide for yourselves what does and does not infringe". On the other hand we do not want to make it easy for all to figure out what we have especially if nothing looks really strong. If we have a really strong one that has issued that is key to the operation of the SLDRAM, then we may want to play that card, but again with the above suggested disclaimer.

Id. at R155873-874.[47]

Within the following few weeks, Mr. Crisp personally carried through with his idea to "review our current issued patents and see what we have that may work against them." *Id.* at R155873. For instance, he contacted Allen Roberts inquiring about a divisonal application that he understood to have been abandoned, explaining, "The reason for the renewed interest is SyncLink. I am trying to understand exactly what we can claim against them and what we have already and what we might be able to still claim to ensure their plans infringe our IP." Crisp E-Mail (6/5/95) R233819 [CX0797]. On the following day, Mr. Crisp sent another e-mail, stating, "[I]f it is possible to salvage and get anything that helps us get a claim to shoot synclink in the

[47] As he had done before, Mr. Crisp then suggested that JEDEC's consideration of SyncLink could factor into Rambus's continuing "air war" against JEDEC in the industry trade press. "I'd like to somehow make it appear to the world that the JEDEC group moving in the SyncLink direction is an admission of failure for previous high profile work of JEDEC . . . . If all works well for us, this will have the effect of . . . creating an image that the JEDEC stuff is never successful." Crisp E-Mail (5/24/95) R69511 at 584 [CX0711].

head, we should do it and file what ever divisional is necessary." *Id.*[48]

Mr. Crisp was not the only one focusing on the SyncLink issue at this point in time. Rambus's CEO, Geoff Tate, raised the issue at a Rambus Board meeting in early June 1995. His notes from that meeting record the following input from Rambus co-founders, and Board members, Mike Farmwald and Mark Horowitz:

> SyncLink Strategy
>
> Mike: Says SyncLink violates patents but we'll be reasonable on license fees
>
> Mark: Stirring the pot now makes us look like bad guys & gives them credibility

Tate Notes (6/8/95) R128501 at 504 [CX1727] (emphasis in original).

[49] In addition to the general plan of talking to

[48] It appears that Mr. Crisp's determination to secure the broadest possible patent rights over SyncLink was motivated in part by concerns that SyncLink would aggressively attempt to work around any patents relating to aspects of the SyncLink design. *See* Crisp E-Mail (6/22/95) R233824 [CX0819] (reporting that Proebsting of Hyundai had stated "very vehemently" that SyncLink would "work around anything that is patented").

[49]

Rambus's patent counsel – "Talk to Lester" – it appears that Mr. Tate and Mr. Crisp discussed two plans for going forward, as related to SyncLink:

> (1) Assess current cov -> det. all new claims that could not be filed to better describe the invention
>
> (2) Re OH -> don't want to advise at this time

Id. at R128542.

With regard to the first item, in mid-July, Mr. Crisp sent an e-mail to Allen Roberts – the subject line of which reads, "I want to talk to lester vincent about some claims" – in which he reported: "I have done a review of several of our divisionals and our issued patents. I can see several opportunities for better describing our patents with some additional claims which I believe can be administered by a new divisional or an amendment of one of the pending ones." Crisp E-Mail (7/19/95) R233826 [CX0825].

The second item was in reference to Dr. K.H. Oh of Hyundai. As Mr. Crisp had referenced in his May 24 e-mail, Rambus was in this time frame seeking to negotiate an RDRAM license with Hyundai, and Mr. Crisp had suggested that Rambus might want to disclose aspects of its SyncLink-related intellectual property to Hyundai as a means of advancing those negotiations. *See* Crisp E-Mail (5/24/95) R155869 at 873-874 [CX0794] ("If it is something really key, then we may want to mention it to Hyundai in our attempts to get the negotiation underway again.").[50] In subsequent dealings with Hyundai, however, it does not appear that

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[50] Mr. Crisp had also suggested, in earlier e-mails, that by disclosing to Hyundai the breadth of its patent portfolio, Rambus might be able to deter Hyundai from pursuing SyncLink altogether. In his words, "One angle we can take to address the issue head-on with the Korea folks: Emphasize," among other things, "that when they get finished they will probably find themselves mired in a big intellectual property trap." Crisp E-Mail (2/26/95) R234377-378

Rambus did make any such revelation – consistent with the above statement: "Re OH -> don't want to advise at this time." Tate Notes (6/8/95) R128501 at 542 [CX1727] (emphasis added). *See also, e.g.*, Tate E-Mail (11/22/95) R234580 [CX0841] (reporting on Hyundai contract negotiations; no reference to IP disclosures); Crisp E-Mail (10/10/95) R234538-539 [CX0839] (same).[51]

In August 1995, Mr. Crisp attended an IEEE-SyncLink meeting, during which, the notes of the meeting indicate, he made the following disclosure about potential Rambus patent issues:[52]

> Richard Crisp, of RamBus, informed us that in their opinion both RamLink and SyncLink may violate RamBus patents that date back as far as 1989. Others commented that the RamLink work was public early enough to avoid problems, and thus might invalidate such patents to the same extent that they appear to be

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[CX0783] (emphasis added). On the other hand, Mr. Crisp wrote, "I certainly do not want to bring this intellectual property issue up without careful consideration. I especially do not want it all over JEDEC." *Id.* at R234378.

[51] It appears that Hyundai had earlier inquired with Rambus whether it might have patent claims that would cover use of PLLs on a DRAM. *See* Mooring E-Mail (9/16/93) R233995 [CX0708] (noting that Hyundai representatives "asked some very pointed questions about the scope and status of [Rambus] patents. 'Do you have a patent on putting a PLL on a DRAM'? They seemed pretty worried about it."). Complaint Counsel is aware of no evidence, however, that Rambus ever confirmed that it did possess either pending or issued patents containing such claims – that is, until 2000, when it began to enforce its PLL-related patents against DDR SDRAMs.

[52] An interesting series of events led up to this disclosure. In the course of a heated e-mail exchange with Hans Wiggers of Hewlett-Packard, the Chair of the SyncLink Committee, Mr. Crisp disclosed that it was his "personal opinion . . . that the Ramlink/SyncLink proposals will have a number of problems with Rambus intellectual property." Crisp E-Mail (6/13/95) R69511 at 643 [CX0711]. Mr. Crisp added, at the end of his e-mail, that he regarded his statements "to be a private communication" and that Mr. Wiggers was "not free to copy and distribute . . . without [his] permission." *Id.* at R69644. Mr. Wiggers responded that, as Chair of the committee, he had no choice but to report the patent-related information contained in Mr. Crisp's e-mails. Wiggers E-Mail (7/12/95) R69511 at 641 [CX0711]. Through a series of subsequent e-mails, Mr. Crisp and Mr. Wiggers, with input from their respective lawyers, negotiated a statement that was acceptable to Mr. Crisp, in part because it stressed these were his "personal" opinions. Crisp and Wiggers E-Mails (7/14/95) R69511 at 656-657 [CX0711].

> violated. However, the resolution of these questions is not a feasible task for the committee, so it must continue with the technical work at hand.

Minutes of IEEE SyncLink Meeting (8/21/95) HY-FTC004756 at 57 [CX0486] (emphasis added).[53]

Mr. Crisp's statements to JEDEC about SyncLink were less forthcoming. At the September 1995 JC-42.3 meeting, Mr. Crisp read the following carefully worded letter to the committee, responding to the patent-related inquiry that had been posed by Gordon Kelley in May 1995:

> At that last JEDEC meeting, it was noted that the subject of the SyncLink DRAM proposal bears a strong resemblance to Rambus DRAMs and so I was asked to make a comment about the Rambus intellectual property position as it may relate to the SyncLink proposal.
>
> The first Rambus patents were filed more than five years ago, with development starting years before. We have confirmed that the first Ramlink and Synclink committee meetings and draft proposals occurred years after Rambus began development.

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[53] Mr. Crisp's disclosure prompted IEEE to send a letter to Geoffrey Tate, in which IEEE requested that Rambus "advise whether or not your company will issue a letter of assurance, in accordance with IEEE Standards Patent Policy, which would state that Rambus will make a non-discriminatory license to the technology available under reasonable rates, terms and conditions." Rowden Letter (12/13/95) R164891 [CX0487]. Rambus, however, was unwilling to provide such assurances, stating in response only that Rambus "will continue to license its technology in accordance with its existing business practices." Diepenbrock Letter (1/15/96) R156924 at 925 [CX0855] (emphasis added). *See also* Vincent Letter (1/11/96) R203877 at 878 [CX1243] (earlier draft of the IEEE response letter, drafted by Vincent, stating, "Rambus will not . . . issue the letter of assurance that you have requested regarding non-discriminatory license"). IEEE wrote back to Rambus after receiving this letter, claiming that it understood Rambus's letter to, in effect, state that Rambus was "willing to license applicants on a non-discriminatory basis under reasonable terms." Rowden Letter (2/16/96) R164886 [CX0490]. Yet in response, Rambus again reiterated that it was not willing to make any assurances beyond those contained in its earlier correspondence – i.e., it would only agree to license "in accordance with its existing business practices." Diepenbrock Letter (2/21/96) R164883 [CX0869].

> Today there is no finalized Synclink specification or DRAMs to analyze for potential infringement. Best case, it will be several years before they will exist. So to fully determine Synclink patent risk, the committee should look not just to Rambus but internally.
>
> For example, we are aware of 13 US patents relating to SDRAMs which were issued to member companies of this committee. All were active participants in the SDRAM standardization process. Included in this list are Hitachi, Mitsubishi, Mosaid, Motorola, Oki, Samsung, TI and Toshiba.
>
> Additionally, Synclink is being sponsored by an organization with a less stringent patent policy than JEDEC. Under the bylaws of te IEEE working groups, attendees represent themselves only, not their employers. Furthermore, they are free to patent whatever they desire, and are not bound to relinquish any of their rights to their patents by presenting their ideas for standardization.
>
> Therefore, we conclude that products defined by committees are not guaranteed to be free of patent encumbrances.
>
> At this time, Rambus elects to not make a specific comment on our intellectual property position relative to the Synclink proposal. Our presence or silence at committee meetings does not constitute an endorsement of any proposal under the committee's consideration nor does it make any statement regarding potential infringement of Rambus intellectual property.

September 11, 1995 Letter from Rambus Inc., Attachment C to Minutes of JC-42.3 Meeting (9/11/95) R66450 at 462 [CX0091A].

Mr. Crisp's notes from the September 1995 JC-42.3 meeting recount what transpired after he read this letter:

> The patent statement was read and generated some discussion. Basically, Kelley of IBM said that he heard a lot of words, but did not hear anything said. I reminded them that first of all we are in Washington DC, so it is in keeping with what one would expect to hear in this town (got a lot of laughs which helped to keep things civil) and that we actually did say something. . . . I also reminded them that we have actually reported a patent to the committee in the past and in so doing it put us in a league within JEDEC which has only a small number of members.

Crisp E-Mail (9/11/95) R69511 at 676-677 [CX0711] (emphasis added). As this e-mail shows, Rambus's used its prior disclosure of the '703 patent, which Rambus has acknowledged was not relevant to JEDEC's work, to convey a misleading impression. In simple words, the message that Mr. Crisp conveyed was this: "You can trust us. If we have something to disclose, we will do so, just as we have done before."

Finally, with respect to SyncLink, it is important to note that Rambus's work to secure patent rights over this competing design continued in the years after it left JEDEC. Because SyncLink devices never reached production, it was perhaps less of a concern to Rambus than SDRAM and later DDR SDRAM. On the other hand, Rambus wanted to be prepared in the event that SyncLink had been successful. As Mr. Crisp explained:

> I want to again bring up the issue of IP and the importance that we have our issued patents and any pending claims looked at long and hard to do as much as we can to anticipate the SL [SyncLink] work. If they are successful (I doubt it) but we can collect royalties from them, then it probably doesn't matter other than our pride. As long as we collect big royalty checks every quarter, then we should be OK.

Crisp E-Mail (8/30/96) R69511 at 695 [CX0711] (emphasis added).

Among other things, this e-mail sheds light on how Rambus's strategic thinking may have changed over time. Without question, Rambus's prime business objective was to establish RDRAM "as a standard to effect large royalty payments." RamBus Business Plan (6/26/89) R114628 at 646 [CX0533]. But as this e-mail presages and later events showed, in the end Rambus did not care whether it collected royalties based on patents covering RDRAM or some other technology that became widely adopted as an industry standard, as long as it was able "collect big royalty checks."

a. Consideration of Giving "RAND" Assurance to JEDEC.

Mr. Crisp's report from the September 1995 JC-42.3 meeting mentions that, following the events discussed immediately above, Desi Rhoden "suggested" to Mr. Crisp that if Rambus "would just make a statement such as the one Intel made this morning . . . everyone 'would get off of our backs.'" Crisp E-Mail (9/11/95) R69511 at 677 [CX0711]. Mr. Crisp then explained to his colleagues, "The Intel statement is as follows":

> A license shall be made available to applicants under reasonable terms and conditions that are demonstrably free of any unfair discrimination.
>
> Any company desiring to license technology from Intel should contact Intel Corporate Legal, which will review Intel's policy with them.
>
> John Kelly, EIA Legal, has reviewed Intel's policy and considers it fair and reasonable. License issues are in fact private and JEDEC has no formal requirements for nor program for reviewing individual members company policies. Intel complies with EIA/JEDEC Patent policy, a position supported by John Kelly.

Id.

After explaining the nature of Intel's statement, Mr. Crisp made a pitch for Rambus complying with JEDEC policies by providing similar assurances to the committee:

> It is my opinion that we could and should make a statement exactly like Intel has done and I will volunteer to contact John Kelly and work this issue with him if we come to the conclusion that this is in our best interest.
>
> My feeling is that if we were to do so at the next meeting, that it will pave the way for removing much of the animosity we experience from the JEDEC side of our partner companies and may even help us at the ones we do not currently have licensed. . . .

Id.[54]

Several months later, Mr. Crisp reported to his Rambus colleagues that he had engaged various JEDEC leaders in conversations about the JEDEC patent policy, and about the nature of patent assurances that are required under the policy. It appears that, at this time, Mr. Crisp still had in mind that Rambus might want to provide such assurances to JEDEC – not in connection with its DRAM-related patents, however, but rather in connection with patents that Rambus possessed over certain memory module-related technologies:

> Townsend of Toshiba (general chairman of JEDEC JC 42) and I had lunch together and we talked a bit about the patent policy, and how we could get an R-Module standardized. Basically Jim stated that as long as Rambus was willing to state that we would be willing to abide by the patent policy as far as our modules are concerned, that there would be no problem. The policy requires that we state that we would license the patents necessary to build the module (<u>but not the DRAM patents!</u>) to all-comers on a non-discriminatory basis for "reasonable" license fees and royalties. According to Howard Susman, "reasonable" can mean almost anything we want it to mean.
>
> Sussman, for those that don't know him, is a long time JEDEC leader and the current task group chairman of JC42.4 (non-volatile). . . . I talked with Rhoden of VLSI (also a long time JEDEC veteran and chair of the SDRAM group) about the patent policy. He says the same thing as Sussman: we can say on a case by case basis that we will abide by the policy where it is relevant, we can say when a showing is made that there may be patent activity in that are etc.

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[54] Not long after writing this e-mail, Mr. Crisp sent another e-mail, again suggesting that perhaps Rambus should disclose at least its issued patents to JEDEC and to SyncLink. *See* Crisp E-Mail (9/23/95) R233837 at 838 [CX0837] ("It seems to me that we should re-evaluate our position relative to what we decide to keep quiet about, and what we say we have. . . . [W]e should tell the world what patents have issued (well at least JEDEC and perhaps SyncLink) to be clean on this. We should also redouble our efforts to get the necessary amendments completed, the new claims added and make damn sure this ship is watertight before we get too far out to sea. . . .").

> So the conclusion I reach here is that we can abide by the patent policy on a case by case basis, are free to set the terms of our license arrangements to what we like (as long as we agree to license all-comers to build our modules), "and we give nothing else up in the process". So the patent policy is something you can deal with on a ballot by ballot basis as Sussman had recently advised me. Personally I don't think this is nearly as onerous as some of us had earlier believed. As long as we mention that there are potential patent issues when a showing or a ballot comes to the floor, then we have no engaged in "inequitable behavior."

Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (emphasis added).

This e-mail raises a number of important points. First, it is important to draw a distinction between two different aspects of the "JEDEC patent policy" that are both discussed here: (1) the "disclosure" policy, and (2) the "licensing" requirement. Most of Mr. Crisp's comments go the latter – that is, to the aspect of JEDEC's rules that forbids any JEDEC committee to adopt a standard incorporating technologies that are subject to "known" patents or patent applications without first receiving advance, written assurances from the patent holder (or applicant) that such technologies will be made available for license on "reasonable and non-discriminatory" (often abbreviated as "RAND") terms. As Mr. Crisp notes, JEDEC members can determine "on a case by case" whether they chose to "abide by" this policy. In other words, JEDEC members are not required to agree to RAND licensing terms. However, if they do not, their patented or patent-pending technologies (which presumably have been disclosed to JEDEC) cannot be used in JEDEC's standards; the rules simply forbid this. The disclosure policy, on the other hand, is a mandatory requirement, as Mr. Crisp seems to acknowledge by the final statement quoted above: "As long as we mention that there are potential patent issues when a showing or a ballot comes to the floor, then we have no engaged in 'inequitable behavior.'" *Id.* Hence, with respect to disclosure of relevant patents and patent applications, JEDEC members do

not have the option to choose "on a case by case basis" whether to "abide by" JEDEC's policy. *Id.* Such disclosures are required.

Second, it is interesting to note that, although Mr. Crisp had earlier suggested (in a September 1995 e-mail) the possibility of Rambus making a RAND statement "exactly like Intel" with respect to the company's DRAM-related intellectual property, it does not appear that this was still being considered when Mr. Crisp wrote the e-mail quoted above (i.e., in December 1995). Crisp E-Mail (9/11/95) R69511 at 677 [CX0711]. At a minimum, what is clear from the above e-mail is that his comments were in reference to the idea of possibly making a RAND disclosure in relation to "patents necessary to build" a Rambus "module" – "but not the DRAM patents!," Mr. Crisp quickly and emphatically added. Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (emphasis added). Nor for that matter did Rambus ever provide any RAND assurances to JEDEC, in connection with either modules or DRAMs.[55]

Third, this e-mail suggests that Richard Crisp knew where to turn if he needed input on the effect or proper interpretation of JEDEC's patent policy. In this instance, to assure himself of what the policy required, he went to three very prominent leaders in JEDEC – Jim Townsend, Howard Sussman, and Desi Rhoden. Mr. Crisp's September e-mail discussing the RAND issue

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[55] As noted above, Rambus was expressly asked by IEEE to give RAND assurances in connection with possible intersection between Rambus patents and features in the SyncLink design, but Rambus refused to provide any such assurances to IEEE, not once but twice. *See, supra*, note 53. The fact that Rambus was so stern in refusing to give such assurances to IEEE, in connection with DRAM-related patents, suggests (as does substantial other evidence) that, had it been directly asked to do so, Rambus would have similarly refused to give such assurances to JEDEC. The manner in which Rambus dealt with the RAND issue within both JEDEC and IEEE suggests something else as well – namely, that the key decision makers within Rambus did not agree with the assessment that "'reasonable' can mean almost anything we want it to mean." Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (emphasis added). At a minimum, this was not a risk that Rambus was prepared to take.

suggested that he knew of another person to whom he could turn, if needed, for input on JEDEC's patent policy – i.e., John Kelly, who at that time was the EIA/JEDEC General Counsel (and is now also JEDEC's President). Crisp E-Mail (9/11/95) R69511 at 677 [CX0711] ("I will volunteer to contact John Kelly and work this issue with him if we come to the conclusion that this is in our best interest.").

Fourth, it is interesting to note the following statement from Mr. Crisp's e-mail, regarding JEDEC's patent policy: "Personally I don't think this is nearly as onerous as some of us had earlier believed." Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (emphasis added). At a minimum, this statement is consistent with other evidence showing that Rambus focused attention on the JEDEC patent policy at an early stage during its participation in the organization. *See, e.g.*, Vincent Notes (3/25/92) R203251 at 251 [CX1941] (notes from conference between Mr. Roberts and Mr. Vincent referring to "Jedec . . . Standard for DRAM's," "Advising JEDEC of patent applications," and "Allen" getting "JEDEC bylaws re patents") (emphasis in original); Vincent Notes (3/27/92) R203254 [CX1942] (again referring to "Allen [Roberts] is ordering JEDEC bylaws"). The statement also seems to suggest that Rambus's early impression of the JEDEC patent policy was that it was "onerous," or demanding. Such statements stand in marked contrast to the arguments Rambus seeks to make in this proceeding, to the effect that JEDEC's policy was entirely "voluntary" and applied in only the narrowest of circumstances – i.e., when issued (as opposed to pending) patents contained express claims that, as an objective matter, literally covered or "read on" a final JEDEC standard.

Finally, it is interesting to note the last statement quoted above from Mr. Crisp's December 5, 1995, e-mail: "As long as we mention that there are potential patent issues when a showing or a ballot comes to the floor, then we have no engaged in 'inequitable behavior.'"

Crisp E-Mail (12/5/95) R69511 at 698 [CX0711] (emphasis added). As this statement points out, during the last JEDEC meeting it attended (in December 1995) Rambus remained focused to some degree on the same legal concerns that its lawyers had raised nearly four years earlier – the potential for Rambus's JEDEC-related conduct to be held to constitute "inequitable behavior," in turn resulting in Rambus's JEDEC-related patents being held unenforceable on grounds of "equitable estoppel." As discussed immediately below, such legal risks were very much a focus of concern within Rambus in late 1995.

b. Rambus Decides to Withdraw from JEDEC Amidst Heightened Concerns About Legal Risk.

During the final months of Rambus's participation in JEDEC, the company's focus turned back to the same sorts of legal issues that were a source of concern from the outset. As discussed above, in the first few months of its involvement in JEDEC, Rambus was told by its outside counsel that there was a risk that, through its participation in JEDEC, Rambus patents could be rendered legally unenforceable, under the patent-related doctrine of "equitable estoppel." *See* Vincent Notes(3/27/92) R203254 [CX1942] ("I said there could be equitable estoppel problem if Rambus creates impression on JEDEC that it would not enforce its patents or patent appln . . . cannot mislead JEDEC into thinking that Rambus will not enforce its patent"). In fact, based on this concern, Rambus's outside patent counsel – Lester Vincent – had encouraged the company to withdraw from JEDEC. *See* Vincent, *Rambus v. Infineon* Dep. Tr. (4/11/01) 320:6-321:4 (explaining that, because of "[t]he downside risk . . . of equitable estoppel," he told Rambus he "didn't think it was a good idea"; "Q. The downside risk was that someone was going to raise the issue of equitable estoppel if Rambus attended JEDEC? A. Right. . . .").

During the intervening years of Rambus's involvement in JEDEC, Mr. Vincent would have occasion to raise such legal issues again. For instance, in May 1993 Mr. Vincent forwarded to Richard Crisp a detailed presentation underscoring the legal risks associated with "Patents and Industry Standards." Presentation Entitled "Patents and Industry Standards" attached to Vincent Letter (5/4/96) V1231 at 32 [CX1958]. Among other things, the presentation explained that, when a participant in a standard-setting process seeks to enforce patents covering the relevant standards, there are not one, but two "possible legal theories for non-enforcement":

- "Estoppel," and
- "Antitrust."

Id. at V1242 (emphasis added). The presentation further explained that affirmatively misleading conduct need not exist in order for such legal theories to apply; "intentionally misleading silence" might be sufficient if, for instance, the patent holder had a "duty to speak." *Id.* at V1244 (emphasis added).[56]

Between May 1993 and September 1995, the record does not appear to contain much if any evidence of legal advice regarding such legal risks. This changed, however, in mid-September 1995, when it was announced within Rambus that the company had hired a new in-house patent attorney, Anthony Diepenbrock. The nature of what Diepenbrock was hired to do was clearly spelled out in a broadly addressed e-mail – entitled "keep tony informed of

[56] As Richard Crisp testified during the *Infineon* trial, he understood that simply being silent during JEDEC meetings was not enough to avoid risks of equitable estoppel. *See* Crisp, *Rambus v. Infineon* Trial Tr. Vol. 9 (5/2/01) 98:9-15 [CX2092] ("Q. So what he [Lester Vincent] told you is that even if you go to the JEDEC meetings and stay silent and you don't do anything else, you still have a risk that your patents will be unenforceable if you let the standard go forward and you don't tell them you have patents, right? Isn't that what Lester Vincent told you? A. Yes, that's what he said.").

competitive developments" – sent out by Geoffrey Tate:

> tony's #1 objective right now is to understand competitive technology, get up to speed on all of our patents filed, assess how many and how strong our current patents/claims are vs competition, and determine what should proactively be done to strengthen our IP position relative to competition.
>
> as part of this it would be very helpful if, any time you have any email talking about competitive technology developments/directions (e.g. JEDEC meeting reports, etc.) if you would add "adiepenb" to your distribution list.

Tate E-Mail (9/12/95) R233832 [CX0831].

From all appearances, Mr. Diepenbrock hit the ground running. Within roughly a week of starting, Mr. Diepenbrock had sent an e-mail to Geoffrey Tate and others providing "an initial status of the situation . . . with regards to [Rambus's] coverage" of various competitive DRAM designs. Diepenbrock E-Mail (9/21/95) R233834 [CX0834] (noting, *inter alia*, that Rambus had patents pending that related to "DLL," "PLL," "clock synchronization," and "minimizing clock-data skew in a bus system"). Just as quickly as Mr. Diepenbrock immersed himself into these patent issues, however, he appears to have developed concerns about the legal risks associated with Rambus efforts to secure patents covering competitive DRAM designs, at least to the extent those designs were being established by open standards groups like JEDEC and IEEE-SyncLink.

Mr. Diepenbrock's precise concern, as he would later testify, was that Rambus could be judged to have engaged in "misleading conduct," and that other JEDEC participants, having "relied upon" such conduct "to the[ir] prejudice," could successfully assert the defense of equitable estoppel if sued by Rambus for patent infringement. Diepenbrock, *Rambus v. Infineon* Dep. Tr. (3/14/01) 141:7-8 . This was a risk that, in Mr. Diepenbrock's view, Rambus "did not want to take":

> I explained [to Richard Crisp] that there are certain doctrines in patent laws, equitable doctrines that can render a patent unenforceable. And one of those doctrines is laches, and the other is equitable estoppel, two of them. And that he was running a risk that equitable estoppel, which might have been construed by his actions, would render some or – some patents that had issued unenforceable, and that we did not want to take that risk.

Id. at 148:16-25.

Some of Mr. Diepenbrock's thoughts, and Richard Crisp's reactions to them, were summarized in an e-mail drafted by Mr. Crisp in September 1995, the subject line of which read, "some further thoughts regarding patent issues and a bit about SyncLink":

> One other thought I had regarding Tony's worst case scenario regarding estoppel:
>
> The only thing lost is the ability to enforce our rights against those that can prove estoppel applies: in this case perhaps SyncLink. We do not have our patent invalidated. It is still enforceable on other devices . . . .
>
> Having said all of that, Tony brings up a good point regarding our patent position within the standards organizations. At the time we began attending JEDEC we did so to learn what the competition was working on and what sort of performance systems using that technology would be able to achieve and what sorts of issues would arise when designing with the devices (primarily SDRAM/SGRAM).
>
> As time passed our reasons for attending JEDEC increased into gaining leads into who was working for what semiconductor company (contact points), and where they were putting their emphasis . . . .
>
> During the beginning of this period, we had no issued patents. We decided that we really could not be expected to talk about potential infringement for patents that had not issued both from the perspective of not knowing what would wind up being acceptable t the examiner, and from the perspective of not disclosing our trade secrets any earlier than we are forced to.
>
> As time passed some of the patents issued and then we have really

> not made the committees aware of this fact, except for once [referring to his disclosure of the '703 patent], when I did and later was castigated for doing so.

Crisp E-Mail (9/23/95) R233837 at 837-838 [CX0837].

Mr. Diepenbrock's advice to Rambus was clear, and it was consistent with the advice that Rambus received from Lester Vincent three and a half years earlier. As Mr. Crisp later testified, Mr. Diepenbrock "took the position that he thought [Rambus] shouldn't . . . continue going to any" standard-setting meetings, due to the "equitable estoppel . . . concern." Crisp, *Rambus v. Infineon* Dep. Tr. (4/13/01) at 804:7-9, 805:19-20 [CX2082]. Rambus initially chose to ignore this advice, just as it had ignored Lester Vincent's advice years earlier. As Mr. Crisp testified, "[W]e had to agree to disagree at that point in time." *Id.* at 805:15-16. Rambus's thinking began to change, however, when – in December 1995 – Mr. Vincent forwarded to Rambus a copy of the Federal Trade Commission's proposed consent order in *In the Matter of Dell Computer Corporation*. *See* Vincent Letter (12/19/95) R202778 [CX1990].

The *Dell* Consent Order not only provided tangible proof that conduct of the sort Rambus had been engaging in could be of significant interest to federal antitrust officials, but also demonstrated the breadth of potential antitrust-based remedies relating to such conduct – namely, orders rendering undisclosed patents unenforceable against <u>any</u> affected party. The possibility of such antitrust remedies being imposed against it was a serious concern to Rambus. Prior to the *Dell* decision, it appears that Rambus's management had justified ignoring Mr. Vincent's and Mr. Diepenbrock's advice to withdraw from JEDEC in part based on the perception that the legal remedies for equitable estoppel were considerably more narrow than this. As Richard Crisp reasoned,

> The only thing lost [due to the successful assertion of equitable

> estoppel] is the ability to enforce our rights against those that can prove estoppel applies . . . . We do not have our patent invalidated. It is still enforceable on other devices.

Crisp E-Mail (9/23/95) R233837 at 837 [CX0837] (emphasis added).

Although Mr. Vincent previously had advised Rambus to withdraw from JEDEC,[57] in the wake of *Dell* his calls for Rambus's withdrawal became far more emphatic. As recorded in Mr. Vincent's notes, his message to Rambus was unequivocal: "No further participation in any standards body . . . do not even get **close**!!" Vincent Notes (1/00/96) R203881 [CX1928] (triple underlining in original). This time, Rambus followed Mr. Vincent's advice. By late January 1996, the internal decision to withdraw from JEDEC had been made. As Richard Crisp reported, "in the future, the current plan is to go to no more JEDEC meetings due to fear that we have exposure in some possible future litigation." Crisp E-Mail (1/22/96) R234662 at 663 [CX0858] (emphasis added). Thus, it appears that, after learning of the Commission's *Dell* Consent Order, Rambus and its lawyers finally came to the mutual conclusion that the "downside risk" of continued participation in JEDEC was simply too great. *See* Vincent, *Rambus v. Infineon* Dep. Tr. (3/14/01) 191:20-23 ("given Dell's decision, my advice was . . . if you do a balancing of the upside potential versus the downside risk, it would be prudent to withdraw. . ."). As Mr. Crisp later wrote, "remain[ing] in an ownership position with our patent rights . . . was a show stopper for us in participating in JEDEC." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903].

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[57] *See* Diepenbrock, *Rambus v. Infineon* Dep. Tr. (4/11/01) 262:10-19 ("[H]e said that Dell had been estopped from enforcing [a] patent" and that this "supported his . . . previous statements to Rambus people that they should not participate" in standard-setting activities); *see also id.* at 263:7-12 ("He told me that he had advised – previously advised people, before I had arrived apparently, that they shouldn't attend those meetings" because "there's an equitable estoppel issue").

c. 200 Megahertz SDRAMs and Rambus's "IP Crush Plan."

On September 21, 1995, Allen Roberts sent an e-mail to other senior Rambus executives entitled, "Let the IP war begin." Roberts E-Mail (9/21/95) R233833 [CX0833] (emphasis added). The issue that prompted this was not SyncLink, but rather a new, potentially far more serious threat – 200 Mhz SDRAMs, which (by contrast to SyncLink) were not far off in terms of actual production. The text of Mr. Roberts's e-mail read as follows:

> During dinner last night Dr. Jun told me that LG is working of 200 Mhz SDRAM. I asked how he was going to solve the AC timing problem. He said they were going to use a DLL to compensate for output delay! . . . He said they are planning on having the parts next year (this probably means 1997). I did not ask, but I assume these parts have low swing signals as well.
>
> He said that "several" companies are doing similar parts. Dr. Jun is good buddies with Dr. Lim of Samsung (they went to school together) and also is very chummy with Hitachi (LG does lots of production for Hitachi); so I assume this means that Hitachi and Samsung at least are doing similar parts.
>
> I did not comment to Dr. Jun on his statements.
>
> I think we are going to need to generate a IP crush plan on this. Both the idea of clock compensation and low swing signals are claims which we have filed but have not been issued.

Id. (emphasis added).

As noted by Mr. Roberts, the 200 Mhz SDRAM threat was not limited to this one company – LG – but rather it was his understanding "that 'several' companies" were doing work on "similar parts." *Id.* In the months that followed, Rambus would receive confirmation of this. *See, e.g.*, Mooring E-Mail (12/18/95) R233845 [CX0847] ("ATI is using a DLL to run their SDRAMs fast."); Tate Notes (10/25/95) R33935 at 34053 [CX1729] (notes of meeting with NEC; refer to NEC developing "New SDRAM"). In the case of Samsung, Rambus came by this

information in an interesting manner. In January 1996, Allen Roberts sent an e-mail to other Rambus executives explaining as follows:

> This morning we met with Samsung. They also were meeting with Intel today. As it turned out, I met with CK Lee (Rambus project lead) for awhile in Mr. Choi's office (Lee's boss). On Choi's desk was a copy of a presentation being given to Intel on SDRAM enhancements. The list of enhancements included data transmitted on both edges (control and address on one edge), differential clocks and PLL's/DLL on die. The slide had pro had cons for the enhancements, so it was like Samsung explaining the ideas they are thinking about. I wasn't able to read everything, so I don't know what the conclusions were.

Roberts E-Mail (1/26/96) R234669 [CX0861].

Given that various DRAM manufacturers, who were also JEDEC members and RDRAM licensees, were working on 200Mhz SDRAMs in this time period[58] – devices that incorporated features, such as on-chip PLLs, over which Rambus had pending patent claims – Rambus was squarely faced with a decision as to what it would, and would not, say about the potential for such SDRAM devices to infringe its patents. In dealing with this issue, it appears that Rambus tried to balance two considerations. On the one hand, it was in Rambus's interest to discourage these firms from continuing to pursue these high-speed SDRAM devices, as opposed to dedicating more resources to RDRAM. On the other hand, it appears that Rambus – consistent with the policy it had followed to this point of not disclosing to JEDEC, or JEDEC members, the scope of its IP – did not want to disclose too much.

The first time this issue arose was in December 1995, when Geoffrey Tate and his Rambus colleague Subodh Toprani had a meeting with the Korean firm LG – the same firm that

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[58] *See* Mosys Competitive Summary (3/29/96) R43963 at 970 [CX1319] (stating that "SDRAMs" are "going quickly to 200 MHz").

Mr. Roberts had earlier reported was working on 200 Mhz SDRAM. In an e-mail reporting on that meeting, Mr. Tate noted that the subject of a "200Mhz" SDRAM device "with low swing/dll, etc." was again discussed. Tate E-Mail (12/10/95) R234618 at 618 [CX0844]. In addressing this issue with LG, Mr. Tate carefully chose his words: "We pointed out that by the time that could happen that a) rambus will be much improved and b) the sdrams would start looking a lot like rambus so why not go straight to rambus." *Id.* (emphasis added). That these words were carefully and strategically selected seems clear. In fact, commenting on this approach to addressing this issue with DRAM makers, Toprani stated,

> [I]mplying that sdrams with low voltage swings, terminated transmission lines and phase lock loops on both edges begin to look a lot like rambus may not be a bad ploy.

Toprani E-Mail (3/20/96) R234716 at 716 [CX0875] (emphasis added).[59]

There is some evidence in the record to suggest that Rambus may have believed that some of the companies developing 200 Mhz SDRAMs were knowingly using elements of Rambus intellectual property. *See id.* ("if they are out to screw us and use our IP for their sdram, there is nothing we can do now"). On the other hand, Complaint Counsel is aware of no evidence suggesting that any such concerns on Rambus's part were well justified. In fact, a Rambus document that addresses this subject seems to undercut the notion that the companies that were developing 200 Mhz SDRAMs in this time period were aware of any Rambus intellectual property issues pertaining to such devices. The document – entitled "200MHz

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[59] Mr. Tate took the same approach in a meeting later in 1996 with Samsung. *See* Tate E-Mail (11/3/96) R234880 at 881 [CX0912] ("he asked our perception on sdram-2. i said we think 200mhz will be very hard due to interconnect issues . . . and that the solutions are to put PLL's on board, change addressing solutions, etc. but then it starts looking a lot like rambus so why bother") (emphasis added).

SDRAM Myth?" – does suggest that the makers of such products might be seeking "to copy Rambus' implementation as much as possible hoping that Rambus ignores IP issues." (RF0485173 at 174 [CX1277].)[60] Yet immediately following this statement, the document reads:

- **Challenges (do not tell them :-)**

Id. (emphasis added).[61]

The presence of such a statement in a Rambus document, relating to this subject, in this time period, tends to suggest two things. First, it suggests that SDRAM makers at this time in fact did not know – or certainly were not told by Rambus, within or outside of JEDEC – that use of such things as DLLs and dual edge lock on an SDRAM would, or might in the future, infringe upon Rambus patents. Second, this statement suggests that Rambus, for strategic reasons, did not want DRAM makers to be aware that its intellectual property extended to use of such technologies in an SDRAM device.

d. Asynchronous Competition and "SDRAM Lite."

In the years immediately following publication of the initial SDRAM standard, SDRAMs were slow to be embraced by the marketplace. As noted in the minutes of the September 1995

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[60] Notably, two aspects of Rambus's intellectual property explicitly referenced in this document are "Dual Edge . . . Clock" and "DLL." *Id.* at RF0485177.

[61] As Your Honor may know, the symbol used here – **:-)** – is known as an "emoticon." As Random House's website explains, "Emoticons are a very clever use of standard punctuation marks to express human emotion." www.randomhouse.com/features/davebarry/emoticon.html. The specific type of emoticon used in this instance is typically used to express satisfaction, or a sarcastic joke. *See* www.muller-godschalk.com/emoticon.html ("A :-) emoticon is a standard smiley and means 'you are joking; satisfied.'"). It also happens to be the same symbol that Richard Crisp used when, in 1999, he joked about missing JEDEC-related documents having "fallen victim" to the company's document retention policy. *See* Crisp E-Mail (10/28/99) R221422 [CX1079] ("I'm looking for a copy (paper or electronic) of one of the original DDR datasheets from the 1996/1997 timeframe. Hopefully someone here has one that hasn't **fallen victim to the document retention policy :-)**") (emphasis added).

JC-42.3 meeting, "SDRAMs [we]re being made, but a clear market [wa]s not yet there." Minutes of JC-42.3 Meeting (9/11/95) R66450 at 455 [CX0091A]. The reasons for this are fairly clear. As Rambus co-founder Mark Horowitz has noted, in choosing between competing technologies or architectures, the DRAM industry seeks to end up with a solution that is "cheap enough to be competitive" but still "meets their needs." M. Horowitz, Merged DRAM/Logic (1996) MR0072786 at 800 [CX1323]. In the mid-1990s, it appears that many in the DRAM industry believed that they already had such a solution in the asynchronous DRAM architectures that predated SDRAM – namely, "EDO" and an enhanced version known as "Burst EDO."

Both inside and outside of JEDEC, there was a tremendous amount of discussion in this time period about the potential for these types of asynchronous DRAM designs to continue meeting the market's needs for years to come. *See, e.g.*, Crisp E-Mail (10/5/93) R69511 at 511 [CX0711] ("HP, Micron and Mitsubishi are now saying that EDO is the right thing to do that it offers better performance than DRAM at a much lower cost than SDRAM."); Tate Notes (1994) R34093 at 174 [CX1717] (notes from October 6, 1994: "Burst EDO => Nail if coffin for SDRAM").[62] In fact, there were elements of JEDEC's membership who preferred to focus their attention on improving such asynchronous designs rather than pursue the synchronous DRAM path. *See* Crisp E-Mail (12/7/94) R69511 at 558 [CX0711] ("There will be a special meeting in

[62] *See also, e.g.*, Crisp E-Mail (7/13/94) R69511 at 543 [CX0711] ("the EDO threat is real"); *id.* at R69545 (noting that, because of cost concerns, DRAM makers were "having a very hard time getting users to adopt . . . SDRAMs"); Crisp E-Mail (9/16/94) R69511 at 552 [CX0711] (noting that a "recent survey . . . of DRAM suppliers" showed that they had "favorable feelings to the EDO devices"); Crisp E-Mail (3/14/95) R69511 at 566 [CX0711] (noting that various JEDEC participants were "extolling the virtues of EDO"); Minutes of JC-42.3 Meeting (9/11/95) R66450 at 456 [CX0091A] (noting that "as compared to EDO, SDRAM is harder to make and the yields are lower," and that "[w]ith CAS latency of 3 SDRAM, is not faster than EDO").

San Jose during January to work on Burst DRAM issue. It appears that the Burst DRAM is beginning to build some momentum within JEDEC.") (emphasis added). By May 1995, Richard Crisp was predicting that "[t]he DRAM group will be split into two groups at JEDEC . . . . In the future they will have the Asynch DRAM group and the Synchronous DRAM group. The differentiation will be whether or not a clock is controlling the interface." Crisp E-Mail (5/24/95) R69511 at 579 [CX0711]. *See also id.* at R69580 (noting that some members "prefer" a "dual standard" – i.e., synchronous and asynchronous – and "feel the market will sort out what they want"). By July 1995, Mr. Crisp had become increasingly confident that Burst EDO would prevail over SDRAM. *See* Crisp E-Mail (7/18/95) R69511 at 660 [CX0711] ("What is Desi [Rhoden] going to do when the world rejects SDRAM in favor of Burst EDO?").[63]

Of course, the attractiveness of asynchronous DRAM designs, such as EDO and Burst EDO – as well as the slow acceptance of SDRAMs – related in large measure to cost. *See, e.g.,* Crisp E-Mail (12/7/94) R69511 at 555 [CX0711] ("Desi Rhoden lectured . . . that the real reason for the non-adoption of [SDRAMs] is the cost."). As noted above, the DRAM industry throughout the relevant time period had an almost singular preoccupation with controlling costs. Moreover, it was not just the DRAM vendors who were concerned about costs, but their customers as well. *See, e.g.,* Crisp E-Mail (7/13/94) R69511 at 544 [CX0711] ("The customers (Pentium type users) are saying . . . they want cheap cheap cheap. . . . Even 'Mr Synch DRAM,

[63] It is interesting to note that Rambus's experts have expressed doubts that EDO could have ever achieved the higher bandwidths that might have been necessary to make it, or similar asynchronous architectures, a more long-term alternative to synchronous DRAM. However, during the relevant time period, Rambus CEO Geoffrey Tate expressed confidence that EDO would be able to achieve higher bandwidths. *See* Tate E-Mail (11/2/94) R131933 at 934 [CX1246] ("What I expect directionally of competition is that EDO will have lower latencies . . . and that EDO will find ways to get higher bandwidth") (emphasis added).

Desi Rhoden', says they are going to have a helluva hard time getting synch parts introduced and used. His customers tell him they want the cheapest memory solution period.") (emphasis added).[64]

It was in this environment that JEDEC's JC-42.3 subcommittee commenced work on a new, scaled-down version of SDRAM – dubbed "SDRAM Lite" – in hopes that this might enable JEDEC to reduce the costs associated with SDRAM and hence motivate PC OEMs and others to begin to adopt SDRAM in lieu of competing technologies, such as EDO. As Richard Crisp observed, "the goal" of the SDRAM Lite initiative was "to develop a subset device for standardization which will be more acceptable to customers because it is cheaper." Crisp E-Mail (3/11/94) R69511 at 527 [CX0711].[65] As he also noted, in the market environment that prevailed at that time, "customers [we]re willing to leave performance on the table in exchange for having lower cost systems." Crisp E-Mail (7/13/94) R69511 at 544 [CX0711] (emphasis added).[66] And the record demonstrates that this was true inasmuch as, when confronted with such cost concerns, many JEDEC members showed a ready willingness to jettison features from the recently

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[64] *See also, e.g.*, Mitchell E-Mail (4/7/94) R69511 at 534 [CX0711] ("It is also clear to me that many of the user community are starting to get concerned about how much the modules are really going to cost."); *id.* at R69535 (reporting that Mike Pearson of Apple Computer stated "the committee has just priced the SDRAMs out of the market from his perspective"); Crisp E-Mail (6/15/95) R69511 at 623 [CX0711] ("Walther of Micron says the target market should be PC main memory (desktop), no bells and whistles etc. Cheap. (he is probably right).") (emphasis added).

[65] In the same e-mail, Mr. Crisp underscored again the fact that JEDEC was worried about the costs of SDRAM, and other JEDEC-specified devices, slowing their marketplace adoption: "They are leaning heavily toward a simplified design . . . that will be inexpensive. They have been burned by the SDRAM experience and do not want to suffer the same fate in the graphics area. . . . . Seems like the committee feels under pressure to deliver as they know there is much competition out there waiting (like us!)." *Id.* at R69529.

[66] In fact, recognizing this, Mr. Crisp suggested that Rambus itself "should be emphasizing low cost and good performance, not highest performance." *Id.* at R69545.

completed SDRAM specification. *See* Crisp E-Mail (5/27/94) R69511 at 537 [CX0711] (noting that HP proposed cutting "Precharge" and "Cas latency of 3"; Siemens proposed cutting "auoprecharge, self refresh and power down," "RAS latency 6," "CAS latency 3," and "burst length of 4").

Part of the problem with the SDRAM standard – as many JC-42.3 members observed at the time – was that it had been developed in an environment of conflicting agendas and comprise, leading to inclusion of various features that were not truly needed. *See, e.g.*, Minutes of JC-42.3 Meeting (9/11/95) R66450 at 456 [CX0091A] (noting that "SDRAM lite was pursued because . . . [t]here were too many conflicting agendas when the SDRAM spec was created so there were a lot of features added"). Removing these unneeded features was one of the central motivations for JEDEC's consideration of an "SDRAM Lite" standard. The whole idea was to strip away many of these unneeded features in order to pare the standard down to the most essential functions and thereby reduce the cost of SDRAMs. The minutes of the September 1995 JC-42.3 Meeting are very instructive on this point, in that they show how willing many members were to discard features of the SDRAM standard in order to reduce cost and speed market acceptance of SDRAM. For instance, several members expressed the view that they "[d]on't . . . care on CAS latency." *Id.* Others found no need for certain burst options. *See id.* ("Don't need burst of 1," "Don't need burst of 2," "Don't need burst of 4," "Don't need burst of 8," "Don't need autoprecharge").

By late 1995 or very early 1996, it was clear that the SDRAM Lite initiative would not result in the development of an alternative standard – partly, it appears, because JC-42.3's members had not yet reached consensus on which features should be withdrawn for the SDRAM

standard,[67] and partly because (as discussed below) momentum was building at this time to complete JEDEC's work on the "next-generation" SDRAM standard, which work culminated in the development of DDR SDRAM.

e. SDRAM-II and Rambus's "Patent Minefield."

During the first half of 1996 – that is, the last six months during which Rambus was a member of JEDEC – both JEDEC and the DRAM industry more generally were heavily concentrating their efforts on developing new, high-speed SDRAM devices. Rambus was well aware of what was occurring on both fronts. Among other things, Rambus was aware that various proposals for high-speed SDRAMs discussed within JEDEC in this time period, and the work being done on such devices outside JEDEC, tended to share certain common features – and that many of these features were ones over which Rambus had patents pending. In a March 1996 Rambus document summarizing the features of the "SDRAM-II" proposals, Rambus identified four key features:

> Proposals to Achieve 200 MHz . . .
>
> - Dual Edge data Transfer – 100MHz Clock
> - Change driver type from LVTTL to SSTL_3
> - Data Strobe
> - DLL for Data Out (no input DLL)

[67] At an "interim" JC-24.3 meeting at the end of January 1996, there was a discussion of the results of the SDRAM "Lite" survey ballot. Minutes of JC-42.3 Interim Meeting, Attachment E (1/31/96) R66308 at 314-315 [CX0100A]. As that those results show, the members who participated in the survey – including 11 DRAM users and 13 DRAM suppliers – remained divided on whether various technical features were in fact necessary. For instance, some members commented that "[a] single fixed CAS latency is preferred," whereas others seemed to favor multiple CAS latencies. *Id.* (emphasis added).

