PUBLIC RECORD VERSION

In the Matter of Rambus, Inc.
Docket No. 9302

OPINION OF THE COMMISSION ON REMEDY

By Majoras, Chairman:

I.[1]

On July 31, 2006, the Commission ruled that Rambus Inc.'s "acts of deception constituted exclusionary conduct under Section 2 of the Sherman Act, and that Rambus unlawfully monopolized the markets for four technologies"[2] incorporated into the Joint Electron Device Engineering Council ("JEDEC") standards in violation of Section 5 of the Federal Trade Commission Act ("FTC Act").[3] The Commission further found "a sufficient causal link between Rambus's exclusionary conduct and JEDEC's adoption of the SDRAM and DDR-SDRAM standards (but not the subsequent DDR2-SDRAM standard)."[4]

We asked the parties to provide supplemental briefs on the question of remedy.[5] The parties submitted initial briefs on September 15, 2006, and reply briefs on September 30, 2006. Several interested parties also submitted amicus briefs.[6] We heard oral argument on the issue of remedy on November 15, 2006.

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[1] This opinion uses the following abbreviations:

CCBR - Complaint Counsel's Brief on Remedy
CCRBR - Complaint Counsel's Reply Brief on Remedy
CX - Complaint Counsel's Exhibit
ID - Initial Decision of the Administrative Law Judge (ALJ)
JX - Joint Exhibits
Op. - Commission's Liability Opinion
RB - Respondent's Brief on Appeal and Cross-Appeal
RBR - Respondent's Brief on Remedy
RRBR -Respondent's Reply Brief on Remedy
RX - Respondent's Exhibit
Tr. - Trial Transcript

[2] Op. at 1.

[3] 15 U.S.C. § 45.

[4] Op. at 5.

[5] *Id*. at 119.

[6] Brief for Amicus Curiae Broadcom Corporation and Freescale Semiconductor, Inc. on the Issue of Appropriate Remedy (Sept. 15, 2006); Brief for Amicus Curiae JEDEC Solid State Technology Association (Sept. 15, 2006); Brief for Amicus Curiae Gesmer Updegrove LLP and Andrew Updegrove on the Issue of Appropriate Remedy (Sept. 15, 2006); Brief for Amicus Curiae Nvidia Corporation, Micron Technology, Inc., Samsung Electronics Corporation, Ltd., and Hynix Semiconductor, Inc. on the Issue of Appropriate Remedy (Sept. 15, 2006); Brief for Amicus Curiae American Antitrust Institute on the Issue of Appropriate Remedy (Sept. 29, 2006).

The parties agree that the Commission has the authority to issue an injunction against future deceptive conduct by Rambus. Rambus acknowledged that the Commission has authority to "issue orders broad enough to prevent Rambus from misleading any [standard-setting organization ("SSO")] from unknowingly adopting its proprietary technology."[7] To that end, Rambus submitted a proposed order that is limited to prohibiting repetition of the conduct in this case – that is "knowingly" engaging in a deceptive course of conduct as a member of an SSO.[8] We believe the order should be broader. In Part IV, we summarize and explain the terms of the Commission's Order, including the requirement that Rambus cease and desist from future deceptive conduct while a member or a participant in an SSO.

The fundamental question upon which the parties disagree is whether the Commission may order broader relief, and, if broader relief is authorized, on the scope of an appropriate remedy on the basis of the record before us. The Supreme Court has not yet addressed the scope of the Commission's remedial authority where, as here, the Commission has applied the legal standards of Section 2 of the Sherman Act.[9] This counsels caution but does not limit our ability to create a forward-looking remedy tailored to our liability findings. In assessing the appropriate remedy in this case, we have studied the principles that guide the courts in the exercise of their remedial authority in Sherman Act cases.

II.

The threshold issue is whether the Commission's remedial authority is limited to prohibitory "cease-and-desist" orders. Rambus argues that Section 5 of the FTC Act "gives the Commission authority [only] to issue forward-looking cease-and-desist orders that prevent conduct deemed to be unlawful and ensure against its repetition."[10] Thus, Rambus concludes, even if it obtained monopoly power as a result of its deceptive course of conduct, the Commission is limited to a mere prohibitory injunction on any future deceptive conduct.[11] Rambus asserts that these limitations are supported by the language of Section 5, decisions of the U.S. Supreme Court and the U.S. Court of Appeals for the District of Columbia Circuit, and Commission testimony in support of the enactment of Section 13(b) of the FTC Act in 1973 to enable the Commission to seek broader relief from district courts.