Document Entitled "200MHz SDRAM Myth?"(RF0485173 at 177 [CX1277]) (emphasis added). Numerous other documents show that Rambus was well aware of the fact that the work being done on high-speed SDRAMs in this time period involved use of such features. *See, e.g.*, Roberts E-Mail (9/21/95) R233833 [CX0833] ("During dinner last night Dr. Jun told me that LG is working of 200 Mhz SDRAM. I asked how he was going to solve the AC timing problem. He said they were going to use a DLL to compensate for output delay!") (emphasis added); Roberts E-Mail (1/26/96) R234669 [CX0861] (noting that Samsung's "list of enhancements" to SDRAM "included data transmitted on both edges (control and address on one edge), differential clocks and PLL's/DLL on die") (emphasis added); Barth E-Mail (8/15/96) 930DOC00533 at 533 [CX0898] ("When LG was here in April they said they are working on 200MHz SDRAM with DLL") (emphasis added).

As explained above, insofar as JEDEC was concerned, initial work on "future SDRAMs" began in the spring of 1993, right as the JC-42.3 Subcommittee was finalizing the initial SDRAM specification. Yet for the first couple of years, that worked progressed slowly, without developing a next-generation standard. By the early part of 1995, JEDEC's slow progress on Future SDRAMs had become a cause for complaints. *See* Crisp E-Mail (3/14/95) R69511 at 564 [CX0711] (noting that Hans Wiggers of Hewlett-Packard "bluntly" complained that "JEDEC has been working for over two years to standardize a high speed interface and has not yet reached consensus") (emphasis added). By the end of 1995, however, it appears that a growing consensus had developed within JC-42.3 that the committee should buckle down and complete a new, high-speed SDRAM standard. As Richard Crisp reported, based on attending an early December 1995 JC-42.3 meeting,"The momentum is building for getting a new SDRAM standard . . . . They all say it must change." Crisp E-Mail (12/5/95) R69511 at 702 [CX0711].

Mr. Crisp's notes from this same December 1995 meeting also mention that a "special meeting" had been scheduled for "the end of January" to address "advanced SDRAM (next generation)." *Id.* (emphasis added).

Mr. Crisp did not attend that January 1996 meeting, although as explained below, he did receive and focus great attention on the minutes. Among other things, those minutes record that Micron made a "first presentation" on "Future SDRAM Clock Issues." Minutes of JC-42.3 Interim Meeting (1/31/96) R66308 at 309 [CX0100A]. The slides used with that presentation, which are attached to the minutes, discuss in some detail the use of "PLL/DLL Circuits and/or Echo Clocks" in "Future SDRAM" devices, and other "FUTURE SDRAM – CLOCK ISSUES." *Id.* at R66316-318.[68]

While Rambus did not attend this January 1996 meeting, it was still a member of JEDEC and thus continued to receive minutes. Moreover, during this time period, the company – through Richard Crisp – was continuing to closely monitor JEDEC activities, as it would for many years even after formally withdrawing from JEDEC in June 1996.[69] Given the high degree

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[68] The minutes from this January 1996 meeting also contain the following interesting statement: "A suggestion was made to call different versions of SDRAM specs with different names. The present spec was considered to be good up to 100 Mhz and the next generation would be good up to 200 Mhz." *Id.* at R66309 (emphasis added). As already noted, the term "DDR SDRAM," when it first emerged within JEDEC later in 1996, was simply a "name" invented to label the higher-speed SDRAM specification that JEDEC had been working on for years by that point. *See* JC-42.3 Committee Letter Ballot (4/23/97) HR905_047484 at 91 and 95 [CX2256] (noting that "DDR SDRAM has been under discussion within JEDEC since the September 1996 meeting" but that "the concept of doubling the data rate by using both edges of the clock has been discussed in JEDEC for several years.") (emphasis added).

[69] *See, e.g.*, Crisp E-Mail (6/13/97) R210489 [CX0932] ("My 'deep throat' (DT) source told me that the DDR bandwagon is moving fast within JEDEC with all companies participating. the consensus seems to be forming around a data strobe rather than two clocks or no functionality change."); Crisp E-Mail (9/11/97) R213689 [CX0953] (reporting, based on information from "the Carroll contact," on JEDEC meeting in Taipei involving various "DDR discussions"); Crisp

of interest that Rambus had in the substance of what was discussed at the January 1996 JC-42.3 meeting – i.e., "Future SDRAMs" – it is not surprising that Richard Crisp distributed the meeting minutes to various others with Rambus as soon as he received them. In so doing, he was careful to draw his colleagues' attention to the Micron presentation on "FUTURE SDRAM – CLOCK ISSUES" discussed above. *See* Crisp E-Mail (2/20/96) R233849 [CX0868] (subject line reads, "JEDEC minutes from January interim meeting"; text reads, in part, "I have put copies of the JC42.3 meeting minutes in each of you mail slots. Notice the Micron presentation especially the part about transmit and receive clocks.") (emphasis added).

In the same e-mail in which he advised his Rambus colleagues of these JEDEC minutes, Mr. Crisp returned to a thought he had expressed, by this point, on several prior occasions:

> I think we should have a long hard look at our IP and if there is a problem, I believe we should tell JEDEC there is a problem. Other opinions?

Id. We know, of course, that Rambus did not "tell JEDEC there [wa]s a problem." *Id.* However, the evidence from this same time period suggests that – in terms of conflicts between JEDEC's work and Rambus's IP – there was not just a problem, but a major problem.

The record plainly shows that during this same time period Rambus was gearing up its "crush plan" for an upcoming ""IP war" against high-speed SDRAMs. Roberts E-Mail (9/21/95) R233833 [CX0833] (emphasis added). In late January 1996, Mr. Vincent's notes from a meeting with Anthony Diepenbrock record that they discussed ways to expand Rambus's claims over

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E-Mail (12/12/97) R211797 [CX0979] ("I talked to a guy that attended the Tempe JEDEC meeting this week. HE said that JEDEC indeed has flip flopped and eliminated the unidirectional data strobe option . . . No discussion of any rambus patents that my source heard either officially or unofficially"); Crisp E-Mail (12/1/97) R211638 [CX0973] ("DDR is going down the bidirectional strobe path now, a complete reversal of what was done in the September meeting").

DLL circuitry. *See* Vincent Notes (1/14/96) R204205 [CX1999] ("Get variety of claims => Try to get broad & narrow claims Say 'DLL' w clock recovery circuit"). In early February 1996, Mr. Diepenbrock and Mr. Vincent met again, and once more discussed adding claims directed at use of DLLs in connection "with synchronous DRAMs." Vincent Notes (2/5/96) R204207 at 210 [CX2001] ("Add Back up narrow claims" on "DLL"; "Add claims saying delay-lock loop"); *see also id.* at R204210 ("HP – putting PLLs on boards with synchronous DRAMs => next step is putting on chip!").

In mid-February, Rambus CEO Geoffrey Tate sent an e-mail to Anthony Diepenbrock referencing "rambus-like" SDRAMs and directing Mr. Diepenbrock to "prepare the minefield." Tate E-Mail (2/15/96) R233848 [CX0867] (emphasis added). This only five days before Mr. Crisp posed, to Mr. Tate and others, the question of whether "there [wa]s a problem" with the overlap between JEDEC's work on Future SDRAMs and "our IP." Crisp E-Mail (2/20/96) R233849 [CX0868].

In March 1996, Anthony Diepenbrock sent an e-mail to Allen Roberts, the subject line of which read, "Thoughts on clocks and DLL." Diepenbrock E-Mail (3/13/96) R233850 [CX0871]. In addition to reporting on his review of Rambus patent applications concerning use of a dual edge clock, Mr. Diepenbrock described his thoughts regarding desirable amendments to Rambus's pending patent claims "On the PLL/DLL on DRAMs" and gave instructions to Lester Vincent in this regard. *Id.* at R233851 ("I have instructed outside counsel to redraft the broad claimso that the functionality is claimed without the use of the words DLL or PLL.").

One day later, these issues were addressed in a Rambus Board meeting, as the reflected in the minutes of that March 1996 meeting:

> IP Strategy
>
> Mr. Tate discussed strategy for the Company's intellectual property, including a review and broadening of key patent claims in current applications and analysis of potential infringement of the Company's issue patents.

Minutes of Rambus Board Meeting (3/14/96) RF0165475 at 476-477 [CX0607].[70] **********

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******** Meanwhile, on March 20, 1996, the JC-42.3 Subcommittee met again to discuss its continuing work on Future SDRAMs. *See* Minutes of JC-42.3 Meeting (3/20/96) JEDEC0016776 at 784 [JX0031] (noting presentations by Samsung, NEC, and others on "Future SDRAM Concepts").

(3) Rambus's JEDEC Withdrawal Letter.

In March 1996, Rambus also commenced the process of drafting an official letter to JEDEC notifying the organization of its decision to withdraw – a process that would take roughly three months to complete. The letter went through numerous (at least five) drafts before being finalized and sent in mid-June 1996. A March 20 draft (apparently the earliest existing draft) contained the following language:

> We feel that our interests are not being served by continuing our involvement with JEDEC. In particular the patent policy of JEDEC is something that we find inconsistently applied and at

[70] It was within days of this Rambus Board meeting that Subodh Toprani, as noted above, commented that "it was not a bad ploy" for Mr. Tate – as he had been doing, in RDRAM-related negotiations with memory vendors – to imply "that sdrams with low voltage swings, terminated transmission lines and phase lock loops on both ends begin to look a lot like rambus." Toprani E-Mail (3/20/96) R234716 at 716 [CX0875] (emphasis added).

> odds with our business model. . . . It is our feeling that the JEDEC patent policy is inconsistently applied to material subject to standardization and is therefore arbitrary and unworkable.

Crisp Letter (3/20/96) R156926 [CX0873]. Much of this language was edited out of the next iteration, drafted later the same day, which in this regard stated only as follows: "We feel that our interests are not being served by continuing our involvement with JEDEC. In particular the patent policy of JEDEC does not comport with our business model." Crisp Letter (3/20/96) R156928 [CX0874]. In subsequent drafts, however, nothing at all was said about Rambus's views concerning the JEDEC patent policy, the manner in which it had been applied, or the extent to which it "comported" or was "at odds" with Rambus's business model.

On the other hand, the following language from the first March 20 draft was retained in several subsequent drafts:

> In the spirit of full disclosure, Rambus Inc. would like to bring to the attention of JEDEC all issued US patents held by Rambus Inc. This list is complete as of this writing and follows below.

Crisp Letter (3/20/96) R156926 [CX0873]. Immediately following this language, both March 20 drafts – as well as March 22 and March 27 drafts containing the same language – then listed a total of 19 issued U.S. patent. *See* Crisp Letter (3/20/96) R156928 [CX0874]; Crisp Letter (3/22/96) R156929 [CX0876]; Crisp Letter (3/27/96) R156933 [CX0880]. However, the second March 27 draft said nothing about a "spirit of full disclosure," nor did it represent that the list of issued patents it attached (at this point, 21 U.S. patents and two foreign patents) was "complete." Crisp Letter (3/27/96) R156930-932 [CX0879].[71]

[71] This draft of Rambus's JEDEC withdrawal letter was sent to Lester Vincent for his comments. Crisp Facsimile (3/27/96) R203864 [CX0882] (attaching draft JEDEC withdrawal letter and asking for input on "the wording").

The final withdrawal letter – sent from Mr. Crisp to JEDEC Secretary Ken McGhee on June 17, 1996 – was virtually identical to the second March 27 draft, and read in substantial part as follows:

> I am writing to inform you that Rambus Inc. is not renewing its membership in JEDEC.
>
> Recently at JEDEC meetings the subject of Rambus patents has been raised. Rambus plans to continue to license its proprietary technology on terms that are consistent with the business plan of Rambus, and those terms may not be consistent with the terms set by standards bodies, including JEDEC. A number of major companies are already licensees of Rambus technology. We trust that you will understand that Rambus reserves all rights regarding its intellectual property. rambus does, howeer, encourage companies to contact Dave Mooring of Rambus to discuss licensing terms and to sign up as licensees.
>
> To the extent that anyone is interested in the patents of Rambus, I have enclosed a list of Rambus U.S. and foreign patents. Rambus has also applied for a number of additional patents in order to protect Rambus technology.

Crisp Letter (6/17/96) R157080 at 080 [CX0888].

The letter then attached the same list of 21 issued U.S. patents and two foreign patents that was attached to the second March 27 draft. Yet the letter said nothing to explain how, if at all, any of these Rambus patents related to JEDEC's work, nor does it appear that any of these patents (including the '703 patent, which Richard Crisp had previously disclosed) did relate in any way to JEDEC's work. Though the last sentence of Rambus's JEDEC withdrawal letter does refer to the fact that Rambus "had also applied for a number of additional patents," beyond this Rambus's JEDEC withdrawal letter said nothing with respect to Rambus's pending patent applications.

In addition, the list of issued patents attached to Rambus's withdrawal letter was not

complete. It omitted only one patent that had issued to Rambus by this point in time – U.S. Patent No. 5,513,327 (hereinafter, "the '327 patent"), which issued in April 1996 and related to use of a dual-edge clocking scheme on a DRAM. Notably, this was the only issued Rambus patent that did relate to JEDEC's work – that is, to the work on Future SDRAMs that was the principal focus of the JC-42.3 Subcommittee in this time period.

Clearly, Rambus was aware of the '327 patent when it sent its June 17, 1996 JEDEC withdrawal letter. In fact, by this time Rambus had already commenced working on efforts to enforce the '327 patent – not against SDRAMs (as SDRAMs with dual edge clocks were still a ways off[72]), but against the Mosys "Multi-Bank DRAM" – a product that, like Future SDRAMs, used PLL/DLL circuitry and a dual edge clock.[73] *See* Vincent Letter (6/12/96) R302517 [CX2013] ("In response to your request, I have enclosed a copy of the prosecution history for . . . Rambus U.S. Patent No. 5,513,327").

In fact, on the very same day that Rambus's withdrawal letter was sent out – June 17, 1996 – another letter was sent, which did reference the '327 patent. It was a letter from Anthony Diepenbrock to Lester Vincent, relating to Rambus's consideration of enforcing the '327 patent against the Mosys product. The letter read in part as follows:

> Pursuant to our discussion of June 13, 1996, regarding our issued patent, U.S. 5,513,327 (P001C2) INTEGRATED CIRCUIT I/O USING HIGH PERFORMANCE BUS INTERFACE, we would like your firm to give a legal opinion on the enforcement readiness

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[72] That said, Rambus fully expected that SDRAMs with dual-edge clocks would infringe the '327 patent as well. *See* Tate E-Mail (8/15/96) 930DOC00531 at 531 [CX0897] ("wouldn't a double-edge-clocked sdram violate our issued patent claim," referring to '327 patent).

[73] *See* Mosys Competitive Summary (1/19/96) R43942 at 947 [CX1316] (referring to Mosys's use of "Dual edge transport" and "DLL/PLL timed Data transport"); Mosys Competitive Summary (3/29/96) R43963 at 968 [CX1319] (same).

> of this patent. We would also like your firm's opinion regarding whether this patent would be infringed, literaly or otherwise, if a device were constructed according to information sent to you on June 14th. Management at Rambus would like to have this opinion by June 24th . . . .

Diepenbrock Letter (6/17/96) R204363 at 364 [CX0889]. A facsimile sent the next day by Mr. Diepenbrock to Mr. Vincent's law firm makes clear that Rambus's intention was to assert that the '327 patent was infringed by the Mosys device's use "both edges of the clock." Diepenbrock Facsimile (6/18/96) R204359 at 359 [CX0891]. By mid-August 1996, Rambus had informed Mosys about its infringement concerns with respect to the '327 patent. *See* Hsu Letter (8/23/96) R128267 [CX0901] (responding to Mr. Tate's August 16 letter).

(4) Intel's Endorsement Breaths New Life Into RDRAM.

Throughout the time that Rambus was a JEDEC member, it was far from certain that Rambus would succeed with its primary objective of making the proprietary RDRAM architecture an industry standard. Many of the customers that Rambus sought to interest in its RDRAM design voiced a preference for using JEDEC's standards. As Rambus CEO Geoffrey Tate put it, "JEDEC is a big deal" to DRAM vendors "because it represents the big users." Tate E-Mail (7/22/93) R233981 at 981 [CX0707].[74] Moreover, there were a number of companies that found RDRAM's performance claims intriguing, but at the same time were turned of by what Richard Crisp himself described as "extremely high license/royalty terms," which he feared could "scare" customers "away." Crisp E-Mail (7/13/94) R69511 at 545 [CX0711] (emphasis

[74] *See also, e.g.*, Tate E-Mail (4/28/92) R233949 [CX1227] (reporting that Samsung representatives, despite believing that RDRAM was "a very good technology," were "waiting on JEDEC to see what standard evolves and then support it").

added).[75]

Rambus's fortunes began to change, however, when at some point in 1996 Intel decided that it would support RDRAM with the next generation of Intel microprocessors. *See* Tate E-Mail (8/15/96) 930DOC00531 at 531 [CX0897] (referring to "intel's . . . initial let's-go-rambus decision"). By early 1997, Intel's support for RDRAM was a matter of public record. *See, e.g.*, S. Przybylski, *Intel's RDRAM Strategy a Sure Winner*, MICROPROCESSOR REPORT (4/21/97) MR0057650 at 650 [CX2634] (noting "Intel's adoption of Rambus's Direct RDRAM as its next-generation main-memory technology for PCs"). Intel's support for RDRAM came with some conditions, however. One of those conditions was that Rambus not seek to charge royalties for RDRAM exceed a level of two percent. *See* Tate E-Mail (11/3/96) R234880 at 881 [CX0912] ("intel's goal here is to keep rambus from driving up royalties"); Davidow E-Mail (7/11/97) R233898 at 898 [CX0936] (noting that Intel "limited the royalties" DRAM makers "have to pay" to Rambus).

Even with Intel's support, Rambus was not assured of success in making RDRAM an industry standard. Indeed, during the mid-to-late 1990s the competition between DDR and RDRAM – that is, competition to see which architecture would capture broad support as a standard for next-generation memory design – was extremely intense. With DRAM makers and others strongly backing DDR, Rambus feared that Intel would be forced to back DDR as well. Rambus appears to have done everything within its power to encourage Intel and the DRAM makers to "drop DDR" in favor of RDRAM. During this time period, however, Rambus stopped

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[75] *See also, e.g.*, Crisp E-Mail (3/8/94) R69511 at 523 [CX0711] (noting that Terry Walther's statement that Micron did not "like license type business"); Crisp E-Mail (3/23/95) R69511 at 571 [CX0711] ("Farhad [Tabrizi of Hyundai] says their #1 issue with the Rambus business proposal is the royalty rate.") (emphasis added).

short of actually disclosing to the DRAM industry the fact that it possessed patent rights covering aspects of JEDEC's SDRAM and DDR SDRAM standards.

(5) Rambus Continues to Conceal Its JEDEC-Related Intellectual Property.

As discussed above, throughout the time that it participated as a member of JEDEC, Rambus concealed from the organization and its members the fact that it possessed various patent applications and at least one issued patent – the '327 patent – that closely related to specific aspects of JEDEC's standardization work on both SDRAMs and "Future SDRAMs," which later became known as "DDR SDRAMs." And Rambus did so despite the fact that, during this same time period, it was actively working to develop broader and broader patent rights to assert against SDRAMs in the future.

After leaving JEDEC, Rambus continued to conceal its JEDEC-related intellectual property from DRAM manufacturers. In fact, in early 1997 Rambus CEO Geoffrey Tate gave specific instructions to his team, "[D]o 'NOT' tell customers/partners that we feel DDR may infringe – our leverage is better to wait." Tate E-Mail (2/10/97) R200497 [CX0919] (emphasis added). On the other hand, it does appear that Rambus, for strategic reasons, was somewhat more forthcoming with Intel. In August of 1996, for instance, Rambus was concerned that Intel might throw its weight behind 200 Mhz SDRAMs. *See, e.g.*, Barth E-Mail (8/15/96) 930DOC00533 at 533 [CX0898] (discussing concern with Intel supporting 200MHz SDRAMs). At the time, Geoffrey Tate suggested that one way to deal with this threat might be to alert Intel that, among other "potential problems," these devices might infringe upon Rambus patents. *See, e.g.*, Tate E-Mail (8/15/96) 930DOC00531 at 531 [CX0897] ("my gut-level inclinations on an action plan . . . send intel a rambus assessment on 200mhz sdram raising the potential problems

we see with feasibility, risk and compatibility; 'AND' point out that we have issued patents that this proposal could very well infringe") (emphasis added). Whether Rambus did in fact inform Intel of this in August 1996 is unclear.[76]

On the other hand, there is evidence showing that roughly a year later, in July 1997, Rambus privately disclosed to Intel representatives – in the context of confidential discussions covered by non-disclosure agreements ("NDAs") – that it believed certain competitive DRAM designs, including DDR SDRAM, would infringe Rambus intellectual property. It appears that the first such disclosure was made via an e-mail sent by Rambus's Chairman, William Davidow, to a senior counterpart at Intel, Gerry Parker. That e-mail read in part as follows:

> Gerry, I have been discussing the DRAM Company problem with rambus. Below is one of my updates. One of the things we have avoided discussing with our partners is intellectual property problem . . . . We feel that it would drive a deeper wedge between us some of them and that maybe the problem will solve itself with time. We are hoping that they will either drop their competitive efforts or discover for themselves that they have violated Rambus patents an will conclude that getting around them will be either extremely difficult or impossible and will take a lot of time
>
> BELOW IS THE RAMBUS UPDATE . . .

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[76] As discussed above, Rambus was similarly strategic in what it told DRAM makers about 200 Mhz DRAMs, although in the case of DRAM makers Rambus's statements were, intentionally it would appear, far more vague. *See* Tate E-Mail (12/10/95) R234618 at 618 [CX0844] (upon hearing LG was developing a "200Mhz" SDRAM device "with low swing/dll, etc." Mr. Tate "pointed out that by the time that could happen that a) rambus will be much improved and b) the sdrams would start looking a lot like rambus so why not go straight to rambus") (emphasis added); Tate E-Mail (11/3/96) R234880 at 881 [CX0912] ("he asked our perception on sdram-2. i said we think 200mhz will be very hard due to interconnect issues . . . and that the solutions are to put PLL's on board, change addressing solutions, etc. but then it starts looking a lot like rambus so why bother") (emphasis added). *See also* Toprani E-Mail (3/20/96) R234716 at 716 [CX0875] ("[I]mplying that sdrams with low voltage swings, terminated transmission lines and phase lock loops on both edges begin to look a lot like rambus may not be a bad ploy.") (emphasis added).

> We have not yet told Siemens that we think SLDRAM and SDRAM-DDR infringe our patents. We think that will just irritate them. Hopefully, SLDRAM and DDR will die due to their technical/infrastructure faults so we don't have to play that card.

Davidow E-Mail (7/11/97) R233902-903 [CX0938] (emphasis added).

Precisely what Mr. Parker of Intel said in response to this e-mail is unclear – Complaint Counsel has been unable to locate any response in the record. However, later the same day, Mr. Davidow sent the following "PROPOSED REPLY TO GERRY" to Geoffrey Tate, stating , "I would like to send this to Gerry Parker. Is that OK?":

> Gerry, we really need to talk about these issues. I agree that it accomplishes very little to get everyone angry with Intel and Rambus.
>
> From Rambus's point of view, we have not tried to swing a big club even though memory manufacturers feel beaten up. Actually, Intel is their best friend in this deal. You limited the royalties they will have to pay.
>
> Both Dennis and Gelsinger understand our patent portfolio. It is highly likely that anything the DRAM guys will do to produce high performance parts will violate it. If we knew a way to get around it, we would have already filed a patent for it.
>
> At any rate, we are fairly confident that if Synclinc goes forward, they will have to do a lot of re-engineering to get around issued and soon to be issued patents. My guess is that this will delay their efforts from two to five years.
>
> We have not discussed this with the DRAM manufacturers. We hope we never have to. We would rather have Synclinc just die of its own accord. We feel that threatening the DRAM guys will really piss them of.
>
> Your pushing for a non-Rambus chip set will help to keep Synclinc alive and probably force Rambus to play the Synclinc infringement chip. I don't think this will be good for either of us.
>
> At any rate, we would like to work with Intel to solve the problem and would like to have a chance to talk before you act so that we

> can come up with the most effective solution from both of our points of view.
>
> Incidentally, the royalties on Rambus patents as they apply to Synclinc are unlimited. Now that would really be a way to Helmut and Y W really pissed.

Davidow E-Mail (7/11/97) R233898-899 [CX0936] (emphasis added).

It is unclear to Complaint Counsel whether this e-mail was ever sent. The prior e-mail, however, does appear to have been sent to Intel. Therefore, Rambus – by this point in 1997 – had shared with Intel, in the context of confidential NDA discussions, that it thought "SLDRAM and SDRAM-DDR infringe [Rambus] patents," but that it also was hoping that it did not "have to play that card." Davidow E-Mail (7/11/97) R233902-903 [CX0938]. On the other hand, as both of these e-mails show, Rambus had not communicated this information to DRAM makers. *See id.* ("One of the things we have avoided discussing with our partners is intellectual property problem. . . . We have not yet told Siemens that we think SLDRAM and SDRAM-DDR infringe our patents.") (emphasis added). *See also* Davidow E-Mail (7/11/97) R233898 at 898 [CX0936] ("We have not discussed this with the DRAM manufacturers. We hope we never have to.") (emphasis added).

The fact that Rambus had not made such disclosures to DRAM manufacturers is further confirmed by an e-mail sent by Geoffrey Tate to his colleagues in early August 1997, after learning that Rambus had obtained another issued patent likely to be infringed by DDR SDRAMs – that is, in addition to the '327 patent, which issued in April 1996, two months before Rambus withdrew from JEDEC. That e-mail (portions of which Rambus has redacted) reads as follows:

> we already have the 327 patent but few people are aware of what it means. we are to officially get public allowance of our new patent with a much more descriptive title on 8/12.

> our policy so far has been NOT to publicize our patents and i think we should continue with this.
>
> . . . BUT i think this new patent MIGHT get public attention because the title is so obviously provocative (i forget the exact title but it's something like pll on a memory chip, or some such very fundamental sounding thing).
>
> i think we should PREPARE our position IF we get calls from microprocessor report/etc asking us about this new patent when it issues . . . .
>
> . . . [A]fter the new patent on pll/memory i public i think dave believes we should meet with intel pete macwilliams/dennis lenehan and educate them for 15-45 minutes on these two patents: what are the key claims, whay are they important, why competitive solutions like ddr/sldram are likely to infringe. reason is to back up our verbal claims that we have IP and to get them aware IF they were to consider a DDR chipset there is a minefield of 60+ rambus patents that would have to be avoided – we convince them 2 of the mines are real but not give them a map to the whole minefield. this should be done probbly mid-August.

Tate E-Mail (8/4/97) R233868 [CX0942] (emphasis added).

It is quite interesting to note Mr. Tate's comment that "few people are aware" of what "the 327 patent . . . means." *Id.* This, of course, is the same patent that Rambus omitted from its JEDEC withdrawal letter. Furthermore, it is interesting to note Mr. Tate's acknowledgment that Rambus, to this point, had a "policy . . . NOT to publicize . . . patents," a policy that Mr. Tate desired to "continue." *Id.* In terms of Mr. Tate's request that Rambus develop a "position" statement on this new patent, in the event of press calls inquiring about after issuance, other documents show that Rambus employees "created a 'party line' to help address any inquiries," the central thrust of which was to avoid comment directly on whether SDRAMs or DDR SDRAMs would be infringed:

> Q2: Do synchronous DRAMs (SDRAMs) use this patent?

A: If a memory device does not incorporate phase-locked loop circuitry, it doesn't come under the scope of this patent.

Q3: Do Double Data Rate (DDR) SDRAMs use this patent?

A: We don't know yet. No DDR products exist for us to evaluate.

Clarke E-Mail (8/15/97) R213296 at 296 [CX0947] (emphasis added).[77]

Turning to Mr. Tate's suggestion that Rambus "meet with intel . . . to get them aware IF they were to consider a DDR chipset there is a minefield of 60+ rambus patents that would have to be avoided," Tate E-Mail (8/4/97) R233868 [CX0942], other evidence shows that Rambus and Intel representatives did have such discussions. On August 14, 1997, Mr. Tate wrote to his colleague Dave Mooring laying out further strategies for convincing Intel not to develop a chipset that would support DDR SDRAM memory. *See* Tate E-Mail (8/14/97) 930DOC00535 at 535 [CX1244] ("i think we need to make it clear to them that we aren't going to make any significant further changes in our business deal with them without their decision they are not doing a ddr backup chipset period.") (emphasis added). As Mr. Tate stated, "they need to know that a ddr backup chipset is . . . real bad for their objectives," and in this regard Mr. Tate suggested that Mooring should "educate" himself on Rambus's "double-data-rate/327 and pll-on-a-memory-device . . . /418 " patents. *Id.*[78] Mr. Tate and Mr. Mooring then met with Intel executives Gerry Parker and Pat Gelsinger on September 9, 1997.

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[77] Apparently, it was not until early 1998 that Rambus even began to consider making public statements about DDR infringing Rambus patents. *See* Tate E-Mail (1/10/98) R233877 at 880 [CX0987] ("ddr infringes our patents (question: do we start saying this publicly?).").

[78] Note that one of the factors influencing Intel's consideration of supporting DDR through a DDR-compatible chipset was the fact that Intel's principal chipset rival – VIA – was itself "aggressively promoting DDR." Crisp E-Mail (11/11/97) R235277 [CX0968] (suggesting that VIA's support for DDR, along with the support of other companies, had "Intel worried" and could cause Intel to "be scared into doing a DDR program").

Mr. Tate's summary of the meeting reveals that it was a contentious one. Intel was demanding that Rambus, among other things, lower its RDRAM royalties even further to help overcome DRAM maker resistance to producing RDRAM devices:

> NEW REQUEST: they want us to have license deals that reward time to market, etc (old request) AND have long term reduction of royalty based on volume going to less than 1/2% for rdrams (at this point i choked/gasped).

Tate E-Mail (9/9/97) R233895 at 896 [CX0952]. Intel went on to explain that if Rambus did not lower its RDRAM royalties, this could cause DRAM makers "to find alternative solutions to avoid paying rambus a royalty" and could cause Intel "to rearchitect things to be completely different if necessary." *Id.* Mr. Tate's summary of the meeting indicates that he and Mooring made the following points in response:

> our response . . .
>
> – for a dram company to pursue an alternative and be successful they have to
>
> a) actually have a superior solution – so far the dram companies have proven themselves incapable of doing this
>
> b) set an industry standard with multiple sources all 100% compatible – again, poor track record
>
> c) avoid EVERY rambus patent or prove it invalid in court – we said this would be extremely hard to do, that all proposals we've seen violate several fundamental patents we have or that are in process
>
> then we shut up . . . .

Id. R233896-897.[79]

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[79] These notes provide Mr. Tate's contemporaneous account of what was said at this 1997 meeting with Intel. Precisely how clearly Rambus explained the scope of its intellectual property to Intel is not apparent, however. For instance, in 1998 Mr. Tate posed, for his

In this same time period, Rambus was also seeking to persuade DRAM makers not to produce DDR. However, its strategy with DRAM makers was very different, consistent with Mr. Davidow's statement that Rambus was still hoping that it did not "have to play that card" against DRAM makers. Davidow E-Mail (7/11/97) R233902-903 [CX0938]. Thus, rather than directly threatening them with its "patent minefield," Rambus sought to persuade the DRAM makers to "drop" DDR by offering them preferential RDRAM license terms in exchange. For instance, in a meeting with Samsung Geoffrey Tate "said if samsung is willing to consider dropping ddr, synclink and announcing that after sdram-100 that rambus is their only dram strategy then we could talk about . . . rewards to samsung." Tate E-Mail (9/23/97) R235252 at 253-254 [CX0956] (emphasis added). Mr. Tate's e-mail account of that meeting makes no mention of any discussion of Rambus patents covering DDR or SyncLink.[80]

Mr. Tate's meeting with Korean DRAM maker LG, two days later, seems to have followed the same track. Again, Mr. Tate's proposal to LG was that if it were to "cancel ddr" and commit to fully support RDRAM, Rambus "could consider some [RDRAM] royalty breaks .

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colleagues, the question, "should we tell Intel" that "we believe ddr/sldram/etc will likely infringe our patents?" Tate E-Mail (1/5/98) R233884 at 886 [CX0984]. Presumably, Mr. Tate would not have posed such a question if it had already been made clear to Intel that such devices would infringe Rambus patents.

[80] A few months later, Mr. Tate again met with Samsung and again tried to convince Samsung to "drop DDR" – yet still without playing "the IP card." Tate E-Mail (12/15/97) R235314 at 316 [CX0981] ("i asked him if they would consider making a commitment to drop dDR and announced it and stop promoting it; and drop plans/activities for any competitive dram like sldram; and switch their customers from sdram ro rambus period"); *id.* at R235317 ("i think we should offer them 250K warrants in return for their commitment NOW to drop ddr"). *See also* Tate E-Mail (12/16/97) R235324-325 [CX0983] ("i asked if he'd commit . . . to not do any competitive memory and to switch the market from sdram–>direct rdram").

. . in return." Tate E-Mail (9/25/97) R213937-938 [CX0957] (emphasis added).[81] In the LG meeting, however, LG indirectly did raise the issue of IP covering DDR. The head of LG's memory business, H. J. Chun, explained to Mr. Tate that LG's reason for favoring DDR was that it understood DDR to be a "royalty-free . . . open, jedec standard":

> his thinking is a bunch of issues
>
> – they are under very severe pricing and profit pressure and they already have to pay us lots of patent royalties [on RDRAM] so how can they pay more
>
> – if rambus has a royalty then people will prefer royalty-free alternatives like ddr (we asked him why he thought ddr would be royalty-free?: he said it's an open, jedec standard)

Id. (emphasis added). From Mr. Tate's summary of the meeting, it would appear that he did nothing to disabuse Mr. Chun of his beliefs regarding the "open" and "royalty-free" nature of JEDECs DDR SDRAM standard.[82]

One can infer several things from the fact that Rambus – in this time period – took such different approaches in its dealings with Intel, on the one hand, and DRAM makers, on the other, relating to disclosures of Rambus intellectual property covering SDRAMs and DDR SDRAMs. First, one can safely infer that Rambus, at this point in time, did not want DRAM makers to know that it had patents covering SDRAMs and DDR SDRAMs. Second, one can just as safely

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[81] *See also* Tate E-Mail (11/8/97) R235273 [CX0966] (suggesting that Rambus "tie" lower RDRAM royalties "to agreement [by LG] to NOT do ddr/sldram and public announcement of this NOW") (emphasis added).

[82] In May 1998, Mr. Tate again met with LG, and he was directly asked by an LG executive whether SLDRAM would infringe Rambus patents. Mr. Tate answered, "I . . . can't tell one way or the other till we get silicon." Tate E-Mail (5/20/98) R216863 at 863 [CX1034]. In the same meeting, DDR was discussed, yet Mr. Tate's report makes no reference of any discussion of Rambus's intellectual property.

infer that Rambus, at this time, had no reason to believe DRAM makers already did know that it possessed such patents. Finally, one can safely infer from this evidence that Rambus did not believe that, through making these facts known to Intel under confidential NDA discussions, it was at risk of having such facts become known to the DRAM makers, from whom Rambus continued to want to conceal such information.

With respect to this last point, it is important to understand that, throughout the relevant time period, Rambus insisted that any discussions it had with actual or potential business partners or licensees be conducted in strict confidence pursuant to NDAs. *See, e.g.*, Rambus Business Plan (11/1/90) R170065 at 65 [CX0535] (noting that Rambus sought to "protect [its] intellectual property through signing non-disclosures with all parties exposed to the technology"). In fact, not only did Rambus insist up the signing of such agreements before they would discuss Rambus intellectual property with other companies, but also, once such agreements were signed, Rambus insisted that the signatory companies strictly comply with their NDA obligations by holding in confidence all information that they obtained from Rambus. The seriousness with which Rambus took such issues is fully evident from the following e-mail written by Geoffrey Tate in January 1998.

> our rdram partners receive confidential information/IP from us under our contracts. they have the right to use the information/IP under the terms of the license. they CANNOT disclose our confidential information to 3rd parties . . . .
>
> our partners employee's working on competitive products, e.g. DDR, might have access to our confidential information. they might even go to committees like jedec to discuss DDR. BUT they are obligated as employees of our partners' to keep our confidential information secret and to not use our IP outside the license scope. this applied to our partners' employees working on 'SLDRAM consortium'.

Tate E-Mail (1/30/98) R212377 at 377 [CX0993]. Thus, through non-disclosure agreements, Rambus sought to preserve in strict confidence anything that it disclosed to its business partners, such as Intel, about Rambus intellectual property. Rambus's firm position was that its business partners were not at liberty to disclose such information to third parties, including – in particular – standard-setting organizations such as JEDEC and the SyncLink Consortium.

(6) Rambus Hires Joel Karp to Prepare to Enforce the Strategic Patent Portfolio.

By early 1997, Rambus was focusing attention not only on securing patent rights against SDRAMs and DDR SDRAMS but also was preparing to enforce such rights. As relates to DDR, because the devices were not yet available, Rambus was not yet able to determine for certain in this time period whether it could establish infringement, but it was gearing up for enforcement actions nonetheless. As Geoffrey Tate wrote in February 1997: "There are many issued and in-process patents that DDR SDRAMS . . . 'might' infringe, but with so little hard data and no silicon there are no patents that we can definitely say are infringed." Tate E-Mail (2/10/97) R200497 [CX0919]. Mr. Tate's marching orders at this point in time were clear:

> ACTION:
>
> 1. keep pushing our patents through the patent office
>
> 2. do "NOT" tell customers/partners that we feel DDR may infringe – our leverage is better to wait
>
> 3. get hard data (data sheets, silicon) as they become available and re-assess periodically but wait on taking action till we see silicon (later this year maybe)

Id. (emphasis added).

By May 1997, it appears that Geoffrey Tate had concluded that Rambus would need additional resources in order to prepare itself for enforcing SDRAM- and DDR SDRAM-related

patents. In late May, Mr. Tate reported to other senior Rambus executives that he was "inclined to make . . . an offer" of employment to Joel Karp, a former Samsung employee, with the intention of placing Mr. Karp in charge of Rambus's strategies vis-a-vis enforcing patent claims against non-Rambus, or what Rambus often referred to as "non-compatible," technologies. Tate E-Mail (5/23/97) R233866 [CX0928].[83] As Mr. Tate explained, Mr. Karp was "NOT a technologist" and thus would not be in a position "to determine who infringes [Rambus patents] and how." *Id.* On the other hand, Mr. Tate suggested that Mr. Karp's "real strength" would be in "negotiating deals with infringers." *Id.*[84]

Several months later, in October 1997, Mr. Tate informed Rambus's executive management team that "Karp called to accept our offer." Tate E-Mail (10/1/97) R233872 [CX0960]. "He will have the title of vp," Mr. Tate reported, and "his role" would be "to prepare and then to negotiate to license our patents for infringing drams (and potentially other infringing ic's)," with a particular emphasis on preparing patent actions against JEDEC-compliant DDR SDRAMs. *Id.* Yet Mr. Tate cautioned his team to "keep this confidential" – referring to Mr. Karp's acceptance of employment with Rambus – until Mr. Karp started later in October 1997. *Id*. Moreover, even after he started at Rambus, Mr. Tate suggested that the company should be

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[83] Mr. Tate and others within Rambus previously had dealt with Joel Karp in connection with RDRAM-related licensing negotiations with Mr. Karp's former employer, Samsung. *See* Tate E-Mail (7/22/93) R233981-982 [CX0707].

[84] It is clear that Mr. Karp's primary mission at Rambus was to be overseeing efforts to enforce patents against DDR SDRAMs. In fact, it appears that briefly – in June 1997 – Mr. Tate reconsidered whether Rambus should hire Mr. Karp, considering that DDR devices were not likely to be available as early as he had predicted. *See* Tate E-Mail (6/6/97) R233867 [CX0931] ("I've decided to NOT make Joel an offer and NOT make him consultant. reasons: . . . DDR is not coming 2H/97 but more like 1H/98, mid-98 . . . if we get surprised and DDR happens sooner we can always . . . try to hire joel later").

careful not to make it known externally precisely what Mr. Karp was hired to do: "when joel starts we have to have our spin control ready for partners/etc as to why we are hiring him and what he will be doing. my thought is we say externally that joel is coming on board to help us with contracts and ip licensing." *Id.* (emphasis added).

With reference to the "non-compatible" DRAM licenses that Mr. Karp was responsible for negotiating, Mr. Tate made it clear that Mr. Karp was not to agree to any such license unless the royalty rate was greater than the rates Rambus charged for its proprietary RDRAM technology. *Id.* ("i advised clearly that if a chip co wants to license all of our present and future patents for use for any infringing dram, then the only acceptable deal is the royalty on infringing drams must be greater than the royalty on rambus drams.") (emphasis added). In this sense, Mr. Karp would be doing more than simply helping Rambus to obtain additional royalty revenues. In addition, he would be furthering Rambus's broader strategic objective to promote the adoption of RDRAM, in this case by raising the costs of competing technologies. Mr. Karp's handwritten notes indicate that he discussed these issues in a "one-on-one" meeting with Geoffrey Tate in October 1998. *See* Karp Notes (10/7/98) R300665 at 815 [CX1744] ("SDRAM Royalties – royalty rate dependent on . . . RDRAM,"and immediately following states, "idea . . . to prevent a new competitive device") (emphasis added).

Once on board at Rambus, Mr. Karp immediately commenced work on Rambus's "strategic license program," which was the term used within Rambus to refer to Mr. Karp's mission of preparing to assert Rambus patent claims against non-compatible products, such as SDRAM, DDR SDRAM, and SLDRAM (referring to SyncLink DRAM devices). In February 1998, Mr. Karp produced a draft document entitled "Strategic Patent Licensing Program" in which, for instance, he identified target royalty rates for DDR SDRAM (3.0-4.0%) and

SLDRAM (3.5-5.0%). Strategic Patent Licensing Program (2/12/98) R302512 [CX0551]. In the same time period, Mr. Karp formed an internal "Rambus Patent Council," which was to "meet once a month with the intent of discussing [Rambus's] overall patent strategy/directions from a strategic perspective." Tate E-Mail (4/14/98) R127188 [CX1017].

One question that arose early on in Mr. Karp's tenure at Rambus was whether the company should begin to discuss publicly the fact that Rambus held patents over RDRAM's principal competitor – DDR. As noted above, in 1998, Geoffrey Tate noted to his colleagues, "ddr infringes our patents," and then posed a "question: do we start saying this publicly?" Tate E-Mail (1/10/98) R233877 at 880 [CX0987]. As the person now chiefly responsible for enforcing Rambus's patents against DDR, Mr. Karp found it appropriate to respond, and his advice was clear. Mr. Karp thought it best that Rambus not make any such public disclosure, because this could cause DRAM manufacturers to band together in finding ways to avoid paying royalties to Rambus. The better approach, Mr. Karp suggested, was to "approach companies individually and without any publicity":

> I am very uncomfortable with any public statements regarding who or what infringes our patents. All we do is start a war with the entire industry. As long as we approach companies individually and without publicity, they will not be motivated to help each other against us. Once one or two sign up to strategic licenses it will be much easier to license the others but public announcements only stimulate a lot of negative emotion toward Rambus.

Karp E-Mail (1/10/98) R233882 at 882 [CX0988].

Roughly two months later, in March 1998, Joel Karp would attend a Rambus Board meeting in order to "update[] the Directors on the Company's strategic licensing and litigation strategy." Minutes of Rambus Board Meeting (3/4/98) RF0165751 at 752 [CX0613] . In other words, by this time, Rambus was not merely expecting to enforce its SDRAM-related patents in

the future, but was expressly contemplating litigation.[85] And it was in part due to concerns over such litigation that Rambus, in this same time period, made the decision to launch a massive document destruction program, resulting in the elimination of a variety of documents and computer files that would, at a minimum, have been discoverable in this litigation.[86]

(7) The Rambus-Intel Relationship "Blows Up," Causing Rambus to "Play" the JEDEC "IP Card."

From the earliest stages of their relationship, there was tension between Intel and Rambus, much of it having to do with two related issues: (1) the percentage royalty levels that Rambus desired to charge to makers of RDRAM; and (2) the added costs of producing RDRAM compared to other, more conventional DRAM devices, which in turn led to higher relative prices. *See* Tate Notes (1994) R33776 at 848 [CX1715] (notes from a July 29, 1994 Intel-Rambus meeting, listing as first of "3 Major issues" raised by Intel, "Royalty won't play because margins aren't there => thinx more like 1%);

As noted above, Intel chose to proceed with Rambus despite such concerns, but only after extracting certain commitments from Rambus. For

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[85] This is confirmed by other evidence. For instance, according to Rambus's privilege log in the *Micron* litigation, Mr. Karp jointly authored with Rambus's outside counsel, Dan Johnson, a memorandum dated March 2, 1998, entitled "Rambus Strategic Patent Litigation," which was addressed to Rambus's Board of Directors and senior executives. Rambus Privilege Log, Item 317, *Micron v. Rambus* (7/6/01) FTC30002621 at 2643 [CX1804]. The same Rambus privilege log withholds two additional documents, jointly authored by Messrs. Karp and Johnson in February 1992, describing the withheld documents as "Confidential attorney-client communications regarding legal strategy and reflecting work in anticipation of litigation." *Id.* (Items 320-21) (emphasis added).

[86] Because the facts pertaining to Rambus's document destruction have been set forth in detail in various previous submissions relating to Complaint Counsel's motions for default judgment and additional adverse inferences, we will not restate those facts here.

instance, given its concerns about Rambus's DRAM-related royalties being too high, Intel insisted that Rambus cap its royalties at a maximum of two percent, and Intel later pressured Rambus to lower its royalty rates even further. *See, e.g.*, Tate E-Mail (9/9/97) R233895 at 896 [CX0952] (reporting on Intel's "NEW REQUEST" that Rambus institute "long term reduction of royalty based on volume going to less than 1/2% for rdrams").

The first signs of serious deterioration in the Rambus-Intel relationship seem to have surfaced in roughly mid-1997. This is apparent, in part, from the e-mail exchange discussed above between Rambus Chairman Bill Davidow and Gerry Parker of Intel. As that exchange makes rather clear, Intel was concerned by the extent to which the DRAM makers were unhappy with Rambus. *See* Davidow E-Mail (7/11/97) R233898-899 [CX0936] (noting that "memory manufacturers feel beaten up" by Rambus). It appears that Intel sought to influence Rambus, in this time period, to establish better relations with DRAM makers. *See* Tate E-Mail (8/11/97) R213228 at 229 [CX0944] (noting that he had met with Samsung and that "the main objective of this meeting was to start to address intel's 'dram vendor happiness' issue").

. But by the latter part of 1997, the problems seem to be getting worse, not better.

In October 1997, Rambus CEO Geoffrey Tate had a one-on-one meeting with Pat Gelsinger, the senior Intel executive responsible for the Rambus relationship. The reason for the meeting, Mr. Tate explained, was to follow up on Mr. Gelsinger's earlier request that Rambus "lower . . . rdram royalties to <0.5%," and his suggestion that if Rambus failed to do so DRAM makers would "insist on developing alternatives" to RDRAM. Tate E-Mail (10/13/97) R229266 at 266 [CX0961]. Part of the discussion at this meeting focused on various technical and cost-

related issues associated with RDRAM. *See, e.g.*, *id.* at R229267 ("die size is the new BIG concern at pat's level – he's concern that our die size premium could price us out of much of the market in 99"). But much of the meeting focused on the extent to which DDR had "GAINED ground" with PC manufacturers and thus was a continuing "threat" to RDRAM. *Id.* at R229267-268. In particular, Mr. Gelsinger was concerned by the increasing level of segmentation in the PC business, especially the emergence of new sub-$1,000 PC segment – in Intel parlance, "segment-0" – where "cost is the critical factor." *Id.* at R229266. Mr. Gelsinger's precise concern seemed to be that DDR devices, because of their lower costs, would be a more natural fit for this low-price market segment, and that the DRAM market's propensity to concentrate "volume . . . in one device type" could result in "high-end users . . . find[ing] ways to use the segment-0 part!!!" *Id.* at R229269-270. In other words, Mr. Gelsinger conveyed that "the REAL issue is ddr as a threat in segment 0." *Id.* at R229270. According to Mr. Tate's report of the meeting, "they see ddr being aggressively pushed by samsung BECAUSE of rambus royalties." *Id.* During another meeting with Mr. Gelsinger in December 1997, many of the same issues were again discussed. *See* Tate E-Mail (12/1/97) RF0673372 at 372 [CX0974] [("COST – biggest issue"; "rdram price premiums of 20-30%!!"; "die size premium"; "royalty reduction").