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[7] RRBR at 12; *see also* RBR at 1.

[8] RBR at 5. In our July 31, 2006, ruling, the Commission determined that Rambus's deceptive course of conduct was "intentionally pursued," Op. at 51, and that Rambus "intentionally and willfully engaged in deceptive conduct." Op. at 68.

[9] 15 U.S.C. § 2. This is not surprising given that the Court has not considered a government Section 2 challenge for over thirty years. *See* Otter Tail Power Co. v. United States, 410 U.S. 366 (1973).

[10] RRBR at 2; *see also* RBR at 1, 4-5.

[11] RBR at 2 ("Rambus does not believe . . . that the Commission has or should exercise the statutory authority to order" relief that would affirmatively alter current market conditions).

Rambus's contention that the Commission is limited to prohibiting future deceptive conduct is mistaken. Insofar as the argument is premised on principles of Section 2, it is contrary to clear Supreme Court precedent.[12] Insofar as the argument is based on the language of Section 5,[13] it is inconsistent with long-established principles of implied agency authority.[14] The Supreme Court's decision in *FTC v. Dean Foods Co.*[15] recognized that the Commission possesses the ancillary powers essential to the effective discharge of its responsibilities. The Court relied on its earlier decision in *Pan American World Airways, Inc. v. United States,*[16] which held that "'the power to order divestiture need not be explicitly included in the powers of an administrative agency to be part of its arsenal of authority.'"[17]

Indeed, the Commission's authority to terminate the ill effects of a violation repeatedly has been confirmed. As the D.C. Circuit has held, "[I]t is clear that the Commission has the power to shape remedies that go beyond the simple cease and desist order."[18] None of the cases cited by Rambus teaches otherwise. To the contrary, in *FTC v. National Lead Co.,*[19] a case involving the Commission's prohibition of specific conduct by which the effects of an unlawful agreement might be continued, the Court held that the Commission had "wide discretion" in bringing an end to the unfair practices at issue, but expressly indicated that it was *not* defining

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12 *See* Schine Chain Theatres, Inc. v. United States, 334 U.S. 110, 128 (1948) ("In this type of case we start from the premise that an injunction against future violations is not adequate to protect the public interest. If all that was done was to forbid a repetition of the illegal conduct, those who had unlawfully built their empires could preserve them intact. They could retain the full dividends of their monopolistic practices and profit from the unlawful restraints of trade they had inflicted on competitors.").

13 The FTC Act states that the Commission shall order an offending party "to cease and desist from using such method of competition or such act or practice." 15 U.S.C. § 45(b).

14 *See* Neil W. Averitt, *Structural Remedies in Competition Cases Under the Federal Trade Commission Act*, 40 OHIO ST. L.J. 781, 784 (1979) (concluding that "case law has clearly established the Commission's authority [under Section 5 of the FTC Act] to impose divestiture and other affirmative requirements").

15 384 U.S. 597, 606-07 (1966) (rejecting an argument that the Commission needed express statutory authority to seek a preliminary injunction).

16 371 U.S. 296 (1963).

17 *Dean Foods*, 384 U.S. at 606 n.4 (quoting *Pan Am.*, 371 U.S. at 312 n.17).

18 Warner-Lambert Co. v. FTC, 562 F.2d 749, 757 (1977) (upholding the Commission's corrective advertising order designed to terminate the otherwise continuing ill effects of false advertising). *See also* Novartis Corp. v. FTC, 223 F.3d 783, 787 (D.C.Cir. 2000) (upholding corrective advertising order); Detroit Auto Dealers Ass'n, Inc. v. FTC, 955 F.2d 457 (6th Cir. 1992) (upholding, with modification, an order requiring automobile dealers to maintain a minimum number of showroom hours per week in order to eliminate the continuing effects of an unlawful agreement to limit showroom hours); L.G. Balfour Co. v. FTC, 442 F.2d 1, 23-24 (7th Cir. 1971) (upholding FTC order requiring divestiture as remedy for illegal monopolization); Charles Pfizer & Co. v. FTC, 401 F.2d 574, 586 (6th Cir. 1968) (upholding an order requiring compulsory licensing).

19 352 U.S. 419 (1957).

the full scope of Commission powers.[20] The Court also declared that the Commission "was not obliged to assume, contrary to common experience, that a violator of the antitrust laws will relinquish the fruits of his violation more completely than [it] requires."[21]

Since *National Lead*, no court has held, or indicated, that the Commission is powerless to ensure that antitrust violations are fully remedied.[22] The only remedy issues in *FTC v. Colgate-Palmolive Co.*,[23] a case cited by Rambus in this regard,[24] involved the clarity of the order and the scope of the Commission's "fencing-in" authority.[25] Moreover, the D.C. Circuit in *United States v. Philip Morris USA Inc.*[26] did not speak to the Commission's remedial authority at all, as Rambus represents.[27] That case involved the RICO statute, not the different language of Section 5 of the FTC Act, and the decision rejected a disgorgement order, not an order prospectively terminating the ill effects of unlawful conduct.

Rambus relies on *Reynolds Metals Co. v. FTC*[28] and *Ford Motor Co. v. United States*[29] to argue that the courts have distinguished the Commission's Section 5 authority from a district court's purportedly broader equitable powers.[30] Neither case holds that the Commission's authority to eliminate the ill effects of a violation is narrower than that exercised by the district courts. Rather than ruling that the Commission's authority is more limited than that of the

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[20] *Id.* at 430 n.7 ("We need not discuss the full scope of the powers of the Federal Trade Commission, nor their relative breadth in comparison with those of a court of equity.").

[21] *Id.* at 430 (quoting Int'l Salt Co. v. United States, 332 U.S. 392, 400 (1947)). The Court's declaration in this respect is consistent with its repeated statements that an antitrust wrongdoer can – and should – be made to relinquish the fruits of his violation. United States v. United Shoe Mach. Corp., 391 U.S. 244, 250 (1968); United States v. U.S. Gypsum Co., 340 U.S. 76, 88 (1950).

[22] As the Supreme Court has recognized, in a monopolization case, there is a presumption that a mere prohibitory injunction allows a monopolist "to retain the full dividends of [its] monopolistic practices . . . ." *Schine Chain Theatres*, 334 U.S. at 128; *accord* United States v. Grinnell Corp., 384 U.S. 563, 577 (1966) ("We start from the premise that adequate relief in a monopolization case should . . . render impotent the monopoly power found to be in violation of the Act.").

[23] 380 U.S. 374, 395 (1965).

[24] *See* RBR at 4.

[25] *Id.* at 392-95. *See infra* Part IV (discussing "fencing-in" relief).

[26] United States v. Philip Morris USA Inc., 396 F.3d 1190 (D.C. Cir. 2005).

[27] *See* RBR at 6 n.4.

[28] 309 F.2d 223 (D.C. Cir. 1962).

[29] 405 U.S. 562 (1972).

[30] *See* RRBR at 2-3.

courts, *Reynolds Metals* merely determined that the record did not support going *beyond* that by ordering divestiture of unrelated assets. The court of appeals in *Reynolds Metals* overturned a Commission order requiring divestiture of a factory acquired after a merger when the Commission had failed to demonstrate that there was "any nexus between the continued possession of [the factory] and the violation of Section 7 . . . " or a need to divest the factory for "restoration of the competitive status quo."[31] In rejecting a suggestion that *Reynolds Metals* limited remedies in a district court action brought by the United States, the Supreme Court's *Ford Motor* opinion cursorily noted that *Reynolds Metals* concerned the enforcement powers of the Commission, not those of the courts; set that issue to the side, without further comment; and proceeded to focus on the appropriate remedy in the district court action before it.[32] In sum, neither opinion provides a basis for Rambus's claim that the Commission is confined to issuing prohibitive injunctions.

We turn next to the legislative history of the 1973 amendments to the FTC Act. Contrary to Rambus's claim,[33] there is no basis for concluding that Congress, in enacting Section 13(b), or the Commission, in requesting the provision, effectively acknowledged the Commission's inability to take action affirmatively to terminate the ill effects of a violation. To begin with, courts "will not construe an agency's request for authorizing legislation as affirmative proof of no authority; '[p]ublic policy requires that agencies feel free to ask [for] legislation which will terminate or avoid adverse contentions and litigations.'"[34] Moreover, Congress intended Section 13(b) to provide a mechanism that would enable the Commission to obtain equitable relief from district courts without the delay that administrative proceedings entail.[35] Nothing in the legislation or the legislative history of Section 13(b) suggests that the Commission lacks power *after* administrative proceedings have concluded to issue an order requiring a violator to relinquish the "fruits" of its violation of Section 2.[36] Thus, the limitation that the legislation was

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[31] 309 F.2d at 231.