Notwithstanding its various concerns with RDRAM, Intel continued to work to try to make RDRAM a market success. For instance, in March 1998 David Mooring of Rambus reported that Intel "would invest about $1 billion in . . . several of the top DRAM companies with the funding tied to RDRAM execution." Mooring E-Mail (3/17/98) R124452 at 452 [CX1006]. Yet Intel fully expected Rambus to do its part as well – by lowering its RDRAM royalties. *See* Tate E-Mail (3/23/98) RF0179062 at 62-63 [CX1007] ("What Intel wants Rambus to do: Share in risk – offer royalty reduction for DRAM suppliers who are willing to risk starting

RDRAM as directed by Intel/Rambus").[87]

Despite efforts to build market support for RDRAM, Intel's concerns with RDRAM persisted. In April 1998, Geoffrey Tate again met with Pat Gelsinger of Intel, and again the spirit of the meeting was contentious. As Mr. Tate alarmingly reported to his colleagues, "intel says they are basically going to compete with us on the next generation." Tate E-Mail (4/14/98) 930DOC00537 at 537 [CX1016]. The basic message of this meeting seemed to be that in the intermediate term, Intel was continuing to support RDRAM, but in the long term, it may not:

> LONG TERM
>
> pat: big issue is this one. the dram industry doesn't like the rambus business model.
>
> rambus business model is fundamentally at odds with what the dram industry wants
> – free technology
> – differentiation
> – control of destiny
> – etc. . . .
>
> pat perceives that rambus business model has been what makes the rdram ramp so hard to manage
> – royalties
> – control/rambus using intel as a club

Id. at 930DOC00539-540 (emphasis in original). This was a sobering message for Rambus to hear, and it raised serious questions for Rambus's ongoing strategy, as Mr. Tate pointed out:

> when will intel tell the dram companies that they are investigating next generation interface without rambus? if so, will the dram companies then not want to work with us (on next generation)? this could force us to play our IP card with the dram companies

[87] The same e-mail suggests that Intel, at this time, was also seeking to obtain from Rambus "rights to Rambus IP for use in non-competing areas," and also in "competing areas after Intel introduces the broad range of products." *Id.* at RF0179063. In other words, Intel wanted "to eliminate any chance of IP-related litigation from Rambus." *Id.*

> earlier.

Id. at 930DOC00542 (emphasis added).

Rambus co-founder Michael Farmwald responded to Mr. Tate's e-mail, suggesting that "[i]f it comes to all-out war" with Intel, Rambus might be "in a position to go after them for royalties," or could produce documents that would make Intel "look extremely bad both to the press, a court, and to the FTC." Farmwald E-Mail (4/15/98) R233893 at 893 [CX1021]. Rambus Chairman Davidow, in turn, commented, "I am concerned that Mike may be right although I would prefer a more measured approach." Davidow E-Mail (4/16/98) R233890 at 890 [CX1022]. Mr. Davidow's thought was to "try to negotiate something" with Intel – as he stated:

> The advantage of trying to negotiate something with them is that it will take months. In the process we gain time. We will not have to play the intellectual property card with Micron and SDRAMs during this time.

Id. at R233891. Mr. Davidow quickly added:

> If things blow with Intel, then we can begin to pursue the intellectual property issue with these guys. That will get Intel really mad but they will already be really mad.

Id. (emphasis added).

Not long thereafter, however, things clearly did "blow up with Intel." In September 1999, several publications released stories reporting Intel's decision to abandon RDRAM, and instead support the 133Mhz version of JEDEC's SDRAM standard, for high-volume server applications. *See* E. Kinsella, *Intel to Back Alternative to Rambus Chips*, street.com (9/1/99) R218297 [CX1077] ("Ending months of speculation, Intel . . . embraced a low-cost alternative to Rambus-based . . . memory chips). Then, in October 1999, Pat Gelsinger sent a letter to Messrs. Tate and Davidow in which he bluntly summed up the status of the Intel-Rambus relationship. According

to Mr. Gelsinger's letter.

- "Industry acceptance of RDRAM technology [was] poor, at best";
- "Rambus ha[d] failed to support [Intel's] efforts";
- Rambus had "grossly missed" its commitments in terms of projected cost reductions, and thus the RDRAM product continued to be significantly more expensive than competing SDRAM devices; and
- there were technical issues associated with RDRAM's designs that were "causing major concerns" for Intel's business partners, mainly personal computer manufacturers.

Gelsinger Letter (10/26/99) RF0638756-58 [CX2887]. For all of these and other reasons, and "as a direct result of Rambus's failure to adequately deal with these issues," Mr. Gelsinger explained that Intel had "been forced to re-architect its chipset roadmap to accommodate additional SDRAM products," and that it had "no choice but to continue re-assessing" its future relationship with Rambus. *Id.*

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Consistent with the plan outlined by Messrs. Davidow and Tate several months earlier, Rambus responded to these development by immediately gearing up to "play" its "IP card with the dram companies." Tate E-Mail (4/14/98) 930DOC00537 at 542 [CX1016]. At the October 1999 Rambus Board meeting, Joel Karp made a presentation relating to the "selection" of "target" companies against which to begin asserting JEDEC-related patents, and a "timetable" for negotiating licenses. Minutes of Rambus Board Meeting (10/14/99) RF0165693 at 696 [CX0623]. With this, the process of Rambus enforcing, and ultimately going public, with its JEDEC-related patents had finally begun. But even at this stage, Rambus CEO Geoffrey Tate wanted to keep a tight lid on Rambus's plans, mindful of Mr. Karp's advice that Rambus should

"approach companies individually and without publicity" so "they will not be motivated to help each other." Karp E-Mail (1/10/98) R233882 at 882 [CX0988]. Thus, Mr. Tate advised his colleagues that, if asked questions about the potential for DDR to infringe Rambus patents, "it's important NOT to indicate/hint/wink/etc what we expect the results of our [infringement] analysis to be!!!" Tate E-Mail (12/9/99) R214755 [CX1089] (emphasis added).[88]

[88] Again, one can infer from statements like these that Rambus, even as late as 1999, had no reason to believe that DRAM producers were aware that JEDEC's SDRAM standards embodying technologies that would infringe upon Rambus patents. Indeed, one need not infer this; Rambus's documents show this to be true. A document from somewhat earlier in 1999 is telling in this regard. In response to a trade press report that major DRAM industry players were throwing their weight behind JEDEC's DDR SDRAM as opposed to SyncLink DRAM, Joel Karp wrote, "They probably think they avoid our IP if they don't go 'packet based.'" Karp E-Mail (5/1/99) R228720 [CX1069]. In other words, though Rambus had given the DRAM industry reason to believe that SyncLink – which, like RDRAM, was a "narrow-bus," "packetized" design – would infringe upon its intellectual property, Rambus had successfully managed to conceal that its patents were broad enough to also cover JEDEC's "wide-bus," "non-packetized" DRAM designs. *See also* Rambus Developer Forum (9/14/00) R157779 at 827 [CX1385] (noting that the "View from Outside" was that "DDR is Free," then adding, "Not really").

[89]

(8) Enforcement of Rambus's SDRAM- and DDR SDRAM-Related Patents.

In late 1999, Rambus certainly did become "proactive" concerning its JEDEC-related IP. *Id.* By January 2000, Rambus had already instituted litigation against Hitachi, relating to Hitachi's alleged infringement of Rambus patents in connection with its development and production of SDRAMs and DDR SDRAMs. *See* Complaint for Patent Infringement, *Rambus v. Hitachi* (1/18/00) FTC20002979 [CX1855] (asserting that Hitachi's JEDEC-compliant SDRAMs and DDR SDRAMs infringed Rambus's patents). Rambus took a hard line with Hitachi, as it later would with other companies. As Geoffrey Tate discussed with his fellow Rambus executives and Board members, "if they insist on a fight to the finish we have said we want an injunction: NO LICENSE." Tate E-Mail (1/18/00) RF0642825 at 825 [CX1097]. *See, e.g.*, Analyst Meeting (9/14/00) R157779 at 877 [CX1385] ("Rambus Licensing Approach ... Those

[89]

companies that decide to litigate will pay higher royalty rates... Rambus may not license those companies that litigate and lose").

Ultimately, the Hitachi suit settled, with Hitachi agreeing to pay Rambus a 1.0% royalty on SDRAMs and a 4.25% royalty on DDR SDRAMs. *See* Rambus-Hitachi Settlement and Patent License Agreement (6/22/00) R105902 at 916 [CX1681]. In a press release on the Hitachi settlement, Rambus made a point of publicizing the fact that the DDR royalty rate agreed to by Hitachi was higher that Hitachi's RDRAM royalty rate:

> Under the licensing agreement, the royalty rates for DDR SDRAM and the controllers, which directly interface with DDR SDRAM, are greater than the RDRAM compatible rates.

Rambus and Hitachi Settle Legal Dispute (6/22/00) RF0628412 at 412 [CX1864]. Talking points prepared by Rambus in association with this press release shed further light on Rambus's thinking with respect to the higher royalty rate for DDR:

> **Why lower royalty on SDRAM? Is it because there is less IP on SDRAM?**
>
> Our position all along is that it is not acceptable that our own IP is used to compete against us without compensation. However, we have never viewed SDRAM as competition. . . . DDR on the other hand was created specifically to compete with Direct RDRAM. We don't think for the most part it is an effective competitor, but the intent is clear. Our policy is that competitive memory interface that utilizes our patented inventions to achieve its performance cannot have a lower royalty rate than the RDRAM compatible interface.
>
> **Why is it fair to charge a higher royalty rate on DDR when it uses fewer patents than Rambus?**
>
> We have no obligation to license our patents at all.

Id. at RF0628417 (underscored emphasis added). Another question and answer appears to have been designed to publicly signal the hard line that Rambus was prepared to take with those who,

unlike Hitachi, refused to settle and forced Rambus to litigate on its patents:

> **Would you refuse to license companies that do not settle?**
>
> Rambus prefers to negotiate and settle amicably. But if we are forced to litigate in court, we reserve the right to refuse to license.

Id. at RF0628414 (underscored emphasis added). *See also* Rambus Developer Forum (9/14/00) R157779 at 877 [CX1385] ("Those companies that decide to litigate will pay higher royalty rates . . . Rambus may not license those companies that litigate and lose").

Of course, Hitachi was not the only company that agreed to take an SDRAM/DDR license from Rambus. By September 2000, Rambus had succeeded in licensing NEC, Oki, Toshiba, and Hitachi, representing "20% of the Worldwide SDRAM Production." Rambus Developer Forum (9/14/00) R157779 at 879 [CX1385]. By November 2000, this number had risen to ">40%" of the "SDRAM/DDR market." Big Picture Update (11/20/00) RF0627031 at 038 [CX1391].

[90] As was true in Hitachi's case, all of the companies that have taken SDRAM-related licenses from Rambus have agreed to pay royalties, on DDR, exceeding Rambus's RDRAM royalty rates. *See* Rambus Developer Forum (9/14/00) R157779 at 880 [CX1385] ("All agreements provide DDR memory and logic royalty rates which are greater than

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[90] To date, three companies – Infineon, Hynix, and Micron – have refused to agree to Rambus's SDRAM/DDR licensing demands, and each of these companies remains embroiled in patent-related litigation with Rambus. In those suits, collectively, Rambus has sought to enforce a total of 12 patents. Rambus has stated publicly, however, that there are other patents, which it believes cover SDRAMs and DDR SDRAMs, that it has not yet asserted in any litigation. *See* Rambus Press Release (5/4/01) RF0152793 [CX1888] ("Rambus holds newly issued U.S. and European patents covering Rambus inventions used by SDRAMs and DDR SDRAMs that have not yet been asserted in any litigation and are not impacted by the [*Infineon* trial] Court's decision.").

the rambus compatible royalty rates") (emphasis added).

Several things appear reasonably clear with respect to Rambus's strategy relating to the licensing of its patents on SDRAMs and DDR SDRAMs.

First, through its DDR royalties in particular, Rambus has sought to reduce the competitive threat that SDRAM and DDR SDRAM pose to RDRAM. In Geoffrey Tate's words, Rambus strategy, through its SDRAM/DDR license terms, is to "reduce attractiveness of alternatives." Tate E-Mail (1/18/00) RF0642825 at 826 [CX1097] (emphasis added).

It appears to be Rambus's view that, by taking this approach, it can overcome "What Went Wrong in 2000 " – namely, Intel's decision to "Support SDRAM, DDR, [and] RDRAM" and to "let the market decide" which is "the best price/performance solution." Big Picture Update (11/20/00) RF0627031 at 37 [CX1391]. *See also* Rambus Developer Forum (9/14/00) R157779 at 890 [CX1385] (suggesting that one of the ways for Rambus "to win" was to decrease the RDRAM "[p]rice premium" through "[r]oyalties on alternative DRAMs (eg SDRAM and DDR)").[91]

Second, it is plainly true that, in negotiating SDRAM/DDR licenses, Rambus has sought to discriminate between licensees based on, among other things, how quickly they agree to take

[91] Of course, this approach to licensing Rambus's SDRAM-related patents follows precisely along the lines of what Geoffrey Tate had outlined several years earlier. *See* Tate E-Mail (10/1/97) R233872 [CX0960] ("i advised [Karp] clearly that if a chip co wants to license all of our present and future patents for use for any infringing dram, then the only acceptable deal is the royalty on infringing drams must be greater than the royalty on rambus drams.") (emphasis added); Karp Notes (10/7/98) R300665 at 815 [CX1744] (notes from one-on-one meeting with Tate; "SDRAM Royalties – royalty rate dependent on. . . RDRAM," and immediately following states, "idea . . . to prevent a new competitive device") (emphasis added).

licenses and whether they choose to litigate. Hitachi is a very good example of this in that Hitachi, which initially chose to litigate and later settled, was forced to accept higher royalty rates on both SDRAM and DDR SDRAM (1.0% and 4.25%, respectively) compared to the terms given to rival DRAM makers that agreed to take Rambus licenses without resorting to litigation. *Compare* Rambus-Hitachi Settlement and Patent License Agreement (6/22/00) R105902 at 916 [CX1681],

; Rambus-Elpida Patent License Agreement (10/31/00) R171530 at 546 [CX1686] (same); Rambus-Samsung Patent License Agreement (10/31/00) R171569 at 584 [CX1687] (same).[92] A presentation to the Rambus Board of Directors during this period summarized the varying terms and royalty rates Rambus was seeking from licensees. *See* "Rambus Licensing Update" R301148 at 1157-58 [CX1273].

Rambus made no secret about its willingness to discriminate in licensing terms among DRAM makers depending upon their level of cooperativeness and their willingness to avoid litigation.

[92] Hitachi's higher royalty rates clearly place it at a competitive disadvantage compared to rivals that have secured licenses from Rambus at lower rates. In seeking to persuade others to take licenses without resorting to litigation, Rambus impressed upon them that the alternative was to go the route of Hitachi and suffer a competitive handicap. *See* Tate E-Mail (10/17/00) RF0730477 [CX1146] (encouraging Samsung to finalize and sign the agreement; noting that this will give Samsung the "most favored royalty rate," and "Samsung will have a substantial competitive advantage [over those who have sued Rambus rather than negotiate]") (emphasis added).

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Third, based on internal Rambus documents, it appears that part of Rambus's long-term strategy in licensing its SDRAM- and DDR SDRAM-related patents is to continue increasing not only its royalty rates on SDRAM/DDR licenses, but RDRAM royalty rates as well. *See, e.g.*, KR01 Kickoff Meeting Framework Thoughts (8/24/00) RF0504486 at 488 [CX1380A] ("We are ratcheting up royalty rates over time to the value of the IP"); Big Picture Update (11/20/00) RF0627031 at 63 [CX1391] ("over time we can drive royalties [on RDRAM] from1-2% average to 3-5% (DDR shows the value of our technology; price our own standards to value).[94]

Finally, it should be noted that Rambus's SDRAM/DDR licenses do not cover future

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[93] Note the SDRAM rate quoted here – 1.25% – would have placed NEC at a competitive disadvantage even compared to Hitachi, which pays 1% to Rambus on SDRAMs.

[94] *See also id*. (at RF0627062) (graphs showing, during the 2000-2005 period, (1) Rambus's "Market Share" increasing to 100%; (2) its "Average Royalty Rate" increasing from 1% to 5%; and (3) its annual royalty income increasing from $90 million to $3 billion). *See also* Undated Rambus Spreadsheets RF0453304 at 304 [CX0527] (projecting total Rambus royalty revenue – on SDRAM, DDR, and RDRAM – of $2.8 billion by 2005);

generations of DDR. *See, e.g.*, Intel Executive Meeting Presentation (8/8/00) RF0639434 at 444 [CX1379] ("The licenses explicitly exclude logic products for controlling future memory devices"). In fact, it appears that Rambus has considered a strategy whereby it would simply refuse to license its intellectual property to anyone in connection with future versions of DDR.

Were it successful in doing this, Rambus not only will have succeeded in eliminating as a competitive threat essentially all other alternative DRAM designs, but in addition, it will have succeeded in eliminating the competitive threat posed to Rambus by JEDEC. In fact, it would appear that this may be precisely what Rambus has in mind. *See* MATD (10/5/00) RF0508213 at 219 [CX1387] (last slide states, "**JEDEC Implodes**") (emphasis in original).

With the foregoing chronology complete, we now turn to the legal issues raised by the Commission's Complaint.

III. Elements and Burdens of Proof Applicable to the Claims Set Forth in the Complaint.

A. Essential Elements of Proof.

The Complaint alleges three claims under Section 5 of the FTC Act, which generally prohibits "unfair methods of competition." 15 U.S.C. § 45(a)(1). This prohibition includes "practices that violate the Sherman Act and the other antitrust laws," as well as "practices that the Commission determines are against public policy for other reasons." *FTC v. Indiana Federation of Dentists*, 476 U.S. 447, 454 (1986). Two of the three are based upon Section 2 of the Sherman Act, alleging that Rambus has engaged in monopolization and attempted monopolization. The third claim alleges that Rambus has engaged in "unfair methods of competition" in violation of Section 5.

(1) Monopolization Claims.

Section 2 of the Sherman Act makes it unlawful for any person to "monopolize, or attempt to monopolize . . . any part of the trade or commerce among the several States, or with foreign nations." 15 U.S.C. § 2. A Section 2 monopolization offense requires proof of only two elements: "(1) the possession of monopoly power in a relevant market, and (2) the willful acquisition, maintenance, or use of that power by anticompetitive or exclusionary means or for anticompetitive or exclusionary purposes." *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 595-96 (1985) (citing *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966)).

The separate offense of attempted monopolization under Section 2 of the Sherman Act requires proof of three elements: (1) exclusionary or anticompetitive conduct; (2) a specific intent to monopolize; and (3) a dangerous probability of achieving monopoly power. *Spectrum*

Sports, Inc. v. McQuillan, 506 U.S. 447, 456 (1993). Accordingly, exclusionary or anticompetitive conduct is an element of both monopolization claims.

(2) Unfair Competition Claim.

Section 5 of the FTC Act authorizes the Federal Trade Commission to define and proscribe "unfair methods of competition." 15 U.S.C. § 45(a)(1). Thus, the Commission may sanction "conduct which, although not a violation of the letter of the antitrust laws, is close to a violation or is contrary to their spirit." *E.I. Du Pont de Nemours & Co. v. FTC*, 729 F.2d 128, 136-37 (2d Cir. 1984); *see also FTC v. Sperry & Hutchinson Co.*, 405 U.S. 233, 239 (1972); *Grand Union Co. v. FTC*, 300 F.2d 92, 98-99 (2d Cir. 1962). This empowers the Commission with broad authority to "declare trade practices unfair." *FTC v. Brown Shoe Co.*, 384 U.S. 316, 321 (1966). Specifically, "Congress intentionally left development of the term 'unfair' to the Commission rather than attempting to define 'the many and variable unfair practices which prevail in commerce.'" *Atlantic Refining Co. v. FTC*, 381 U.S. 357, 367 (1965) (citing S. Rep. No. 592, 63d Cong., 2d Sess., 13 (1914)). Indeed, the Commission has acted on this authority to attack "collusive, predatory, restrictive [and] deceitful conduct that substantially lessens competition," *Du Pont*, 729 F.2d at 137, and "activities that violate the spirit of certain Sherman and Clayton Act sections that were clearly intended to promote competition and deter anticompetitive acts." *In the Matter of General Motors Corp.*, 103 F.T.C. 641, 701 (1984).

Of particular relevance here, the FTC has found that exclusionary conduct which results in anticompetitive effects, even if it fails to satisfy all the elements of a Section 2 offense, violates Section 5 of the FTC Act. *See In the Matter of Ethyl Corp.*, 101 F.T.C. 425, 597 (1983), *vacated sub nom. E.I. Du Pont de Nemours & Co. v. FTC*, 729 F.2d 128, 136-37 (2d Cir. 1984) (noting that "single-actor conduct which is unfair competitive behavior but which falls short of

an attempt to monopolize under Section 2 of the Sherman Act" violates Section 5). In *Ethyl*, the Commission held expressly that "Section 5 was not intended to be subject to the same limitations as the Sherman Act and the Clayton Act when there is good evidence that the [c]hallenged practices have anticompetitive effects very similar to those prohibited by those two Acts." *Ethyl*, 101 F.T.C. at 597. It concluded that, "conduct which excludes competitors unfairly," and "in turn . . . lead[s] to monopoly pricing," is unlawful under Section 5. *Id.* at 598.[95]

Complaint Counsel's third claim alleges unfair competition, here the use of exclusionary, unfair conduct to gain a marketplace advantage that adversely affected competition. In addition to demonstrating that Rambus's conduct was "unfair," as that term has been defined by the case law, Complaint Counsel will show that Rambus's conduct has actually harmed competition.

B. General Burden of Proof.

Complaint Counsel must prove its case by a preponderance of the evidence. Commission Rules of Practice provide that Complaint Counsel "shall have the burden of proof, but the proponent of any factual proposition shall be required to sustain the burden of proof with respect thereto." 16 C.F.R. § 3.43(a) (2003). Complaint counsel discharges its burden by proving its allegations with a "preponderance of credible evidence." *In the Matter of Bristol-Myers Co.*, 1983 FTC LEXIS 63, *373 (1983) (Initial Decision; Conclusions of Law) (requiring proof by

[95] A requirement that the Commission show anticompetitive effects fully satisfies the limitations various courts have placed on the FTC's authority to prevent an abuse of the FTC's power. *See Du Pont*, 729 F.2d at 137. For example, *Du Pont* demands that any conduct that the Commission deems unlawful have a line of demarcation between "conduct that is anticompetitive and legitimate conduct that has an impact on competition." *Id.* at 138; *see also Boise Cascade Corp. v. FTC*, 637 F.2d 573, 581-82 (9th Cir. 1980) (court would not uphold violation in "absence of some reliable indicator that the practice had an effect on overall price levels"). As Complaint Counsel will demonstrate at trial, Rambus's conduct threatens further anticompetitive effect in several relevant markets.

"preponderance of credible evidence."); *In the Matter of Washington Crab Assn.*, 1964 FTC LEXIS 86, *23 (1960) (Initial Decision) (holding that complaint counsel satisfied its burden by showing "by a preponderance of the reliable, probative and substantial evidence and the fair and reasonable inferences drawn therefrom, . . . the material allegations of the complaint") (emphasis added). This standard comports with the general rule that litigants in civil cases are required to prove facts by a preponderance of the evidence. See FTC v. Abbott Laboratories, 853 F. Supp. 526, 535 (D.D.C. 1994) (holding that "the government has failed to show by a preponderance of the evidence that its action was the result of collusion with its competitors."); *see also* C. McCormick, McCormick on Evidence § 339 (2d ed. 1972); 9 J. Wigmore, Wigmore on Evidence § 2498 (Chadbourn ed. 1981).

The policy reasons underlying the preponderance-of-the-evidence standard apply here with full force. Courts employ this standard in conventional litigation so that both parties "share the risk of error in roughly equal fashion." *Herman & MacLean v. Huddleston*, 459 U.S. 375, 390 (1983) (citations omitted). "Any other standard expresses a preference for one side's interests." *Id.* In *Herman & MacLean*, the Supreme Court expressly noted that the preponderance-of-the-evidence standard is appropriate in cases involving the violation of federal antitrust statutes. In reversing the lower court's decision to impose a clear-and-convincing standard, the Court explained that the higher standard of proof in civil law fraud actions at common law involved allegations

> that were unenforceable at law because of the Statute of Wills, the Statute of Frauds, or the parol evidence rule. . . . Concerned that claims would be fabricated, the chancery courts imposed a more demanding standard of proof. The higher standard subsequently received wide acceptance in equity proceedings to set aside presumptively valid written instruments on account of fraud.

459 U.S. at 388 n.27 (citations omitted). The Court stated that the context of those older proceedings "bear little relationship to modern lawsuits under the federal securities laws." *Id.* It opined that interests of defendants in a securities case "do not differ qualitatively from the interests of defendants sued for violations of other federal statutes such as the antitrust or civil rights laws, for which proof by a preponderance of the evidence suffices." *Id.* at 390 (emphasis added). The Court further noted that the lower standard was appropriate even in cases that contemplate severe civil sanctions. *Id.* at 389-90.

Courts have recognized, in circumstances not applicable here, certain narrow exceptions to the general rule that a preponderance-of-the-evidence standard suffices to prove violations of federal antitrust law. The only such exception that is plausibly relevant here involves antitrust-based challenges to the fraudulent procurement and assertion of patents.[96] For example, courts have held that claims of monopolization based on alleged fraud on the patent office must be established by clear-and-convincing evidence. *See, e.g., Walker Process Equipment, Inc. v. Food Machinery & Chemical Corp.*, 382 U.S. 172 (1965). Courts similarly impose this heightened standard in monopolization claims based on sham infringement actions. *See, e.g., Handgards, Inc. v. Ethicon, Inc.*, 601 F.2d 986, 996 (9th Cir. 1979) (*en banc*), *cert. denied*, 444 U.S. 1025 (1980).

The expressed rationale underlying the imposition of a higher burden in such cases is to "provide reasonable protection for the honest patentee who brings an infringement action to protect his legal monopoly." *Handgards*, 601 F.2d at 996; *see also CVD, Inc. v. Raytheon Co.*,

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[96] Other exceptions, which are not at all relevant here, include cases involving predatory pricing, s*ee, e.g., Southern Pacific Communications v. American Telephone and Telegraph Co.*, 740 F.2d 980 (D.C. Cir. 1984), and trade secrets, *see, e.g., CVD, Inc. v. Raytheon Co.*, 769 F.2d 842, 850 (1st Cir. 1985), *cert. denied*, 475 U.S. 1016 (1986).

769 F.2d 842, 850 (1st Cir. 1985), *cert. denied*, 475 U.S. 1016 (1986) (clear-and-convincing standard "ensures the free access to the courts by allowing honest patentees to protect their patents without undue risk of incurring liability for asserting their rights."). The higher standard gives effect to a presumption that a patentee's infringement suit is in good faith and accords the patentee a presumption commensurate with the statutory presumption of patent validity set forth in the patent laws, 35 U.S.C. § 282, which can be rebutted only by a showing of clear-and-convincing evidence. *Handgards*, 601 F.2d at 996.

In terms of balancing the interests of patent law and antitrust law specifically, the policy rationale is to "prevent frustration of patent law by the long reach of antitrust law." *Handgards*, 601 F.2d at 996. However, the higher standard is not a "barrier . . . intended to be utilized in antitrust litigation generally. It is fashioned in response to the unique characteristics of proceedings in which the alleged violation of the antitrust law consists solely of one or more infringement actions initiated in bad faith." *Handgards*, 601 F.2d at 996.[97]

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[97] As Justice Harlan explained in his concurrence in *Walker Process*:

> To hold, as we do, that private suits may be instituted under § 4 of the Clayton Act to recover damages for Sherman Act monopolization knowingly practiced under the guise of a patent procured by deliberate fraud, cannot well be thought to impinge upon the policy of the patent laws to encourage inventions and their disclosure. Hence, as to this class of improper patent monopolies, antitrust remedies should be allowed room for full play. On the other hand, to hold, as we do not, that private antitrust suits might also reach monopolies practiced under patents that for one reason or another may turn out to be voidable under one or more of the numerous technicalities attending the issuance of a patent, might well chill the disclosure of inventions through the obtaining of a patent because of fear of the vexations or punitive consequences of treble-damage suits.

382 U.S. at 179-80 (Harlan, J., concurring) (emphasis added).

The *Walker Process* line of cases are not apposite here for several reasons. First, the complaint does not challenge in any way the validity of Rambus's patents or its conduct before the PTO in obtaining the patents. Further, it does not allege "a violation of antitrust law [that] consists solely of one or more infringement actions initiated in bad faith," as described in the *Handgards* case, 601 F.2d at 996. What is at issue is Rambus's anticompetitive conduct as a member of a standard-setting organization while that group was promulgating standards potentially incorporating technologies that might be covered by existing or anticipated future Rambus patents. Although Rambus's attempts to enforce its patent rights are one piece of Rambus's larger anticompetitive and exclusionary scheme, the Complaint does not allege that this practice, in and of itself, violates the FTC Act. Nor does it challenge that Rambus pursued these enforcement efforts in bad faith, *i.e.*, believing that it did not have legitimate patents. Accordingly, the policies sought to be vindicated through the imposition of the higher burden of proof in the *Walker Process* cases – not chilling the enforcement of legitimate patents and not frustrating patent law – do not come into play here.[98]

Indeed, the policies at issue in this case much more closely align with those at issue in *Indian Head, Inc. v. Allied Tube & Conduit Corp*, 486 U.S. 492 (1988), *affirming Indian Head, Inc. v. Allied Tube & Conduit* Corp., 817 F.2d 938 (2d Cir. 1987), discussed below. *Allied Tube*, like this case, involved the subversion of the standard-setting process in a way that harms competition and consumers. In that case, the courts did not require proof of anticompetitive conduct by clear-and-convincing evidence. Accordingly, in this case, where the anticompetitive

[98] The "chilling effect" of this litigation would be upon deceptive, bad faith participation in standard-setting organizations. As this litigation will demonstrate, chilling such anticompetitive activity is beneficial for consumers and the economy, and will not deter good-faith participation in such organizations that have social and economic benefit.

conduct at issue is the undermining of the standard-setting process, not the bad-faith acquisition or enforcement of patents, a clear-and convincing standard of proof is not appropriate.

Second, the Complaint alleges violations of the FTC Act, not violations of the Sherman Act. Although, as discussed above, violations of Section 2 of the Sherman Act violate Section 5 of the FTC Act, the Commission had brought this case under the Sherman Act. Indeed, even in FTC cases in which the Section 5 allegations involve Sherman Act offenses, the preponderance-of-the-evidence standard applies. *See, e.g., In the Matter of Washington Crab Assn.,* 1964 FTC LEXIS 86 (1964). In *Washington Crab*, the FTC alleged that actions of an association of crab fishermen constituted an attempt to monopolize. The ALJ held that the FTC had established "a violation of [Section 2] of the Sherman Act [which] is also a violation of the Federal Trade Commission Act . . . by a preponderance of the reliable, probative and substantial evidence . . . ." *Washington Crab*, 66 F.T.C. at 23, 156 n.33.

Significantly, the Sherman Act , unlike FTC Act cases, can result in the imposition of treble damages. Indeed, as the Ninth Circuit explained in a case in which it declined to require clear-and-convincing evidence to prove a malicious prosecution counterclaim in a patent infringement case: "one of the reasons that we found it necessary in *Handgards* to protect patentees from antitrust actions [through the imposition of the clear-and-convincing standard] was that they posed the threat of treble damages. . . . The chilling effect of that potential remedy upon the good faith actions of patentees is far greater than that posed by the enforcement of state malicious prosecution laws." *U.S. Aluminum Corp./Texas v. Alumax, Inc.,* 831 F.2d 878, 818 (9th Cir. 1987). As with a malicious prosecution claim, a Section 5 allegation does not risk the chilling effect threatened by the Sherman Act's provision of treble damages.

The one plausibly relevant, though inapplicable, exception to this general rule is that if

the complaint specifically alleges fraud, then fraud must be established with clear-and-convincing evidence.[99] Unlike in this case, in *In the Matter of VISX, Inc.*, the FTC specifically alleged that the defendant had violated Section 5 of the FTC Act by committing fraud against the PTO in the patent application process. 1999 WL 33577396 (F.T.C.). In essence, the Commission was bringing a *Walker Process* case. Accordingly, the ALJ, consistent with *Walker Process*, applied a clear-and-convincing evidentiary standard to the fraud element, but not to the other elements of the case. *Id.*[100] Indeed, requiring clear-and-convincing evidence only for the fraud element but not the other elements of an antitrust violation is characteristic of *Walker Process*-type cases. *See, e.g., Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861 (Fed. Cir. 1985); *State of North Carolina v. Chas. Pfizer & Co.*, 384 F. Supp. 265 (E.D.N.C. 1974); *Phillip Morris, Inc. v Brown & Williamson Tobacco Corp.*, 641 F. Supp. 1438 (M.D. Ga. 1986).[101] The

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[99] Courts have established that an FTC Act Section 5 violation does not require a showing of intent to defraud or bad faith. *See FTC v. World Travel Vacation Brokers, Inc.* 861 F.2d 1020, 1029 (7th Cir. 1988); *Beneficial Corp. v. FTC*, 542 F.2d 611, 617 (3d Cir. 1976), *cert. denied*, 430 U.S. 983 (1977). Even if Your Honor were to find that the deceptive and misleading practices alleged were so severe as to rise to the level of fraud, even though fraud has not been pled, imposing the clear-and-convincing standard would represent a sharp departure from the general rule. Courts have found that the preponderance-of-the-evidence standard is sufficient even in FTC Act, Section 5 cases in which the court perceives that the practices alleged, although not pled as such, amount to fraud. *See, e.g., FTC v. Renaissance Fine Arts, Ltd.*, 1994 WL 543048, *8 (N.D. Ohio 1994) (finding, by preponderance of evidence, that the defendants had violated Section 5 through "a lucrative scheme to defraud," although fraud had not been pled); *In the Matter of Amrep Corp.*, 102 F.T.C 1362, *265 (1983) (applying preponderance standard to practices described by court as "land sale fraud," although fraud had not been pled).

[100] Moreover, the court specifically distinguished the standard of proof required to establish fraud, clear and convincing, from the preponderance standard required to establish "inequitable conduct," which the complaint also alleged. *In the Matter of VISX, Inc.*, 1999 WL 33577396 (F.T.C.).

[101] Similarly, in cases alleging bad faith or sham patent infringement cases, courts require clear-and-convincing evidence only as to that element. *See, e.g., Neumann v. Reinforced Earth Co.*, 786 F.2d 424 (D.C. Cir. 1986); *Handgards, Inc. v. Ethicon, Inc.*, 701 F.2d 986, 996 (9th Cir. 1979); *Argus Chemical Corp. v. Fibre Glass-Evercoat Co.*, 645 F. Supp. 15 (C.D. Cal. 1986).

Supreme Court, in comparable circumstances, took this approach. In *Ramsey v. United Mine Workers of America*, 401 U.S. 302 (1971), a case involving an antitrust action by coal mine operators against a union, The Supreme Court held that Section 6 of the Norris-LaGuardia Act, 29 U.S.C.A. § 106, required use of the clear-and-convincing standard only as to one element of proof (the union's authorization, participation in, or ratification of the acts allegedly performed on its behalf). 401 U.S. at 311. The Court rejected the defendant's argument that the higher standard should apply to all elements of the case. *Id.* Because the statute did not require a higher standard as to the other elements of the case, the Court could not "discern any basis for our fashioning a new standard of proof applicable in antitrust actions against labor unions." *Id.* As explained above, the complaint in this matter does not allege fraud, in the procurement or enforcement of patents, or otherwise. Thus, given that the clear-and-convincing standard would apply, at most, only to proof of fraud allegations, and that such allegations have not been pled, the heightened standard has no relevance in this case.

Because the Complaint challenges anticompetitive behavior in connection with standard setting, not fraudulent conduct in connection with procuring or enforcing patents, is brought under the FTC Act, not the Sherman Act, and does not allege fraud, Complaint Counsel need establish its case only by a preponderance of the evidence.

These cases are also easily distinguishable. Not only were they brought pursuant to the Sherman Act rather than the FTC Act, they refer specifically to bad faith in the bringing of a patent infringement action.

C. The Effect of Rebuttable Adverse Presumptions on Complaint Counsel's Burden of Proof.

As Complaint Counsel has detailed in various submissions,[102] in 1998, Rambus embarked on a broad campaign to destroy documents that might be harmful in litigation with DRAM manufacturers and the Federal Trade Commission. Beginning on "Shred Day 1998," when Rambus destroyed 20,000 pounds of material in just five hours, Rambus intentionally purged millions of documents relating to almost every issue in this case. *See* Complaint Counsel's Adverse Inference Mem. at 3-5.

After reviewing over 150 pages of briefing material and 120 exhibits, Judge Timony concluded that Rambus engaged in "spoliation of evidence."[103] Accordingly, Judge Timony sanctioned Rambus by imposing the following seven adverse presumptions:

(1) Rambus knew or should have known from its pre-1996 participation in JEDEC that developing JEDEC standards would require the use of patents held or applied for by Rambus;[104]

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[102] *See* Memorandum in Support of Complaint Counsel's Motion for Default Judgment Relating to Respondent Rambus Inc.'s Willful, Bad-Faith Destruction of Material Evidence ("CC Default Judgment Mem."); Complaint Counsel's Corrected Reply to Rambus Inc.'s Memorandum in Opposition to Motion for Default Judgment ("CC Reply"); Memorandum in Support of Complaint Counsel's Motion for Additional Adverse Inferences and Other Appropriate Relief Necessary to Remedy Rambus Inc.'s Intentional Spoliation of Evidence ("CC Adverse Inference Mem."); Reply in Support of Complaint Counsel's Motion for Additional Adverse Inferences and Other Appropriate Relief Necessary to Remedy Rambus Inc.'s Intentional Spoliation of Evidence ("CC Adverse Inference Reply").

[103] *See* Judge Timony's February 26, 2003, Order on Complaint Counsel's Motions for Default Judgment and for Oral Argument at 4 (finding that Rambus engaged in "spoliation of evidence")("Adverse Inference Order"); s*ee also* Judge Timony's February 26, 2003, Order Granting Complaint Counsel's Motion for Collateral Estoppel (reconsideration denied) at 5 (finding that Rambus "instituted its document retention policy" for the "purpose of getting rid of documents that might be harmful in future litigation.") ("Collateral Estoppel Order").

[104] On February 27, 2003, Complaint Counsel filed a Motion to clarify several "implicit understandings" in the Adverse Inference Order. *See* Complaint Counsel's Request for Immediate Clarification of February 26, 2003 Order on Complaint Counsel's Motions for Default

(2) Rambus never disclosed to other JEDEC participants the existence of these patents;

(3) Rambus knew that its failure to disclose the existence of these patents to other JEDEC participants could serve to equitably estop Rambus from enforcing its patents as to other JEDEC participants;

(4) Rambus knew or should have known from its participation in JEDEC that litigation over the enforcement of its patents was reasonably foreseeable;

(5) Rambus provided inadequate guidance to its employees as to what documents should be retained and which documents could be purged as part of its corporate document retention program;

(6) Rambus's corporate document retention program specifically failed to direct its employees to retain documents that could be relevant to any foreseeable litigation; and

(7) Rambus's corporate document retention program specifically failed to require employees to create and maintain a log of the documents purged pursuant to the program.

Adverse Inference Order at 8-9. Moreover, on the same day he issued his Adverse Inference Order, Judge Timony separately ruled that Rambus should be barred, by principles of collateral estoppel, from contesting that it destroyed documents to eliminate evidence that the company feared could be harmful in anticipated JEDEC-related litigation. *See* Collateral Estoppel Order at 5. Thus, Judge Timony ruled that the following fact findings shall be binding upon Rambus for purposes of this litigation:

(1) When "Rambus instituted its document retention policy in 1998," it did so,

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Judgment and for Oral Argument at 1-3 ("Clarification Mem."). Complaint Counsel asked Judge Timony to clarify this inference by modifying it as follows: "While participating in JEDEC's development of RAM standards, Rambus knew or should have known that JEDEC RAM standards being developed at that time (i.e., prior to mid-1996) would require the use of patents held or applied for by Rambus." Complaint Counsel also asked that references to patents in the adverse inferences be broadened to cover patents applied for by Rambus. Judge Timony, in denying Complaint Counsel's Motion, stated that these modifications were unnecessary because it would add self-evident detail. Order Denying Request for Clarification, February 27, 2003.

"in part, for the purpose of getting rid of documents that might be harmful in litigation."

(2) Rambus, at the time it implemented its "document retention policy," "[c]learly . . . contemplated that it might be bringing patent infringement suits during this time frame" if its efforts to persuade semi-conductor manufacturers to license "its JEDEC-related patents" "were not successful."

(3) Rambus's "document destruction" was done "in anticipation of litigation."

Id.

The burden of proof has shifted to Rambus to rebut these presumptions. Moreover, because of "Rambus's utter failure to maintain an inventory of the documents its employees destroyed," the findings as to Rambus's intentional spoliation should have a much more pervasive impact on the burdens of proof in this case. Adverse Inference Order at 7. Rambus's bad acts and the resulting loss of evidence have handicapped Complaint Counsel's ability to prove each issue of fact which may have been affected by the document destruction.[105] Yet the truth is we cannot identify with certainty <u>any</u> category of evidence <u>not</u> tainted by spoliation. Thus, it is profoundly inappropriate to identify with certainty any issues on which the risk of erroneous outcome should not be born by Rambus: "It has long been the rule that spoliators should not benefit from their wrongdoing." *West v. Goodyear Tire & Rubber Co.*, 167 F.3d 776, 779 (2d Cir. 1999). Accordingly, Complaint Counsel respectfully requests, and equity demands, that Your Honor not reward Rambus for its bad acts by holding Complaint Counsel to an unreasonable standard of proof as to any issue for which the supporting evidence may have fallen prey to Rambus's "document retention" policy.

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[105] As Your Honor recognized, "Respondent's spoliation places Complaint Counsel in a most difficult situation." Order Denying Complaint Counsel's Motion for Additional Adverse Inferences and Other Appropriate Relief, at 4 n.2 (April 15, 2003).

(1) Rambus Bears the Burden of Proof on Several Core Issues.

As a sanction for its intentional destruction of documents, Rambus now bears the burden of proving several key factual issues in this case. When courts impose an adverse presumption as a sanction for destruction of evidence, the presumption shifts the burden of persuasion to the spoliating party. *See Welsh v. United States*, 844 F.2d 1239, 1245-46 (6th Cir. 1988); *Nation-Wide Check Corp. v. Forest Hills Distributors, Inc.*, 692 F.2d 214, 216-20 (1st Cir. 1982) (adverse inference from document destruction is sufficient to shift to the spoliator the burden of tracing proceeds of money order sales).[106] In *Welsh*, a medical malpractice case, several hospital employees destroyed evidence. The district court created a rebuttable presumption of negligence and causation, which the Sixth Circuit affirmed, holding that "[t]he burden thus shifts to the defendant-spoliator to rebut the presumption and disprove the inferred element of plaintiff's prima facie case." 844 F.2d at 1248.

As in *Welsh* and *Nation-Wide Check*, the sanctions imposed by Judge Timony shift the burden of proof to Rambus with respect to each rebuttable presumption. Rambus bears the burden of rebutting, among other things, that while participating in JEDEC's development of RAM standards, Rambus knew or should have known that JEDEC RAM standards being developed at that time (*i.e.*, prior to mid-1996) would require the use of patents held or applied for by Rambus; that Rambus never disclosed to other JEDEC participants the existence of these patents or patent applications; and that its failure to disclose the existence of these patents or patent applications to other JEDEC participants could serve to equitably estop Rambus from

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[106] Even courts that do not specifically impose a heightened rebuttal standard, such as the D.C. Circuit, recognize the mitigating effect such presumptions should have on the plaintiff's burden. *See, e.g., Battocchi v. Washington Hospital Center*, 581 A.2d 759, 765 (Ct. App. D.C. 1990) ("[S]uch [a] presumption aids the case of an opposite party having the burden of proof.").

enforcing its patents as to other JEDEC participants. Shifting the burden of proof on these issues ensures that Rambus will not benefit from its intentional destruction of documents and sends a message to similarly tempted entities that the FTC will not tolerate spoliation of evidence affecting its adjudicative proceedings.

(2) Judge Timony's Spoliation Findings Ease Complaint Counsel's Burden of Persuasion.

Judge Timony's findings that Rambus destroyed documents in anticipation of litigation should also lessen Complaint Counsel's burden in proving other issues potentially affected by Rambus's destruction of documents.[107] As recognized by Judge Timony, sanctions for spoliation of evidence serve three policy rationales, "(1) deter parties from destroying evidence; (2) place the risk of an erroneous evaluation of the content of destroyed evidence on the party who destroyed it; and (3) place the party injured by the loss of evidence helpful to its case to where the party would have been in the absence of spoliation."[108] Adverse Inference Order at 4-5. One way to satisfy these objectives is to ensure that the innocent party bears a reasonable burden in light of the spoliation. *See Welsh* at 1249 (holding that the spoliator should bear the onus of proving a fact placed into doubt by the destruction of evidence); *Anderson v. Cryovac, Inc.*, 862 F.2d 910, 925 (1st Cir. 1988) ("As between guilty and innocent parties, the difficulties created by

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[107] *See* Complaint Counsel's Adverse Inference Proposed Order, Attachment A (listing 100 issues impacted by Rambus's document destruction campaign).

[108] The importance of these three rationales is ancient and well-established law. *See Pomeroy v. Benton*, 77 Mo. 64, 86 (1882); *Armory v. Delamirie*, 1 Strange 505, 93 Eng. Rep. 644 (1722) (cited by then-appellate-Judge Breyer in *Nation-Wide Check*, 692 F.2d at 218, to illustrate that adverse inferences serve both prophylactic and punitive purposes). Thus, "the critical question for the courts is not whether some kind of adverse consequence should flow from the fact of destruction of evidence, but rather how best to integrate the teachings of *Armory* into a coherent scheme of 20th century evidentiary principles, that includes inferences, presumptions, and shifting burdens of production and persuasion." *Welsh*, 844 F.2d at 1246.

the absence of evidence should fall squarely upon the former.").

Although Complaint Counsel expect to establish all the elements by a preponderance of the evidence at trial, Rambus's document destruction must be considered when evaluating whether Complaint Counsel has met its burden of proof. To the extent that Your Honor finds Complaint Counsel's proof on any issue to be lacking, Rambus should be required to show that the record as it pertains to that issue has not been affected by Rambus's spoliation of evidence. Rambus cannot be permitted to exploit any insufficiency in proof created by its own misconduct.

IV. Rambus Engaged in A Course of Conduct That Was Exclusionary and Anticompetitive.

The antitrust laws have long condemned exclusionary conduct. Broader legal principles condemn the type of exclusionary conduct at issue here. Whether the issue arises in an antitrust context, in a patent context, or in the context of common-law fraud claims – as was true in the *Infineon* case – the remedy typically has been the same: patent holders who engage in wrongful conduct in order to cover standards have been forbidden from enforcing their patents or are otherwise forced to forgo their ill-gotten gains. Rambus's exclusionary, misleading, subversive conduct violated the antitrust laws and should result in a bar on the future enforcement of its relevant patents.

A. Manipulation of a Standard-Setting Process in Order to Restrict Competition or Attain a Monopoly Violates the Antitrust Laws, and Leads to the Unenforceability of Patents.

Rambus engaged in conduct that has been held unlawful in the patent context, the common-law-fraud context, and, most important, the antitrust context. Rambus's conduct will be shown at trial to be of a type that has been held inequitable and to erect a bar on the enforcement of the patent. Its conduct will also be shown to have been fraudulent, or, at a

minimum, sufficiently misleading as to be deceptive. And, most important, these legal wrongs will be shown to violate basic principles of antitrust law.

Rambus's conduct, and types like it, has been established in patent cases as unlawful. *Stambler v. Diebold, Inc.*, 11 U.S.P.Q.2d 1709, 1988 WL 95479 (E.D.N.Y., Sept. 2, 1988), *aff'd mem.*, 878 F.2d 1445 (Fed. Cir. 1989), is one example. That case dealt with an inventor who participated in a standard-setting organization ("SSO") for automatic-teller machines, where he became aware that the SSO was considering the adoption of technology that would infringe his patent. He left the SSO without informing the organization of his patent, and did not seek to enforce the patent until roughly ten years later, once the standard incorporating his patent had been widely adopted throughout the industry. The court held that the inventor's failure to identify his patent was an affirmatively misleading breach of a duty to speak. 1988 WL 95479, at *6. On this basis, the court estopped the inventor from enforcing his patent.

In another case, *Wang Laboratories, Inc. v. Mitsubishi Electronics America, Inc.*, 103 F.3d 1571 (Fed. Cir. 1997), the court deemed Wang to have granted an implied license to Mitsubishi after it deceived Mitsubishi into adopting its patented technology for Mitsubishi's new memory chips. Mitsubishi met with Wang on several occasions to discuss the design of its new memory chips, which Wang was negotiating to purchase from Mitsubishi. Wang offered several suggestions, which happened to involve the use of technology for which Wang held patents. Wang did not disclose its patent position to Mitsubishi, however, and Mitsubishi adopted Wang's proposals. Mitsubishi subsequently began to mass-produce these chips, selling many of them to Wang, and in the process establishing a *de facto* industry standard. Several years later, Wang sued Mitsubishi for patent infringement. The court held that Wang's course of conduct entitled Mitsubishi to an implied license to practice the patents. 103 F.3d at 1582. It

thus precluded Wang from using its deceptive conduct to enrich itself through royalty payments.

Just as courts, in the patent context, have condemned deceptive conduct designed to capture patent rights over an industry standard, antitrust law has sanctioned such conduct – deceptive or otherwise – through which a firm seeks to manipulate the activities of an SSO to achieve an anticompetitive result. Standard-setting activities, properly focused and contained, serve to promote consumer welfare. *See Indian Head, Inc. v. Allied Tube & Conduit Corp.*, 486 U.S. 492, 501 (1988). Yet courts recognize that, because of the influential nature of standards, such organizations often wield "great power in the Nation's economy." *American Soc'y of Mech. Eng'rs, Inc. v. Hydrolevel Corp.*, 456 U.S. 556, 570 (1982). Because of that power, antitrust law has been applied to SSO activities to ensure that their activities have not been co-opted to benefit some or all of the association's members to the detriment of consumers. *See Hydrolevel*, 456 U.S. at 571 (SSOs are "rife with opportunities for anticompetitive activity"); *Radiant Burners, Inc. v. Peoples Gas, Light and Coke Co.*, 364 U.S. 656, 658 (1961). Accordingly, an SSO and its participants must operate within certain prescribed areas of conduct that are reasonable and applied with an even hand. When an SSO's activities "are not based on 'objective standards,'" thereby allowing it to act as an exclusionary mechanism, the Sherman Act is violated. *See Radiant Burners*, 364 U.S. at 658. Similarly, where an SSO fails to take adequate safeguards to protect the integrity of its decisions, allowing its members "to frustrate the competition in the marketplace," this too can lead to a violation of the antitrust laws. *Hydrolevel*, 456 U.S. at 571. Indeed, the Supreme Court has upheld antitrust liability against companies that manipulate or subvert a standard-setting process in order to cause the adoption of standards they favor, or the rejection of standards they oppose. *See Indian Head, Inc. v. Allied Tube & Conduit Corp.*, 486 U.S. 492 (1988).

Similarly, the Commission has previously taken enforcement action against a firm that misled a standard-setting group into selecting a standard over which the company held patent rights. It charged Dell Computer Corporation ("Dell") with engaging in unfair methods of competition by undermining the standard-setting process for the standard governing signals between a computer and its peripherals – a standard established by an organization known as VESA. *See In the Matter of Dell Computer Corp.*, 121 F.T.C. 616, 1996 FTC LEXIS 291 (1996). After allowing VESA to promulgate a standard and letting computer companies adopt it, Dell threatened to exercise patent rights that it had not previously disclosed to the association.[109] The FTC majority, in approving a consent decree that barred Dell from enforcing the patent at issue, determined that the wide acceptance of the standard "effectively conferred market power upon Dell as the patent holder," and that this market power "was not inevitable," as evidence showed that had VESA been aware of Dell's patent, it would have implemented a different, nonproprietary design. *Dell*, 121 F.T.C. at 624 n.2. More generally, it concluded that the deceptive conduct before an SSO, resulting in the requisite market impact, violated the Sherman Act and the FTC Act.[110]

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[109] As part of the approval process, a Dell representative allegedly certified that he knew of no patent, trademark, or copyright that the bus design would violate.

[110] Deceptive conduct, when it results in marketplace injury, is reachable under the antitrust laws, regardless of the factual context in which it occurs. *See, e.g.*, *Conwood Co. v. United States Tobacco Co.*, 290 F.3d 768, 783-84 (6th Cir. 2002) (destroying and removing competitors' racks and point-of-sale advertising, providing misleading sales information to store managers in order to minimize space made available to competitors, and entering into exclusive arrangements with retailers violated Section 2); *National Ass'n of Pharmaceutical Manufacturers, Inc. v. Ayerst Labs.*, 850 F.2d 904, 916 (2d Cir. 1988) (deceptive advertising used to perpetuate patent monopoly potentially violated the Sherman Act); *United States v. Microsoft Corp.*, 253 F.3d 34, 76-77 (D.C. Cir. 2001) (deceiving applications developers using Sun's Java programming language by falsely telling the developers that Microsoft's software would allow applications using them to work on all computer platforms constituted a violation of

The paramount objective of the forgoing legal principles is to preserve the neutrality and fairness of the standard-setting process to ensure that the public value of industry standards is not misappropriated to serve the private ends of a single firm, or group of firms, bent on achieving an undeserved monopoly. There is no prescribed form of conduct that must exist before antitrust law can take effect as a mechanism for ensuring that the public interest is served through an industry standard-setting process. Any form of conduct — deception or otherwise — that subverts the proper ends of a standard-setting collaboration, causing the process to be corrupted, and the public interest to be harmed, gives rise to antitrust concerns. Indeed, *Indian Head, Inc. v. Allied Tube & Conduit Corp.*, 817 F.2d 938 (2d Cir. 1987), *aff'd*, 486 U.S. 492 (1988), establishes this proposition. *Allied Tube* also establishes that when a firm or group of firms, with the purpose "of achieving an anticompetitive result," has "subverted," "undermined," and "violated the integrity" of a standard-setting association's processes, "literal compliance" with the organization's rules will not serve as a defense to antitrust liability. *See* 817 F.2d at 947 ("We refuse to permit a defendant to use its literal compliance with a standard-setting organization's rules as a shield to protect such conduct from antitrust liability").

Allied Tube concerned a private standard-setting process overseen by the National Fire Protection Association ("NFPA"). Allied Tube, a steel conduit producer, was concerned by the prospect that the plaintiff, Indian Head, a polyvinyl chloride ("PVC") conduit producer, might

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Section 2), *cert. denied*, 534 U.S. 952 (2001); *Taylor Publishing Co. v. Jostens, Inc.*, 216 F.3d 465, 482 (5th Cir. 2000) (defendant's hiring of its competitor's employees combined with a practice of steering the competitor's customers to the company could be predatory); *Caribbean Broadcasting System, Ltd. v. Cable & Wireless PLC*, 148 F.3d 1080, 1087 (D.C. Cir. 1998) (misrepresentations to advertisement purchasers about competitor's radio-signal coverage are sufficient to state a claim under Section 2); *Du Pont*, 729 F.2d at 137 ("collusive, predatory, restrictive [and] deceitful conduct that substantially lessens competition" violates the FTC Act).

succeed in persuading the NFPA to revise its standards code to permit PVC-based electrical conduit, in addition to the already permissible steel conduit. Allied Tube enlisted the help of other steel-pipe manufacturers in an effort to block the adoption of a PVC-accepting standard. The scheme they used to achieve this end essentially involved "stuffing the ballot box." Although in doing so Allied was technically "[a]cting within the letter of NFPA rules," it alone "arranged for 155 persons . . . to join the NPFA, to register as voting members, and the attend the annual meeting to note against the [PVC] proposal," at a cost of over $100,000, much of that covering membership fees. *Allied Tube*, 817 F.2d at 940. Other steel-pipe manufacturers did the same, and in the end they succeeded in defeating the PVC proposal.

The court of appeals affirmed a jury verdict and finding that "Allied's conduct subverted the consensus standard-making process of the NFPA, and constituted an unreasonable restraint of trade in violation of the antitrust laws." 817 F.2d at 941.[111] The Second Circuit thus rejected Allied Tube's argument that, "as a matter of law, its conduct did not constitute an unreasonable restraint of trade." *Id.* at 946. The court held that, "although Allied acted within the letter of the NFPA's rules," its conduct nonetheless

- "'circumvented' NFPA rules,"
- "subverted" NFPA's process,
- "violated the integrity" and was "inconsistent with the intent" of "NFPA's procedures,"
- was "inconsistent with the concept of 'consensus' standard-making," and
- was done with the purpose "of achieving an anticompetitive result — the

[111] Indian Head had appealed the negative vote to NFPA's "Standards Council," which in turn referred the matter to the "Board of Directors." *Id.* at 941. Yet the Board denied the appeal, "[f]inding that the NFPA rules had been circumvented, but not violated." *Id.*

exclusion of PVC conduit from the marketplace."

817 F.2d at 947. It thus concluded that "We refuse to permit a defendant to use its literal compliance with a standard-setting organization's rules as a shield to protect such conduct from antitrust liability." *Id.* The Supreme Court subsequently affirmed the holding of Sherman Act liability, echoing the words of the Second Circuit, stating: "The antitrust validity of these efforts is not established, without more, by petitioner's literal compliance with the rules." *Allied Tube & Conduit Corp. v. Indian Head, Inc.*, 486 U.S. 492, 509 (1988).

Allied Tube's holding is not limited to cases involving "subversion" of a standard-setting process through means such as those employed by Allied Tube. The Commission's majority statement in *Dell* expressly relied upon *Allied Tube* for the proposition that "a standard-setting organization may provide a vehicle for a firm to undermine the standard-setting process in a way that harms competition and consumers." *Dell*, 121 F.T.C. at 626. Courts likewise have applied *Allied Tube* to purely unilateral conduct. *See Stearns Airport Equip. Co. v. FMC Corp.*, 170 F.3d 518, 526 (5th Cir. 1999) (applying *Allied Tube* in the context of claims of unilateral monopolization, and noting that the Second Circuit in *Allied Tube* found that the behavior at issue "constituted exclusionary conduct").[112] Commentators as well generally recognize that deceptive conduct before standard-setting organizations violates the antitrust laws. *See* Herbert Hovenkamp, FEDERAL ANTITRUST POLICY: THE LAW OF COMPETITION AND ITS PRACTICE 23-24 (2d ed. 1999) (discussing *Allied Tube* as an example of the sort of "exclusionary conduct" that, when used as a means to achieve monopoly, can impose a substantial "social cost"); Mark R.

[112] It is of no consequence that Indian Head brought its case under Section 1 of the Sherman Act, alleging that Allied Tube had acted in concert with other members of NFPA. The conduct is exclusionary, with a harmful effect on competition, under either Section 1 or Section 2 of the Sherman Act (and, as explained below, Section 5 of the FTC Act).

Patterson, *Antitrust Liability for Collective Speech: Medical Society Practice Standards*, 27 IND. L. REV. 51, 84 (1993) (interpreting *Allied Tube* as "show[ing] little tolerance for deception in the standard-setting process"); A. Douglas Melamed, *Network Industries and Antitrust,* Address Before The Federalist Society 1999 WL 1257308, *6 (Apr. 10, 1999) (discussing *Allied Tube* as an example of various types of "anticompetitive tactics" through which firms may seek "to give themselves preferential access to controlling standards at the expense of competitors and sometimes at the expense of superior standards").

Legal commentators recognize the potential for manipulation of a standard-setting process, resulting in anticompetitive harms. As one expert in the field has noted, "The literature on antitrust and SSOs is voluminous." Mark A. Lemley, *Intellectual Property Rights and Standard-Setting Organizations*, 90 Cal. L. Rev. 1889, 1894 n.11 (2002). Furthermore, one of Rambus's economic experts – Professor David Teece – has written that "the 'evil' that the antitrust law seeks to address" in this context is "manipulation" of a standard-setting process in a way that leads to the "enhanced value" of relevant patents. David J. Teece & Edward Sherry, *Standards Setting and Antitrust*, at 45-46 (Business and Public Policy Working Paper) (Aug. 28, 2002) [CX1902]. This enhanced value results, as Professor Teece explains, from "lock-in" that can occur when a standard-setting organization adopts, and the relevant industry implements, an industry-wide standard. *Id.* at 16. As he explains, "*Ex ante*, prior to the adoption of the standard, there will typically be a range of feasible alternatives available," and hence if the existence of relevant patents is known, "choosing an alternative proposed standard" that works around the patents is not difficult. *Id.* at 15-16. On the other hand, "*ex post*, once firms have committed to the standard and made the requisite investment in complementary assets to make and sell the standardized product, switching to an alternative may be much less feasible." *Id.* at 16. This is

true, Professor Teece explains, for three reasons:

> First, the industry may have made investments in implementing the (patented) standard. . . . While from an economic standpoint those costs are often "sunk costs" (not recoverable), manufacturers clearly do not want to incur the additional costs associated with switching to another alternative.
>
> Second, the need/desire for compatibility (especially backwards compatibility with the existing installed product base) may make it costly to switch to a different standard.
>
> Third, there is often a significant coordination problem in getting all interested parties to switch to an alternative. For example, . . . switching to a different chip design would require changes, not only to the chips themselves, but to the motherboards and computers. The difficulties associated with coordinating the necessary changes may make it impracticable to switch away from the patented standard.

Id. Professor Teece not only acknowledges that antitrust law has an important role to play in policing anticompetitive conduct occurring in the context of private standard-setting activities, but in defending this proposition he essentially describes this case.

Rambus's conduct falls well within the parameters of *Allied Tube*. As explained in the next section, Rambus's conduct was unlawful and deceptive, such that it can be reached under the antitrust laws. As explained, Rambus's conduct reached the level of fraud or, at a minimum, came sufficiently close to demonstrate that it was misleading and deceptive, ultimately allowing it to acquire a monopoly over relevant markets that, absent its conduct, it would not have acquired. Indeed, its conduct directly contravened the policies of JEDEC and subverted the organization's fundamental purpose of avoiding standards that are covered by patents.

B. JEDEC Operates Under a Broad Collection of Policies, Rules, and Procedures Designed to Achieve the Fundamental Objective of Open Standards.

(1) JEDEC Is Committed to Developing "Open Standards" and Avoiding Patents Wherever Possible.

The fundamental purpose of the JEDEC organization, in the words of Rambus's representative to JEDEC, Richard Crisp, "is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903]. Creating "open" standards, free to be used by anyone, and unencumbered — whenever possible — by private patent rights, is JEDEC's main goal. Crisp, as explained above, plainly understood this, as would anyone who spent time attending JEDEC meetings or reviewing JEDEC's written policies.

The EIA Legal Guides, under which all JEDEC standardization programs operate, articulate the basic principles of the organization:

> All EIA standardization programs shall be conducted in accordance with the following basic rules: (1) They shall be carried on in good faith under policies and procedures which will assure fairness and unrestricted participation . . . (5) They shall not be proposed for or indirectly result in . . . restricting competition, giving a competitive advantage to any manufacturer, excluding competitors from the market.

EIA Legal Guide (3/14/83) JEDEC0009277 at 9282 [CX0202].

As JEDEC's rules themselves make clear, the organization's patent disclosure policy is part of a broad set of rules and procedures through which JEDEC seeks to achieve a more fundamental set of purposes and objectives, namely:

(1) "setting open standards";

(2) preventing "a single entity from stifling competition";

(3) being "especially careful not to unintentionally standardize patented technology";

(4) "prohibiting the incorporation of patented technology into a standard unless the patent owner is willing to grant a license on reasonable terms"; and

(5) requiring "JEDEC committee members to disclose, as early in the standard development process as possible."

Amicus Curiae Brief of JEDEC Solid State Technology Association in Support of Defendants-Appellees' Petition for Rehearing and Rehearing En Banc ("JEDEC Amicus Br.") at 2-3 (record citations omitted; emphasis added).

Attendance at JEDEC meetings or review of JEDEC's written policies demonstrates that the organization is firmly committed to these core principles. Indeed, Joel Karp, Rambus's Vice President of Intellectual Property, like Crisp, fully appreciated the nature of JEDEC's process. Before joining Rambus in 1997, Karp served as a JEDEC representative for his prior employer, Samsung, during roughly the same period when Rambus was a JEDEC member.[113] Karp explained his understanding of JEDEC's objectives and philosophy when Samsung sought to counter patent infringement claims filed against it by Texas Instruments. That suit focused largely upon Texas Instruments' failure to disclose patent-related materials to a standards body, and its subsequent effort to enforce such patents over standardized products. In a sworn declaration, Karp talked about his experience at JEDEC:

> I am familiar with the EIA (Electronics Industry Association) patent policy and I understand that other standard-setting groups have similar policies. My understanding of the EIA patent policy is that standards promulgated by standard-setting groups are "open" standards, unless the holder of an intellectual property right

[113] *See* Karp, *Micron v. Rambus* Dep. Tr. (8/7/01) at 313 [CX2102] (confirming that he participated in JEDEC from "December 1990 to March 1996").

> has previously disclosed during the standard-setting process its property interest and agreed to license its intellectual property rights on reasonable and non-discriminatory terms, or waive them altogether. . . . It is contrary to industry practice and understanding for an intellectual property owner to remain silent during the standard-setting process – and then after a standard has been adopted and implemented – later attempt to assert that its intellectual property covers the standard and allows it to exclude others from practicing the standard.

Declaration of Joel A. Karp, *In re Certain Electronic Products* (5/15/96) F-SEC00049 at 050 [CX2957]. In short, JEDEC's preference for non-proprietary standards were readily understood.

(2) JEDEC's Patent Disclosure Policy Was Well Understood by JEDEC Members.

a. JEDEC Undertook Extensive Efforts to Inform Its Members of the Applicable Disclosure Rules.

In order to carry out the basic purposes of the organization and ensure that the "basic rules" were observed during its standard-setting work, JEDEC adopted and applied a number of specific provisions. First, JEDEC specifically provided that all of its meetings are to "be conducted within the current edition of EIA legal guides . . . incorporated herein by reference." JEDEC Manual of Organization and Procedure, JEP 21-I, § 9.1 (10/00/93) JEDEC0009323 at 9340 [CX0208] ("JEDEC Manual" or "JEP 21-I"). As the JEDEC Manual explains, JEDEC standards "that require the use of patented items should be considered with great care." *Id*. § 9.3, at 9341. In addition, JEDEC's rules provide that "committees should ensure that no program of standardization shall refer to a product on which there is a known patent unless all the relevant technical information covered by the patent is known to the formulating committee or subcommittee, or working group." *Id*. The JEDEC Manual further provides:

> If the committee determines that the standard requires the use of patented items, then the committee chairperson must receive a written assurance from the organization holding rights to such

> patents that a license will be made available without compensation to applicants desiring to implement the standard, or written assurance that a license will be made available to all applicants under reasonable terms and conditions that are demonstrably free of any unfair discrimination.

Id. (emphasis added); *see also* JEDEC Manual JEDEC0009349 [CX0208]; EIA Style Manual for Standards and Publications of EIA, TIA, and JEDEC, EP-7-A, § 3.9 (8/00/90) JEDEC0009401 at 9409-10 [JX0054].

To implement these policies, JEDEC adopted a disclosure rule, pursuant to which all members had an obligation to disclose patents and patent applications that might involve the work of a JEDEC committee. As set forth in the JEDEC Manual:

> The Chairperson of any JEDEC committee, subcommittee, or working group must call to the attention of all those present the requirements contained in EIA Legal Guidelines, and call attention to the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking.

JEDEC Manual, § 9.3.1 JEDEC0009341 [CX0208]. This disclosure rule ensured that JEDEC committees and their members would be informed of relevant patents; indeed, only with such knowledge could members fulfill the requirements to consider "the use of patented items . . . with great care," to "ensure that . . . all the relevant technical information covered by the patent is known," and to obtain "a written assurance from the [patent holder] . . . that a license will be made available . . . under reasonable [and non-discriminatory] terms and conditions." *Id.* § 9.1, 9.3 at JEDEC0009341-42.

JEDEC for many years, long predating Rambus's involvement in the organization, has had rules relating to the disclosure of relevant intellectual property. But in the early 1990s, JEDEC's leadership – and in particular, the leadership of JEDEC's JC-42.3 subcommittee –

began to focus increased attention on ensuring that the rules were clearly articulated and explained at each meeting. The goal was to create a heightened level of awareness among JEDEC's members, new and old, concerning what JEDEC's rules and procedures required in terms of disclosure of relevant patents and patent applications. The person largely responsible for spearheading JEDEC's efforts in this regard was Jim Townsend, who served as Toshiba's JEDEC representative and was a long-time, active member of the JC-42.3 subcommittee. Townsend's efforts to draw increased attention to JEDEC's disclosure rules appear to have started, in earnest, around the time of JC-42.3's May 1991 meeting in Anchorage, Alaska, the minutes of which state:

> INTELLECTUAL PROPERTY: Toshiba noted that some of the procedure documents have been issued a long time ago but because of high Committee turnover many reps don't know what the policies are. Toshiba recommended that at each meeting a showing be made to explain what the intellectual property policies are. . . . The important thing is disclosure. If it is known that a company has a patent on a proposal then the Committee will be reluctant to approve it as a standard.[114]

Minutes of JC-42.3 Meeting (5/9/91) JEDEC0013930 at 932-933 [JX0005].[115] As reflected in the minutes from the next meeting of the JC-42.3 subcommittee, in September 1991, Townsend followed through with his proposal to "explain" JEDEC's intellectual property policies "at each

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[114] This excerpt references "Attachment B," which is a document entitled, "PATENT TRACKING, JIM TOWNSEND, TOSHIBA." Minutes of JC-42.3 Meeting (5/9/91) JEDEC0013949-51 [JX0005]. It thus appears that the May 1991 meeting was the first occasion on which Townsend presented the JEDEC "Patent Tracking List," which is a practice that he and others followed for many years thereafter.

[115] The same portion of the minutes from the May 1991 JC-42.3 meeting also state, "It was noted that the Wang patent case on Memory Modules has gone to trial and the JC-42 Committee minutes were subpoenaed in the case." *Id.* at JEDEC0013933. As explained below, Townsend's zeal on the patent disclosure issue had a great deal to do with his, and his company's (Toshiba's), experience in the *Wang* litigation.

meeting":

> PATENT TRACKING: Mr. Townsend gave a presentation (see Attachment C). He reminded everyone of the responsibility to inform.

Minutes of JC-42.3 Meeting (9/18/91) JEDEC0013989 at 991 [JX0007]. At the next meeting of the JC-42.3 subcommittee, in December 1991, Jim Townsend was selected as the next Chairman of the 42.3 subcommittee. *See* JC-42.3 Meeting Minutes (12/4-5/91) JEDEC0014181 at 192 [JX0010]. His selection coincided with the first meeting attended by a representative of Rambus, Billy Garrett. *See id.*, at JEDEC0014182 (noting that Mr. Garrett was in attendance on behalf of Rambus). The JC-42.3 subcommittee's work on a synchronous DRAM standard really began to take focus at this meeting.[116] The December 1991 meeting otherwise followed much the same pattern as previous and subsequent JC-42.3 meetings, including a presentation by Townsend to all members, reminding them of their obligations to disclose relevant patents and patent applications. *See id.* JEDEC0014191 ("PATENT MATTERS: Mr. Townsend presented the patent policies and a list of patents identified.").

Between December 1991 and June 1996, the period Rambus was a member of JEDEC, JEDEC leadership and members took a series of steps to ensure that all members understood these obligations. JEDEC staff and leadership conveyed the existence and scope of the patent policy and rules to members orally at every meeting, in every set of minutes, in JEDEC and EIA Manuals, at the top of ballots for standards, and through the application of the policy to the real-

[116] Mr. Garrett's "Trip Report" from the meeting makes this clear. That report notes, among other things, that there was fairly wide support for certain technological features to be included in "the definition of synchronous DRAMs," including programmable "[l]atency" and programmable "[b]urst sequence and wrap length." Garrett Trip Report (12/4/91) R200468 at 468 [CX0670].

life disclosure (and in some cases non-disclosure) of patents and patent applications. Every step of the JEDEC process contained some statement – either oral or written – that informed members of their obligations as a voluntary member of an organization, the primary purpose of which was to develop standards that were free of cumbersome intellectual property claims. Through presentations, documents, and actual practice, all JEDEC members became aware of their obligations under the patent policy.

Townsend spearheaded the JC-42 committee's effort to educate its members. Townsend's views on patent disclosure were well known to anyone who attended JEDEC meetings in the early through mid-1990s. As some have said in deposition testimony, Townsend was a zealot on this issue. As the evidence at trial will make abundantly clear, Townsend was committed to do everything possible to draw attention to, and highlight the importance of, JEDEC's patent disclosure policy. This is evident not only from the minutes of JC-42.3 meetings throughout the period of Townsend's involvement, but also from correspondence between Townsend and various JEDEC participants, staff, and officials. *See, e.g.*, Kinn Letter (3/11/91) JEDEC0012906-07 [CX0317] (in responding to Townsend's earlier "query" on various patent policy questions, Kinn, Vice President of EIA's Engineering Department, identified "[t]he basic documents containing our policy on patents," including "The JEDEC Manual JEP-21-H," and expressed mutual interest in taking steps to "sensitize members" to the importance of patent-related disclosures).

Beginning in mid-1991, before the JEP 21-I Manual was adopted, Townsend made an oral presentation of the JEDEC patent and disclosure policies at the beginning of every meeting of the JC-42.3 subcommittee. JEDEC participants uniformly remember the Townsend presentations as one of the most important sources of information about the JEDEC disclosure

policy:

> Q: And how was the policy communicated to the members?
>
> A: Jim Townsend ran a session that ran one hour and sometimes more that presented the policy, asks – asked for any new issues and showed a tracking record of all of the past and with the addition of new issues. He kept that going for every meeting.

Kelley, *Rambus v. Infineon* Dep. Tr. (1/26/01) at 94-95.

> Q: How did you come to have an understanding of the contents of the JEDEC patent policy?
>
> A: Through several means. Early on those means would have included discussions with Gordon Kelley. In 1990 I believe a new style manual was published which included a more detailed policy. And at least by 1991 Jim Townsend was regularly reviewing policy at the start of meetings and in fact, including a patent tracking list.

Kellogg, *In the Matter of Rambus* Dep. Tr. (2/24/03) at 14-15.[117]

The patent presentations were not the only means that Townsend utilized to keep JEDEC members well aware of their obligations under the patent policy. He also developed a memorandum soliciting patent-related information that, although nominally directed to members who previously had disclosed patent information, was included in the minutes of each meeting. The minutes of the September 1992 meeting (which Rambus attended) include a memorandum entitled "Patent Issues in JEDEC." These "Patent Issues" memoranda requested that members "report your company's position on patents held or applied for." *E.g.*, JC-42.3 Committee on

[117] Townsend was not the only participant to provide patent presentations to the membership. The chairpersons of every committee and subcommittee were charged with giving a patent presentation at the beginning of each session. *See* Tabrizi, *Micron v. Rambus* Dep. Tr. (3/12/01) at 272-73 (stating that he discussed the obligation to disclose patent applications in his role as a chairman).

RAM Memories, Minutes of Meeting No. 64, Attachment A (9/16-17/92) JEDEC0014916 at 14928 [CX0042]. The memoranda, which were regularly attached to meeting minutes, also attached the patent tracking list that alerted participants to patent-related information that had been disclosed.[118]

Members were also informed of the patent policy through the various JEDEC and EIA publications that addressed the policy. The JEDEC Manual set forth in the most specific terms members' obligations under the JEDEC disclosure rule. In October 1993, the Manual was revised to emphasize to members that the disclosure rule was obligatory, that it applied to all participants, and that it applied with equal force to patent applications:[119]

> **9.3.1 Committee Responsibility Concerning Intellectual Property** The Chairperson of any JEDEC committee, subcommittee, or working group must . . . call attention to the obligation of all participants to inform the meeting of any knowledge they may have of any patents, or pending patents, that might be involved in the work they are undertaking.

JEDEC Manual of Organization and Procedure, JEP 21-I (10/00/93) JEDEC0009323 at 9341 [CX0208]. JEDEC also added a footnote to Section 9.3 of the JEDEC Manual, which refers to the use of a "patented item," to clarify that the term "patented" also refers to items covered by a

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[118] The existence of pending patents on the patent tracking list confirms that JEDEC members understood their obligations included disclosure of patent applications. *See, e.g., id.* at JEDEC0014931.

[119] The 1993 revision did not entail a change in the patent policy; rather it was a mere clarification of what the members and the JEDEC staff previously understood. *See, e.g.*, Meyer, *Rambus v. Infineon* Dep. Tr. (12/13/00) at 177-79 [CX2057]; Tabrizi, *Micron v. Rambus* Dep. Tr. (3/12/01) at 280-81; Russell, *Rambus v. Infineon* Dep. Tr. (1/31/01) at 296-97. Furthermore, the 21-I Manual is entirely consistent with longstanding EIA policy. As explained by John Kelly, JEDEC's President and General Counsel, his understanding since he began working at EIA in 1990 was that the EIA patent policy required the disclosure of patent applications. Kelly, *In the Matter of Rambus* Dep. Tr. (2/26/03) at 41-42.

pending patent:

> ***For the purpose of this policy, the word "patented" also includes items and processes for which a patent has been applied and may be pending*.

Id., § 9.3 at JEDEC009341. In addition to the operative language contained in the body of the Manual, Appendix E to the 21-I Manual contained the following summary of the EIA/JEDEC patent policy.

> Standards that call for the use of a patented item or process may not be considered by a JEDEC committee unless all of the relevant technical information covered by the patent or pending patent is known to the committee, subcommittee, or working group.

Id., Appendix E, JEDEC009349.

JEDEC further advanced its policy by placing a reminder notice on the top of the "Meeting Attendance Roster" that each participant in a JEDEC meeting was required to sign. The caption at the top of the Meeting Attendance Roster contained the following language: "Subjects involving patentable or patented items shall conform to EIA Policy . . . Consult EIA General Counsel about any doubtful question." *See* JEDEC Meeting Attendance Roster with Part I, General Guides Applicable to all EIA activities, I140075-76 [CX0306]. JEDEC also added a separate set of boxes to the ballot form again indicating the obligations of participants to disclose relevant patent information. *See, e.g.*, JEDEC Ballot JC-42.3-92-83, item 376.1 (6/11/92) J0009473-75 [CX0253].

Members also understood their obligations by participating in or observing discussions of patent-related issues within JEDEC. One particularly memorable event was the controversy involving the alleged failure of Texas Instruments to disclose properly its issued patent relating to Quad CAS technology. After JEDEC adopted the standard, Texas Instruments began to assert

patent rights over devices using its patented Quad CAS technology. The issue first arose at the JC-42.3 subcommittee meeting in September 1993, when Micron accused Texas Instruments of having failed to comply with the JEDEC disclosure policy. JEDEC Secretary Ken McGhee summarized the incident in a memorandum to JEDEC and EIA General Counsel John Kelly:

> TI did not disclose to the Committee that they had this patent until JEDEC approved some standards. The Committee is very suspicious of TI because TI did not pursue any requests for royalties until after the JEDEC standard was approved.

McGhee Memorandum (11/2/93) JEDEC0000343 at 343 [CX0346]; *see also* McGhee Letter (11/3/93) JDC001761-762 [CX0452] (distributing to all JC-42.3 members a memo, discussed by Jim Townsend at the September 1993 meeting, drawing their attention to "the existing rules of the EIA governing patentable matters," and reminding them of their obligation to relevant "patents held and applied for").

The Quad CAS issue came to a head at the December 1993 meeting of the JC-42.3 subcommittee. The meeting minutes summarize in formal terms what many witnesses recall as a heated debate:

> Mr. Kelley noted that the letter from TI [explaining its position] does not address the key issue that the Committee was not informed of TI's patent. TI was asked why the Committee was not informed of the patents. TI did not respond because litigation is going on. . . . –Samsung: We are reluctant to vote yes [on the ballot relating to the proposed standard] because we do not think TI is following the patent policy. . . . Micron noted that all companies should have equal access to a standard developed by the Committee. . . . –Sanyo: It is understood that if and when TI conforms to the EIA policy, work should continue. . . . if TI has knowingly and intentionally violated the EIA/JEDEC patent policy, EIA may need to consider additional actions/discussions with TI.

JC-42.3 Committee on RAM Memories, Minutes of Meeting No. 69 (12/8-9/93) JEDEC0015652 at 0015659 [JX0018]. The following month, Gordon Kelley of IBM wrote to Buf Slay of Texas

Instruments, expressing concern about the impact that TI's conduct could have on JEDEC's work:

> I am and have been concerned that this issue can destroy the work of JEDEC. If we have companies leading us into their patent collection plates, then we will no longer have companies willing to join the work of creating standards; i.e., widely used designs. . . .
>
> Our DRAM work on JC-42 is particularly exposed. . . . If we allow JC-42 standards to be used for patent collection purposes, then we do a great disservice to the very sort of industry that feeds us.
>
> This issue on the Quad CAS patents has brought my concern to the surface. If we on JEDEC council do not deal with it completely, we set ourselves up for bigger problems in the future.

Kelley Letter (1/14/94) JEDEC0000002 [CX2384].

At the following meeting in March 1994, the issue was revisited. TI requested a clarification of the Committee's interpretation of the patent policy, which was provided:

> Applicability of patents to use of JEDEC standards was discussed. The issue is warning, IBM noted. Failure to disclose a patent prevents the Committee from considering the standard.
>
> The Committee was asked if the patent policy is clear. The Committee felt it was clear.

JC-42.3 Committee on RAM Memories, Minutes of Meeting 70 (3/9/94) JEDEC0015797 at 15800-01 [JX0019]. Kelly elaborated, explaining that "[w]ritten assurance must be provided by the patent holder when it appears to the committee that the candidate standard may require the use of a patented invention." Kelly Memo (3/29/94) JDC013843 at 844 [CX0355]. On May 12, 1994, JC-42 Secretary, Ken McGhee, forwarded Mr. Kelly's response to all members of the JC-42 committee. *Id.*, JDC013843. Richard Crisp was present to witness the whole episode, and reported the details back to others at Rambus:

> TI was chastized for not informing JEDEC that it had a 1987 patent on quad CAS devices. . . . The bottom line is that all quad CAS devices will be removed from standard 21C.

Crisp E-Mail (10/5/93) R155825 at 825 [CX0710].

JEDEC's multiple efforts to inform members of the requirements of its disclosure policy were, in total, very effective. The combination of the sign-in sheet, the JEP 21-I Manual, the ballot forms, Jim Townsend's oral presentations at the beginning of each meeting, Mr. Townsend's follow-up memoranda to members holding relevant patents or applications, and discussion and debate within JEDEC (both written and oral) were more than adequate to ensure that each and every member of JEDEC was fully aware of the substance or their obligations under the JEDEC rules.

b. JEDEC's Members Understood the Rule to Require All Members to Disclose Patents and Patent Applications of Which They Were Aware That Were Relevant to Standards Under Consideration.

JEDEC representatives and members understood clearly that JEDEC implemented a patent policy, consisting of a disclosure obligation and an assurance with respect to licensing terms, in support of JEDEC's goal of setting "open" standards that do not unintentionally permit one company to obtain monopoly power and collect royalties by means of asserting a patent over a technology used in the standard. Reese Brown, a former consultant to JEDEC and long-time attendee of the JC-42.3 subcommittee, explained the two components of the JEDEC patent policy:

> Q. Can you tell me what the patent policy is?
>
> A. Well, there are two parts. One that says that whenever material comes up in the committee for discussion and for voting, any members who are aware of any patent position or potential patent positions on the material should and are

obligated to reveal that to the committee at that time.

Q. When you say "patent positions or potential patent positions," does that mean either issued patents or pending patent applications?

A. Issued patents or pending patent material. The other portion of the policy has to do with if a specific patent material has been -- or patent positions have been identified in connection with a proposal that is in the process of being approved for a ballot for standardization, the owner of that patent is obligated to adhere to the JEDEC policy and issue a letter stating that they will license that in a nondiscriminatory fashion and a reasonable royalty. And lacking that letter, the committee has the option of withholding the approval of that standard.

Brown, *Rambus v. Infineon* Dep. Tr. (4/5/01) at 80-81 [CX2076]. Thus the policy had two components, a disclosure rule and a licensing rule. In this case, the disclosure rule, and Rambus's failure to comply with it, is principally at issue.

The purpose behind this rule was well recognized as necessary to avoid precisely the circumstancs presented in this litigation. John Kelly, President and General Counsel of JEDEC, explained the purpose of the JEDEC policy:

> My understanding of the reason for the patent policy is that the patent owner in effect is given a monopoly by the federal government over a particular technology, and that the patent policy is designed to disclose the existence of those rights or the claim to those rights as early in the process as possible so that EIA and its standard developing committees do not inadvertently give that patent owner additional market power over and beyond that which was conferred by the federal government and thereby create a real monopoly over a particular line of commerce or over a particular technology. So it's designed in general to avoid the serious antitrust problems that could arise if a patent owner were to embed its technology or that technology were to be embedded in a standard without the knowledge of the other players in the industry.

Kelly, *Rambus v. Infineon* Dep. Tr. (1/9/01) at 37-38. Other JEDEC members have described the

purpose of the policy in similar terms. For example, Samuel Calvin and Kevin Ryan, long-time representatives of Intel and Micron, respectively, at the JC-42.3 subcommittee and both included on Rambus's preliminary witness list, each described the purpose of the policy simply. *See* Calvin, *In the Matter of Rambus* Dep. Tr. (1/13/03) at 81 ("The rationale is to not issue a standard for general use unless you were aware of any of the patent liabilities that might affect it.").[120] Ken McGhee, JEDEC Secretary to the JC-42.3 subcommittee, described the disclosure policy similarly. McGhee, *Micron v. Rambus* Dep. Tr. (8/10/01) at 65-66 ("[T]he policy was basically that if a standard in development related to a patent that somebody that was a member of the committee was either in the process of getting or already had issued, a pending or issued patent, there was a responsibility to disclose that to the committee."); *see also* Brown, *Rambus v. Infineon* Dep. Tr. (4/5/01) at 81 [CX2076] ("[W]henever material comes up in the committee for discussion and for voting, any members who are aware of any patent position or potential patent positions on the material should and are obligated to reveal that to the committee at that time."). Moreover, the testimony at trial will confirm that the policy effectuated a binding rule, not merely a generic hope.

> Q. OK. In other words, it was not your understanding that the policy was to simply encourage reporting?
>
> A. No, it was mandatory.

Russell, *Rambus v. Infineon* Dep. Tr. (1/31/01) at 294. The rule was therefore well understood to

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[120] *See also* Wagner, *In the Matter of Rambus* Dep. Tr. (1/16/03) at 49-50 ("My understanding is the spirit of the policy is to make sure that if we're standardizing something that is going to have an issue that people need to get a license for any aspect of it, the group has an obligation to make that public so the group can decide whether or not they want to proceed down that path or go in a different direction, the main goal being not to waste everybody's time developing things that everybody is going to have to pay royalties on. That's not the objective of the group.").

require the disclosure of intellectual property.

The policy applied both to patents and patent applications. *See* Russell, *Rambus v. Infineon* Dep. Tr. (1/31/01) at 294-295. ("Q. And it was your understanding that the policy applied to both patents as well as patent applications, correct? A. Absolutely.") (emphasis added); Tabrizi, *Micron v. Rambus* Dep. Tr. (3/12/01) at 279 ("Q. Okay. And was it the policy of JEDEC to require disclosure of patent applications during the entire period of time that you were attending JEDEC meetings? A. Yes.") (emphasis added). Moreover, that understanding of the policy was well established early in Rambus's period of membership at JEDEC. *See* Donohoe, *Micron v. Rambus* Dep. Tr. (2/6/01) at 174 ("Q. And how long has JEDEC's patent policy required disclosure of patent applications? A. Well, I think it's gone back a long time, but it was formally put into writing, I believe, in early 1993, or sometime in 1993."). As summarized by Mr. Landgraf:

> Well, the way I always treated this was that it applied to both patents that – that were being applied for as well as patents that were owned because . . . the intention of the policy is to standardize things without any kind of hidden agendas, if you will . . . .
>
> I think the distinction between patent applications and patent pending was -- I mean, I think if you make a distinction between the two, then you're really violating the spirit of how the entire organization works, and, so, we didn't attempt to make that distinction, that's how we operated, and I think the vast majority of the companies in JEDEC would probably come – agree with my – my assessment on this.

Landgraf, *In the Matter of Rambus* Dep. Tr. (12/17/02) at 118-20. The policy, as will be shown at trial, unquestionably required disclosure of patents and patent applications.

Members understood the duty to apply universally, not just to members making presentations. John Kelly, President and General Counsel of JEDEC, Ken McGhee, the JEDEC

Secretary to the JC-42.3 subcommittee, and Reese Brown, a consultant to JEDEC regularly present at JC-42.3 subcommittee meetings, all state that the policy is not so limited:

> Q. And I asked you earlier if there was any different duty for a sponsor of a standard to disclose patents or patent applications if in fact there's a duty to do that?
>
> . . . .
>
> A. . . . [T]he duty is based on knowledge and the duty is not higher or different for a sponsor per se unless they have a higher degree of knowledge. It's all tied to knowledge.

Kelly, *Rambus v. Infineon* Dep. Tr. (1/9/01) at 68-69. McGhee shared this view:

> Q. . . . . Any difference in the disclosure requirements for patents or applications for patents that pertained to a sponsor, as opposed to any other member of JEDEC?
>
> A. No.

McGhee, *Rambus v. Infineon* Dep. Tr. (12/19/00) at 126; *see also* Brown, *Rambus v. Infineon* Dep. Tr. (4/5/01) at 126-127 [CX2076] ("If the person was a member, I believe that he has the obligation."). The rule therefore applied to <u>any</u> member, not just one advancing a particular technology proposal for inclusion in a standard.

The JEDEC policy, as will be shown at trial, was mandatory. It required <u>all</u> members with knowledge of relevant patents <u>or</u> patent applications to disclose that information to JEDEC when those patents were relevant to technology under consideration for inclusion in a standard. As explained in the next section, Rambus breached that policy, and simultaneously misled the other members in JEDEC into believing that it was, in fact, complying fully with the rules.

(3) JEDEC's Rules Require Members to Act in Good Faith.

Through its participation in JEDEC, Rambus not only violated and subverted JEDEC's rules — including but not limited to the patent disclosure rules — but also engaged in conduct

that can fairly be characterized as exhibiting bad faith. The bad-faith nature of Rambus's conduct is relevant to the application of antitrust law in this setting. It is also relevant as a purely factual matter, however, for JEDEC's rules and procedures themselves create an expectation and duty requiring JEDEC members to act in good faith. Thus, by acting in bad faith – with the purpose of subverting JEDEC's open standards process – Rambus was violating an additional duty incumbent upon all JEDEC members.

There is abundant evidence establishing that JEDEC members, by virtue of their voluntary participation in the organization, committed themselves to comply in good faith with the organization's principles, rules, and procedures. Rambus's lead attorney in this case has acknowledged, for instance, that "it's only reasonable to expect all members of JEDEC to have acted in good faith." Scheduling Conference Tr. (8/2/02) at 41. It is also apparent from documents written by Richard Crisp that Rambus itself expected fellow JEDEC members to comply at all times with the organization's policies in good faith. *See* Crisp E-Mail (6/13/95) R69511 at 614 [CX0711] ("I think it is only fair to ask, in fact demand, that you and others play by the rules," referring to possible disclosure within JEDEC of statements made by Crisp within the SyncLink group). Joel Karp's declaration also alludes to a requirement of good faith, stating that it "is contrary to industry practice and understanding for an intellectual property owner to remain silent during the standard-setting process – and then after a standard has been adopted and implemented – later attempt to assert that its intellectual property covers the standard and allows it to exclude others from practicing the standard." Declaration of Joel A. Karp, *In re Certain Electronic Products* (5/15/96) F-SEC00049 at 50 [CX2957].

Numerous JEDEC participants from companies other than Rambus, as explained above, will testify that there is indeed a strong expectation of good faith among JEDEC members, and

that it would violate a member's duty of good faith if it were consciously to act in ways that were at odds with JEDEC's fundamental goal of developing open standards. Other JEDEC participants have expressed the same concept in terms of business ethics. Regardless of how the obligations of JEDEC members are described, it is clear that members of JEDEC expected each other to act in good faith, and, as will be shown at trial, Rambus failed woefully to meet those expectations.

C. Rambus Undertook to Subvert the Policies and Rules of the JEDEC Standards Process.

The evidence to be introduced in the upcoming hearing will establish that Rambus's conduct subverted the policies of the JEDEC standard-setting organization, and violated the rules of that organization, for Rambus's anticompetitive gain. The subversion fundamentally took the form of a fraudulent plan to deceive JEDEC and its members so that JEDEC would adopt a standard for computer memory chips that required technology covered by patents that Rambus had or planned to obtain. By joining JEDEC, but failing to comply with its rules and by engaging in misleading and deceptive non-disclosure and partial disclosures, Rambus subverted the JEDEC standard-setting process, and, ultimately, monopolized the relevant markets set out above.

(1) The Development of Rambus's Scheme to Subvert the JEDEC Standard-Setting Process.

As explained above, two electrical engineers founded Rambus in 1990.[121] Rambus was conceived purely as a design company that would license its technology and provide technical

[121] Rambus Inc. Business Plan 1992-1997 (9/00/92) R169923 at 927 [CX0545].

support to other companies that manufacture memory.[122] In April 1990, Rambus filed a lengthy patent application (Application 07/510,898, referred to as the '898 application), which contained a 62-page specification and 15 drawings describing the invention, as well as 150 claims.[123]

Even before this, Rambus's founders recognized that Rambus would have a tremendous advantage over competing technologies if the Rambus architecture were adopted as an industry standard.[124] Adoption as a standard would likely lead to widespread commercial acceptance. To accomplish its standardization goal, in late 1991, Rambus decided to join and participate in the ongoing standard-setting activities of JEDEC and IEEE.

Rambus attended its first JEDEC meeting on December 4-5, 1991, and continued to attend quarterly meetings on a regular basis through December of 1995. It officially withdrew from JEDEC on June 17, 1996. Richard Crisp, Rambus' DRAM Project Manager, was Rambus's primary representative to JEDEC during the years of its membership, although, on occasion, Rambus's future President, David Mooring, and an engineer, Billy Garrett, also attended meetings. Rambus quickly learned that JEDEC already was working to solve some of the same problems that Rambus was tackling with its RDRAM architecture. To this end, JEDEC was focusing its efforts on establishing standards for synchronous DRAM ("SDRAM").[125] SDRAM was intended to be a version of the traditional, wide bus, non-packetized DRAM

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[122] *Id.* R169923 at 924.

[123] *See* Rambus Patent Application 07/510,898 (4/18/90) R12895 [CX1451].

[124] Handwritten Notes (9/28/89) R114340 at 342 [CX1702] ("Much depends upon getting a standard which depends on our patents.") .

[125] JEDEC had already issued two releases of its 21-C standard, covering memory. The JC-42.3 subcommittee ("JC-42.3") was working towards future releases of the 21-C standard, which would set the basic standards for SDRAM.

architecture. Rambus, therefore, faced the disconcerting prospect that SDRAM, rather than RDRAM, would become the standard and therefore the memory technology of choice for memory manufacturers and their customers.[126]

Rambus thus embarked on its scheme to capture the SDRAM standard. Rambus's CEO, Geoff Tate, laid out this scheme in a draft of the Rambus 1992-1997 Business Plan. In the June 18, 1992, draft of the Plan, Tate noted:

> For about 2+ years a JEDEC committee has been working on the specifications for a Synchronous DRAM. No standard has yet been approved by JEDEC. Our expectation is a standard will not be reached until end of 1992 at the earliest.[127]
>
> * * *
>
> [W]e believe that Sync DRAMs infringe on some claims in our filed patents; and that there are additional claims we can file for our patents that cover features of Sync DRAMs. Then we will be in position to request patent licensing (fees and royalties) from manufacturers of Sync DRAMs. Our action plan is to determine the exact claims and file the additional claims by the end of Q3/92. Then to advise Sync DRAM manufacturers in Q4/92.[128]

By the time that he wrote the final draft of the plan in September 1992, Tate was even more certain that SDRAMs infringed Rambus intellectual property:

> Rambus' [*sic*] expects the patents will be issued largely as filed and that companies will not be able to develop Rambus-compatible or Rambus-like technology without infringing on multiple fundamental claims of the patents . . . Rambus' patents are likely to have significant applications other than for the Rambus

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[126] Garrett E-Mail (2/28/92) R200470 [CX0672] ("SDRAMs will happen. They may happen sooner than we want, and they may become quite standardized and highly multi-sourced.").

[127] RAMBUS Inc. 1992-1997 Business Plan (6/18/92) R46394 at 408 [CX0543A].

[128] *Id.* R46394 at 410.

> Interface.[129]

Later in the same document, Tate explained that:

> Sync DRAMs infringe claims in Rambus' filed patents and other claims that Rambus will file in updates later in 1992.[130]

Rambus systematically pursued its plan to amend patent claims to cover JEDEC's SDRAM standards throughout its membership at JEDEC. Rambus representatives attended JEDEC meetings during which they observed what technologies were being considered for adoption in the standards. These same Rambus representatives, along with top Rambus management, then met with Lester Vincent, Rambus's patent attorney, to determine whether Rambus's patent claims covered such technologies.[131] When Rambus believed its claims fell short, it had its patent attorneys draft and file new claims specifically designed to cover these technologies. Although Tate had indicated in the business plan that Rambus would advise SDRAM manufacturers at the end of 1992 that it had applicable patents, it did not do so. Instead, Rambus intentionally stayed silent.

(2) Rambus Engaged in Deceptive and Misleading Conduct, Both During and After Its Membership in JEDEC.

Rambus's conduct violated JEDEC's "basic rule" that standardization programs conducted by the organization "shall not be proposed for or indirectly result in . . . restricting competition, giving a competitive advantage to any manufacturer, [or] excluding competitors

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[129] Rambus Inc. Business Plan 1992-1997 (9/28/92) R169923 at 929 [CX0545].

[130] *Id.* at R169923 at 943

[131] Geoff Tate, Rambus CEO, testified that from 1991 through 1995 Crisp and others were sending e-mails from JEDEC meetings reporting on SDRAM standardization and that it was those features that Rambus was trying to claim in its patents. *See* Tate, *Rambus v. Infineon* Trial Tr. Vol. 4 (4/25/01) at 143-144 [CX2088].

from the market." EIA Legal Guides (3/14/83) JEDEC0009277 at 9282 [CX0202]. Rambus's conduct also circumvented JEDEC rules designed to avoid, where possible, the incorporation of patented technologies into its published standards, or at a minimum to ensure that such technologies, if incorporated, will be available to be licensed on royalty-free or otherwise reasonable and non-discriminatory terms. Finally, Rambus's conduct violated the general requirement of good faith. By depriving JEDEC of critically important, patent-related information, Rambus subverted an otherwise pro-competitive, open standards process, causing that process to become a vehicle for endowing monopoly power upon a single firm, to the enduring detriment of JEDEC and its broader membership, not to mention the relevant markets at issue in this case, and all consumers of computer memory chips.[132]

Although Complaint Counsel will show that JEDEC's rules are directly breached when one of the organization's members knowingly engages in conduct such as Rambus's, it would not matter for purposes of antitrust liability if these actions were found to comply with the literal terms of JEDEC's rules. Even if Rambus's conduct did not technically violate JEDEC's rules, Rambus's actions subverted, undermined, and violated the integrity of JEDEC's central purposes, rules, and procedures. Here, Rambus's conduct clearly did subvert, undermine and violate the integrity of JEDEC's rules, inasmuch as Rambus engaged in a pattern of misleading conduct that was fundamentally in conflict with JEDEC's open standards process, and did so

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[132] The organization's recent amicus submission to the Federal Circuit suggests that JEDEC agrees with this assertion. *See* JEDEC Solid State Technology Association's Motion for Leave to File Brief of Amicus Curiae in Support of Defendants-Cross-Appellants for Rehearing, and Rehearing en Banc, ("JEDEC *Amicus* Br.") (2/28/03) FTC3-0002858 at 2871-72 [CX3089] (stating that the majority's "narrow" interpretation of JEDEC's rules "flies in the face of JEDEC and its members' long-held understanding that the patent policy broadly requires committee members to disclose patents 'that might be involved in the work they are undertaking'").

with an anticompetitive purpose and intent.

a. Rambus Intentionally Made Material Misrepresentations Through Silence and Partial, Misleading Disclosures.

JEDEC's rules required members to disclose patents and patent applications that related to standards under consideration. To implement its policy and associated rules, JEDEC adopted a disclosure policy, pursuant to which all members had an obligation to disclose patents and pending patent applications that might involve the work of a JEDEC committee. JEDEC leadership and its members, during the entire time that Rambus was a member, took steps to ensure that all members understood these obligations. As explained above, JEDEC ensured that all members were aware of their obligations under the disclosure rules through presentations, documents, and regular reminders. The scope of the policy was confirmed by observation of actual practice. Together, these regular explanations ensured that all JEDEC members became aware of their obligations under the patent policy. Documentary and testimonial evidence will confirm that Rambus understood the obligations it assumed as a JEDEC member. JEDEC's disclosure policy required members to disclose patents that relate to the standards under consideration at JEDEC.

b. Rambus Knew It Had Patents and Patent Applications Relevant to the Standards Under Consideration at JEDEC, But Rather Than Disclosing, Worked to Perfect Its Claims Over the Standards.

Despite the existence of a well-established policy requiring disclosure, Rambus failed – indeed refused – to disclose the existence of a patent and a number of patent applications that related to the technologies under consideration for inclusion in JEDEC standards. At the same time, Rambus made continual efforts to perfect its patent claims to cover the standards it observed under development.

(1) SDRAM Technology.

Rambus was well aware from near the outset of its membership in JEDEC that it had patent rights that potentially related to technologies contained in the developing SDRAM standard. Specifically, these involved CAS latency technology, which is technology used to set the latency period following a read request made to a memory chip; and burst length technology, which is technology used to determine the number of transmissions of data sent by a memory chip in response to a single instruction. Programmable CAS latency and programmable burst length are technologies specified in the JEDEC standard and over which Rambus claims patent rights.

As early as 1992, as explained above, Rambus representatives at JEDEC (Crisp and Garrett) observed proposals at JEDEC to incorporate programmable CAS latency and programmable burst length into the proposed SDRAM standard. *See, e.g.*, EIA/JEDEC Minutes Meeting No. 61 (2/27/92) JEDEC0014358 at 396 [JX0012] (Presentation of NEC: "Programmable RAS, CAS latency"); *id.*, JEDEC0014358 at 426 (Presentation of Hitachi: "Programmable RAS, CAS latency"); *id.*, JEDEC0014358 at 443 (Presentation of Fujitsu: "programmable burst type and wrap [burst] length (4, 8, full column)"); EIA/JEDEC Minutes Meeting No. 62 (5/7/92) JEDEC0014547 at 605 [CX0034] (Presentation of NEC: "Programmable RAS, CAS latency using Register Command + Address key"); *see also* Crisp, *Rambus v. Infineon* Trial Tr. Vol. 9 (5/2/01) at 118:10-23 [CX2092] (Crisp acknowledges observing presentations of programmable CAS latency and burst length technologies at JEDEC).

Rambus, upon seeing those presentations, instructed its patent counsel, Lester Vincent, to add claims to Rambus's pending patent applications to cover those two technologies. *See* Vincent Notes (5/2/92) R202989 [CX1946] ("Richard Crisp wants to add claims to original

application => add claims to mode register to control [CAS] latency"). Indeed, Crisp has admitted that the ideas he had to add claims to Rambus's pending patent applications were "spurred on" by his attendance at the April and May 1992 JEDEC meetings.[133]

In July 1992, Richard Crisp voted on the JEDEC ballot proposing to add programmable CAS latency and burst length to the JEDEC standard. EIA/JEDEC Minutes of Meeting No. 63, paragraph 16.3 (7/21/92) R65401 at 5405 [CX0037A]. Although Mr. Crisp voted against the proposal, he observed as the JC-42.3 Subcommittee approved including programmable CAS latency and burst length in the SDRAM standard. *Id.* Mr. Crisp said nothing about Rambus's potential patent rights.

In September 1992, after observing yet more discussion at JEDEC involving programmable CAS latency, Richard Crisp met with its outside patent counsel Lester Vincent to go over his proposed claims again.[134] In October, 1992, Richard Crisp was asked to give a report at the meeting of the Rambus Board of Directors on "the SDRAM status at JEDEC, [and] the

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[133] Mr. Crisp testified:

> Q. And the ideas that you had to add claims to the Rambus patent applications for the mode register and for programmable CAS latency, those were ideas that were spurred on by your attendance at the JEDEC meeting in April and May and participating in this SDRAM standardization effort, right?
>
> A. Yeah. Those were our inventions. We had invented those for the RDRAM.

Crisp, *Rambus v. Infineon* Trial Tr. Vol. 9 (5/2/01) at 132:18-25 [CX2092].

[134] *See* Vincent Notes (9/25/92) R203940 [CX1949] ("w/ Richard Crisp . . . What to include in divisional applications: . . . 2) DRAM – programmable [CAS] latency via control reg[ister] . . . => so cause problem w/ synch DRAM and Ramlink"); *id.* R203943 ("Richard => will get me copy of the Ramlink spec and synch DRAM spec").

Rambus patent strategy." Minutes of a Regular Meeting of the Board of Directors of Rambus, Inc. (10/22/92) R28106 at 107 [CX0606]. In November 1992, Lester Vincent met for two hours with Richard Crisp and Rambus founder and director Michael Farmwald regarding additional claims. Blakely, Sokoloff, Taylor & Zafman Time Sheets (1/31/93) V1321 at 1379 [CX1930] (entry for 11/05/92).

In December 1992, Rambus Vice President David Mooring accompanied Rambus engineer Billy Garrett to the JEDEC JC-42.3 meeting, and informed Rambus executives and others that JEDEC was likely to complete its SDRAM standard in early-to-mid 1993. Mooring E-Mail (12/11/92) R155815 [CX0685] ("The SDRAM features have almost consolidated. Probably March 93 for the consensus and June when the committee blesses the spec.").

In February 1993, Richard Crisp turned responsibility for pursuing additional claims over to Rambus engineer Fred Ware. In response to Mr. Ware's request for "a list of claims which were under consideration for addition to the original patent," Richard Crisp included as the first item in his list, "1) DRAM with programmable access [CAS] latency." Crisp E-Mail (2/9/93) R233742 [CX0686].

In March 1993, Billy Garrett attended the JEDEC meeting on behalf of Rambus and observed the JC-42.3 Subcommittee adopt the SDRAM standard, including the earlier-approved item incorporating programmable CAS latency and burst length into the standard. JC-42.3 Committee Minutes Meeting No. 66, ¶ 13 (3/3/93) JEDEC0015199 at 5211-212 [JX0015]. Shortly thereafter, Rambus, through its patent counsel Lester Vincent, filed a preliminary amendment with the Patent and Trademark Office. *See* Preliminary Amendment, Application No. 07/847,651 (5/17/93) R14106 [CX1458]. Reporting on this action, Fred Ware informed Richard Crisp and others at Rambus:

> The current status of the additional claims that we want to file on the original (P001) patent follows. . . . (1) Writable configuration register permitting programmable CAS latency. This claim has been written up and filed. This is directed against SDRAMs.

Ware E-Mail (6/18/93) R202996 [CX1959]. Rambus thereby acted to obtain patents that covered JEDEC's SDRAM standard, though it later determined that the application had a flaw that did not achieve the desired objective.[135]

After this application was filed, Rambus and Lester Vincent focused their efforts on

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[135] Rambus asserts that Lester Vincent inadvertently included a narrowing limitation in the claims of the '651 application that prevented them from covering the on-going JEDEC work. Indeed, Rambus trumpets this mistake as though it somehow absolves Rambus of any disclosure obligation:

> [T]he fundamental fact is this: when we got to JEDEC we saw that our inventions were being used by the standards, we tried, but failed, to protect ourselves by improving our patents. For periods of time we thought we had improved our patents to cover these technologies by filing applications that better understanding – in fact we failed.

Rambus Webcast Teleconference (6/20/02) FTC30003785 at 3804 [CX1901]. Regardless of this mistake, Rambus executives and employees at the time believed that its patent applications contained claims covering the on-going work at JEDEC. As Fred Ware, who was responsible for working with Lester Vincent to file the appropriate claims, testified:

> Q. . . . Is that correct that with respect to the programmable CAS latency claim . . . as far as you were concerned, and as far as you knew, Rambus had successfully asserted claims that were broad enough to cover SDRAMs? [Objection omitted.]
>
> THE WITNESS: Yes, that's what I believed.
>
> Q . That was your intent; correct?
>
> A. Correct. Yes.

Ware, *Micron v. Rambus* Dep. Tr. (8/9/01) at 220:12-221:2 [CX2103]. This belief was sufficient to trigger a duty to disclose at JEDEC.

drafting and filing claims covering other technologies. In late 1994, however, attention returned to programmable CAS latency and burst length, and in January 1995 Lester Vincent filed another preliminary amendment to one of Rambus's pending patent applications to ensure coverage of the programmable CAS latency and burst length features. See Amendment, Application No. 07/847,961 (1/6/95) R14454 at 456-457 [CX1470] (claim 151: "A computer system comprising: . . . at least one register operative to store information specifying a manner in which the semiconductor device is to respond to transaction requests received from the bus . . ."); *see also id.* at R14459-461 (claims 160, 164, 165). This time, Lester Vincent got it right; the new claims were not limited to Rambus's narrow bus architecture, and clearly covered programmable CAS latency and burst length as used in the JEDEC SDRAM standard. *See* Expert Report of Prof. Bruce L. Jacob (12/10/02) at 41-44[CX3081]; Rebuttal Expert Report of Prof. Bruce L. Jacob (1/31/03) at ¶¶ 4, 7-9 [CX3082]; Expert Report of Mark E. Nusbaum (12/9/02) at 27-30 [CX3080]; Rebuttal Expert Report of Mark E. Nusbaum (1/31/103) at 8-10 [CX3084].

Rambus withdrew its '961 application in June 1995, but three weeks later Lester Vincent filed another amendment to Rambus's follow-on application that also contained claims reading on programmable CAS latency as used in the JEDEC SDRAM standard. Preliminary Amendment, Application No. 08/469,490 (6/23/95) R14496 at 14502-504 [CX1476] (claims 183-185: "A computer system comprising . . . a semiconductor device comprising an access-time register operative to store a value indicative of an access time for the semiconductor device . . ."); *see also* Jacob Report (12/10/02) at 44-46 [CX3081]; Jacob Rebuttal (1/31/03) at ¶¶ 7-9 [CX3082]; Nusbaum Report (12/9/02) at 30-31 [CX3080]; Nusbaum Rebuttal (1/31/03) at 11-13 [CX3084].

In the latter half of 1995, Richard Crisp observed further work at JEDEC involving

programmable CAS latency and burst length. During that time period, there was a spirited debate among JEDEC members as to whether they should adopt a simplified standard, known as SDRAM Lite, that would either use fewer CAS latency and burst length values or eliminate programmability entirely and use fixed CAS latency and burst length. *See, e.g.*, Minutes of Meeting No. 76 (9/11/95) R66450 at 6455-56 [CX0091A]. Richard Crisp also observed work directed toward the standard for "Future SDRAM" (which later became known as the DDR SDRAM standard) involving programmable CAS latency and burst length. *See, e.g.*, Minutes of Meeting No. 77 (12/6/95) R66493 at 6513 [CX0098A] ("3.6.3 CAS Latency Survey Results").

Rambus clearly understood at the time that the claims contained in the '961 and '490 applications covered technology incorporated in JEDEC's SDRAM standard and proposed for use in JEDEC's Future (DDR) SDRAM standard. For example, at the May 1995 meeting of the JEDEC JC-42.3 Subcommittee, Chairman Gordon Kelley of IBM specifically asked Richard Crisp to "state whether or not Rambus knows of any patents especially ones we have that may read on" a presentation of SyncLink made at the JEDEC meeting. Crisp E-Mail (5/24/95) R69511 at 69583 [CX0711]. Crisp refused to answer. In his e-mail to Rambus executives, however, he stated: "As far as intellectual property issues go here are a few ideas: . . . 4. DRAM with programmable access [CAS] latency." *Id*.

Although JEDEC already had adopted its SDRAM standard, Rambus had an ongoing obligation to disclose relevant patents and applications. *See, e.g.*, JEDEC Manual of Organization and Procedure. JEP-21-I, Appendix F (10/00/93) JEDEC0009323 at 9351 [CX0208] ("By its terms, the EIA Patent Policy applies with equal force to situations involving: 1) the discovery of patents that may be required for use of a standard subsequent to its adoption . . ."). At no time did Rambus disclose to JEDEC that it was working with its lawyers to draft

claims to cover programmable CAS latency or burst length, or that it had it had such claims pending in applications before the Patent and Trademark Office.

(2) DDR Technology.

Rambus also worked to perfect patent applications relating to on-going work involving other technologies that ultimately were incorporated into JEDEC's DDR SDRAM standard. In addition to programmable CAS latency and burst length, which were carried over from the SDRAM standard first adopted in the early 1990s, the DDR standard includes two additional technologies relevant here: The first is so-called "dual-edge clock" technology, which is a technology used to speed up data transfer along the memory bus, or pathway between the memory chip and the device in which it operates. The second is a form of technology intended to synchronize the timing of the memory chip and the device in which it operates, consisting of an on-chip delay lock loop circuit ("DLL"); a variant of this that also was considered by JEDEC was an on-chip phase lock loop circuit ("PLL"). Both dual-edge clock and on-chip DLL are technologies specified in the JEDEC standard and over which Rambus claims patent rights.

From the very first JEDEC meetings attended by Billy Garrett of Rambus in 1991, certain JEDEC members were proposing to use a technology called "toggle mode," which is the functional equivalent of dual-edge clocking technology. *See* Minutes Meeting No. 60 (12/4/91) JEDEC0014181 at 264 [JX0010] (IBM presentation comparing "Synchronous DRAM -vs- HST Toggle"); EIA/JEDEC Minutes Meeting No. 61 (2/27/92) JEDEC0014358 at 376 [JX0012] (item 312.1, "Toggle Mode"). By April 1992, IBM was proposing to combine its toggle-mode concept with other proposals for synchronous DRAMs to create what would have been an SDRAM with dual-edge clocking. *See* EIA/JEDEC Minutes Meeting No. 62, Attachment E (JEDEC Special Meeting, Apr. 9-10, 1992) (5/7/92) R65286 at 300-01 [CX0034A] (presentation of William

Hardell of IBM, "dual clock edge").[136] However, a number of companies in the industry had difficulty generating symmetric clock signals (a prerequisite to implementing dual-edge clock technology), so JEDEC postponed consideration of a dual-edge clock, opting for a single-edge clock in its SDRAM standard, with a plan to revisit dual-edge-clock technology for its next-generation standard. *See* Sussman, *In the Matter of Rambus* Dep. Tr. (1/15/03) at 45:21-49:17. At no time during this consideration of possible dual-edge clock technologies for the first-generation SDRAM standard did Rambus disclose any potential intellectual property claims in this technology.

After learning that JEDEC had postponed consideration of dual-edge clock for the SDRAM standard, Rambus continued its efforts to add claims to its pending patent applications directed at the next generation of SDRAMs. In September 1994, Rambus filed an amendment containing claims covering dual-edge clock technology. *See* Preliminary Amendment, Application No. 08/222,646 (9/6/94) R15155 at 156 [CX1466] ("Please add the following new claims: 151. A dynamic random access memory (DRAM) . . . comprising . . . [a] receiver circuit for latching information received . . . in response to a rising edge of the clock signal and a falling edge of the clock signal."). As with all the other relevant applications, this application claimed a priority date dating back to the original 1989 '898 Rambus patent application.

Rambus, led by Richard Crisp working with Lester Vincent, also began in 1992 to add claims to Rambus's pending patent applications covering on-chip PLL/DLL, which Crisp thought

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[136] *See also* Crisp E-Mail (undated) R45724 [CX1708] ("The IBM folks (led by a contingent of three very sharp technical guys . . . (. . . William Hardell and Mark Kellog [sic]) really contributed heavily to the discussion. The Hardell from Austin had a proposal for what was basically an asynchronous DRAM with a dual edge triggered output register.").

JEDEC might try to use in the future.[137] Rambus ultimately filed an amendment in June 1993. *See* Preliminary Amendment, Application No. 07/847,692 (6/28/93) R12110 at 113 [CX1459] ("Add the following claims: 151. A memory device . . . comprising . . . a phase locked loop (PLL) coupled to the clock signal receiving circuit and the memory array.").

In the meantime, after JEDEC adopted the SDRAM standard in 1993, it began preliminary work to develop the next-generation standard, known at first as "Future SDRAM" or "Next Generation SDRAM," and ultimately as "DDR SDRAM." At the September 1994 JEDEC meeting, as part of this work, NEC gave a presentation proposing to include on-chip PLL in the next generation SDRAM standard.[138] Crisp recognized immediately the potential significance to Rambus of NEC's proposal. He wrote an e-mail to Rambus executives with the subject line, "NEC PROPOSES PLL ON SDRAM!!!" Crisp E-Mail (9/14/94) R69511 at 546 [CX0711]. In the text he explained that JEDEC "plan[s] on putting a PLL on board their SDRAMs . . . . Obviously we need to think about our position on this for potential discussion with NEC regarding patent issues here. . . . What is the exact status of the patent with the PLL claim?" *Id.* at R69546-47.[139] As it turns out, NEC's proposal for use of on-chip PLL was covered by claim

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[137] *See* Vincent Notes (9/25/92) R203940 at 944 [CX1949] ("=> many different ways of designing PLL => want to cover concept of having concept [sic] of deskewing input"); Crisp, E-Mail (2/9/93) R233742 [CX0686] (including in the "list of claims which were under consideration for addition to the original patent" sent to Fred Ware "4) DRAM using PLL/DLL circuit to reduce input buffer skews"). Fred Ware confirmed Rambus's intentions to amend its patent claims to cover PLL/DLL. *See* Ware, E-Mail (6/18/93) R202996 [CX1959] (regarding the status of additional claims Rambus wanted to file, "(3) DRAM with PLL clock generation. This claim is partially written up. . . . This is directed against future SDRAMs and RamLink.").

[138] *See* JC-42.3 Committee Minutes Meeting No. 72 (9/13/94) R66143 at 189 [CX0074A] ("PLL Enable Mode . . . On-Chip-PLL Improves Access Time").

[139] Crisp's e-mail set off a flurry of e-mails within Rambus. Allen Roberts responded, "So if we want to fight this one (after the claim is issued), we better stock up our legal warchest." Roberts E-Mail (embedded in Crisp E-Mail) (9/14/94) R233785 [CX0757]. Crisp responded: "It

151 in Rambus's '692 application, as amended in June 1993. *See* Jacob Expert Report (12/10/02) at 46-47 [CX3081]; Jacob Rebuttal Expert Report (1/31/03) ¶ 10 [CX3082]; Nusbaum Expert Report (12/9/02) at 36-37 [CX3080]; Nusbaum Rebuttal Expert Report (1/31/03) at 13 [CX3084]. Rambus, however, did not disclose to JEDEC this pending patent application.

During the latter part of 1995 and early 1996, work at JEDEC involving both dual-edge clock and on-chip PLL/DLL technology picked up. In May 1995, Hyundai (now Hynix), Mitsubishi, and TI presented proposals at JEDEC on a technology called SyncLink. One of the proposals involved a reference clock using "both edge[s] for input, positive edge for output." Minutes Meeting No. 75 (5/24/95) JEDEC0016433 at 544 [JX0026]. In September 1995, JEDEC decided to issue a survey ballot to gauge member interest in certain "next generation issues." Minutes Meeting No. 76 (9/11/95) R66450 at 456 [CX0091A]. Issues with strong support included "On-chip PLL/DLLs to reduce clock access time;" issues with mixed support included "Using both edges of the clock for sampling inputs." Minutes Meeting No. 77

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seems likely we will have to fight litigation at some point in the future. . . . I think it is very important to go after one we are certain we can win first." *Id.* The following month, license negotiations with Samsung raised the prospect that Rambus might feel compelled to grant Samsung (but not other companies) a license broad enough to permit Samsung to use Rambus technology not only for RDRAM, but also for other products in certain circumstances. Richard Crisp wrote to Rambus executives:

> Why can't we sue for using a PLL on an SDRAM if we [are] granted that patent? . . . I've felt for some time that we need to hold this as one of our key technology patents. If it is allowed, we need to be able to collect on it. . . . I hope we would sue other companies, in particular those that are not licensed. For those that are licensed, I would like to see us collect a similar royalty as for RDRAMs.

Crisp E-Mail (10/25/94) R234245 [CX0763].

(12/6/95) R66493 at 510 [CX0098A].[140] Subsequently, at JEDEC meetings in early 1996, the organization heard a series of presentations incorporating dual-edge clock and on-chip PLL/DLL technologies, as explained above. Technology in several of these proposals, including the dual-edge clock proposal in March 1996, were covered by claims in Rambus's pending '646 application. *See* Jacob Expert Report (12/10/02) at 50-51 [CX3081]; Nusbaum Expert Report (12/9/02) at 41-42 [CX3080].

During this time, Rambus continued its efforts to broaden its patents to ensure that they would cover future generations of SDRAM. In February 1996, Rambus in-house counsel Diepenbrock met with its outside patent lawyer Vincent to discuss, among other topics, adding more claims covering delay lock loops. Vincent Notes (2/5/96) R204207 at 208-09 [CX2001]. In early 1996, Rambus also learned that the '646 application had formally issued as U.S. Patent No. 5,513,327. *See* Vincent Letter (5/10/96) R171630 [CX2010]. On June 17, the day on which Rambus formally withdrew from JEDEC, Mr. Diepenbrock requested from Mr. Vincent a legal opinion on the enforcement readiness of the '327 patent, thus taking a principal formal step to ensure that a patent is ready to be asserted against an alleged infringer. Diepenbrock Letter (6/17/96) R204363 at 364 [CX0889].

In short, throughout the time it was a member of JEDEC, Rambus knew it had patents and patent applications relevant to the standards under consideration at JEDEC. But rather than disclosing, Rambus worked to perfect its claims over the standards and prepare for infringement litigation against those who adopted the standards.

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[140] At this meeting, Mosaid (a JEDEC member that engaged in technology development and licensing) announced that it had a pending patent application relating to on-chip DLL, but noted that "it was a particular implementation and may not be required to use the standard." *Id*. at R66495.

c. Rambus Made Limited and Misleading Disclosures.

Throughout the entire time of its involvement in JEDEC, Rambus never informed JEDEC that the technologies it had adopted or was considering for adoption into JEDEC standards were covered by Rambus intellectual property. Rambus did not disclose that it had patents that covered the SDRAM technologies of programmable CAS latency and programmable burst length. It did not reveal its patent applications covering on-chip PLL/DLL and dual-edge clock, which were later incorporated in the DDR standard and issued as patents. As Richard Crisp bluntly testified:

> Q. Did you ever stand up in JEDEC in the four years that you attended meetings and watch the SDRAM standardization, did you ever stand up and say, Stop doing this; I own it?
>
> A. No, I never said that.
>
> Q. You never told them that?
>
> A. That's correct.

Crisp, *Rambus v. Infineon* Trail Tr. Vol. 9 (5/2/01) at 148:20-149:1 [CX2092]. In short, Rambus never disclosed the existence of patents or patent applications. Indeed, it has already been presumptively established that Rambus did not disclose any patents or patent applications relevant to the JEDEC standards. *See* Adverse Inference Order at 8 (Rebuttable Presumption 2).

Rambus's misleading conduct was not limited to silence in the face of a disclosure obligation, however. Rambus did speak, in order to allay concerns about the scope of its intellectual property, and did so in a manner that misled JEDEC and its members. At a JEDEC meeting in September 1993, Rambus disclosed its '703 patent to JEDEC. Rambus knew, however, that the patent did not relate to any work going on in the JEDEC committee. *See* Crisp, *Rambus v. Infineon* Trial. Tr. Vol. 9 (5/2/01) at 198:3-6 [CX2092] ("Q: But you characterized

[the ‘703 patent] at your deposition as being totally unrelated to JEDEC’s SDRAM work, right? A: I think I did, yes.”). By disclosing this irrelevant patent (the irrelevance of which was not immediately known to JEDEC), Rambus actively led JEDEC’s membership to believe that Rambus was disclosing patents in compliance with JEDEC rules, and that it had told the “whole truth,” by disclosing all relevant patents.

Later, at the JEDEC meeting in September 1995, Crisp, on behalf of Rambus, failed to respond directly to Gordon Kelley’s question as to whether Rambus had patent rights relating to the SyncLink presentations at JEDEC. As Crisp subsequently acknowledged to his colleagues at Rambus, he successfully defused concerns his non-response created among JEDEC’s members by “remind[ing] them that we have actually reported a patent to the committee in the past.” Crisp E-Mail (9/11/95) R69511 at 676-77 [CX0711]. Crisp’s statement to Rambus not only avoided disclosing relevant patents and applications, it also led JEDEC’s members to believe that Rambus was willing to disclose relevant patents, if it possessed any, but had nothing to disclose.

Finally, Rambus disclosed a number of patents in June 1996, contained in a lengthy list submitted when it resigned from JEDEC. Absent from this list, however, was the critical ‘327 patent, which contained the claims covering dual-edge clock. *See* Crisp Letter (6/17/96) I140022 at 023 [CX0887]. Indeed, the ‘327 patent was Rambus’s sole issued patent relevant to JEDEC’s work. Also missing from this list was any mention of specific patent applications containing claims covering JEDEC’s work. *See id.* These incomplete, misleading disclosures of irrelevant patents served to reinforce the impression Rambus sought to make upon JEDEC’s members: that Rambus did not have any patents or patent applications relevant to JEDEC’s work.

Rambus’s affirmatively misleading conduct did not cease when Rambus withdrew from JEDEC. For years thereafter, Rambus continued to conceal the patent-related information that it

had wrongfully withheld from JEDEC, and it purposely conveyed misleading messages in the press and elsewhere in an effort to squelch suspicions that Rambus might possess patents rights covering aspects of the JEDEC standards. *See, e.g.*, Karp E-Mail (1/10/98) R233882 [CX0988] ("I am very uncomfortable with any public statements regarding who or what infringes our patents."); Clarke E-Mail (8/15/97) R233869 [CX0948] (re: "Rambus Confidential: Approved Q&A for Latest Patent...Q3: Do Double Data Rate (DDR) SDRAMs use this patent? A: We don't know yet. No DDR products exist for us to evaluate."). Rambus's continued failure to inform JEDEC of its patents prevented JEDEC and its members from reversing course before irrevocably committing and being locked into the standards it promulgated.

d. Rambus's Misrepresentations Were Intentional.

Documentary evidence will demonstrate that Rambus followed a cold, calculated decision not to disclose its relevant patents or applications at JEDEC. For example, when Chairman Gordon Kelley specifically asked Mr. Crisp to state whether Rambus had patent rights relating to the SyncLink presentations at the May 1995 JEDEC meeting, Mr. Crisp wrote to high-level Rambus executives that "If it is not a really key issue . . . then I think it makes no sense to alert them to a potential problem they easily can work around . . . we may not want to make it easy for all to figure out what we have especially if nothing looks really strong." Crisp E-Mail (5/24/95) R155869 at 873-74 [CX0794]; *see also* Crisp E-Mail (9/23/95) R233837 at 838 [CX0837] ("As time passed some of the patents issued and then we have not really made the committees aware of this fact . . . . It seems to me that we should re-evaluate our position relative to what we decide to keep quiet about, and what we say we have."). Even after leaving JEDEC, Rambus continued with its carefully orchestrated, strategic silence. As CEO Geoff Tate instructed employees: "do *NOT* tell customers/partners that we feel DDR may infringe [Rambus patents]

– our leverage is better to wait." Tate E-Mail (2/2/97) R200497 [CX0919]. Rambus's actions (or, in most instances, inactions) were unquestionably intentional, with a specific intent to hide the truth from JEDEC and its members.

Rambus may not hide behind its claims that it was not immediately aware of the scope of its intellectual property. If changed factual circumstances render a previous statement false, the speaker is obliged to correct that earlier statement, even if it was initially made without intent to defraud. *See Ware v. Scott*, 257 S.E.2d 855, 858 (Va. 1979). Courts have therefore recognized that one who has made a statement that becomes misleading by reason of intervening circumstances is under a duty to make corrective disclosure if another is relying on the misleading statement. *Koch v. Williams*, 193 Cal. App. 2d 537, 541 (Cal. App. 4 Dist. 1961) ("One who learns that his statements, even if thought to be true when made, have become false through a change in circumstances, has the duty before his statements are acted on to disclose the new conditions to the party relying on his original representations."); *see also Donovan v. Aeolian Co.*, 200 N.E. 815 (N.Y. 1936) (piano seller created fraudulent misrepresentation by failing to disclose that piano sold from showroom floor was actually used, not new; where conduct creates "mistaken belief" then seller is "under a duty to speak to correct mistaken impression"). Rambus's duty to correct the misperceptions created by its omissions and deceptively incomplete disclosures did not terminate when it left JEDEC. Indeed, it left JEDEC members with a demonstrably false impression that Rambus did not correct until it began to seek royalty payments for practicing its patents in 1999.

e. JEDEC and Its Members Relied upon Rambus's Silence and Incomplete Disclosures.

As Allied Tube establishes, where a defendant, with the purpose "of achieving an anticompetitive result," "subvert[s]," "undermines[s]," and "violate[s] the integrity" of a standard-setting association's processes, "literal compliance with a standard-setting organization's rules" will not serve "as a shield to protect such conduct from antitrust liability." *Allied Tube*, 817 F.2d at 941. In this case, Rambus subverted JEDEC's "open" standards process through a pattern of conduct that was fundamentally misleading and that had the effect of depriving JEDEC of critical information that it needed in order to fulfill a core organizational objective – i.e., the objective of avoiding, where possible, the establishment of standards incorporating patents or pending patents known to JEDEC's members. Moreover, as discussed below, Rambus engaged in this pattern of conduct with a clear anticompetitive intent – namely, the intent to eliminate, or at a minimum limit, competition from a competing DRAM design. Although Complaint Counsel submits that, in this context, it is not necessary to prove that Rambus's deceptive conduct satisfies the elements of common-law fraud, as noted in the following discussion, principles of fraud law help to bolster the conclusion that Rambus's actions were deceptive, and did have the effect of subverting JEDEC's process. We note, in this regard, that Courts – without requiring technical proof of the elements of fraud – have imposed antitrust liability based on deceptive or misleading conduct leading to anticompetitive market effects. *See* cases cited *supra*, n.110.

It is well established that a false representation can be demonstrated by showing, *inter alia*, "affirmative misrepresentations" and "omission" or "concealment." *Bank of Montreal*, 193 F.3d at 827; *accord Allen Realty Corp. v. Holbert*, 318 S.E.2d 592, 597 (Va. 1984)

("Concealment of a material fact by one who knows that the other party is acting upon the assumption that the fact does not exist constitutes actionable fraud."). Indeed, nondisclosure or concealment may be misleading when, among other circumstances, "the defendant makes partial representations but also suppresses some material facts." *Wilkins v. National Broadcasting Corp.*, 71 Cal. App. 4th 1066, 1082 (1999); *see also Meade v. Cedarapids, Inc.*, 164 F.3d 1218, 1222 (9th Cir. 1999) ("One who makes a representation that is misleading because it is in the nature of a 'half-truth' assumes the obligation to make a full and fair disclosure of the whole truth.") (quoting *Gregory v. Novak*, 855 P.2d 1142, 1144 (Or. Ct. App. 1993)); *United States v. Keplinger*, 776 F.2d 678, 697 (7th Cir. 1985) ("Omissions or concealment of material information can constitute fraud . . . without proof of a duty to disclose the information pursuant to a specific statute or regulation."). Rambus engaged in misleading conduct of both types. First, it failed to disclose in the face of a duty to do so. Second, it made misleading partial disclosures and diversionary statements that were intended to (and succeeded in) persuade JEDEC and its members that Rambus did not have patents or patent applications that covered the technologies under consideration.

Rambus's participation in JEDEC alone indicated to others that it agreed to comply with the organization's rules. Indeed, Rambus continued to attend JEDEC meetings, yet never explicitly disavowed an intention to comply with JEDEC's rules. Rambus, while itself plotting internally not to disclose intellectual property relevant to the standards under consideration, never informed JEDEC of its true intentions. Rambus's failure to disavow compliance with the JEDEC policy merely set the stage, however, for its later non-disclosures and partial, misleading disclosures.

Through the manner in which it participated in JEDEC, Rambus reinforced, in the minds

of other JEDEC members, the expectation that it would "play by the rules." Crisp E-Mail (6/13/95) R69511 at 614 [CX0711]. The following affirmative acts — among others — served to reinforce the misleading impression that Rambus could be trusted to make appropriate patented-related disclosures:

(1) In 1992, Rambus voted "no" on several ballot items relating to the work of JEDEC's JC-42.3 subcommittee, and then he later explained the basis for his "no" votes;

(2) in September 1993, Rambus disclosed to the JC-42.3 subcommittee the fact that Rambus had recently obtained a new patent – U.S. Patent No. 5,423,703 ("'703 patent'");

(3) in September 1995, Rambus read a letter to the JC-42.3 subcommittee purporting to respond to patent-related issues pertaining to the SyncLink technology, which was the subject of a presentation at a previous JC-42.3 meeting, in May 1995; and,

(4) in June 1996, when it withdrew from JEDEC, Rambus provided an additional letter that, among other things, purported to list all of the patents that had been issued to Rambus by that date.

These actions, taken together with Rambus's very presence at JEDEC, served to convey the impression that Rambus was a full-fledged participant in JEDEC, and that it could be trusted to abide by the obligations associated with JEDEC membership. This in itself was misleading, since Rambus privately knew that it had no intention of complying with such obligations. Yet these actions were made all the more misleading as a result of Richard Crisp's efforts to draw attention to Rambus's past JEDEC participation in an effort to assuage concerns about potential Rambus patent claims relevant to the SyncLink technology. Rambus's message conveyed not only a misleading impression regarding its patent portfolio, but also a misrepresentation about its compliance with JEDEC's patent policy. In simple words, the message Mr. Crisp sought to convey was: You can trust us. If we have something to disclose, we will do so, just as we have

done before. This could not have more fundamentally mischaracterized Rambus's true plans.

Rambus has previously contended that members of JEDEC were aware that Rambus had patents that potentially related to the technologies under consideration for inclusion in the SDRAM standard, and therefore it was not reasonable for them to have relied on Rambus's non-disclosure. Where a defendant throws another person "off guard" or "diverts" that person from learning the truth, however, reliance is readily justified. *See Bank of Montreal*, 193 F.3d at 830; *Hitachi Credit*, 166 F.3d at 629 ("A buyer may therefore recover for fraud if the seller does or says anything to divert the buyer 'from making the inquiries and examination which a prudent man ought to make.'"). Thus, even with possible knowledge that Rambus patents may have covered the technologies under consideration, any suspicions "were allayed by [Rambus's] subsequent reassurances," which would entitle JEDEC members to rely upon them. *Garrett v. Perry*, 346 P.2d 758, 760 (Cal. 1959). This is particularly true because Rambus had "superior knowledge" of the relevant facts. *Id.*

Any suspicions that JEDEC members may have had about Rambus's patents were allayed by Rambus's failure to inform JEDEC that it did, in fact, have patent rights that potentially covered the technologies under consideration at JEDEC, and by other affirmatively misleading conduct by Rambus. "[T]he receipt of some unfavorable information [does not] preclude" reliance when "suspicions . . . arising from the information [a party] has obtained upon his investigations were allayed by defendant's subsequent reassurances." *Garrett*, 346 P.2d at 760. Indeed, "one 'must not say or do anything to throw another off his guard or to divert him from making the inquiries and examination which a prudent man ought to make.'" *Wells v. Wells*, 401 S.E.2d 891, 893 (Va. App. 1991) (quoting *Horner v. Ahern*, 153 S.E.2d 216, 219 (Va. 1967)); *see Hitachi Credit*, 166 F.3d at 629 (quoting *Horner*); *see also United States v. Autuori*, 212 F.3d

105, 119 (2d Cir. 2000) ("A duty to disclose can also arise in a situation where a defendant makes partial or ambiguous statements that require further disclosure in order to avoid being misleading.") (citing *Remington Rand Corp. v. Amsterdam-Rotterdam Bank, N.V.*, 68 F.3d 1478, 1484 (2d Cir. 1995)). In short, JEDEC and its members did, and were permitted to, rely upon Rambus's misrepresentations about its patent portfolio.

(3) Rambus's Deceptive Conduct Has Not Been Excused by the Federal Circuit's *Infineon* Ruling.

The ruling in the Court of Appeals for the Federal Circuit in *Infineon*[141] — much discussed in motions in this case — in no way limits or undermines Complaint Counsel's proof of deceptive conduct. That court's conclusion that Rambus did not engage in fraud is not binding by collateral estoppel or *res judicata* principles on the Commission or Complaint Counsel, who were not a party to that proceeding. *Parklane Hosiery Co., Inc. v. Shore*, 439 U.S. 322 (1979) (neither res judicata nor collateral estoppel binds a person who was not a party to the proceeding in which the ruling was rendered). Furthermore, "collateral estoppel . . . simply does not apply against the government." *United States v. Mendoza*, 464 U.S. 154, 162 (1984). Indeed, the *Infineon* ruling, though addressing the same underlying conduct, is only marginally relevant to this case because (among other things) the ruling involved a different issue of law, a more limited factual record, and a different standard of proof than pertains here.[142]

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[141] *Rambus Inc. v. Infineon Technologies AG*, 318 F.3d 1081 (Fed. Cir. 2003), *affirming in part, reversing in part, vacating in part, and remanding Rambus Inc. v. Infineon Technologies AG*, 164 F.Supp.2d 743 (E.D.Va. 2001).

[142] Complaint Counsel's previous motions seeking to invoke collateral estoppel to bar Rambus from relitigating issues it lost in that litigation are in no way inconsistent with this position. Rambus, unlike Complaint Counsel, had a full opportunity to litigate many issues relating to fraud in the *Infineon* litigation, and is appropriately bound to its previous losses.

The *Infineon* case differs, however, in at least two critical respects from this one. First, both the district court decision and the court of appeals decision rest expressly on an interpretation of the Virginia law of fraud, not on antitrust law principles pertaining to the subversion of the standard-setting process for anticompetitive gain. Second, the ruling rests on an interpretation of the JEDEC rules alone. The ruling makes no attempt even to consider the possibility that Rambus might have complied with the literal requirements of the JEDEC rules but nonetheless subverted the purposes of JEDEC for anticompetitive ends – the conduct explicitly recognized by the Supreme Court as the basis for antitrust liability in *Allied Tube*.[143] Given the different legal standards and more limited factual record, Complaint Counsel's case should not be undermined by the Federal Circuit ruling.

It is particularly appropriate not to hold the *Infineon* court's conclusions against Complaint Counsel in the circumstances here. Infineon litigated its fraud claims in the context of a patent-infringement suit filed by Rambus. Infineon, understandably, was reluctant to submit any proof which might have the effect of demonstrating that Rambus's patents in fact do cover, or "read on," the JEDEC standards. Complaint Counsel, on the other hand, has no reason to show such reluctance in submitting proof concerning the scope and coverage of Rambus's patents. The different litigation incentives facing Infineon render the holding against it of limited relevance to Complaint Counsel's case.

Finally, even if the *Infineon* ruling is deemed to have relevance, Complaint Counsel will

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[143] This is particularly true with respect to its holding on DDR, which rested on a conclusion that Rambus had no obligations of disclosure until formal work was begun with respect to DDR. As explained above Rambus failed to disclose DDR technology when it was under consideration for inclusion in SDRAM, and never corrected the misimpression that it did not have relevant patents once DDR began to be considered formally.

present evidence at trial demonstrating that, even if the JEDEC disclosure rule were to be construed in the manner held by the Federal Circuit majority in *Infineon*, Rambus did – while participating as a member of JEDEC – possess at least one patent and several patent applications that "reasonably might [have been] necessary to practice the [JEDEC] standard." *Rambus Inc. v. Infineon Technologies AG*, 318 F.3d 1081, 1100 (Fed. Cir. 2003). Complaint Counsel will therefore prove not only its own case, but Infineon's as well.

(4) Rambus's Deceptive Conduct Was in Bad Faith.

Rambus's violation of the terms of its participation in JEDEC also breached its duty of good faith and fair dealing. "Every contract imposes upon each party a duty of good faith and fair dealing in its performance and its enforcement." Restatement of Contracts (2d) § 205.[144] Indeed, the JEDEC rules expressly require members to participate in "good faith." This requires "faithfulness to an agreed common purpose and consistency with the justified expectations of the other party." *Id.*, comment a. Accordingly, the parties may not "'do anything which will injure the right of the other to receive the benefits of the agreement.'" *Kransco v. American Empire Surplus Lines Insurance Co.*, 23 Cal. 4th 390, 400 (2000) (quoting *Comunale v. Traders & General Ins. Co.*, 50 Cal. 2d 654, 658 (1958)).[145] The doctrine thus "forbid[s] the kinds of

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[144] California courts recognize a covenant of good faith and fair dealing inherent in all contracts. *Carma Developers (California), Inc. v. Marathon Development California, Inc.*, 2 Cal. 4th 342 (1992) (citing Restatement 2d, Contracts, § 205). Likewise, this duty is recognized under Virginia law. *See McMullen v. Entre Computer Centers, Inc.*, 819 F.2d 1279 (4th Cir. 1987) (applying Virginia law and citing § 205 of the Restatement), *overruled on other grounds, Busby v. Crown Supply, Inc.*, 896 F.2d 833 (4th Cir. 1990); *Pennsylvania Life Ins. Co. v. Bumbrey*, 665 F. Supp. 1190 (E.D. Va. 1987) ("Under Virginia law, every contract contains an implied covenant of good faith and fair dealing in the performance of the agreement.") (citing *McMullen*).

[145] The covenant of good faith can be breached for "objectively unreasonable conduct, regardless of the actor's motive." *Carma*, 2 Cal. 4th at 373. "The essence of the good faith

opportunistic behavior that a mutually dependent, cooperative relationship might enable in the absence of rule." *Market St. Assoc. Ltd. Partnership v. Frey,* 941 F.2d 588, 595 (7th Cir. 1991). Rambus's conduct completely violated this duty, which it undertook by joining JEDEC and subjecting itself to the organization's rules of conduct.

The obligation of good faith applies particularly strongly where the parties are engaged in a cooperative venture such as JEDEC. *See Universal Sales Corp. v. California Press Mfg. Co.*, 20 Cal. 2d 751, 772 (1942) (where "the cooperative arrangement of the parties partook of the nature of a joint venture, the defendant owed to the plaintiff the duty of fair, open, honest disclosure, and it cannot by connivance, deceit or suppression of facts within the right or to the advantage of the plaintiff to know, secure or accept secret gains."). Accordingly, where a partner to a joint venture "withhold[s] information . . . [it] is a violation of the contract in letter and spirit." *Id.*; *accord Miller v. Ferguson*, 57 S.E. 649, 651 (Va. 1907) (partners breached duty of good faith by "availing themselves of [the third partner's plan to purchase land] and eliminating him as a possible competitor, carr[ying] on negotiations behind his back and withh[olding] from him information of the gravest importance vitally affecting his interests."); *see also MacIsaac v. Pozzo*, 26 Cal. 2d 809, 813 (1945) (joint venturers "occupied a fiduciary relationship similar in many respects to that of partners, and each owed to the other the duty of highest loyalty and utmost good faith, being charged not to take any unfair advantage or secret profit"). Rambus violated the duty to its co-members in JEDEC by not complying with the organization's rules. It thereby further subverted the purpose and policies of JEDEC's rules to further its anticompetitive scheme.

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covenant is objectively reasonable conduct." *Lazar v. Hertz Corp.*, 143 Cal. App. 3d 128, 141 (1983).

D. The Antitrust Rule Applicable to This Case is Amply Clear.

The clarity of the JEDEC rules is not determinative of this case. Even full literal compliance with the JEDEC rules, if that could be demonstrated here, would not shield Rambus from antitrust liability. As discussed above, antitrust law recognizes that the private standard-setting process can be "rife with opportunities for anticompetitive activity," including the risk that members of a standard organization may seek to harm competitors "through manipulation of [the organization's] codes." *American Society of Mechanical Engineers, Inc. v. Hydrolevel Corp.*, 456 U.S. 556, 571 (1982). *Allied Tube* makes clear that even full literal compliance with the rules of a standard-setting organization does not preclude antitrust liability where a defendant has manipulated the purposes and rules of the organization in order to achieve anticompetitive effects in the market as a whole. The clarity of the organization's rules, and the defendant's literal compliance with them, is not dispositive of the issue of antitrust liability.

Rambus has previously cited contract and antitrust cases to support its claim that the lack of clarity in JEDEC's rules make a finding of liability for their violation improper as a matter of law. *See* Rambus Memorandum in Support of Summary Decision 14-15. As explained in Complaint Counsel's response thereto, these cases are inapposite.[146] This is not a contract suit; it is a conduct case, challenging as anticompetitive Rambus's deceptive conduct. The antitrust cases are likewise inapposite. The relevant antitrust rule is a bar on conduct that subverts a standard-setting process. That rule was set out clearly in *Allied Tube*, and, as Complaint Counsel will demonstrate at trial, Rambus's conduct violated that rule.

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[146] Complaint Counsel's Memorandum in Opposition to Respondent Rambus Inc.'s Motion for Summary Decision, at 55-57 (Mar. 25, 2003).

V. Rambus Acted with Specific Intent to Monopolize.

A. Intent as an Element of the Alleged Violations.

To find a violation of the Sherman Act's strictures against monopolization, a plaintiff must prove "(1) the possession of monopoly power in the relevant market and (2) the willful acquisition or maintenance of that power as distinguished from growth or development as a consequence of a superior product, business acumen, or historic accident." *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966). A plaintiff need not show, to prove monopolization, that the defendant specifically intended that result, but merely that the defendant had "an intent to bring about the forbidden act." *United States v. Aluminum Co. of America*, 148 F.2d 416, 432 (2nd Cir. 1945) (hereinafter "*Alcoa*"); *Aspen Skiing Co. v. Aspen Highlands Skiing Corp.*, 472 U.S. 585, 602 (1985). That is, "the completed offense of monopolization under § 2 demands only a general intent to do the act, for no monopolist monopolizes unconscious of what he is doing." *Times-Picayune Publ'g Co. v. United States*, 345 U.S. 594, 626 (1953) (internal quotations omitted).

The offense of attempted monopolization, in comparison, requires, *inter alia*, proof also that the defendant had a specific intent to monopolize.[147] *Times-Picayune Publ'g Co.*, 345 U.S. at 626 ("a specific intent to destroy competition or build monopoly is essential to guilt" for the charge of attempted monopolization). Courts have interpreted specific intent to mean "an intent which goes beyond the mere intent to do the [exclusionary] act." *Alcoa*, 148 F.2d at 432. In particular, the plaintiff must also show that the defendant engaged in the challenged conduct with

[147] In order to prove attempted monopolization, a plaintiff must show "(1) that the defendant has engaged in predatory or anticompetitive conduct with (2) a specific intent to monopolize and (3) a dangerous probability of achieving monopoly power." *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 456 (1993).

"the intent to control prices or unreasonably restrict competition." *Conoco Inc. v. Inman Oil Co.*, 774 F.2d 895, 905 (8th Cir. 1985). In other words, the plaintiff must demonstrate that the defendant undertook the challenged conduct with a purpose to further anticompetitive ends. *Aspen Skiing*, 472 U.S. at 602 ("[For a claim of attempted monopolization], it is necessary to prove a 'specific intent' to accomplish the forbidden objectives.").

The element of specific intent may be proved not only by direct evidence of intent such as statements of the defendant or its agents, but also by inferences drawn from the defendant's conduct. *M&M Medical Supplies & Service, Inc. v. Pleasant Valley Hosp.*, 981 F.2d 160, 166 (4th Cir. 1993) (*en banc*) ("Specific intent may be inferred from the defendant's anticompetitive practices."), *cert. denied*, 508 U.S. 972 (1993); *Volvo N. Am. v. Men's Intern. Pro. Tennis Coun.*, 857 F.2d 55, 74 (2d Cir. 1988) ("Proof of the first element of an attempted monopolization claim, anticompetitive or exclusionary conduct, may be used to infer the second element, specific intent to monopolize. . . ."); *Conoco Inc.*, 774 F.2d at 904 n.6 ("The intent element [in an attempted monopolization case] is often proven by inferences drawn from the defendant's conduct."); *id.* at 905 ("Specific intent may be shown either by direct evidence of intent or by inference from proof of unlawful conduct."); *H.J., Inc. v. Intern. Telephone & Telegraph Corp.*, 867 F.2d 1531, 1542 (8th Cir. 1989) (finding that evidence of defendant's anticompetitive conduct supported the jury's inferential conclusion that the defendant consciously intended to monopolize the relevant market).

The evidence will demonstrate that Rambus not only acted with knowledge that it was violating the purposes and rules of JEDEC, but with the specific intent of ensuring that the JEDEC standards embody its patented technology, and pursuing claims of infringement against firms that followed the standards.

B. Rambus Was Well Aware of the JEDEC Policy Against Standards Based on Patented Technology and the JEDEC Disclosure Policy.

The evidence will show that Rambus itself plainly understood JEDEC's policy against the inclusion of proprietary technology in its standards, and the JEDEC patent disclosure policy. Its effort to subvert those policies could not remotely be considered inadvertent.

Richard Crisp, Rambus's designated JEDEC representative, understood well the purposes and rules of JEDEC. He once explained JEDEC's purpose in these succinct terms, in a communication to others at Rambus: "The job of JEDEC is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903]. Rambus also well understood the requirements of the JEDEC patent disclosure policy. Rambus produced from its own files (despite its extensive document destruction efforts) a nearly complete copy of the JEP 21-I Manual, setting out the JEDEC patent disclosure policy, bearing Rambus production numbers.[148] Indeed, Crisp has testified (1) that he not only received the JEP 21-I Manual, but also that it was given to him at his specific request; (2) that it was the material that JEDEC provided to members for the purpose of understanding their obligations under the JEDEC disclosure policy; and (3) that he in fact read the document and understood the disclosure obligations set forth in that document:

> Q. Did you ever get a copy of 21-I while you were at JEDEC?
>
> A. I think I did.
>
> Q. When did you get a copy of 21-I?
>
> A. It was in 1995.

[148] JEDEC Manual of Organization and Procedure JEP 21-I, R173458 *et seq.* [CX0208A].

Q. And how did you come to get that copy in 1995?

A. I had made a request to be given whatever kind of manual they must have had there for members that outlined what the patent policy was.

Crisp Dep. Tr. *Rambus v. Micron* (8/10/01) at 851-52 [CX2104].

Crisp's receipt of the JEDEC Manual permitted him to learn the patent disclosure rules of JEDEC:

Q. And when you got a copy of 21-I, did you read it?

A. I read – I didn't read all of it, but I looked through it, I believe – I believe I read a lot of it. I don't think I read all of it.

Q. Okay. Based on your reading of 21-I, did you come to some understanding of what the written patent policy was of JEDEC?

A. I think I did, yes.

Q. What was that understanding?

A. Well, they wanted to know about both patents and patent applications that might relate to the works that were going on within JEDEC.

Id. at 852-53 [CX2104].

The JEP 21-I Manual was not the only way Crisp learned about JEDEC's purposes and rules. As explained in Section IV.B.2.a, *supra*, JEDEC, and particularly Jim Townsend, undertook extensive efforts to educate JEDEC members about the disclosure rules. Crisp observed Townsend's presentations, which explaining the JEDEC patent policy, at each of the meetings that he attended:

Q. Did Chairman Townsend or anyone else regularly start these JEDEC meetings with a presentation on the patent policy of JEDEC?

. . . .

THE WITNESS: I believe that he generally made some sort of a presentation about patent policy.

. . . .

Q. At each of the meetings you attended he did, right?

. . . .

THE WITNESS: I believe that he did.

Crisp Dep. Tr. *Rambus v. Infineon* (11/9/00) at 306-07 [CX2053].[149]

The efforts other than Townsend's oral presentations also reached Rambus. Crisp acknowledges that when attending at least some JEDEC meetings, he saw the JEDEC sign-in sheet stating that "Subjects involving patentable or patented items shall conform to EIA Policy (reverse side). Consult the EIA General Counsel about any doubtful question." *See* Crisp Dep. Tr. *Rambus v. Micron* (7/20/01) at 439-40 [CX2094] (discussing document contained in CX0356).

Crisp also observed the debate within JEDEC concerning Texas Instruments' alleged failure to disclose the existence of a relevant patent on a timely basis. Indeed, Crisp commented in an e-mail to others at Rambus commented in detail upon, Mr. Crisp wrote, "TI was chastized [sic] for not informing JEDEC that it had a 1987 patent on quad CAS devices . . .. The bottom line is that all quad CAS devices will be removed from [JEDEC] standard 21-C." Crisp E-mail (10/5/93) R69511 [CX0711]. At a subsequent meeting, Crisp observed further debate on the

[149] Crisp became aware that JEDEC had a disclosure requirement near the beginning of his involvement in JEDEC. Crisp Dep. Tr. *Rambus v. Micron* (7/20/01) at 434 [CX2094] ("I believe that I became aware of that at some point in time near the beginning of my involvement.").

issue. He described the debate as follows:

> The meeting opened with a lot of controversy regarding Patents. . . Micron says the policy exists due to anti-trust concerns. That if a group of companies wanted to keep out competition they could agree amongst themselves to standardize something that is patented and not license those that they do not want to compete with.

Crisp E-mail (3/9/94) R155836 [CX0724]. Crisp later testified that the discussions of the quad CAS incident he observed in JEDEC caused him to come to understand the JEDEC disclosure policy. Crisp Dep. Tr. *Rambus v. Infineon* (11/8/00) at 199 [CX2052]; *see also* Crisp E-mail (12/5/95) R155901 [CX0842] ("SSTL passed 30/0 and was sent to council. However Hitachi stated that they had a patent relating to it. This created a big ruckus. The major thrust of the criticism of Hitachi was that they waited until the ballots had been passed before mentioning that they had a patent."). Based on the Townsend presentations at every meeting, the sign-in sheet, the quad CAS debate spanning a number of meetings, the 21-I Manual, and other events and discussions within JEDEC, Richard Crisp and others at Rambus came to have an accurate understanding of the JEDEC disclosure policy. *See* Crisp E-mail (8/26/96) R208394 at 395 [CX0903] ("The job of JEDEC is to create standards which steer clear of patents which must be used to be in compliance with the standard whenever possible.").[150]

The testimony of Crisp and others flatly contradicts Rambus's current assertion that the

[150] *See also* Crisp E-mail (12/5/95) R155901 at 102 [CX0842] ("So the conclusion I reach here is that we can abide by the patent policy on a case by case basis. . . . As long as we mention that there are potential patent issues when a showing or a ballot comes to floor, then we have not engaged in "inequitable behavior. . . . The things we should not do are to not speak up when we know that there is a patent issue."); Crisp E-mail (9/23/95) R233837 at 838 [CX0837] ("As time passed some of the patents issued and then we have not really made the committees aware of this fact. . . . It seems to me that we should re-evaluate our position relative to what we decide to keep quiet about, and what we say we have.").

JEDEC disclosure policy did not require the disclosure of patent applications. Crisp's testimony, on three separate occasions, could not be clearer:

> Q. As of September 1995 . . . did you understand the JEDEC patent policy to also require disclosure of patent applications?
>
> A. I understood it to apply to applications as well, yes.

Crisp Dep. Tr. *Rambus v. Infineon* (11/8/00) at 190 [CX2052].

> Q. When is the first time, sir, that you believed patent applications had to be disclosed under the JEDEC patent policy?
>
> A. Sometime in 1995 I received a copy of the patent policy as part of the users in the manual that they had that was to be used to tell people what the rules were. And I read in there that it applied to patent policies.
>
> Q. Patent applications?
>
> A. Patent applications, that's right.

Crisp, *Rambus v. Infineon* Trial Tr. (Vol. 9) (5/2/01) at 60 [CX2092].

> Q. Okay. Based on your reading of [the JEP] 21-I [Manual], did you come to some understanding of what the written patent policy was of JEDEC?
>
> A. I think I did, yes.
>
> Q. What was that understanding?
>
> A. Well, they wanted to know about both patents and patent applications that might relate to the works that were going on within JEDEC.

Crisp Dep. Tr. *Rambus v. Micron* (8/10/01) at 853 [CX2104].

Others at Rambus shared this understanding. For example, Anthony Diepenbrock, former

in-house counsel at Rambus, has admitted that, based on information provided to him by Richard Crisp, he thought that the JEDEC disclosure policy might require disclosure of patent applications:

> Q. When you say "a duty might attach," you mean a duty to disclose pending applications?
>
> . . . .
>
> A. As I recall thinking about it, there – I believe that the JEDEC disclosure policy might have required that not just issued patents but pending applications be made available to members of the meetings, if there were a duty to disclose that information, that possibly pending applications might have to be disclosed.

Diepenbrock *Rambus v. Infineon* Dep. Tr. (3/14/01) at 155.[151]

Rambus also understood that the JEDEC disclosure obligation was not limited to companies making presentations. Diepenbrock testified that the JEDEC disclosure duty might attach based on Rambus's attendance at JEDEC meetings, even though Rambus was not presenting any proposals at JEDEC:

> Q. My question is: What was the conclusion?
>
> A. The conclusion is that a duty -- there was a risk that a duty might attach if he were attending those meetings.

Diepenbrock *Rambus v. Infineon* Dep. Tr. (3/14/01) at 154-55. In a subsequent deposition, he

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[151] Mr. Diepenbrock testified:

> Q. How did you come to learn about the JEDEC patent policy, patent disclosure policy?
>
> THE WITNESS: That's my recollection, that Mr. Crisp told me that such a policy existed.

Diepenbrock, *Rambus v. Infineon* Dep. Tr. (3/14/01) at 152-53.

expanded on his testimony, and clarified that the IEEE rules did not make any distinction between active participants and observers:

> Q. And what did you conclude in that regard? Is that where you said that you didn't want to take the risk, so you just decided to get out?
>
> A. What I recall is that after reading these rules, it appears that you can't sit on the fence; either you are participating or you are not participating the rules would like to have it. And because the rules have that kind of tone to them, that raises the risk that Richard's participation is active participation because there's no – there's no observing status. That's enough for me to have a risk.
>
> Q. So what you are saying is the rules contemplate people who attend and people who don't attend, and that's really the only distinction?
>
> A Right. They don't make a distinction about someone who's there but not attending.

Diepenbrock, *Rambus v. Infineon* Dep. Tr. (4/11/01) at 278-79.

Rambus's lawyers advised Rambus that the company might well incur obligations that, if not fulfilled, could render their patents unenforceable. Lester Vincent, Rambus's outside counsel, informed Rambus representatives of concerns with respect to equitable estoppel if "Rambus creates impression on JEDEC that it would not enforce its patent[s] or patent appl[ication]s." Vincent, Handwritten Notes (3/27/92) R203254 [CX1942]. Both Vincent and Diepenbrock recognized that Rambus ran a serious risk that its patents would be held to be unenforceable due to its participation in, and lack of disclosure to, JEDEC. Lester Vincent testified:

> Q. Did you tell Richard Crisp and Allen Roberts that at this March 27th, 1992 meeting, that they should not participate in JEDEC?

A. I'm having trouble remembering what I said at this specific meeting beyond [the handwritten notes]. But I do want to say that I believe at some point early on, and I don't know whether it was at this particular meeting, that I believe I said I didn't think it was a good idea.

. . .

Q. The downside risk was that somebody was going to raise the issue of equitable estoppel if Rambus attended JEDEC?

A. Right. I mean, we were having this meeting about the implications, that's right.

Vincent, *Rambus v. Infineon* Dep. Tr. (4/11/01) at 320-21. Diepenbrock provided similar advice:

Q. Did you discuss with Mr. Crisp whether or not the JEDEC policies, by attending the JEDEC meetings, he was obligated under the JEDEC patent disclosure policies to disclose Rambus patents or patent applications related to what was being discussed at the meetings he attended?

. . .

A. We never discussed whether he was under any particular duty or not. We just simply said there was a risk of equitable estoppel or other legal problems if he continued to attend those meetings. We were not presenting legal conclusions.

Diepenbrock, *Rambus v. Infineon* Dep. Tr. (4/11/01) at 147-48.

In sum, the evidence will confirm that Rambus shared the common understanding of the JEDEC disclosure policy.[152] Its actions in contradiction of that policy were not inadvertent.[153]

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[152] Rambus pursued its strategy after leaving JEDEC, even contemplating its own standard-setting organization from which it could appropriate the value of standards. In August 1996, Crisp discussed with others at Rambus the possibility of Rambus creating something called "REDEC," referring to a Rambus-sponsored standards organization designed to compete against JEDEC. *See* Garrett E-Mail (8/23/96) R208371 [CX0902]. In another email about REDEC sent three days later, Crisp acknowledged the fundamental economic principle such an organization could satisfy. In his words, "The most valuable patents are ones that must be used in order to be in compliance with a standard." Crisp E-Mail (8/26/96) R208394 at 395 [CX0903]. He described the fundamental purpose of JEDEC as creating "standards which steer clear of patents

C. Rambus Specifically Intended To Subvert JEDEC Policy, Ensure that the JEDEC Standards Embody Its Patented Technology, and Pursue Claims of Infringement Against Firms that Followed the Standards.

Rambus, throughout much of the 1990s, worked to position itself to assert patent claims against the manufacturers of JEDEC-compliant synchronous DRAM devices. As the company's June 1992 Business Plan explained, "For about 2+ years a JEDEC committee has been working on the specifications for a Synchronous DRAM. No standard has yet been approved by JEDEC. Our expectation is a standard will not be reached until end of 1992 at the earliest." Rambus Inc. 1992-1997 Business Plan, (June 1992) R46394 at 6408 [CX0543A]. Two pages later, Tate outlined Rambus's "action plan" with respect to claiming patent rights over synchronous DRAMs:

> [W]e believe that Sync DRAMs infringe on some claims in our filed patents; and that there are additional claims we can file for our patents that cover features of Sync DRAMs. Then we will be in position to request patent licensing (fees and royalties) from any manufacturer of Sync DRAMs. Our action plan is to determine the exact claims and file the additional claims by the end of Q3/92. Then to advise Sync DRAM manufacturers in Q4/92.

Id. R46410 [CX0543A]. In a September 1992 version of Rambus's Business Plan, Mr. Tate added: "Sync DRAMs infringe claims in Rambus' filed patents and other claims that Rambus

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which must be used to be in compliance with the [JEDEC] standard whenever possible." *Id*. He also acknowledged that open standards are "at odds with [Rambus's] business model" because "Rambus would want to retain ownership of IP developed so that we could tax the makers." *Id*. Mr. Crisp concluded that he could not visualize how Rambus could establish "anything resembling JEDEC" that would not be in "direct conflict with [Rambus's] business model." *Id.* at 396.

[153] Judge Timony has already entered presumptions that "Rambus knew or should have known from its pre-1996 participation in JEDEC that developing JEDEC standards would require the use of patents held or applied for by Rambus," and that "Rambus never disclosed to other JEDEC participants the existence of these patents." Order On Complaint Counsel's Motions for Default Judgment and for Oral Argument at 9 (Feb. 26, 2003).

will file in updates later in 1992." Rambus Inc. 1992-1997 Business Plan (Sept. 1992) R169923 at 943 [CX0545].

In the months, and indeed years, that followed, Vincent, working with Crisp, Allen Roberts, and others, followed through on Tate's plan to "file . . . additional claims" intended to "cover features of Sync DRAMs," so that Rambus would be "in position to request . . . royalties."[154] Tate himself remained personally involved in monitoring this work. *See, e.g.*,Tate E-Mail (6/17/94) R233775 [CX0740] ("this stuff is real critical – I'd like a list of which claims we are making that read directly on current/planned sdrams . . . , so i can track progress from lester's periodic status lists.").

At the same time that this process of amending Rambus patent applications to cover aspects of JEDEC-compliant SDRAM was moving forward, Crisp on numerous occasions commented in e-mails addressed to Rambus colleagues that various DRAM-related technologies discussed within JEDEC infringed, appeared to infringe, or otherwise might infringe Rambus's patents or pending patent applications.[155] Crisp also commented on one occasion, in an internal

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[154] *See, e.g.*, Ware E-Mail (6/18/93) R202996 [CX1959] (reporting on a phone conference "with Lester Vincent" regarding "current status of the additional claims that we want to file," many of which were "directed against SDRAMs" or "against future SDRAMs"); Vincent, Handwritten Notes (1/10/94) (R203314) [CX1970] (reporting on conference with Mr. Tate and others concerning "Enforcement: Sync DRAMs"); Roberts Letter (5/5/94) R202763-64 [CX0734] (providing Mr. Vincent a "list of enhancements" that Rambus desired to have covered through amended patent applications, including "[u]se of both edges of the clock"); Tate, Handwritten Notes (7/21/94) R33831 [CX1720] ("SDRAM . . . CLAIMS – Allen gave Lester a list of claims we need"); Handwritten Note of Roberts to Rick Barth, Fred Ware, et al., attaching August 1, 1994, Correspondence from Lester Vincent (R204436) [CX1959] ("This is Lester's attempt to work [up] claims for the . . . SDRAM defense. Please comment."); Barth, Handwritten Notes (2/2/95) R203055 [CX1978] (referring to "claims to prevent Sync DRAM m[anufacturers]").

[155] *See, e.g.*, Crisp E-Mail (5/27/94) R69511 at 69537 [CX0711] (referring to externally supplied reference voltage, "I believe we have a claim we added to cover this."); Crisp E-Mail

e-mail to his Rambus colleagues, that Rambus should seek to "collect big royalty checks" on the SyncLink technology, which was the subject of a May 1995 JEDEC presentation attended by Crisp. *See* Crisp E-Mail (8/30/96) R69511 at 69695 [CX0711].

Tate also acknowledged to his colleagues, on many occasions, that Rambus held patents and patent applications that would likely be infringed by products built in compliance with JEDEC's SDRAM and DDR SDRAM standards. *See, e.g.*, Tate E-Mail (8/4/97) R233868 [CX0942] ("competitive solutions like ddr/sldram are likely to infringe"); January 10, 1998, Tate E-Mail (1/10/98) R233877 at 233880) [CX0987] ("ddr infringes our patents"); Tate E-Mail (1/5/98) R233884 at R233886) [CX0984] ("we believe ddr/sldram/etc will likely infringe our patents"). Meanwhile, Tate and others within Rambus worked hard to keep this information confidential until the right strategic moment arrived. *See, e.g.*, Karp E-Mail (1/10/98) R233882 [CX0988] ("I am very uncomfortable with any public statements regarding who or what infringes our patents."); Transcript of "Approved Q&A for Latest Patent" R233869 [CX0948] ("Q3: Do Double Data Rate (DDR) SDRAMs use this patent? A: We don't know yet. No DDR products exist for us to evaluate."). As Mr. Tate himself described it, the company's goal was to prepare a "minefield" of SDRAM-related patents that no DRAM manufacturer, or related component supplier, could successfully navigate without agreeing to pay royalties to Rambus. *See, e.g.*, Tate E-Mail (2/15/96) R233848 [CX0867]; *see also* Tate E-Mail (8/4/97) R233868 [CX0942] ("IF [Intel] were to consider a DDR chipset . . . there is a minefield of 60+ rambus patents that would

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(9/14/94) R157024 [CX0756] (referring to on-chip PLL, "What is the exact status of the patent with the PLL claim?"); Crisp E-Mail (3/15/95) R69511 at 69568 [CX0711] (referring to Fujitsu's suggestion that it may use source synchronous clocking, "Of course they may get into patent trouble if they do this!"); *see also* Crisp E-Mail (6/5/95) R233819 [CX0797] ("I am trying to understand exactly what we can claim against [SyncLink] ensure their plans infringe our IP").

have to be avoided."). Mr. Tate wanted to ensure that, once Rambus began asserting its patents, manufacturers of SDRAM would be forced to take a Rambus license, and agree to pay high royalties, given the high costs of avoiding the patents or proving them invalid in court. *See* Tate E-Mail (9/9/97) R233895 at 233897 [CX0952] (speculating it would be "extremely hard" for DRAM companies to "avoid EVERY rambus patent or prove it invalid in court"); *See also* Karp, Handwritten Notes (11/9/98) R300665 at 826 [CX1744] (Positioning for future – IP Rights – secure strategic portfolio – convince industry that paying royalties to Rambus is a fact of life."). As Tate and others recognized, this strategy would be successful only if Rambus waited long enough to gain needed "leverage" before playing its "IP card." *See* Tate E-Mail (2/10/97) R200497 [CX0919] ("1. keep pushing our patents through the patent office 2. do *NOT* tell customers/partners that we feel DDR may infringe – our leverage is better to wait."); Tate E-Mail (1/10/98) R233877 at 878 [CX0987] ("we should get patents/contracts/etc in place so that dram companies/module companies/pc companies cannot build/use" JEDEC-related products "without legal agreements with us. then we have leverage to get royalties . . . in return."); Tate E-Mail (4/14/98) 930DOC00537 at 542 [CX1016] (referring to Rambus playing "our IP card with the dram companies").[156] Rambus was very much aware that when it did begin to assert patent claims over JEDEC-compliant SDRAM, litigation was virtually inevitable.

[156] At times, some within Rambus optimistically hoped that the company's strategy of "playing the IP card" against DRAM manufacturers would prove unnecessary, as might be the case if RDRAM succeeded in the marketplace while SDRAM and other competitive technologies failed. *See* Mooring E-Mail (7/11/97) R233900 [CX0937] ("We have not yet told Siemens that we think . . . SDRAM-DDR infringe our patents. . . . Hopefully, . . . DDR will die due to their technical/infrastructure faults so we don't have to play that card."); Davidow E-Mail (4/16/98) R233890 at 891 [CX1022] ("We will not have to play the intellectual property card with Micron and SDRAMs during this time. If things blow up with Intel, then we can begin to pursue the intellectual property issue with these guys.").

Because the prospect of litigation was so closely intertwined with Rambus's "action plan" to assert patent rights over JEDEC-compliant SDRAMs, references to possible litigation frequently arose in internal Rambus correspondence during the period during which Rambus was a member in JEDEC. For instance, in an October 1994 e-mail to Allen Roberts and other senior Rambus executives, Crisp commented repeatedly on the future prospect of suing DRAM makers "for using a PLL on an SDRAM." Crisp E-Mail (10/25/94) R234245 [CX0763] ("can't we sue"; "I would hope we would sue other companies"). The next day, in an e-mail to Geoffrey Tate, Crisp again commented about "opportunities to sue" DRAM makers who use "PLLs/Dlls on SDRAMs." Crisp E-Mail (10/26/94) R234250 [CX0766]; *see also id.* ("I . . . want to make sure we keep the proper perspective . . . when we engage with others"). Crisp, indeed, had previously warned that "if we want to fight this one (after the claim is issued), we better stock up our legal warchest." Crisp E-Mail (9/14/94) R233785 [CX0757] (emphasis omitted). In the same e-mail, Crisp also stated, "It seems likely we will have to fight litigation at some point in the future." *Id.*; *see also* Roberts E-Mail (9/21/95) R233833 [CX0833] ("I think we are going to need to generate an IP crush plan on this.").

Others within Rambus also fully understood that litigation was likely to ensue when Rambus began asserting its SDRAM-related patent claims. An e-mail exchange between Rambus's VP of Engineering, Allen Roberts, and Rambus's Lead Architect, Rick Barth, in early 1995 demonstrates this. At the time, Roberts was seeking to persuade (and ultimately succeeded) Anthony Diepenbrock to leave his job as in-house patent attorney with Intel in order to join Rambus in a similar capacity.[157] Relating to his ongoing discussions with Diepenbrock, Roberts

[157] The reason for hiring Mr. Diepenbrock, as Rambus's CEO Geoffrey Tate explained, was to have someone "focused full time" on analyzing Rambus's "IP position vs competitive

reported to Barth and others that "Tony . . . is wondering if what he should do is to get a position writing and litigating patents. He has correctly concluded that he will not get to do too much of that at Rambus." Roberts E-Mail (2/17/95) R233804 [CX0779]. In response, Barth made it clear that. Diepenbrock would be able to pursue his interest in patent litigation: "Do you really think there won't be litigation once products start shipping? In my view there will be plenty" *Id.*

Tate also was conscious of the likelihood of future patent litigation involving Rambus's SDRAM-related patents. For instance, in negotiating with Samsung over their initial RDRAM license agreements, Tate agreed to terms that might have allowed Samsung to use Rambus technology for non-Rambus memory products, provided Samsung did not do so "intentionally." *See* Tate E-Mail (10/25/94) R234242 [CX0762]. As Tate explained to his colleagues, in advocating for a license, if Samsung were intentionally to use Rambus technology for non-compatible DRAM products, Rambus could "sue them." *Id.*; *see also* Tate E-Mail (10/31/94) R46195 [CX0768] ("we can clearly terminate the deal and go after them 100% for any infringement").[158]

To advance its litigation plans, Tate reported, in May 1997, to other senior Rambus executives that he was "inclined to make . . . an offer" of employment to Joel Karp, who at that

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technologies." Tate E-Mail (8/28/95) R233828 [CX0827]. In that capacity, he was to report directly to Tate, and his ultimate responsibility would be "maximizing [Rambus's] Intellectual Property protection." *Id.*

[158] Indeed, it appears that one of the reasons Rambus ultimately did agree to grant Samsung rights to practice Rambus technology in non-compatible products was that it hoped, by doing so, it might lead other companies (lacking such contractual protections) to do the same, making them easy targets for patent infringement suits. *See* Crisp E-Mail (10/26/94) R234250 [CX0766] ("In a way it is good having Samsung licensed to do it as they will pull the market along that direction. As others that we have not made the covenant not to sue follow, we get opportunities to sue them.").

time worked for Samsung, with the intention of placing Karp in charge of Rambus's strategies vis-a-vis enforcing patent claims against non-Rambus, or what Rambus often referred to as "non-compatible," technologies. Tate E-Mail (5/23/97) R233866 [CX0928]. As Tate explained, Karp was "NOT a technologist" and thus would not be in a position "to determine who infringes [Rambus patents] and how." *Id.* On the other hand, Tate suggested that Karp's "real strength" would be in "negotiating deals with infringers." *Id.*

Several months later, in October 1997, Tate informed Rambus's executive management team that "Karp called to accept our offer." Tate E-Mail (10/1/97) R233872 [CX0960]. "He will have the title of vp," Tate reported, and "his role" would be "to prepare and then to negotiate to license our patents for infringing drams (and potentially other infringing ic's)," with a particular emphasis on preparing patent actions against JEDEC-compliant DDR SDRAMs. *Id.*[159] Yet Tate cautioned his team to "keep this confidential" – referring to Mr. Karp's acceptance of employment with Rambus – until Mr. Karp started later in October 1997. *Id.* Moreover, even after he started at Rambus, Mr. Tate suggested that the company should be careful not to make it known externally precisely what Mr. Karp was hired to do: "when joel starts we have to have our spin control ready for partners/etc as to why we are hiring him and what he will be doing. my thought is we say externally that joel is coming on board to help us with contracts and ip licensing." *Id.*

Upon arrival at Rambus, Karp immediately commenced work on Rambus's "strategic license program." That program was Rambus's name for Karp's mission of preparing to assert

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[159] *See also* Karp, *Rambus v. Infineon* Dep. Tr. (1/8/01) at 19-20 [CX2059] ("I was responsible for the intellectual property for patents, for licensing of noncompatible types of license matters," meaning "licensing of the patents for other than the Rambus technology," including "SDRAMs and DDR SDRAMs").

Rambus patent claims against non-compatible products, such as SDRAM, DDR SDRAM, and SLDRAM (the being an alternative DRAM design originally sponsored by the Institute of Electrical and Electronics Engineers, Inc. and later considered by JEDEC). In February 1998, Karp drafted a document entitled "Strategic Patent Licensing Program" in which, for instance, he identified target royalty rates for DDR SDRAM (3.0-4.0%) and SLDRAM (3.5-5.0%). *See* Draft Presentation Entitled "Strategic Patent Licensing Program" (2/12/98) R302512 [CX0551]. Around the same time, Karp formed an internal "Rambus Patent Council," which was to "meet once a month with the intent of discussing [Rambus's] overall patent strategy/directions from a strategic perspective." Tate E-Mail (4/14/98) R127188 [CX1017].

Meanwhile, another Rambus employee, Neil Steinberg – a patent attorney – was charged with augmenting Rambus's "Strategic Patent Portfolio" by drafting and prosecuting additional patent amendments covering non-compatible devices such as SDRAM, DDR SDRAM, and SLDRAM. *See* Karp E-Mail (11/30/99) R214621 [CX1085] (congratulating Neil Steinberg "for successful prosecution of another addition to our Strategic Patent Portfolio"). Karp's and Steinberg's joint efforts in this regard received high praise within Rambus. *See, e.g.*, Toprani E-Mail (3/17/00) R128883 [CX1104] ("remember, a lot of our IP did not become 'valuable' till Neil and Joel got in and created strategic patent portfolio 1"). In late 1999, Steinberg was promoted to serve alongside Karp, both with the title Vice President of Intellectual Property. *See* Confidential Rambus Presentation Entitled "Promotions" (11/18/99) R189311 at 317 [CX1353] ("Tremendous progress on Strategic Patent Portfolio 1: SDRAM/DDR/Controllers all infringe . . . Neil & Joel will be '2 in the box' as VP IP"). Karp and Steinberg served together in that capacity until July 2000, when Karp announced his retirement.

Another part of the strategy that Karp and others at Rambus were pursuing to prepare for

litigation against DRAM makers was an extensive document destruction program. The program was intended to eliminate documents that might be troublesome for Rambus in the eventual litigation it would pursue against industry members that practiced the JEDEC standards. The contours of that document destruction program have been addressed in various pretrial motions and in Judge Timony's Adverse Inference Order. As previously found in this litigation, Rambus's conduct included the following:

(1) "Rambus never disclosed to other JEDEC participants that it either held or had applied for patents that would be infringed upon by the proposed JEDEC standards for RAM." Adverse Inference Order at 3.

(2) "While participating in JEDEC's development of RAM standards, Rambus was advised by its counsel that this participation, combined with its failure to disclose the existence of the patents that would be infringed by the proposed JEDEC standard, could create an equitable estoppel that would make it difficult, if not impossible, for Rambus to enforce its patents and, most importantly, to collect royalties or damages from patent infringements resulting from the proposed JEDEC standards." *Id.*

(3) "In mid-1996, Rambus ceased participating in JEDEC," *id.*, and its decision to do so was precipitated in large measure by the FTC's issuance of a consent order in *In re Dell Computer Corporation* – an order that signaled to Rambus and its lawyers that the same JEDEC-related conduct that they understood to create risks of adverse equitable estoppel rulings also created risks of antitrust liability, and potential risks of FTC enforcement actions. *Id.*

(4) "In October 1997, Rambus hired Joel Karp" as its Vice President of Intellectual Property, and Mr. Karp thereafter "worked on preparation and strategy concerning RAM-related patent infringement," focusing significant attention on future enforcement of Rambus's as-yet-undisclosed JEDEC-related patents. *Id.*

(5) Virtually simultaneously with his arrival at the company in late 1997, "counsel for Rambus advised Mr. Karp that Rambus should implement a document retention program," and Mr. Karp – a non-lawyer – then personally oversaw the development and implementation of such a program. *Id.* at 4, 6.

(6) In implementing this program, starting in July 1998, neither Mr. Karp nor

anyone else gave guidance to Rambus employees "about what documents they should keep" – "[s]pecifically, no instruction was given to Rambus employees to retain documents relevant to future litigation, nor were employees instructed to create and retain an inventory of all documents purged." *Id.* at 4.

(7) "[T]his virtually unsupervised destruction of documents took place at a time when Rambus knew or should have known of related litigation" – or at a minimum, "reasonably foreseeable litigation" (including the potential of an FTC enforcement action akin to the *Dell* proceeding) – involving "the proposed JEDEC standards for RAM." *Id.* at 4, 6.

Additionally, other evidence will show that:

(8) The volume of business records destroyed by Rambus was massive and clearly encompassed – among other things – millions upon millions of pages of paper documents, as well as thousands of electronic back-up tapes, containing equally massive amounts of e-mail and other documentation. *See* Complaint Counsel Memorandum in Support of Default Judgment Motion 59-60.

(9) Rambus's document destruction impacted numerous categories of evidence directly relevant to this proceeding, including JEDEC-related documentation, documents pertaining to Rambus's prosecution of JEDEC-related patents and patent applications, and business files kept by certain key individuals, including Richard Crisp (the company's primary JEDEC representative), Lester Vincent (Rambus's outside patent counsel), Anthony Diepenbrock (Rambus's in-house patent attorney), and Mark Horowitz (Rambus co-founder, board member, and lead inventor). *Id.* at 61-69.

(10) Because of "Rambus's utter failure to maintain an inventory of the documents its employees destroyed," it is now "impossible to discern the exact nature" of all that was destroyed "or the relevance of the documents destroyed to the instant matter." Adverse Inference Order at 7.

Judge Timony made a separate conclusion that, for purposes of this litigation, Rambus shall not be permitted to contest that it instituted its document destruction program "in part, for the purpose of getting rid of documents that might be harmful in litigation" involving the same "JEDEC-related patents" that Rambus feared could be held unenforceable. Order Granting

Complaint Counsel's Motion for Collateral Estoppel at 5;[160] *see also* Adverse Inference Order at 4 ("Rambus destroyed or failed to preserve evidence for another's use in reasonably foreseeable litigation.").

This evidence is but a small part of that which will be adduced at the hearing. The evidence, as a whole, will demonstrate that Rambus's conduct was undertaken with specific intent to turn the JEDEC standards to the anticompetitive advantage of Rambus. Rambus's protestations that its non-disclosure was inadvertent simply will find no support at trial. Rambus knew it was violating JEDEC's rules while it was a member. And Rambus, having violated those rules, later sought to capitalize on its violation of those rules through aggressive patent litigation.

VI. Rambus's Anticompetitive Conduct Caused the Competitive Harm Alleged in the Complaint.

A. Rambus Violated the Law if Its Conduct Was A Material Cause of The Competitive Harm.

While Complaint Counsel must prove causation to win its antitrust case, the standard for causation is less stringent in an antitrust case than a fraud case. To satisfy its burden of proving causation, Complaint Counsel need show only that Rambus's deceptive acts, accomplished through its lack of mandatory disclosure, implicit denials of relevant patents and patent applications, and partial disclosures of putatively relevant patents, were a "material cause" of JEDEC's decision to adopt standards incorporating Rambus propriety technology. *See Zenith Radio Corp. v. Hazeltine Research, Inc.*, 395 U.S. 100, 114 n.9 (1969). Accordingly, Complaint

[160] Reconsideration of this Order was denied. *See* Order Denying Respondent's Application for Review of February 26, 2003, Order (Granting Complaint Counsel's Motion for Collateral Estoppel) (Mar. 26, 2003).

Counsel "need not exhaust all possible alternative sources of injury in fulfilling [its] burden." *Id.*; *see also Law v. National Collegiate Athletic Ass'n*, 5 F. Supp. 2d 921, 927 (D. Kan. 1998) (Complaint Counsel "need not rule out 'all possible alternative sources of injury'"). Rather, it is required to show "only that the violation 'played a substantial part' in causing anticompetitive harm." *The Bohack Corp. v. Iowa Beef Processors, Inc.*, 715 F.2d 703, 711 (2d Cir. 1983).[161] Indeed, to "require that §2 liability turn on a plaintiff's ability or inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action." *United States v. Microsoft Corp.*, 253 F.3d at 79 (2001). Here, it is clear that Rambus's deceptive actions had a material effect on JEDEC's determination to adopt a standard that read on Rambus's patents.

Of course, Rambus is entitled to advance its own causation theories, but such theories are only alternatives for the finder of fact to consider. *See Hasbrouck v. Texaco, Inc.*, 842 F.2d 1034, 1042 (9th Cir. 1987). Thus even where there are possible "intervening causes," as Rambus posits, causation may still be proven where the antitrust harm "flowed from the anticompetitive conduct." *Id.* The rule of causation in antitrust cases means that even where the result complained of might have arisen also because of factors not related to the defendant's conduct, if the defendant's conduct was a material cause, it is properly the subject of antitrust liability. *See, e.g.*, *Sullivan v. National Football League*, 34 F.3d 1091, 1103 (1st Cir. 1994) (finding NFL liable for anticompetitive ban on public ownership of franchises despite plaintiff-owner's failure to request exception to ban and minimal proof that a public sale would have succeeded); *see also*

[161] Furthermore, Complaint Counsel need show only that Rambus's conduct caused some of the alleged consumer harm. *See William Inglis & Sons Baking Co. v. Continental Baking Co.*, 942 F.2d 1332, 1339 (9th Cir. 1991).

Andrx Pharmaceuticals, Inc. v. Biovail Corp., 256 F.3d 799, 808-09 (D.C. Cir. 2001) (holding that FDA restrictions on entry into drug market did not defeat causation from anticompetitive agreement that prevented entry). Rambus apparently seeks to hold Complaint Counsel to an unjustifiably high burden to prove Rambus's conduct was the sole cause of consumer harm. Complaint Counsel need prove no such thing. Instead, it must show only this: Had Rambus complied with JEDEC's rules and otherwise participated in good faith, DRAM manufacturers would not have committed to the JEDEC SDRAM and DDR SDRAM standards, if such standards would have been promulgated at all by JEDEC.

Here, Rambus failed to disclose its intellectual property, in violation of JEDEC's policy. Moreover, it deceived JEDEC members by strongly implying that it was complying by disclosing the '703 patent and by using elusive language to suggest that it had nothing to disclose. That conduct alone was sufficient to cause JEDEC to adopt a standard that infringed Rambus patents, even if the members of JEDEC contributed to that result through their failure to see Rambus's "red flags." Simply put, even if JEDEC members somehow were negligent (which we submit they were not, and, on summary decision, it must be presumed they were not), that negligence was, at best, one of two reasons leading to the adoption of the JEDEC standards. Accordingly, Rambus is not entitled to summary judgment on the ground that its lack of disclosure did not cause JEDEC to adopt standards that read on Rambus's patents.

Had Rambus complied with the JEDEC rules, the standards that evolved for SDRAM and DDR SDRAM would have been materially different than those that were actually adopted, or that JEDEC would have been able to secure Rambus's agreement to limit its royalties to amounts that were fair and reasonable and non-discriminatory. However, because the industry standards developed for nearly ten years along a path dictated by Rambus's deliberate failure to disclose its

patents and patent applications, Complaint Counsel should not be required to prove which of several alternative paths the industry would have followed.

Courts routinely have recognized that, in assessing antitrust damages, a defendant cannot benefit from the uncertainties created by its own violative conduct. *See Bigelow v. RKO Radio Pictures, Inc.*, 327 U.S. 251, 264-65 (1946). As the *Bigelow* Court noted:

> Any other rule would enable the wrongdoer to profit by his wrongdoing at the expense of his victim. It would be an inducement to make wrongdoing so effective and complete in every case as to preclude any recovery . . . The most elementary conceptions of justice and public policy require that the wrongdoer shall bear the risk of the uncertainty which his own wrong has created.

Id. The Court then added that the "principle is an ancient one, and is not restricted to proof of damage in antitrust cases . . . ." *Id.* (citation omitted).

There are sound policy reasons to apply the *Bigelow* rule in this case.[162] Rambus's conduct set the industry on a development path that it would not otherwise have followed, and any uncertainty in what would have happened on the alternative paths should be resolved against Rambus. As the Second Circuit noted in discussing damages: "The amount for which defendants are to be held liable will depend on the attempt, difficult but ineluctable, of seeking to find what would have been." *Fogel v. Chestnutt*, 533 F.2d 731, 755 (2d Cir. 1975) (citing *Bigelow*), *cert. denied*, 429 U.S. 824 (1976). This sort of inquiry is exactly what is involved in ascertaining what would have happened had Rambus played by the JEDEC rules.[163]

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[162] The policy reasons apply notwithstanding the fact that courts generally have distinguished between the quantum of evidence needed to prove the fact of damages and the evidence necessary to prove the amount of damages. *See Story Parchment Co. v. Paterson Parchment Paper Co.*, 282 U.S. 555, 562 (1931).

[163] It is of no consequence that these cases discuss the issue in the context of antitrust damages. The point is the same: Rambus cannot evade ultimately liability for its conduct because that conduct prevents a determination of precisely how the world would have been in its

Indeed, in cases brought by government regulatory agencies, courts extend beyond the damages context the principle that uncertainties in the "but-for" world should be resolved against the wrongdoer. For example, in labor relations and employment discrimination cases, in which the courts were called upon to reconstruct the situation had there been no violation of law, they have cited the *Bigelow* principle to resolve uncertainties in the "but-for" world against the party that created the situation. For example, the Second Circuit approved a district court's imposition of a collective bargaining agreement and the choice of a date as of which the agreement should be considered to have been in effect, where the employer had been found to have acted in bad faith. *TNT USA Inc. v. NLRB*, 208 F.3d 362, 367-68 (2d Cir. 2000). Similarly, the same circuit upheld an affirmative action plan against a union on the ground that the goal was "to place eligible minority members in the position which the minority would have enjoyed if it had not been the victim of discrimination." *Rios v. Enterprise Assn. Steamfitters Local 638 of U.A.*, 501 F.2d 622, 632 (2d Cir. 1974). The court noted: "Of course any attempt to reconstruct what would have happened . . . is fraught with considerable difficulty. But the court is called upon to do the best it can with the data available to it." *Id.* (citing *Bigelow*); *see also NLRB v. Staten Island Hotel Ltd. Partnership*, 101 F.3d 858, 862 (2d Cir. 1996) (reinstating contract on showing that employer had bargained in bad faith); *United Dairy Farmers Cooperative Assn. v. NLRB*, 633 F.2d 1054 (3d Cir. 1980). And, as the *Microsoft* court explained, "To some degree, 'the defendant is made to suffer the uncertain consequences of its own undesirable conduct.'" 253 F.3d at 79. As with the respondents in these other regulatory actions, Rambus should not be permitted to benefit from any uncertainty created by its own conduct.

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absence.

B. Rambus's Behavior Caused the Anticompetitive Harm that Is the Subject of the Complaint.

As discussed above, JEDEC had a strong and clearly-stated institutional objective of developing open standards and avoiding the inclusion of patented technologies in its standards whenever possible. The evidence will show that JEDEC, had it been aware of Rambus's claim of proprietary rights in the subject matter of the standards, would have pursued other, non-proprietary technologies to accomplish the objectives of the standards, or would have taken other steps to avoid the competitive harm caused by Rambus's conduct. There can be little doubt that Rambus's program of concealment and affirmatively misleading behavior caused the anticompetitive effects that Rambus intended – to enable Rambus to capture the industry standards and give it the power to extract royalty payments from those practicing the standards. The effects of the Rambus conduct extended to both the SDRAM and DDR standards adopted by JEDEC, which embody technologies to which Rambus claims intellectual property rights and which were considered during the period Rambus was a JEDEC member.

(1) Rambus Knew That If It Disclosed Its Claimed Intellectual Property Rights, JEDEC Members Would Pursue Other Alternative Technologies or Accept Rambus Technologies Only at Much Lower Royalty Rates.

As Rambus recognized, the choice between or among various alternative DRAM technologies "is a function of" four things: "performance, features, economics, and assessment of risk." RAMBUS Inc. 1992-1997 Business Plan R46394 at 423 [CX0543A]. The purpose of the Rambus scheme, which succeeded, was to subvert the ability of JEDEC to make an informed and balanced assessment of these factors in connection with the adoption of the JEDEC standards.

The evidence will show that the choice Rambus made to conceal its claims of intellectual property rights was based on the fundamental (and accurate) view that JEDEC and its members,

if they could, would avoid infringing patent rights and would seek to conform to the JEDEC objective of developing open and non-proprietary standards. As early as 1990, for example, a Rambus strategy document, discussing licensing of Rambus technology, commented that "[t]here are always ways to get around any patent is the assumption we should make" and gave the example of IBM as a firm that would seek to develop "their own solution that does not infringe on Rambus patents." RAMBUS Business Plans: Plans, Ideas, Issues (4/90) R128740 at 742 [CX0534]. As late as 1997, Rambus President Geoffrey Tate sent an email that made clear he understood the strong incentives for firms in the industry to avoid using Rambus technology: "dram companies will not go along happily with paying rambus $100-200M/year so they will therefore go spend $100M's to find alternate solutions to avoid paying rambus a royalty." Tate Email (9/8/97) R233895 at 896 [CX0952].

The evidence also will show that, for each of the relevant technologies embodied in the JEDEC standards and over which Rambus now claims patent rights, there were alternative technologies that could have been pursued by JEDEC in the standard-development process, had Rambus disclosed its claimed rights in a timely fashion. Now that the industry has become standardized on the standards actually developed by JEDEC, however, there are substantial impediments to the implementations of alternatives; these impediments of course help give rise to the market power now possessed by Rambus.

The hearing testimony of Complaint Counsel's expert witness Prof. Bruce L. Jacob, an Assistant Professor of Electrical and Computer Engineering at the University of Maryland, College Park, will describe these alternatives in some detail. Dr. Jacob's Expert Report [CX3081] at pages 52-68 sets forth a discussion of various alternative technologies that were available to JEDEC and that were technically feasible for inclusion in the JEDEC standards

during the time that Rambus was a member. Dr. Jacob's opinion, as set forth in his expert report, is that "[h]ad the JEDEC community believed in the early 1990's that Rambus had patents or patent applications covering certain technologies (i.e., implementation details) chosen by JEDEC for synchronous DRAM, a large number of alternative technologies were available to them." CX3081 at 52. He notes that many of these alternatives, like the technologies actually chosen by JEDEC for embodiment in the standards, were "simply applications of long understood techniques to solving particular problems." *Id.* Dr. Jacob concludes that for each technology in the adopted standards over which Rambus now claims proprietary rights, the numerous available alternative technologies "would have had performance similar to the disputed technologies, and that would have had engineering issues similar in complexity to those encountered in implementing the disputed technologies (i.e., their implementation would not have presented insurmountable obstacles)." *Id.* at 68.[164]

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[164] The fact that there were numerous alternative technologies that would have been available to JEDEC at the time it was developing the standards does not of course suggest that the alternatives could easily be adopted now, after the standards have been in place for some time. As Professor Jacobs describes in his Expert Report:

> A serious problem arises, however, when intellectual property rights are disclosed long after the fact. Though many alternative technologies could have been used in the early-1990's before the SDRAM standard was set, and even in the mid-1990's after the SDRAM standard was set but before it had become widely deployed, a number of factors make these alternative technologies less viable now than they were then. Some of the alternative technologies simply will not work in current JEDEC compliant DRAM systems and would require substantial changes in other components of the system for those technologies to work. Other alternatives might in principle work in current DRAM systems, but they might not work, depending on the system and the DRAM used.

CX3081 at 69. *See* detailed discussion, *id.* at 69-76.

In fact, numerous contemporaneous documents demonstrate that during the time the JEDEC standards were under development, other technologies in fact were considered by JEDEC members as alternatives to the relevant technologies that Rambus now claims as its own. During the time that JEDEC was considering the content of the SDRAM standard in 1992 and 1993, for example, Mr. Crisp of Rambus noted in his reports of JEDEC meetings that various JEDEC participants in the course of discussions expressed views favoring technologies other than the programmable CAS latency and programmable burst length technologies ultimately adopted as part of the SDRAM standard.[165] In this same period and later, during the consideration of the next generation of SDRAM technology, remarks were made by various JEDEC members about the wisdom of including on-board PLL or DLL technology, as Mr. Crisp himself also noted.[166]

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[165] *E.g.* Crisp E-Mail (10/5/93) R69511 [CX0711] ("HP, Micron and Mitsubishi are now saying that EDO is the right thing to do that it offers better performance than DRAM at a much lower cost than SDRAM"); Crisp E-Mail (5/24/92) R69511 at 580 [CX0711] ("TI would prefer to eliminate the requirement for supporting CAS latency =1 to reduce cost of speed testing").

Later discussions about modifications to the SDRAM standard continued to reflect consideration of alternatives to these technologies. *See, e.g.*, JEDEC Meeting Minutes No. 77 JC-42.3 (12/6/95) JEDEC0016644 at 692 [JX0028] ("SUBJECT: Suggestions for Modification of SDRAM Specification for SDRAM Lite … The attachment survey questionnaire was the result of a discussion on the possible reduction of features in an effort to provide a 'minimum' function version of the standardized SDRAM (and hence minimum cost). A previous ballot eliminating the CAS latency of 1 from the standard was the first step in reducing the required feature set."); JEDEC Meeting Minutes No. 76 JC-42.3 (9/11/95) JEDEC0016644 at 692 [JX0026] ("It was noted that as compared to EDO, SDRAM is harder to make and the yields are lower. With CAS latency of 3, SDRAM is not faster than EDO.").

[166] Crisp E-Mail (5/24/92) R69511 at 582 [CX0711] ("Hyundai: SyncLink presentation: …The current proposal assumes a PLL/DLL can be avoided. They claim this is not needed. … They send a strobe with input packets which is used to validate the packet. … They claim that the strobe mechanism avoids the need PLLs/DLLs."). *See also, e.g.*, Crisp JC16 special meeting notes (7/13/94) R155846 at 849 [CX0742] ("The implication here is that customers are willing to leave performance on the table in exchange for having lower costs systems."); JEDEC Meeting Minutes no. 75 JC-42.3 (5/24/95) JEDEC0016433 at 529 [JX0026] ("Avoid using PLL in DRAM components -PLL takes a lot of power and takes time to lock when shut-down -Wider

Alternatives to dual-edge clock technology were also discussed, as Mr. Crisp and Mr. Diepenbrock of Rambus noted.[167] And in fact throughout this period JEDEC and JEDEC members considered possible use of asynchronous technology as a fundamentally different alternative to the synchronous technology reflected in the JEDEC standards as adopted.[168]

The existence of these various technological alternatives, combined with the institutional purpose of JEDEC to avoid use of proprietary technologies, meant that JEDEC could have chosen different technologies had it known of Rambus's intellectual property claims. But this of course would not have been the only possibility open to JEDEC members – it is conceivable that even with knowledge of Rambus's claims JEDEC members could have agreed to the use of Rambus technology in the standards. The evidence will show, however, that had Rambus

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data path allows use of delay or skewed clock"); K. McGhee Email re: message from Micron (11/14/97) MR0111602 at 603 [CX2713] ("The role of the DLL has been diminished to the point where the DLL now has more disadvantages than advantages. Disadvantages of DLL: -Start-up time after power-up - Start-up time after exiting self-refresh - Power Consumption - Jitter - Design time delay/uncertainty - Cost ... I proposed we eliminate one more variable, the DLL.")

[167] *E.g.*, Crisp E-Mail (9/29/93) R155824 [CX0709] (concerning SyncLink, "[i]nstead of using a clocking scheme identical to ours, they teach the use of differential clocks…"); Diepenbrock E-Mail (3/13/96) R233850 [CX0871] ("So there are two problems here. The first is that the specification does not support the use of 'edge' in conjunction with the driver and receiver; instead it discusses the operation of these circuits in terms of periods of the internal clock.").

[168] *E.g.*, Micron, Burst EDO DRAMS. Take performance to new heights (1995) MR0111278 at 279 [CX2683] ("Burst Extended Data-out (EDO) is a cost-effective, high-speed access option to standard DRAMs…"); JEDEC Meeting Minutes no. 75 JC-42.3 **(**5/24/95) JEDEC0016433 at 442 ("BEDO [Burst EDO] Dual CAS Operation"); JEDEC Committee Survey Ballot JC-42.3-95-173 (10/30/95) R128150 at 161, ("[Fast data access time] can be addressed with an on chip Phase Locked Loop (PLL) or Delayed Locked Loop (DLL). Alternatively, an output clock pin could be defined that provides a delayed version of the clock suitable for turning the sampling of output data." * * * "Does your company believe that an output clock pin(s) (single pin or differential) could enhance performance, in SDRAM sub-systems?" * * * "Does your company believe that a differential clock signal (i.e., CLK and CLK\) is important for future generations of SDRAMS?").

disclosed its claim of rights in a timely fashion, industry members would have aggressively sought to keep the royalty rates paid to Rambus as low as possible.

The producers of memory chips were under intense pressure from their customers to keep the cost of their products as low as possible. For example, minutes of discussions in 1992, at the time JEDEC was considering the adoption of the SDRAM standard, reflect a consensus of the participating JEDEC members that to be cost effective, the new SDRAM chips "must cost no more than 5% over conventional DRAMs."[169] This was a perennial issue, as an email by an executive of the major memory chip maker Micron makes clear: "[T]he age old rule for DRAMs still apply. Customers will take as much performance as we can give them for absolutely no added cost over the previous technology. They will not pay extra for increased DRAM performance."[170] Rambus CEO Tate himself was well aware of this strong pressure for cost

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[169] JEDEC Meeting Minutes No. 62 JC-42.3 (5/7/92) JEDEC0014547 at 550 [CX0034] ("Dallas Task Groups Conclusions Mr. Kelley summarized the presentations of 7.2 and 7.3 and presented some of the consensus views of the Dallas meeting: 1)To be cost effect sync DRAM must cost no more than 5% over conventional DRAMs for many applications . . . ."). *See also* Crisp E-Mail (10/5/93) R69511 [CX0711] ("Desi added that if the SDRAM doesn't cost less than 5% more than the standard DRAM they will not be used.").

[170] Mailloux E-Mail (10/27/00) MR0118770 [CX2777]. An executive of Hyundai, another memory chip producer, has testified to similar effect:

> 17. Was the cost of DRAM important to Hyundai?
>
> A. This is very much important, yes.
>
> Q. Why is that?
>
> A. DRAM is -- is a commodity in -- in this electronic market, and they are -- the DRAM manufacturers are producing standard products, so anybody who -- can come and make the standard products. As a result, the -- the competition is very severe, and, as a result, the margin, the profit margin, is very, very small, so we have to be really concerned on

effectiveness in the market for memory chips.[171]

Because of this pressure on memory chip makers to reduce the cost of their products, Rambus in turn faced strong pressures to limit the royalties that it received for its proprietary technologies. For example, Mr. Crisp of Rambus reported in an email after meeting with a Hyundai executive in 1995 that "their #1 issue with the Rambus business proposal is the royalty rate. They do not want to be straddled with 3% royalties."[172] Mr. Tate of Rambus reported in an email after a meeting with executives of Intel that "they want us to have license deals that… have long term reduction of royalty based on volume going to less than 1/2% for rdrams (at this point I choked/gasped)."[173] Another Rambus executive reported a meeting with an executive of memory chip producer Lucky Goldstar, in which the executive reported resistance by a major LG customer to the use of Rambus technology because of royalties: "Mr. Choi said that when he met with Compaq, Compaq (server group) said that they will not use Rambus because of the royalty for the chip set."[174] Indeed, the record will show that industry members preferred the JEDEC standard technologies precisely because of a perception that they could be used without any requirement for the payment of royalties. As one Micron document from 1998 put it succinctly:

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the cost.

Oh, *In the Matter of Rambus* Dep. Tr. (1/8/03) at 136:9-19 [CX2107].

[171] Tate E-Mail (2/24/95) R60694 [CX0781] ("economics - to a PC guy every $ counts and what they design for is maximum performance within a fixed, not-to-exceed budget…").

[172] Crisp E-Mail (3/23/95) R69511 at 571 [CX0711].

[173] Tate E-Mail (9/8/97) R233895 at 896 [CX0952].

[174] Mithani E-Mail (5/12/98) R233905 at 906 [CX1030].

"Why DDR Is Cost Effective – No Royalties."[175]

It is amply clear that had Rambus disclosed its patent position (or even warned JEDEC of the possibility) that its intellectual property covered standards adopted or under consideration at JEDEC, JEDEC would not have adopted the SDRAM and DDR standards it did. *See, e.g.*, Meyer, *Rambus v. Infineon* Dep. Tr. (12/14/00), at 371-72 [CX2058] (had Rambus disclosed, JEDEC could have designed the SDRAM standard differently, dropped features, or modified features to avoid the Rambus patents); prior testimony of Complaint Counsel hearing witness Brett Williams, *Micron v. Rambus* Dep. Tr. (4/13/01), at 459-60 (had Rambus disclosed, JEDEC members would have designed around Rambus's patent rights). Likewise, companies would have taken a different approach to DDR armed with knowledge that the technologies discussed in connection with the SDRAM discussions were covered by Rambus patents. Dr. Oh, Senior Vice President responsible for all semiconductor operations at Hyundai (now Hynix) from 1997 to 1999, when Hyundai began work on its DDR SDRAM products, spoke for many in the industry when he testified:

> Q. . . . In July of 1997, did Hyundai believe that DDR SDRAM would be free of royalties, in other words, that no royalties would apply to DDR SDRAM? [Objection omitted.]
>
> THE WITNESS: If it were not, we will not get into this, developing this DDR.

Oh, *In the Matter of Rambus* Dep. Tr. (1/8/03) at 137:16-21 [CX2107]. As members will explain at trial, had Rambus disclosed its relevant patents and applications, JEDEC would have had the opportunity to design around Rambus's patent rights and create an open standard.

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[175] *DDR SDRAM for the PC Market* (10/26/98) MR0111006 at 012 [CX2726].

In short, there can be little doubt that had Rambus disclosed in a timely fashion its proprietary claims to the technology embodied in the JEDEC standards, JEDEC members would have weighed very differently the factors involved in its choice of standard technologies. As Rambus's own documents make clear, there was a strong economic incentive to choose technologies that did not impose royalty costs on the industry. There were alternative technologies available at the time the standards were under consideration. Even if the Rambus technologies had nonetheless been chosen for the standard, there were strong existing pressures to reduce royalties paid for the use of Rambus technology. All these alternatives were exactly what Rambus intended to – and did – avoid by its scheme of concealment and affirmatively misleading behavior. Rambus's behavior was a material cause of the anticompetitive harms that are the subject of the Complaint.

(2) Rambus's Deceptive Behavior Subverted Both the JEDEC SDRAM and DDR Standards.

In pretrial briefing and elsewhere, Rambus has argued that its misconduct does not extend to the JEDEC standard for DDR (short for "double data rate") SDRAM, on grounds that this standard was not formally considered by JEDEC until after Rambus had resigned as a member of the JEDEC organization. *E.g.*, Rambus Mem. in Support of Motion for Summary Decision (Feb. 27, 2003) at 58-62. Rambus's arguments on this point are based on temporal sleight-of-hand. Contrary to the suggestion advanced by Rambus in support of its motion, the DDR standard is not a freestanding result of informed JEDEC decision-making that occurred entirely after Rambus's departure. Rather, the work that ultimately culminated in the DDR standard began during Rambus's tenure as a member. In the period after the adoption of the SDRAM standard, and over the course of two and a half years before Rambus's departure as a JEDEC member,

JEDEC considered a series of possible technologies for inclusion in the next generation of SDRAM, which eventually became known as DDR. Throughout all this ongoing standard development work, Rambus pursued its strategy of concealment of its claims to intellectual property in technologies under consideration by JEDEC.

Testimony from David Mooring, the President of Rambus, makes clear that long before it left JEDEC, Rambus was aware of JEDEC's consideration of technologies for future standards that resembled those to which Rambus claimed intellectual property rights. In his January 2003 deposition, Mr. Mooring confirmed that one of the reasons that Rambus left JEDEC in 1996 was that it had for some time been seeing things discussed there that resembled Rambus's products. Mooring, *In the Matter of Rambus* Dep. Tr. (1/24/03) [CX2112] at 202. These included, among other things, a presentation to JEDEC in 1994 by NEC concerning a technology that ultimately was included in the DDR standard (*id.* at 162-163), and a presentation in May 1995 by an industry consortium known as SyncLink that embodied several technologies that were similar to the later-adopted DDR standard (*id.* at 205, 220). In the fall of 1995, JEDEC circulated a survey ballot seeking the views of JEDEC members about future technologies that might be included in the next generation of SDRAM standards; Mr. Mooring testified that "we believe we invented key aspects of several of the things on that list." *Id.* at 235.

Rambus argues that it was under no obligation to disclose its intellectual property claims prior to the time that there was any "formal proposal for standardization" of relevant technologies, and asserts that no such formal proposal occurred as to the contents of the DDR standard before it resigned its JEDEC membership. Rambus Mem. in Support of Motion for Summary Decision (Feb. 27, 2003) at 59-60. Yet the fact is that discussion among JEDEC members of the technologies embodied in the DDR standard had begun well before Rambus left

JEDEC. Rambus itself concedes that two of the technologies contained in the DDR standard ("programmable CAS latency" and "programmable burst length") had been discussed and in fact embodied in the 1993 SDRAM standard long before Rambus left the organization. Rambus Mem. in Support of Motion for Summary Decision (Feb. 27, 2003) at 58. The two other relevant technologies embodied for the first time in the DDR standard (involving "on-chip DLL" and "dual-edge clock") also were considered long before Rambus's departure, and long before the assignment of a formal item number for what would eventually become the DDR standard. This is consistent with the common practice at JEDEC of considering various technologies, sometimes under somewhat different names, as part of the process of developing new generations of technology standards.[176]

There is abundant evidence that JEDEC was engaged in ongoing standards development efforts for the next generation of SDRAM technology long before Rambus resigned as a JEDEC member. Within only months after adopting the SDRAM standard in 1993, JEDEC members turned their attention to the next generation of memory technology. In addition to continuing work to implement the SDRAM standard, JEDEC began to discuss and debate the concepts and technologies that ultimately would become known as DDR. While the term "DDR" did not come to represent these discussions until 1996, certain of the discussions are easily identifiable under monikers such as "2nd Generation SDRAM," "Future Generation Sync DRAM," and

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[176] Reese Brown, an employee of JEDEC who was in charge of maintaining the computer log of information on JEDEC activities, recently testified that the assignment of the "item number" pertaining to the development of the DDR standard could "only vaguely" be used to determine when work on the standard began. Mr. Brown explained that "the term 'DDR' was adopted some substantial time after the work was first started . . . [using] different terminology," and that "some of the work was done at planning task group meetings" prior to the first formal entry of an item number in the JEDEC database. (Brown, *In the Matter of Rambus* Dep Tr. (1/22/03) [CX2110] at 67-68.**)**

"Future SDRAM." These discussions included specific consideration of the on-chip DLL and dual-edge clock technologies, over which Rambus claims proprietary rights:

- As early as 1991, and again in early 1992, IBM representatives to JEDEC made a presentation entitled "High-Speed Toggle for Microprocessor Applications" that embodied dual-edge clock technology. These discussions were in the context of JEDEC considerations of the SDRAM standard.[177]

- Rambus's own representative to JEDEC, Mr. Crisp, testified that at JEDEC meetings he attended in April and May 1992 there were discussions about embodying dual-edge clock technology in the SDRAM standard then under consideration.[178] His notes reflect that at that time IBM made a proposal pertaining to a DRAM chip with a "dual edge triggered output register" – a form of dual-edge clock technology.[179] Minutes of the May 1992 JEDEC meeting confirm that an IBM representation made a presentation on technology including "dual edge clock."[180]

- The consensus of the JEDEC group that considered dual-edge clock technology in 1992 in connection with the SDRAM standard was that the technology was not needed at the time, but that the technology could be used in the next generation JEDEC standard in order to increase the data rate.[181]

- As early as September 1994, at a JEDEC meeting in Albuquerque, there was a presentation made by NEC pertaining to on-chip PLL technology, a variant of the on-chip DLL technology that was later embodied in the

[177] Brown, *Rambus v. Infineon* Dep. Tr. (4/5/01) [CX2076] at 115-116; JC-42.3 Committee Minutes (12/4-5/91) R65095 at 114-115 [CX0027A]; JC-42.3 Committee Minutes, 2/27-28/92, R65189 at 65199 [CX0031A].

[178] Crisp, *Rambus v. Infineon* Trial Tr., Vol. 9 (5/2/01) [CX2092] at 112, 114, 118-119.

[179] R45724 [CX1708].

[180] JC-42.3 Committee Minutes (5/7/92) R65286 at 65301 [CX0034A].

[181] Testimony of potential Complaint Counsel rebuttal witness Gilbert Russell, Dep. Tr. (1/30/01) at 268-274.

DDR standard.[182]

- In March 1995, at a JEDEC meeting attended by Mr. Crisp for Rambus, there was a presentation by MOSAID proposing to amend the CAS latency feature in "Future Generation Sync DRAM."[183] CAS latency was a feature in the earlier SDRAM standard.

- In May 1995, at a JEDEC meeting attended by Mr. Crisp for Rambus, there was a presentation by Mitsubishi Electric pertaining to "64Mbit SyncLink" including dual-edge clock technology.[184]

- In September 1995, at a JEDEC meeting attended by Mr. Crisp for Rambus, there was discussion among JEDEC members concerning a process for developing a standard for a "next generation" of SDRAM. A "task group on SDRAM features" was formed, and it was agreed that a survey ballot be prepared and sent seeking JEDEC members' views on particular technologies to be included in a future SDRAM standard.[185]

- The survey ballot distributed during the Fall of 1995 sought JEDEC members' views "regarding potential modifications to the JEDEC standard

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[182] Brown, *Rambus v. Infineon* Dep. Tr. (4/5/01) [CX2076] at 93-96; JC-42.3 Committee Minutes, 9/13/94, R66143 at 148, 186-189 [CX0074A]. This particular NEC presentation did not escape the attention of Rambus's JEDEC representative, Richard Crisp, who immediately e-mailed his colleagues at Rambus about this new development and the "patent issues" it raised:

> Subject: JEDEC #3 (NEC PROPOSES PLL ON SDRAM!!!) ....
>
> ... ******The big news here is the inclusion of a PLL enable mode option.******* .... *****They plan on putting a PLL on board their SDRAMs to improve the output delay by about 2 ns. They want to put the PLL on every chip and let the user use it or not depending on whether they need it. The advantages cited are the power and the lock time. Furnweger billed this as "the most exciting thing" in the presentation. .... Obviously we need to think about our position on this for potential discussion with NEC regarding patent issues here. ****I believe that we have now seen that others are seriously planning inclusions of PLLs on board DRAMs. . . .

R157024 [CX0756] (emphasis in original).

[183] JC-42.3 Committee Minutes, 3/15/95, R66320 at 66326, 66373-66375 [CX0084A].

[184] JC-42.3 Committee Minutes, 5/24/95 JEDEC0016433 at 6544 [JX0026].

[185] JC-42.3 Committee Minutes, 9/11/95, R66450 at 66454, 66456 [CX0091A].

for future SDRAMS."[186] Among the technologies specifically inquired about in the survey ballot were on-chip PLL/DLL and dual-edge clock.[187]

- In December 1995, at a JEDEC meeting attended by Mr. Crisp for Rambus, the results of the survey were discussed, including both on-chip PLL/DLL and dual-edge clock[188] The JEDEC minutes show that one JEDEC member disclosed to the group that it had a patent pending on DLL, remarking that the pending patent involved a particular implementation of the technology that might not be required to use a standard.[189] In contrast, Mr. Crisp of Rambus remained silent about his firm's intellectual property rights to the same technology.

- In an email to Rambus management the day after the December 1995 JEDEC meeting, Mr. Crisp reported the discussion about the results of the survey and the views of various participants at the meeting about possible new technologies. He reported that "the momentum is building for getting a new SDRAM standard kicked off," and made reference to the pending patent disclosure made by another JEDEC member at the meeting.[190]

- At a meeting in January 1996, JEDEC members continued their discussions about "Future SDRAM" technologies, including a presentation by Micron on the use of on-chip PLL/DLL.[191] Mr. Crisp, though he did not attend the meeting, received a copy of the meeting minutes, which he distributed to Rambus management. In an E-mail to Rambus management, Mr. Crisp noted the Micron discussion and said "I think we should have a long hard look at our IP and if there is a problem, I believe we should tell JEDEC that there is a problem."[192] No disclosure of Rambus technology claims was made by Rambus, however.

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[186] R128150 at 152 [CX0260].

[187] The survey asked "Does your company believe that an on chip PLL or DLL is important to reduce the access time from the clock for future generations of SDRAM?" and "Does your company believe that future generations of SDRAMs could benefit from using BOTH edges of the clock for sampling inputs?" R128150 at 161 [CX0260].

[188] JC-42.3 Committee Minutes (12/6/95), JEDEC0016644 at 16688 [JX0028].

[189] *Id.*, JEDEC0016644 at 16649 [JX0028].

[190] Crisp E-mail, 12/6/95, at R157078 [CX0843].

[191] JC-42.3 Committee Minutes, 1/31/96, R66308 at 66316 [CX0100A].

[192] Crisp E-mail, 2/20/96, R233849 [CX0868].

- Discussions of the contents of a possible "Future SDRAM" standard continued at a JEDEC meeting in March 1996, including a presentation by Samsung concerning PLL/DLL technologies,[193] and in June 1996, including a presentation by the EIAJ concerning these same technologies.[194] Both of these meetings occurred prior to the date that Rambus resigned as a member of JEDEC.

- Internal records of Rambus indicate that Rambus executives were aware by 1996, from sources other than JEDEC, that chip makers already had begun planning to incorporate the technologies embodied in the eventual DDR standard on "next generation" SDRAM products. For example, in January 1996 Rambus executive Allen Roberts reported that he had become aware of plans by Samsung for "SDRAM enhancements" including dual-edge and on-chip PLL/DLL technologies.[195] In March 1996 Rambus executive Rick Barth reported that Lucky Goldstar was building a new DRAM "with a PLL on it."[196] By August 1996, Mr. Crisp of Rambus had prepared a marketing document addressing the technical limitations of SDRAM, including new versions including "double clocked data" – a reference to the new dual-edged clock technology.[197]

In short, there is abundant evidence that the relevant technologies embodied in the DDR standard and over which Rambus claims proprietary rights were discussed at JEDEC during the time Rambus was a member. It is also clear that the process of developing a "Future SDRAM" standard was already underway for months and even years before Rambus resigned from JEDEC, even though no "item number" had yet been assigned to those efforts by JEDEC. Rambus was aware not only of the discussions at JEDEC but also of plans by chip-makers to incorporate the new technologies in next-generation versions of SDRAM products. The highly formalistic

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[193] JC-42.3 Committee Minutes, 3/20/96, JEDEC0016776 at 843-847 [JX0031].

[194] JC-42.3 Committee Minutes, 6/5/96, R66585 at 66605-06 [CX0111A].

[195] Roberts E-mail (1/26/96) R234669 [CX0861].

[196] Barth E-mail (4/26/96) R234750 [CX0886].

[197] R300046 et seq. [CX1320].

argument made by Rambus ignores the actual process of standards development at JEDEC and disregards the substantial evidence that all of the relevant technologies embodied in the DDR standard were discussed during the time Rambus was a JEDEC member. Rambus's deceptive conduct subverted both the JEDEC SDRAM standard adopted in 1993, and the later DDR standard as well.

VII. Through Its Challenged Conduct, Rambus Has Succeeded in Monopolizing Several Well-Defined DRAM Technology Markets.

The Rambus conduct implicates the antitrust laws because of its profound impact in the relevant economic markets. Through its strategy over the course of nearly a decade, Rambus was successful in manipulating the evolution of the marketplace so that the users of memory chip technology – memory chip manufacturers and makers of electronic products and components intended to operate with memory chips – have become locked into the form of the technology over which Rambus has claimed patent rights. Not only will the evidence at trial demonstrate that during the course of Rambus's ongoing strategy there has been a "dangerous probability of success" by Rambus in achieving monopoly power, as required to establish the offense of attempted monopolization, but the evidence will also show that Rambus has in fact achieved that monopoly power.

A. The Relevant Antitrust Markets.

Assessment of market power for purposes of monopolization and attempted monopolization requires an inquiry into the relevant product and geographic markets. *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1996); *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447, 456 (1993). The evidence to be adduced at trial will demonstrate that the product and geographic markets alleged in the Complaint are the properly defined antitrust markets in which

to assess the effects of the Rambus scheme.

(1) Relevant Product Markets.

Product Market Definition. Well-established legal principles guide the definition of relevant product markets for purposes of antitrust analysis. The product "market [in which the defendant participates] is composed of products that have reasonable interchangeability," in the eyes of consumers, with what the defendant sells. *See United States v. E.I. du Pont de Nemours & Co.*, 351 U.S. 377, 404 (1956); *see also Image Technical Services, Inc. v. Eastman Kodak Co.*, 504 U.S. 451, 482 (1992). The assessment takes account of the factors that influence consumer choices, including product function, price, and quality (*du Pont*, 351 U.S. at 404), but the object of the inquiry in defining the market is to identify the range of substitutes relevant to determining the degree, if any, of the defendant's market power. *Rothery Storage & Van Co. v. Atlas Van Lines Inc.*, 792 F.2d 210, 218-19 (D.C. Cir. 1986), *cert. denied*, 479 U.S. 1033 (1987); *see also Eastman Kodak*, 504 U.S. at 469 n.15; *U.S. Anchor Mfg., Inc. v. Rule Industries, Inc.*, 7 F.3d 986, 995-96 (11th Cir. 1993); *U.S. Healthcare, Inc. v. Healthsource, Inc.*, 986 F.2d 589, 598-99 (1st Cir. 1993); *Home Placement Service, Inc. v. Providence Journal Co.*, 682 F.2d 274, 280 (1st Cir. 1982).

Accordingly, for goods or services to be in the same market as a defendant's, substitutability in the eyes of consumers of the goods or services (who may consider function, price, quality, etc.) must be sufficiently great that the defendant's charging of supracompetitive prices for its product would drive away not just some consumers but a large enough number to make such pricing unprofitable (and hence induce the defendant to restore the competitive price). *See du Pont*, 351 U.S. at 394-95; *Rothery*, 792 F.2d at 218. In other words, a properly defined market includes only these products that a hypothetical profit-maximizing firm, selling all of the

products in that market, could sell at a price that is significantly more than a competitive price, i.e., without losing too many sales to other products outside of the market. *See, e.g., Coastal Fuels of Puerto Rico, Inc. v. Caribbean Petroleum Corp.*, 79 F.3d 182, 197-198 (1st Cir. 1996); *Rebel Oil Co. v. Atlantic Richfield Co.*, 51 F.3d 1421, 1434 (9th Cir.), *cert. denied*, 516 U.S. 987 (1995).

Technology Markets. Where the product or service at issue is intellectual property, these same principles apply. The resulting properly defined product market is commonly referred to as a "technology market." In defining technology markets, it is appropriate to include those technologies "that are close enough substitutes significantly to constrain the exercise of market power with respect to the intellectual property that is licensed." U.S. Department of Justice and Federal Trade Commission, *Antitrust Guidelines for the Licensing of Intellectual Property* ("*IP Guidelines*") at § 3.2.2 (April 6, 1995). This creates a market with "the smallest group of technologies and goods over which a hypothetical monopolist of those technologies and goods likely would exercise market power – for example, by imposing a small but significant and nontransitory price increase [SSNIP]." *Id.*[198] The analysis seeks to identify those products or technologies that provide sufficient competition for the defendants' products and would prevent

[198] *See also* U.S. Department of Justice and Federal Trade Commission, *Horizontal Merger Guidelines* ("*Merger Guidelines"*), at § 1.11 (revised April 8, 1997). The Guidelines propose an iterative process by which the court begins with the products of the defendant and asks whether imposing a small, but significant and non-transitory price increase would induce so many customers to buy alternative products that the price increase would be unprofitable. If a sufficient number of customers do not switch, then the price increase would be profitable and only those products would be included in the market. If a sufficiently large number of customers would switch, the price increase would not be profitable. The Guidelines then require adding the next best substitute and repeating the process. This results in the smallest number of products being included in the market, such that the only seller of those products could profitably raise prices. *Id.*

the exercise of market power.

There are many factors that the Commission and courts use to identify substitutable technologies, including: "(1) evidence that buyers have shifted or have considered shifting purchases between products in response to relative changes in price or other competitive variables; (2) evidence that sellers base business decisions on the prospect of buyer substitution between products in response to relative changes in price or other competitive variables; (3) the influence of downstream competition faced by buyers in their output markets; and (4) the timing and costs of switching products." *Merger Guidelines,* § 1.11. The timing and cost of switching to alternative technologies is especially important in technology markets. *See, e.g., United States v. Microsoft Corp*., 253 F.3d 34, 52-54 (D.C. Cir. 2001) (inability to switch without bearing substantial cost); *Telex v. IBM*, 510 F.2d 894, 919 (10th Cir. 1975) (including in the relevant market products that "although not fungible, are fully interchangeable and may be interchanged with minimal financial outlay").

The Product Markets Here. The product markets at issue in this case are markets for technologies that enable memory manufacturers to design synchronous DRAM for use in currently manufactured personal computers and other equipment.[199] Each market consists of a set of technologies which could solve a specific problem in memory design and operation that had faced JEDEC in the 1990s. The evidence at trial will show that at that time, at the outset of the Rambus scheme, there were competitors for each of the JEDEC-standardized technologies that could have been chosen by members of the industry as solutions for the specific design problems. But the evidence will also show that today, as a result of the JEDEC standard-setting

[199] Complaint ¶¶ 113-114.

process that Rambus subverted, and the subsequent substantial plant, equipment and other investments by industry members in reliance on the JEDEC standards, there is no practical ability by industry members to switch away from the JEDEC standard to alternative technologies in the foreseeable future.

The relevant technology markets are as follows:

Latency Technology Market. This is a market for technology to set the amount of time (the latency), following a read request made to a memory chip, before that memory chip releases its data onto the data bus. As detailed by Professor Jacob in his expert report, there are a number of technically feasible substitutes for programmable CAS latency (which is a term used to describe the technology specified in the JEDEC standard, and over which Rambus claims patent rights) that were available to JEDEC when it first considered this problem.[200] Those alternatives include: fixed CAS latency, setting CAS latency in the read command, using a pin to set CAS latency, and using a fuse to set CAS latency. These alternatives (and likely others), were in the latency technology market prior to the DRAM industry's adoption of the JEDEC SDRAM standard. [201]

Burst Length Technology Market. This is a market for technology to set the number of columns of data (the burst length) sent by a memory chip in response to a single instruction. As detailed by Prof. Jacob in his expert report, there are a number of technically feasible substitutes for programmable burst length (which is a term used to describe the technology specified in the JEDEC standard and over which Rambus claims patent rights) that were available to JEDEC when it first considered this problem.[202] Those alternatives include: burst interrupt, fixed burst length, setting burst length in the read command, using a pin to set burst length, and using a fuse to set burst length. These alternatives (and likely others), were in the burst length technology market prior to the DRAM industry's adoption of the JEDEC SDRAM standard.[203]

Data Acceleration Technology Market. This is a market for technology to speed up data transfer along the data bus between the memory chip and the memory controller. As detailed by Prof. Jacob in his expert report, there are a number of technically feasible substitutes for dual edge clock technology (which is a term used to describe the technology specified in the JEDEC standard and over which Rambus claims patent rights)

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[200] *See* Expert Report of Prof. Bruce L. Jacob, at ¶¶ 104-112 [CX3081].

[201] *See* Expert Report of Prof. Preston McAfee, at ¶¶ 147-150, 167-169 [CX3079].

[202] *See* Expert Report of Prof. Bruce L. Jacob, at ¶¶ 113-124 [CX3081].

[203] *See* Expert Report of Prof. Preston McAfee, at ¶¶ 151-153, 167-169 [CX3079].

that were available to JEDEC when it first considered this problem.[204] Those alternatives include: interleaving data (either on the DRAM itself, or on the DIMM), widening the data bus, and doubling the clock frequency. These alternatives (and likely others), were in the data acceleration technology market prior to the DRAM industry's adoption of the JEDEC DDR SDRAM standard.[205]

Clock Synchronization Technology Market. This is a market for technology to correct for clock skew in synchronous memory. As detailed by Prof. Jacobs in his expert report, there are a number of technically feasible substitutes for the use of an on-chip delay lock loop circuit ("DLL") (which is the technology specified in the JEDEC standard and over which Rambus claims patent rights) that were available to JEDEC when it first considered this problem.[206] Those alternatives include: moving the DLLs to another location in the system, using a vernier method to measure and account for skew, and achieving a high bandwidth by increasing the width of the data bus rather than by increasing the speed of operation of the DRAMs themselves. These alternatives (and likely others), were in the clock synchronization technology market prior to the DRAM industry's adoption of the JEDEC DDR SDRAM standard.[207]

The evidence at trial will show that the substitute technologies identified by Professor Jacob, and perhaps other technologies that he did not identify, are common electrical engineering solutions to the problems faced by JEDEC in the 1990's.[208] The evidence at trial will also show that the common denominator of all of the technologies at issue in this case, including those currently in the JEDEC standard, is that they are all considered as tools in the DRAM designer's conceptual "toolbox."[209] What the evidence at trial will *not* show is that any of the technologies, including those currently in the JEDEC standard, is manifestly better than all of the others. In

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[204] *See* Expert Report of Prof. Bruce L. Jacob, at ¶¶ 125-134 [CX3081].

[205] *See* Expert Report of Prof. Preston McAfee, at ¶¶ 162-169 [CX3079].

[206] *See* Expert Report of Prof. Bruce L. Jacob, at ¶¶ 135-141[CX3081].

[207] *See* Expert Report of Prof. Preston McAfee, at ¶¶ 154-161, 167-169 [CX3079].

[208] *See* Expert Report of Prof. Bruce L. Jacob, at ¶103 [CX3081] ("As with the technologies actually chosen by JEDEC, many of the alternatives are simply applications of long understood techniques to solving particular problems.")

[209] *Id.*

particular, the evidence will show that different JEDEC representatives evaluate each of the alternatives differently (and did so at JEDEC), depending on the interests of the firm they represent. Consequently, the evidence at trial will likely illustrate precisely the differences of opinion regarding each engineer's favorite substitute technology that make JEDEC such a necessary institution. It takes JEDEC a number of years to come up with a standard, based on millions of dollars of industry investment and many hours of engineering time, even though JEDEC consciously changes as little as possible form standard to standard. Due to the complexity of the technologies and the often conflicting interests of the various JEDEC members, this Court cannot be expected to design a hypothetical new DRAM standard in order to be able to judge whether Rambus has violated the antitrust laws.[210]

Cluster Market. Each of the four technologies discussed above was addressed by the JEDEC standard-setting process and has been embodied in the JEDEC standards now widely relied upon by the industry. For this reason, and particularly in considering the current competitive characteristics in the relevant product markets, it may be appropriate to consider the cluster of various technologies discussed above as a single market ("Synchronous DRAM Technology") since the current competitive conditions in the individual technology markets are determined by the same factors. *See e.g.*, *United States v. AT&T*, 524 F. Supp 1336, 1375-76 (D.D.C. 1981) (although defendant's products were not substitutes from the consumers' perspective, the appropriate market was a cluster market because much of the conduct at issue

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[210] Fortunately, there is no reason for it to do so. All that this Court must show is that Rambus's conduct "reasonably appear[s] capable of making a significant contribution to" Rambus's monopoly power. *United States v. Microsoft Corp.*, 253 F.3d 34, 79 (D.C. Cir. 2001) (en banc) ("To require that § 2 liability turn on a plaintiff's ability or inability to reconstruct the hypothetical marketplace absent a defendant's anticompetitive conduct would only encourage monopolists to take more and earlier anticompetitive action.").

transcended individual products and applied to the whole telecommunications equipment system). A single market can be used as a matter of convenience "as long as there is no compelling reason for thinking that the firm has differential amounts of market power in the different products in the grouping."[211] Thus, a single cluster market can be justified if: (1) there is only one real source of market power in each of the individual markets, or (2) the defendant has the same market share, competitors and barriers to entry in each market.[212] In this case, the current market conditions mean that each of these criteria is met. As we discuss *infra*, the real source of Rambus's market power in the current marketplace is the JEDEC standard combined with Rambus's patents. Rambus asserts that its patent rights cover each of the technologies completely, and indeed, Rambus licenses these technologies as part of a package. As Prof. McAfee concludes, it may be possible to analyze them as a single technology market.[213]

(2) Relevant Geographic Market.

In addition to a definition of the product market, antitrust market analysis requires a definition of the geographic market – that is, the geographic area to which consumers seeking a substitute product could practicably turn to acquire substitutes. *See, e.g., Tampa Elec. Co. v. Nashville Coal Co.*, 365 U.S. 320, 327 (1961). Courts have traditionally examined, as part of the geographic market definition, whether firms, not currently selling the particular product in the market, could participate in the market readily enough to render unprofitable any nontransitory supracompetitive pricing by current market participants. *See, e.g., SBC Communications, Inc. v. FCC*, 56 F.3d 1484, 1493-94 (D.C. Cir. 1995); *Rothery*, 792 F.2d at 218; *Rebel Oil*, 51 F.3d at

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[211] Herbert Hovenkamp, FEDERAL ANTITRUST POLICY, at 102 (2nd Ed. 1999).

[212] *Id.*

[213] Expert Report of Prof. Preston McAfee, at ¶¶ 145 [CX3079].

1436; *United States v. AT&T*, 524 F. Supp. 1336, 1375-76 n.163 (D.D.C. 1981). Because users of memory chip technology can and do seek useful technology wherever it may be found, the Complaint alleges,[214] and Complaint Counsel believe, that the relevant geographic market here is the world.[215]

B. Fundamental Characteristics of the Relevant Markets Concentrate the Economic Power of Rambus.

In order to understand the extent of the economic power wielded by Rambus, it is necessary to understand certain fundamental characteristics of the demand for memory chip technology, which explain how Rambus, by subverting the JEDEC standard-setting process, was able to acquire monopoly power. The importance of these characteristics is that they prevent the purchasers in the relevant technology markets (the DRAM and associated logic manufacturers) from substituting away from the technologies that Rambus claims, even in the face of substantial price increases by Rambus. In particular, the simple fact is that no customer of the DRAM industry will purchase DRAM containing substitutes for the technologies now in the JEDEC standard because such a DRAM would not be compatible with other components in the DRAM customers' own products. In addition, the complexity attendant on generating a new standard that would avoid Rambus's patents mandates that such an effort would take years. Nor is setting the standard all that is required for the DRAM manufacturers to avoid Rambus's patents. Once

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[214] Complaint ¶ 117.

[215] Commentators generally agree that the geographic dimension of technology or innovation markets "is assumed to be worldwide" in the absence of trade or regulatory barriers. Rapp, "The Misapplication of the Innovation Market to Merger Analysis," 64 *Antitrust L.J.* 19, 23 n.19 (1995). *See* Dahdouh, "The Shape of Things To Come: Innovation Market Analysis in Merger Cases," 64 *Antitrust L.J.* 405, 422 (1996); Gilbert and Sunshine, "Incorporating Dynamic Efficiency Concerns in the Merger Analysis: The Use of Innovation Markets," 63 *Antitrust L.J.* 569, 594-595 (1995).

the standard is set, DRAM manufacturers as well as the manufacturers of other components must design and manufacture new components that are compatible with the new DRAM standards. As a result, DRAM manufacturers cannot profitably switch from the JEDEC standard technologies, nor will they be able to do so for the foreseeable future.

The evidence at trial will demonstrate that DRAM using alternatives to the technologies in the JEDEC standard would not be compatible with the range of other components that must work with DRAM,[216] and that, as a result of that incompatibility, DRAM customers will not buy the new DRAM.[217] DRAMs in a personal computer, server or workstation must be compatible

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[216] Expert Report of Prof. Bruce L. Jacob, ¶¶143-166 at ¶166 [CX3081] ("Though it is technically possible to build DRAMs that do not incorporate the disputed technologies, and though such hypothetical DRAMs would perform at a level similar to present DRAMs, such a move would require most other technologies in the industry to change as well, ... The obvious conclusion is that such a move would not be at all welcome in the industry"). This is well understood in the industry:

> Q. Yes, but I'm asking last year, as to whether, after you left Hyundai, but when you first learned of the Rambus patent suit last year, did you think at that time or did you give any thought at that time as to whether Hyundai could go back and change its SDRAM and DDR SDRAM designs to work around the Rambus patents?
>
> . . .
>
> It's too late.... Of course, customers will not change it. I mean, they -- it's -- it cost a lot to change the design. You have to -- changing means that changing all the usage of customer, I mean, the computers. You have to change the -- their customer's mind. It means -- it's impossible, almost impossible.

Oh, *In the Matter of Rambus* Dep. Tr. (1/9/03) at 231-232 [CX2108].

[217] *Id. See also*, Karp E-mail (8/23/99) R218140 [CX1075] (Email contains interview taken of Rambus's CEO Geoff Tate: "A phone or computer that is almost compatible is one that doesn't work. If people build parts 99% compatible, the systems companies won't buy them").

with memory controllers in those systems for those systems to work properly.[218] In addition, because the memory bus runs from the DRAM to the memory controller, traversing the memory modules on which they reside as well as the motherboard on which all of the components reside, the connections and lines on the modules and the motherboards must be compatible with those required for proper operation of the DRAMs. Each of these components of each of these systems has lead-time requirements that are necessary to allow them to be designed, tested and manufactured in volume.[219] The evidence at trial will demonstrate that resolving those incompatibilities requires an effort that could span a number of industries all over the world.[220] In addition, the evidence will show that the intransigence of this incompatibility problem is exactly the reason that JEDEC is used to standardize DRAM,[221] and that if JEDEC began such an

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[218] *See, e.g.,* Karp E-Mail (8/23/99) R218140 [CX1075] ("… everyone wants multiple-sourced DRAMs, so to make DELL happy, you need multiple suppliers of DRAMs, modules, connectors, and clock chips."); MICRON DRAM UPDATE (9/00/99) MR0047888 at 947 [CX2747] ("Infrastructure: Thirteen DRAM vendors collaborating to enable the standard … Multiple chipset vendors developing support- JEDEC standards - component and module.").

[219] *See* Crisp E-Mail (8/30/96) R69511 at 694 [CX0711] (noting that changes to a new technology standard, when they occur, require "fundamentally long lead time efforts," because of "the sort of things that must be done . . . to make . . . technology usable from a deployment perspective (silicon infrastructure, models, modules, etc)").

[220] Tate E-Mail (7/22/93) R233981 [CX0707] ("What they [at Samsung] understand is whether IBM, Sun or DEC says they want it [a product]. JEDEC is a big deal to them because it represents the big users."); Oh, *In the Matter of Rambus* Dep. Tr. (1/9/03) at 151 [CX2107] ("Actually, th[ese] standards are not decided just by DRAM circuit designers. It's -- it involves every corner of the community who uses this DRAM and benefits by this DRAM, namely, of course, us; chip set manufacturers, the system manufacturers, they have to understand all this, you know, in order to set the standards of DDR, so it's imperative for them to join this JEDEC meeting . . ..").

[221] *See* Rhoden E-Mail (7/12/00) MR0075241 [CX2767] ("JEDEC exists because of an industry need for standardization."); *See e.g.*, Oh, *In the Matter of Rambus* Dep. Tr. (1/9/03) at 218-219 [CX2108] ("Our customers, namely, the computer manufacturers, love to have – use the standardized part because they can have, you know – because standard parts means it's available every – you know, easily. They can make it available. They can have it at any time they want.

effort, it would take years.[222]

Furthermore, the evidence at trial will demonstrate that no single DRAM manufacturer can avoid the Rambus patents by specifying its own DRAM without JEDEC. A primary reason why DRAM standards predominate in the industry is that DRAM customers want assured supplies of DRAM and the ability to obtain the best possible prices for that DRAM.[223] This has been achieved in the DRAM industry by creating commodity standards, where any DRAM that complies with the standard can be used interchangeably with any other.[224] Commodity standards allow for multiple sourcing, which assures supply by allowing a customer to interchange compatible products of multiple manufacturers. If one manufacturer fails to deliver a reliable

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We are not the only manufacturer. So they want to have the standard – standardized part, so we have to concentrate on unifying the DDR spec, and how we can do that, JEDEC is the place").

[222]The time needed to change the standard is illustrated by JEDEC's experience with DDR-2 standard setting. Work on that standard, which is only now being introduced to the market, began in April of 1998. *See* Macros E-Mail (4/28/98) HR905_127393 at 394 [CX0379] ("The first JEDEC DRAM Futures Taskgroup meeting was held at the SGI Mountain View facility on April 23rd. The purpose of this meeting was to start the definition of the high speed DRAM type which would follow DDR SDRAM."). *See also* Davidow E-Mail (7/11/97) R233898 [CX0936] ("At any rate, we are fairly confident that if Synclinc [sic] goes forward, they will have to do a lot of re-engineering to get around issued and soon to be issued patents. My guess is that this will delay their efforts from two to five years.") (emphasis added).

[223] Semiconductor Intellectual Property (10/8/97) RF0641999 2023 [CX1340] ("Systems need memory standards... High volume ... Commodity pricing ...Setting a new standard is hard"); Oh, *In the Matter of Rambus* Dep. Tr. (1/8/03) at 136 [CR2107] ("DRAM is -- is a commodity in -- in this electronic market, and they are -- the DRAM manufacturers are producing standard products, so anybody who -- can come and make the standard products.")

[224] Rambus Business Model & DRAM Industry Dynamics (12/3/99) 5006DOC02021 at 2025 [CX1354] ("DRAM Industry Dynamics... Commodity business ... Customers want multiple sourced, compatible DRAMs."); Proposed Procedure and Objectives for Standardizing a Comprehensive Device Specification (1/00/99) MR0131755 at 756 [CX0389] ("Goals for a JEDEC Specification … Provide a 'least common denominator' specification if a system designer designs to this specification, devices from any vendor should 'drop in' to this application (and function identically)").

device in the needed volumes at a low price, then the customer can simply obtain the same DRAM from another manufacturer. Multiple sourcing promotes competition among DRAM manufacturers and maintains their incentive to reduce costs and develop new production technologies.[225] Rambus recognizes the importance of multiple sourcing to the adoption of a DRAM standard. As Geoffrey Tate, Rambus CEO, stated in an interview, "… everyone wants multiple-sourced DRAMs, so to make DELL happy, you need multiple suppliers of DRAMs, modules, connectors, and clock chips.." Karp E-Mail (8/23/99) R218140 [CX1075].

The necessity of standards to the development of the DRAM industry is a fact that has been well recognized by Rambus executives from the formation of Rambus. The chairman of Rambus's board of directors stated it best, relating industry standards to a barrier to entry as described in a 1997 Rambus presentation:

> If something is broadly used and adopted as an industry standard, there is heavy investment in that standard, and the standard keeps getting improved upon, and people are reluctant to switch.

Davidow, *Micron v. Rambus* Dep. Tr. (4/13/01) at 148 [CX2083]. In fact, this understanding of standards in the DRAM industry being barriers to entry for competing technologies formed the basis for Rambus's earliest business strategies.

> The DRAM industry's penchent [sic] for standardization combined with the RamBus marketing strategy of licensing all the major vendors make it extremely unlikely that any potential competitor would be able to gain critical mass enough to challenge an already established and ubiquitous RamBus chip.

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[225] *See, e.g.*, JEDEC Member's Manual (9/00/97) R173388 at 395 [CX0213] ("STANDARDS … Competitiveness Assures- Wide Usage- High Volume- Low Cost- Interface Industry Gets Guidance").

RamBus Business Plan (6/26/89) R115191 at 199 [CX0570].[226]

More recently, a staple of the Rambus business strategy has been to take advantage of the time it would take competitors to change DRAM standards once faced with patent infringement claims. *See* Davidow E-Mail (7/11/97) R233898 [CX0936] ("At any rate, we are fairly confident that if Synclinc [sic] goes forward, they will have to do a lot of re-engineering to get around issued and soon to be issued patents. My guess is that this will delay their efforts from two to five years.") (emphasis added). *See also* Crisp E-Mail (8/30/96) R69511 at 694 [CX0711] (noting that changes to a new technology standard, when they occur, require "fundamentally long lead time efforts," because of "the sort of things that must be done . . . to make . . . technology usable from a deployment perspective (silicon infrastructure, models, modules, etc)").

C. Rambus Possesses Monopoly Power.

The offense of monopolization requires a showing that the defendant possesses monopoly power; the offense of attempted monopolization requires that there be a "dangerous probability of success" by the defendant in achieving monopoly power.[227] Monopoly power traditionally has been defined as "the power to control prices or exclude competition." *United States v. E.I. du*

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[226] *See also* RamBus Business Plan Draft (6/26/89) R114628 at 642 [CX0533] ("Barriers to Entry ... First to market with DRAM vendor design wins. Once a DRAM [vendor is] committed to an architecture unlikely to change. Learning curve mitigates against similar ideas."); *id.*, at R114646 ("RamBus must be established as a standard to effect large royalty payments.."); RamBus Business Overview (8/18/89) R115156 at 182 [CX1282] ("Need to establish RamBus as a standard"); Farmwald Notes (8/28/89) R114340 at 342 [CX1702] (". . . Much depends upon getting a standard which depends upon our patents." (emphasis omitted); Farmwald Notes (9/18/89) R114330 [CX1750] ("Key to success is establishing de facto standard."); Rambus Business Plan: Plans, Ideas, Issues (4/15/90) R128740 at 742 [CX0534] ("If RAMBUS can be seen as a standard… that can get things to the point where it may be very difficult for a second solution to develop critical mass in the market place.").

[227] *United States v. Grinnell Corp.*, 384 U.S. 563, 570-71 (1966) (monopolization); *Spectrum Sports, Inc. v. McQuillan*, 506 U.S. 447 (1993) (attempted monopolization).

Pont de Nemours & Co., 351 U.S. 377, 391 (1956). The offense of monopolization is complete with the acquisition or maintenance of monopoly power; that power does not have to be exercised.[228] Proof of a change in price or output in the marketplace is not required so long as the conduct in question has resulted in the power to affect the market.[229]

Monopoly power can be shown by direct evidence or indirect evidence. Both types of evidence at trial will show that Rambus has achieved monopoly power in the relevant technology markets, establishing the respective monopoly power elements of both the offenses of monopolization and attempted monopolization. This does not appear to be a fact in dispute. Even Rambus's economic expert, Dr. Rapp, agrees that Rambus presently has the power to control prices in the markets defined by Professor McAfee and described above:

> Q. Do you have a view or an opinion as to whether Rambus possesses or ever has possessed monopoly power in any relevant market?
>
> A. I have an opinion that Rambus possesses market power in the four relevant markets proposed by Professor McAfee. And whether the market power is deemed a lot or a little market power, I'm not prepared to characterize it in that way. Therefore, I am not prepared to say that it's monopoly

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[228] *Berkey Photo v. Eastman Kodak Co.*, 603 F.2d 263, 275 (2d Cir. 1979), *cert. denied*, 444 U.S. 1093, 100 S .Ct. 1061 (1980) ("Unlawfully acquired power remains anathema even when kept dormant").

[229] *See Eastman Kodak*, 504 U.S. at 464 (1992); *American Tobacco Co. v. United States*, 328 U.S. 781, 811 (1946) ("the material consideration in determining whether a monopoly exists is not that prices are raised and that competition actually is excluded but that power exists to raise prices or to exclude competition when it is desired to do so"). As then-Professor Muris noted in response to an argument that he believed that monopolization required proof of an effect on price, "[b]ecause I repeatedly stated that the exclusionary conduct must be shown to have led to the creation, maintenance, or enhancement of monopoly power, I could hardly believe that . . . the plaintiff need show that the monopolist's exclusionary conduct had caused prices to increase and output to fall." Muris, Anticompetitive Effects in Monopolization Cases: Reply, 68 *Antitrust L.J.* 325, 328 n.19 (2001).

> power, but to -- if the question were does Rambus have market power in those markets, my answer would be yes.

Rapp, *In The Matter of Rambus* Dep. Tr. (3/7/03) at 73-74 [CX2117].[230]

(1) Indirect Proof of Monopoly Power

Evidence of substantial market share, combined with evidence that competitors and potential competitors cannot expand output, constitutes indirect proof of monopoly power.[231] Courts frequently have found market shares in excess of 70% to be evidence of monopoly power, but have found shares less than 60% to be insufficient.[232] The market share threshold is lower where attempt is concerned; 40% or less of the market may suffice as a threshold for an attempt

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[230] Dr. Rapp defines market power as the ability of a firm to raise prices:

> Q. How do you define the term "market power" as that term is used in this section of your report?
>
> A. Generally speaking, it's -- I mean by market power the ability to charge a price for a technology that is greater than the price of whatever substitutes there may be. I'm shying away from the language of price and cost, because we're talking about technology markets, and the comparison of price to cost is as a measure of market power, Lerner index style is inept. What it means in these circumstances is the ability to charge more than the next person who has the technology that might serve in its place.

Id. at 84.

[231] *Grinnell*, 384 U.S. at 571 ("[T]he existence of [monopoly] power ordinarily may be inferred from the predominant share of the market.").

[232] *See, e.g., United States v. Paramount Pictures, Inc.* 334 U.S. 131, 167-72 (1948) (suggesting that a 70% market share is sufficient to support a finding of monopoly power); *Town of Concord v. Boston Edison Co.*, 915 F.2d 17, 30 (1st Cir. 1990) (70-90% market share is necessary for a finding of monopoly power), *cert. denied*, 111 S Ct. 1337 (1991); *Fineman v. Armstrong World Industries, Inc.*, 980 F.2d 171, 201 (3d Cir. 1992) ("As a matter of law, absent other relevant factors, a 55 percent market share will not prove the existence of monopoly power.").

claim.[233] Courts also consider whether current market shares are likely to be durable.[234]

As described above, prior to standardization by JEDEC, a number of alternatives were available that could have been used to satisfy the technical needs of the DRAM industry. Once JEDEC made its choices, and the industry committed to build to those choices, only one technology in each market could realistically compete. The evidence at trial will show that in each case, Rambus now claims possession of patents that are necessary for DRAM manufacturers and other firms to make, sell or use DRAMs that comply with the JEDEC standard.[235] As

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[233] *See Rebel Oil*, 51 F. 3d at 1438. ("[T]he minimum showing of market share required in an attempt case is a lower quantum than the minimum showing required in an actual monopolization case...When the claim involves attempted monopolization, most cases hold that a market share of 30 percent is presumptively insufficient to establish the power to control price. [A] market share of 44 percent is sufficient as a matter of law to support a finding of monopoly power, if entry barriers are high and competitors are unable to expand their output in response to supracompetitive pricing."(citations omitted)).

[234] *United States v. Microsoft Corp.*, 253 F.3d 34, 54 (D.C. Cir. 2001) (*per curium*) ("Although the 'existence of [monopoly] power ordinarily may be inferred from the predominant share of the market,' . . . because of the possibility of competition from new entrants, looking to current market share alone can be 'misleading'," *quoting Grinnell*, 384 U.S. at 571).

[235] *See IP Guidelines* § 2.2; *Orion Electric Co. v. Funai Electric Co.*, No. 01-CV-3501, 2002 WL 377541 at 377546 (S.D.N.Y., Mar. 11, 2002). The Supreme Court's decision in *Walker Process*, supports the view that the exclusionary power of a patent considered in the context of the relevant product market may constitute monopoly power for purposes of Section 2 Sherman Act analysis:

> To establish monopolization or attempt to monopolize a part of trade or commerce under §2 of the Sherman Act, *it would then be necessary to appraise the exclusionary power of the illegal patent claim in terms of the relevant market for the product involved.* Without a definition of that market there is no way to measure [the patentee's] ability to lessen or destroy competition. It may be that the device [made with the technology covered by the invalid patent] . . . does not comprise a relevant market. There may be effective substitutes for the device which do not infringe the patent. This is a matter of proof . . . .

Walker Process, 382 U.S. 172, 177-78 (1965) (emphasis added).

described above the evidence will also show that, because of investments made by numerous firms in the industry in reliance on the JEDEC standard, and by virtue of the way this industry works, these firms cannot simply switch from the JEDEC-standard technologies to the formerly available alternative technologies now, nor could they do so for the foreseeable future. Finally, the evidence at trial will show that DRAM complying with the JEDEC standard constitutes approximately 90% of the DRAM market, demonstrating that the technologies claimed by Rambus dominate each of the relevant markets. In other words, the indirect evidence of monopoly power at trial will show that Rambus has substantial monopoly power.

There is no question but that Rambus itself believes, at its highest levels, that it owns patents that allow it to sue any manufacturer of JEDEC-compliant SDRAM or DDR SDRAM, or any manufacturer of controllers that work with that DRAM, based on the incorporation of the four technologies in the JEDEC standard.[236] In addition, Rambus has been able to convince others that Rambus owns such patents, or at least it has been able to convince others that it is not worth fighting over. Rambus now has license agreements with manufacturers constituting approximately 45% of world-wide DRAM production and lawsuits against the remaining manufacturers. Matsushita Electric Industrial Co., Ltd. (“Matsushita”), Samsung Electronics Co., Ltd. (“Samsung”), NEC Corporation (“NEC”), Toshiba America Inc. (“Toshiba”), Oki

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[236] *See e.g.*, Rambus presentation re: Promotions (11/18/99) R189311 at 317 [CX1353] ("Intellectual Property - . . . Strategic patent portfolio 1: SDRAM/DDR/Controllers all infringe"); Harmon presentation (9/00/00) FTC-1 at 13 [CX1382] ("Rambus: Three Ways to Win:...Rambus receives royalties on competitive alternatives."); *id.* at FTC-33 (“Non-compatible License Terms: ... All agreements provide DDR memory and logic royalty rates which are greater than Rambus-compatible royalty rates.”); Rambus Presentation re: BHAG for 200x (9/15/00) RF0719497 at 504 [CX1386] ("KR2001 Really Big Picture Goals...Collect royalties on all DRAM and controllers forever"); *id.* at RF0719500 [CX1386] ("Today - We are on the cusp of achieving our original BHAG [big hairy audacious goal] - SDRAM+DDR+RDRAM>> 90% of the DRAM market - SDRAM/DDR: ~20% paying us royalties now; all by 01/E").

Electric Industry Co. Ltd. ("Oki"), Elpida Memory Inc. ("Elpida"), and Mitsubishi Electronics America Inc. ("Mitsubishi") have all signed world-wide licensing agreements with Rambus.[237] Nor is there any question that the market share of the DRAM that Rambus claims is covered by its patents is approximately 90% of the entire DRAM market.[238] Along with the evidence described above that there are substantial barriers to entry, the market share evidence demonstrates that Rambus has the power to control prices in the relevant markets.

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[237] SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and Mitsubishi Electric Corporation (12/22/00) R196139 [CX1689]; SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and NEC Corporation (9/7/00) RF0526078 [CX1685]; SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and OKI Electric Industry Co., Ltd. (7/27/00) R105938 [CX1683]; SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and Toshiba Corporation (6/14/00) R105877 [CX1680]; SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and Samsung Electronics Co., Ltd. (10/31/00) R171569 [CX1687]; SDR/DDR IC and SDR/DDR Memory Module Patent License Agreement Between Rambus Inc. and Elpida Memory, Inc. (10/31/00) R171530 [CX1686]; SDR/DDR IC and SDR/DDR Memory Modules, Settlement and Patent License Agreement Between Rambus Inc. and Hitachi, Ltd. (6/22/00) R105902 [CX1681].

[238] *See e.g.,* Rambus Presentation re: BHAG for 200x (9/15/00) RF0719497 at 500 [CX1386] ("Today - We are on the cusp of achieving our original BHAG [big hairy audacious goal] - SDRAM+DDR+RDRAM>> 90% of the DRAM market - SDRAM/DDR: ~20% paying us royalties now; all by 01/E"). Rambus President David Mooring testified:

> Q. . . . as you sit here today, if we were looking at all DRAMs, do you have an estimate of what percent would be DDR, what percent would be RDRAM, SDRAM, or anything else?
>
> [Objection omitted.]
>
> A. If I were to guess on a revenue basis in the most recent quarter . . . I would think that DDR is about 50 percent, SDRAM 40 percent, RDRAM less than 10 percent with EDO taking up the piece that RDRAM doesn't make in the 10 percent. It's a guess.

Mooring, *In the Matter of Rambus, Inc.* Dep. Tr. (1/24/03) at 309-310 [CX2112].

(2) Direct Proof of Monopoly Power.

Direct evidence of monopoly power is evidence showing that a company has the ability to control prices or exclude competitors.[239] In this case, there is substantial direct evidence showing that Rambus has monopoly power. The clearest direct evidence of Rambus's ability to control prices or output is evidence that it has in fact controlled prices or output.[240] It cannot be disputed that Rambus has in fact exercised control over prices in the relevant markets: it already charges license fees to nearly half of the world's DRAM manufacturers for technology incorporated in the JEDEC standards.[241] Second, Rambus' licensing behavior only makes sense if Rambus has some degree of monopoly power. For example, the manner in which the license fees were

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[239] See *American Council of Certified Podiatric Physicians and Surgeons v. American Board of Podiatric Surgery*, 185 F.3d 606, 622 (6th Cir. 1999), *Rural Telephone Service Company v, Feist Publications*, 957 F.2d 765, 768 n.2 (10th Cir. 1992); *City of Chanute, Kansas, et al. v. Williams Natural Gas Co.*, 955 F.2d 641, 654 (10th Cir. 1992); *Tarabishi v. McAlester Regional Hosp.*, 951 F.2d 1558, 1567 (10th Cir. 1991).

[240] The fact that a firm has raised prices is evidence that it has the power to do so. *FTC v. Indiana Federation of Dentists*, 476 U.S. 447, 460-461 (1986) ("Since the purpose of the inquiries into market definition and market power is to determine whether an arrangement has the potential for genuine adverse effects on competition, 'proof of actual detrimental effects, such as a reduction of output,' can obviate the need for an inquiry into market power, which is but a 'surrogate for detrimental effects'." (citations omitted)); *Toys 'R' Us, Inc. v. FTC*, 221 F.3d 928, 937 (7th Cir. 2000) (Toys 'R' Us "was remarkably successful in causing the 10 major toy manufacturers to reduce output of toys to the warehouse clubs, and that reduction in output protected TRU from having to lower its prices to meet the clubs' price levels."); *Rebel Oil Co., v. Atlantic Richfield Co.*, 51 F.3d 1421, 1434 (9th Cir. 1995).

[241] *See e.g.*,Tate E-Mail (11/1/00) RF0736568 [CX1154] (re: "great job on samsung/lexington!! ... great job by Neil & the IP team for their excellent work in getting the SPP1 [strategic patent portfolio] patents . . . with samsung on board we now have about 40% of the dram market. . .licensed for sdr/dDR. considering it was about 1 year ago that neil/joel first went to see hitachi this is FANTASTIC progress. add to that the ~10%ish share for rdram and we acre close to getting royalties from HALF of the entire dram market!").

negotiated confirms that Rambus had no concern about losing its customers to a rival.[242] These royalty rates were initially determined by Rambus' CEO Tate based on the fact that there were no substitutes that could be sold to the PC industry.[243] All evidence about the negotiations demonstrates that the terms were imposed by Rambus on its licensees.[244] In addition, Neil Steinberg, Rambus's former Vice President of Intellectual Property, established a license negotiation strategy that was feasible only because Rambus' patents, if enforceable, grant Rambus monopoly power. That strategy was to charge a higher royalty rate to firms that challenged Rambus' patents in litigation.[245] Most tellingly, Rambus was able to implement its strategy successfully. In contrast to the other licensees, Hitachi had not agreed to a license before

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[242] Evidence that a firm sets prices without concern for the loss of sales to rivals indicates that the firm has no real rivals. *See e.g., United States v. Microsoft*, 253 F.3d 34, 57-58 (D.C. Cir.) *Cert. Denied,* 122 S.Ct. 350 (2001) (Direct evidence of monopoly power includes behavior that is "difficult to explain unless Windows is a monopoly product," such as setting a price without considering rivals' prices).

[243] Tate, *Rambus v. Infineon* 30(b)(6) Dep. Tr. (1/16/01) at 143-46 [CX2060].

[244]
Q: Did Rambus present any terms as nonnegotiable terms?

A: Yes. Yes.

Q: Which terms were those?

A: Well, among others were the royalty rates.

Donohoe, *Rambus v. Micron* Dep. Tr. (2/6/01) at 33-34.

[245] In a presentation to the September 2000 Analyst Meeting at the Rambus Developers' Forum, Mr. Steinberg laid out Rambus' "Licensing Approach" in a slide:

- Those companies that decide to litigate will pay higher royalty rates
- Rambus may not license those companies that litigate and lose.

Analyst Meeting (9/14/00) R157779 at 877 [CX1385]. In that presentation, Rambus set out three "Ways to Win." The third way, described by Mr. Steinberg, was "Rambus receives royalties on competitive alternatives." *Id.* at R157873.

being sued by Rambus.[246] Rambus demanded, and Hitachi agreed to pay, significantly higher royalty rates for an SDRAM license and a DDR SDRAM license than charged to other manufacturers.[247]

Finally, Rambus has monopoly power because its multiple patents are asserted to cover the design of all memory chips and related devices that are compliant with the JEDEC standards, and the standards exclude all competing technologies. At present, Rambus has not yet successfully asserted its patent rights over the entire market of JEDEC-compliant technology. However, even without having succeeded in each of its various pending litigations, Rambus has used its claims of patent rights to give it power over the marketplace for JEDEC-complaint memory technology.[248] Using the threat of litigation, Rambus already has secured licenses from, and receives royalties from, memory manufacturers accounting for fully 45% of the market production of JEDEC-compliant memory chips and has brought suit against the three remaining

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[246] Tate, *Rambus v. Infineon* 30(b)(6) Dep. Tr. (1/16/01) at 42 and 300 [CX2060].

[247] SDR/DDR Ics and SDR/DDR Memory Modules, Settlement and Patent License Agreement Between Rambus Inc. and Hitachi, Ltd. (6/22/00) R105902 at 916 [CX1681]. Rambus' CEO testified that it set Hitachi's license fees higher than any of the other DRAM manufacturers because of Hitachi's litigation with Rambus:

> [W]e look at the value of the technology …, and then we're looking in our normal mutual negotiation process, at what does it take to close an agreement. This wasn't that normal process. We were in litigation, and this was negotiated, I believe, shortly before the first scheduled trial date.

Tate, *Rambus v. Infineon* 30(b)(6) Dep. Tr. (1/16/01) at 302 [CX2060].

[248] The Supreme Court has recognized that the mere threat of a patent infringement lawsuit "permit[s] invalid patents to serve almost as effectively as would valid patents as barriers to the entry of new firms." *Blonder-Tongue Laboratories, Inc. v. University of Illinois Foundation*, 402 U.S. 313, 346-47 (1971). Indeed, an alleged infringer who is not able to afford the costs of a patent challenge may simply absorb the royalty payments and never reach a position to challenge the patent. *Id.* at 346.

large memory chip manufacturers (Infineon, Hynix and Micron) which together account for nearly all of the remaining production of JEDEC-compliant memory chips.

VIII. The Relief Set Forth in the Notice of Contemplated Relief Is Necessary and Appropriate to Remedy the Harm Caused by the Anticompetitive Conduct of Rambus.

To prevent Rambus from continuing its unlawful practices and to restore competition in the marketplace, Complaint Counsel seek an order prohibiting Rambus from enforcing certain of its patent rights. As we discuss, an order barring Rambus from enforcing the patents at the heart of this case, together with bans on enforcing certain related patents, is clearly within the Commission's broad discretion in fashioning remedies. Such a ban is necessary to ensure that Rambus does not continue the unlawful practices that will be shown at trial and to eradicate any continuing harm to competition from those practices. At the same time, the proposed order is goes no further than reasonably necessary to correct the harm; thus, the ban on enforcement of Rambus's patents does not extend to patents that do not relate to the JEDEC SDRAM standard or the JEDEC DDR specification.

Specifically, complaint counsel seek an order prohibiting Rambus from enforcing any U.S. patent right that claims priority back to Rambus' U.S. Patent Application 07/510,898, filed on April 18, 1990, or to any other U.S. patent application filed before June 17, 1996, (the date Rambus formally resigned from JEDEC) against anyone manufacturing, using, or selling a product that conforms to the JEDEC SDRAM standard (i.e., JEDEC 21-C) or the JEDEC DDR standard (i.e., the JESD 79 specification), including future versions of those standards. The order sought by complaint counsel would also prohibit Rambus from enforcing any foreign patent right that claims priority back to any U.S. patent application filed before June 17, 1996, with respect to any products that conform to the JEDEC 21-C standard or the JESD 79 specification and are

intended for import into or export from the United States. The ban on enforcement would extend not only to patents already in existence, but also to future Rambus patents concerning SDRAM and DDR DRAM technology that claim priority back to the original application. Complaint counsel's proposed relief is tailored to remedy the harm to competition from the specific actions Rambus has already taken and to bar it from using similar tactics to harm competition regarding other products that conform to the JEDEC 21-C standard or the JESD 79 specification.

A. The Commission Has Broad Discretion to Craft a Remedy Designed to End Rambus's Unlawful Practices and Restore Competition to the Market.

The Commission has broad power to remedy violations of the statutes it enforces. Indeed, the Commission has the power to craft a broader remedy than the limited relief being sought in this case. "The Commission has wide discretion in its choice of a remedy deemed adequate to cope with the unlawful practices" that are established. *Jacob Siegel Co. v. FTC*, 327 U.S. 608, 611 (1946); *In the Matter of Firestone Tire & Rubber Co.*, 81 F.T.C. 398, 467 (1972), *aff'd*, 481 F.2d 246 (6th Cir.), *cert. denied*, 414 U.S. 1112 (1973). *See also FTC v. Cement Institute*, 333 U.S. 683, 726 (1948). The Commission, moreover, "has wide latitude for judgment and the courts will not interfere except where the remedy selected has no reasonable relation to the unlawful practices found to exist." *Jacob Siegel*, 327 U.S. at 613. As the Supreme Court also stated, "the Commission is not limited to prohibiting the illegal practice in the precise form in which it is found to have existed in the past. If the Commission is to attain the objectives Congress envisioned, it cannot be required to confine its road block to the narrow lane the transgressor has traveled; it must be allowed effectively to close all roads to the prohibited goal, so that its order may not be by-passed with impunity." *FTC v. Ruberoid Co.*, 343 U.S. 470, 473 (1952). "[T]hose caught violating the [FTC] Act must expect some fencing

in." *FTC v. National Lead Co.*, 352 U.S. 419, 431 (1957).

Thus, the Commission has the power to forbid acts that are lawful, if the cease and desist order is necessary "to prevent a continuance of the unfair competitive practices found to exist." *FTC v. National Lead Co.*, 352 U.S. 419, 430 (1957) (upholding FTC cease and desist order prohibiting unilateral zone pricing, in case finding violation of § 5 for concerted use of zone delivered pricing system). Thus, "it is well established that the Commission 'has the authority to restrict otherwise lawful practices and activities when they are likely to be used to carry out an unlawful purpose.'" *Borden, Inc. v. FTC*, 674 F.2d 498, 517 (6th Cir. 1982) (quoting *Arthur Murray Studio of Washington, Inc. v. FTC*, 458 F.2d 622, 625 (5th Cir. 1972)); *see also Toys "R" Us, Inc. v. FTC* , 221 F.3d 928, 940 (7th Cir. 2000) (FTC's orders "can restrict the options for a company that has violated § 5, to ensure that the violation will cease and competition will be restored"). *Cf. United States v. Crescent Amusement Co.*, 323 U.S. 173, 188 (1944) (approving prohibition on lawful activities in Sherman Act court decree where prohibition was necessary to prevent resumption of the unlawful practice). The goal of the Commission's broad remedial authority, then, is to insure the discontinuance of injury to the public. This may include relief aimed at ending not only the injurious conduct itself but also "the continuing effects of the conduct found to be unlawful." *Firestone*, 81 F.T.C. at 470.

The key consideration in fashioning remedies in antitrust cases is framing relief that will permit competition to flourish unimpaired. *See, e.g., Ford Motor Co. v. United States*, 405 U.S. 562, 573 (1972); *International Salt Co. v. United States*, 332 U.S. 392, 401 (1947). *See also United States v. E.I. duPont de Nemours & Co.*, 366 U.S. 316, 326 (1961) ("The key to the whole question of an antitrust remedy is of course the discovery of measures effective to restore competition.") As the Supreme Court said in *United States v. United States Gypsum Co.*, 340

U.S. 76, 88 (1950), the purpose of relief in an antitrust case is "so far as practicable, [to] cure the ill effects of the illegal conduct, and assure the public freedom from its continuance." The Supreme Court also observed: "A public interest served by such civil [antitrust] suits is that they effectively pry open to competition a market that has been closed by defendants' illegal restraints. If this decree accomplishes less than that, the Government has won a lawsuit and lost a cause." *International Salt,* 332 U.S. at 401. Likewise, the purpose of a Commission order is to restore competition to the condition it would be in but for the unlawful conduct. *In the Matter of Ekco Prods. Co.*, 65 F.T.C. 1163, 1216 (1964), *aff'd,* 347 F.2d 745 (7th Cir. 1965).

The Commission has available to it "a complete array of essentially equitable remedies." *Id.* at 1213. In exercising its broad discretion, the Commission has fashioned a wide variety of orders to remedy the unlawful practices it has found. Thus, courts have approved Commission orders requiring affirmative disclosures and corrective advertising, *see, e.g., Amrep Corp. v. FTC,* 768 F.2d 1171, 1180 (10th Cir. 1985); requiring divestiture, *L.G. Balfour Co. v. FTC,* 442 F.2d 1, 23 (7th Cir. 1971); requiring compulsory licensing of a patent on a reasonable royalty basis, *Charles Pfizer & Co. v. FTC,* 401 F.2d 574 (6th Cir. 1968), *cert. denied,* 394 U.S. 920 (1969); and prohibiting enforcement of clauses in contracts, *Amrep,* 768 F.2d at 1180. The Commission's remedial powers likely also include compulsory licensing or suspension of a trademark. *See In the Matter of Borden, Inc.*, 92 F.T.C. 669, 807 (1978), *aff'd,* 674 F.2d 498 (6th Cir. 1982), *vacated and remanded for entry of consent judgment,* 461 U.S. 940 (1983); *cf. Ford Motor,* 405 U.S. 562 , 576 (1972) (in suit by United States, approving ban on use of trade name to restore premerger competitive structure of market).

The Commission's remedial authority is not limited to the exact practices, exact products, or exact geographic area involved in the violation. Thus, courts have approved Commission

orders covering all geographic areas in which a respondent does business, even if the violation occurred only in a limited area. *See, e.g., National Dairy Prods. Corp. v. FTC,* 395 F.2d 517, 529 (7th Cir.), *cert. denied,* 393 U.S. 977 (1968). Courts have approved Commission orders that are not limited to the products involved in the violation. *See, e.g., FTC v. Colgate-Palmolive Co.*, 380 U.S. 374, 394-95 (1965); *Niresk Indus., Inc. v. FTC,* 278 F.2d 337, 343 (7th Cir.), *cert. denied*, 364 U.S. 883 (1960). Courts have also approved Commission orders extending to conduct not identical to that found to have violated the FTC Act. *FTC v. Mandel Bros., Inc.,* 359 U.S. 385, 391-93 (1959). The courts have upheld these broad proscriptions when necessary to prevent law violators from circumventing the Commission's orders. *Amrep,* 768 F.2d at 1180.

B. Barring Rambus from Enforcing Certain Patents Is Reasonably Related to its Unlawful Conduct and Is an Appropriate Exercise of the Commission's Wide Latitude to Implement Remedies to Restore Competition.

The cease and desist order proposed by complaint counsel is directly related to Rambus's violation of Section 5 and is designed to restore the competitive conditions that would have prevailed but for Rambus's anticompetitive conduct. As discussed above, the evidence at trial will show that, if Rambus had disclosed its patent applications to JEDEC in a timely fashion, the industry would now be able to manufacture, sell and use JEDEC-compliant memory free of Rambus's patents or subject to significantly lower royalty rates. The evidence at trial will show that, during the time it attended JEDEC meetings at which proposed future standards for SDRAM were discussed, Rambus failed to disclose to JEDEC its various patent applications that it believed covered SDRAM technology. The evidence will show, further, that Rambus's nondisclosures were designed to prevent JEDEC from learning that Rambus was planning to claim patent rights to the very technology that was being discussed for inclusion in the standards

under consideration. Additionally, the evidence presented at trial will show that, had Rambus disclosed its patent applications on a timely basis, JEDEC likely would have adopted alternate technologies that would have permitted the standards to remain free of Rambus's patents. Rambus would not have been in a position to exclude SDRAM manufacturers from the production of memory chips or to demand supracompetitive prices for use of its memory technology in the manufacture of SDRAM and DDR SDRAM.

To remedy this violation, complaint counsel propose an order provision barring Rambus from enforcing any U.S. patent rights regarding Rambus architecture or any other memory that conforms to the JEDEC 21-C standard or the JESD 79 specifications. This remedy is not only reasonably necessary to competition but is directly related to Rambus's unlawful practices.

To assure that competition is effectively restored, the ban on enforcement of patents must not be limited merely to those patents that Rambus has, to date, sought to enforce. The order must effectively "close all roads to the prohibited goal, so that [the Commission's] order may not be by-passed with impunity." *Ruberoid,* 343 U.S. at 473. The evidence at trial will show that Rambus planned and carried out a specific scheme, over the course of many years, to obtain patents covering a wide variety of technologies incorporated in the JEDEC standards, but not to disclose its patent rights in order to increase its ability to demand royalties. Thus, while Rambus has sought to enforce against SDRAM manufacturers only 12 of its patents claiming priority back to the '898 application, the evidence at trial will show that Rambus holds, and could assert, a number of additional patents covering the same four technologies at issue in this case.[249] The

[249] Rambus Press Release (5/4/01) RF0152793 [CX1888] (In addition to the patents at issue in the Infineon, Micron and Hynix litigations, "Rambus holds newly issued U.S. and European patents covering Rambus inventions used by SDRAMs and DDR SDRAMs that have not yet been asserted in any litigation . . .").

evidence to be presented at trial will also show that Rambus has a number of pending patent applications covering these technologies and that it intends to assert them. *Id.* Without a bar to enforcing those other patents, Rambus could lie in wait, making a "tactical decision to postpone litigation until there was a plum ripe enough to be plucked" – until the sales of infringers were substantial enough to make an infringement suit worthwhile. *See Stryker,* 741 F.Supp. at 515 (enforcement of patent barred by equitable estoppel).

This concern is particularly compelling in the case of patent applications. A single application can lead, through amendments, continuation applications and divisionals, to multiple patents. It frequently takes years for all of the patents stemming from a single application to be issued. Thus, where the failure to disclose involves an application rather than a patent, it is impossible to define a precise set of related patents as long as the application chain remains alive. The evidence at trial will show that Rambus has deliberately taken advantage of its patent applications to try to insulate itself from the consequences of its conduct before JEDEC. It has not asserted against SDRAM manufacturers patents (such as its '327 patent) that were pending while it was a member of JEDEC. Rather, after leaving JEDEC, it used the same application chain to file additional continuation applications in 1998 and 1999 and then asserted those resulting patents. Rambus currently continues to prosecute additional applications and has stated that it will assert the resulting patents against SDRAM manufacturers. Rambus Press Release (5/4/01) RF0152793 [CX1888]. Its application chain remains alive today, permitting it to file further continuation applications in the future, still claiming priority back to April 1990. Thus, to remedy fully Rambus's failure to disclose its patent applications, the order should bar it from enforcing all patents that claim priority to applications that were pending while Rambus was a member of JEDEC.

The evidence will show, further, that Rambus has patents covering a number of additional technologies that were the subject of JEDEC work while Rambus was a JEDEC member; that Rambus intended, and attempted, to use its '898 application to support later-filed claims against as many technologies in the SDRAM standard as possible; and that Rambus did not properly and timely disclose to JEDEC members that it believed it had patent rights to any such technologies.[250] An order prohibiting Rambus from enforcing these patents is not only directly related to Rambus's unlawful practices but is appropriate fencing-in to ensure that competition will flourish unimpaired.

The order proposed by Complaint Counsel also would prohibit Rambus from enforcing patents outside of the '898 family against the manufacture, sale or use of JEDEC-compliant memory, if Rambus had the patents or pending patent applications while it was a member of JEDEC. If the patents and patent applications were related to the technologies incorporated in the JEDEC standards, it is likely that they should have been disclosed to JEDEC at the time and an order prohibiting their enforcement is appropriate. And, of course, if they are not related to the technologies incorporated in the JEDEC standards, their inclusion in an order likely would be harmless because they would not be asserted against SDRAMs and DDR SDRAMs in any event. Thus, this order provision is an appropriate fencing-in provision.

Also necessary to remedy harm to U.S. customers is the requirement in complaint counsel's proposed order that Rambus be barred from enforcing any of its foreign patent rights

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[250] Crisp E-Mail (5/27/94) R69511 at 537 [CX0711] (externally supplied reference voltage); *id.* at 541 (same); *id.* at 564 (same); *id.* at 583 (low voltage swing signaling); Vincent Notes (7/9/95) R203126 at 128 [CX1963] (same); Ware E-Mail (8/17/94) R233780 [CX0751] (bursting data into an address); Crisp E-Mail (3/15/95) R69511 at 568 [CX0711] (source synchronous clocking).

that claim priority back to the '898 patent application or any other U.S. patent application filed before June 17, 1996, against anyone exporting from, or importing into, the United States a product that utilizes technology covered by the JEDEC 21-C standard and the JESD 79 specification. Although JEDEC does not require its members to disclose foreign patents, its disclosure policy is based on the assumption that any member with significant foreign patent rights will at least have filed a patent application in the United States to protect those rights, so that disclosure of U.S. patent rights will effectively disclose rights in other parts of the world. The evidence at trial will show that, if Rambus had disclosed its U.S. patent rights, JEDEC could and likely would have adopted different technologies that would have avoided Rambus's foreign as well as its U.S. patents. The evidence will also show that JEDEC's standards affect memory and computer component design and manufacture around the world. The evidence presented at trial will show that a large volume of the memory sold in the United States is imported from foreign countries, either in its original form or incorporated into intermediate products such as video cards. Complete relief for U.S. consumers requires that Rambus be prohibited from enforcing these patents with respect to such imports. Thus, by failing to disclose its U.S. patent rights to JEDEC, Rambus denied JEDEC the opportunity to consider alternatives that would have prevented Rambus from enforcing its patents against manufacturers of SDRAM and DDR SDRAM in various other countries and an order provision addressing this failure to disclose is necessary to restoring competition.

The relief proposed by Complaint Counsel is similar to remedies in patent infringement cases decided under the doctrines of equitable estoppel and patent misuse. In cases under the equitable estoppel doctrine, courts have precluded patent holders from future enforcement of patents when they failed properly to disclose the existence of the patents or when the patent

holders engaged in misleading conduct suggesting that patent rights would not be enforced. *See, e.g., A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 1028 (Fed. Cir. 1992) (where an alleged infringer establishes defense of equitable estoppel, patent holder's claim for infringement may be barred entirely); *Jamesbury Corp. v. Litton Indus. Prods., Inc.*, 839 F.2d 1544 (Fed. Cir. 1988) (claim for infringement barred under equitable estoppel based on patent holder's silence); *Jensen v. Western Irrigation & Mfg., Inc.*, 650 F.2d 165, 169 (9th Cir. 1980); *Studiengesellschaft Kohle v. Eastman Kodak Co.*, 616 F.2d 1315, 1325 (5th Cir. 1980) (estoppel forecloses patentee from enforcing patent); *Advanced Hydraulics, Inc. v. Otis Elevator Co.*, 525 F.2d 477, 479 (7th Cir. 1975); *Stryker Corp. v. Zimmer, Inc.*, 741 F. Supp. 509, 512 (D. N.J. 1990) (patent holder that engaged in intentionally misleading silence was equitably estopped from enforcing patent)*; Stambler v. Diebold, Inc.*, 1988 U.S. Dist. LEXIS 10132, at 21 (E.D.N.Y. 1988), *aff'd*, 878 F.2d 1445 (Fed. Cir. 1989) (patent holder that engaged in intentionally misleading silence while participating in a standard-setting organization was barred by laches from enforcing for past infringement and by equitable estoppel from future enforcement of patent); *Potter Instrument Co. v. Storage Tech. Corp.*, 1980 U.S. Dist. LEXIS 14348, 207 U.S. P.Q. (BNA) 763 (E.D. Va. 1980) (estoppel based on patent holder's intentional failure to disclose patent), *aff'd*, 641 F.2d 190, 192 (4th Cir.), *cert. denied*, 454 U.S. 832 (1981);[251] *cf. Wang Labs., Inc. v. Mitsubishi Elecs. Am., Inc.*, 103 F3d 1571 (Fed. Cir. 1997) (affirming district court order deeming patent holder to have granted royalty-free license based on patent holder's deception).

The concept of patent misuse grew out of the equitable doctrine of "unclean hands" and

[251] While the district court in *Potter* found the patent holder's claims barred by both estoppel and laches, the court of appeals affirmed solely on the grounds in laches, but noted that it would be inclined to uphold on the basis of estoppel as well, but for the collateral effect of such a holding on another case before the court.

constitutes a defense to an action to enforce patent rights. As with equitable estoppel, the remedy in patent misuse cases is a prohibition on enforcement of the patent in question. Thus, in *Morton Salt Co. v. G.S. Suppiger Co.*, 314 U.S. 488, 491 (1942), the Supreme Court refused to enforce a patent against an infringer where the patentee was found to have misused the patent by tying the lease of the patented machine to the purchase of unpatented materials.[252] *See also C.R. Bard, Inc. v. M3 Sys., Inc.*, 157 F.3d 1340, 1372 (Fed. Cir. 1998).

Here, to cure the anticompetitive effects of Rambus's illegal conduct and to assure the public freedom from its continuance, Rambus must be barred from enforcing its patents. The Commission ordered just such a remedy based on allegations that a firm engaged in unfair methods of competition by misleading a standard-setting group into adopting a standard over which the firm held patent rights. *In the Matter of Dell Computer Corp.*, 121 F.T.C. 616 (1996) (consent order). The Commission noted that the relief ordered was consistent with cases decided under the concept of equitable estoppel. *Id.* at 624-25.

C. Less Restrictive Remedies Are Not Sufficient to Cure the Effects of Rambus's Violations.

The limitations complaint counsel proposes on Rambus's use of those patents are an appropriate exercise of the Commission's broad remedial powers because less drastic means will not accomplish the same result. *See Jacob Siegel*, 327 U.S. at 611 ("the policy of the law to protect [trademarks] as assets of a business indicates that their destruction 'should not be ordered

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[252] It is worth noting that most courts evaluate patent misuse allegations under traditional antitrust principles, requiring, for example, proof of anticompetitive effects in a relevant market. *See, e.g., Windsurfing Int'l, Inc. v. AMF, Inc.*, 782 F.2d 995, 1002 (Fed. Cir.), *cert. denied*, 477 U.S. 905 (1986); *USM Corp. v. SPS Technologies, Inc.*, 694 F.2d 505, 511-12 (7th Cir. 1982) (Posner, J.). Patent misuse, however, is viewed as a broader wrong than an antitrust violation and may arise when the conditions of an antitrust violation are not met. *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340, 1372 (Fed. Cir. 1998).

if less drastic means will accomplish the same result'"), *quoting FTC v. Royal Milling Co.*, 288 U.S. at 217.

Complaint Counsel's proposed order goes "no further than is reasonably necessary to correct the evil and preserve the rights of competitors and public." *See FTC v. Royal Milling Co.*, 288 U.S. 212, 217 (1933). Like the order in *Dell*, the order proposed by complaint counsel does not affect Rambus's enforcement of its patents against any products other than those made in conformity with the JEDEC standards. The relief complaint counsel seek, while crafted to ensure that future consumers are protected from surprises, is also narrowly fashioned so as not to interfere with Rambus's ability to enforce any of its patents regarding Rambus architecture memory or any other memory that does *not* conform to the JEDEC 21-C standard or the JESD 79 specification. Thus, patents covering other technologies, such as RDRAM, DRAM manufactured to any other standards, and any other forms of memory, are not covered by the order proposed by complaint counsel.

Less restrictive remedial provisions would not suffice to "cure the ill effects" of Rambus's illegal conduct and "assure the public freedom from its continuance." *See United States v. United States Gypsum Co.*, 340 U.S. 76, 88 (1950). Ordering nothing more than a restraint on misleading standard-setting organizations in the future, for example, might deter new violations but would do nothing to restore competition in this market. Moreover, relying on the private remedy of equitable estoppel – *i.e.*, forcing defendants in infringement suits to raise equitable estoppel as a defense – would not restore competition. Instead, such an order would permit Rambus to continuing imposing costs on its rivals – in that instance, by forcing its competitors to incur the not-insubstantial costs of defending patent infringement suits.

In this case, moreover, the evidence at trial will show that Rambus's misleading conduct

was made not just to individual firms but to the entire standard-setting organization; that Rambus's misleading conduct induced JEDEC to adopt the standards that infringe Rambus's patent; that the standard has been widely accepted; and that a significant percentage of the industry is manufacturing selling and using memory compliant with that standard. In this situation, forgoing a Commission order in deference to the uncertain outcome of private litigation would not be in the public interest.

Rambus's patents are, of course, valuable assets, and the order proposed by Complaint Counsel will limit Rambus's ability to profit from those patents. The fact that a remedy may have severe consequences to the respondent does not, however, make it impermissible where the relief ordered is necessary to protect the public interest and where less drastic means appear unlikely to suffice. *Firestone*, 81 F.T.C. at 469; *Borden*, 92 F.T.C. at 807. In *duPont*, the Supreme Court noted that divestiture is the most drastic of antitrust remedies, but also noted that the courts are required "to decree relief effective to redress the violations, whatever the adverse effect of such a decree on private interests." *duPont*, 366 U.S. at 326. In ordering divestiture in that case, the Court went on to state that "the Government cannot be denied the latter remedy [complete divestiture] because economic hardship, however severe, may result. Economic hardship can influence choice only as among two or more effective remedies." *Id.* at 327.

In fashioning antitrust remedies, the public interest in effective competition is paramount and purely private economic interests must be subordinated to the public interest. *Ekco Prods.*, 65 F.T.C. at 1217. The courts have recognized, therefore, that effective relief for antitrust violations may include restrictions on violators' property rights. *See Ford Motor Co. v. United States*, 405 U.S. 562, 576 (1972). In the case of antitrust violations involving patent misuse, fashioning effective relief "often involves a substantial question whether it is necessary to limit

the rights normally vested in the owners of patents." *United States v. Glaxo Group, Ltd.*, 410 U.S. 52, 59 (1973). Orders including mandatory sales and reasonable-royalty licensing are "well-established forms of relief when necessary to an effective remedy, particularly where patents have provided the leverage for or have contributed to the antitrust violation adjudicated." *Id.; see also Besser Mfg. Co. v. United States*, 343 U.S. 444, 447 (1952); *United States v. United States Gypsum Co.*, 340 U.S. 76, 93-94 (1950). Here, however, Rambus's patents more than contributed to the violation – they were the heart of the matter and a complete bar to their enforcement is not too severe.

IX. Conclusion.

The evidence in the hearing in this matter will demonstrate abundantly that Rambus's course of conduct subverted the standard-setting process of JEDEC, resulted in Rambus attaining monopoly power in crucial markets, and constituted exclusionary and anticompetitive behavior that violated the antitrust laws. The relief sought in the Complaint is reasonable and necessary to remedy the harm caused by Rambus's violations of law.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I, Emily Pitlick, hereby certify that on May 27, 2003, I caused a copy of the following Public materials:

1. Complaint Counsel's Pretrial Brief

to be served upon the following persons:

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