[32] 405 U.S. at 573 n.8.

[33] *See* RRBR at 3.

[34] *Warner-Lambert Co.*, 562 F.2d at 758 n.39 (quoting *Dean Foods*, 384 U.S. at 610, in rejecting a contention that a congressional grant of court remedial authority meant that the Commission itself lacked such authority).

[35] *See* James T. Halverson, *The Federal Trade Commission's Injunctive Powers Under the Alaskan Pipeline Amendments: An Analysis* 69 NW. U. L. REV. 872-73 (1974-75).

[36] Citing the testimony of Commissioner Elman during a 1969 Congressional hearing, Rambus argues that the Commission itself has recognized limits on its Section 5 authority. *See* RRBR at 3 n.4. Rambus's reliance on the cited testimony is misplaced, however, because former Commissioner Elman's statement relates to the FTC's authority to administratively assess civil penalties and award so-called "civil damages" in consumer fraud cases. *Id.* at 57-70. Morever, as Rambus conceded at oral argument, Commissioner Elman indicated that his testimony represented his own "separate statement" and not necessarily the views of the other Commissioners. *See* Oral Argument before the Commission on the Issue of Remedy (Nov. 15, 2006), at 42-43. Commissioner Elman provided that caveat during a colloquy with Senator Moss, which Rambus did not cite in its brief. *See Consumer Protection:*

designed to correct – the absence of a specific grant of authority to obtain ancillary and preliminary equitable relief in the district courts in aid of administrative adjudicative proceedings – was not a limitation on the remedies that are available to the Commission in crafting an administrative cease-and-desist order.

In sum, we do not agree with Rambus's contention that the Commission's remedial authority is limited to enjoining it from deceiving an SSO in the future. Instead, the Commission's authority extends to restoring, to the extent possible, the competitive conditions that would have been present absent Rambus's unlawful conduct.[37] We now address the Commission's authority to order compulsory patent licenses.

A.

Rambus argues that even if the Commission has remedial power beyond the issuance of a cease-and-desist order, the Commission does not have the authority to order compulsory licensing on terms prescribed by the Commission.[38] Rambus would have us conclude that it can continue to reap the royalty rates it is now charging (and demanding in pending litigation).[39] Rambus asserts that this conclusion is supported by the Supreme Court's decision in *FTC v. Ruberoid Co.*,[40] in which the Court held that the Commission cannot order compensatory or punitive relief.[41]

We disagree with Rambus. The Commission enjoys "wide latitude for judgment" in fashioning a remedial order, subject to the constraint that the requirements of the order bear a reasonable relationship to the unlawful practices that the Commission has found.[42] The Supreme Court's acknowledgment in *Ruberoid* that orders of the Commission "are not intended to impose

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Hearings on S.2246, et al., before the Consumer Subcomm. of the Comm. on Commerce, 91st Cong. 57 (1969). Rambus also incorrectly relies on other former FTC commissioners' statements, which do not address the Commission's authority to restore competitive conditions after a finding of liability under Section 2. *See* RRBR at 3, n.4; *Agriculture-Environmental and Consumer Protection Appropriations for 1974: Hearings before a Subcomm. of the House Comm. on Appropriations*, 93rd Cong. 99 (1974); S. Rep. No. 93-151, at 10 (1973).

[37] Ekco Products Co., 65 F.T.C. 1163, 1216 (1964), *aff'd*, 347 F.2d 745 (7th Cir. 1965).

[38] RBR at 6.

[39] *Id.* at 2, 16.

[40] 343 U.S. at 473 (1952).

[41] RBR at 5 n.3.

[42] Jacob Siegel Co. v. FTC, 327 U.S. 608, 613 (1946). *See also Colgate-Palmolive Co.*, 380 U.S. at 394-95; *FTC v. Nat'l Lead Co.*, 352 U.S. at 428-29; *Ruberoid Co.*, 343 U.S. at 473.

criminal punishment or exact compensatory damages for past acts"[43] is not contrary authority. The Court in that case emphasized the Commission's wide discretion in its choice of remedy, and stated the expectation that the Commission would "exercise a special competence in formulating remedies to deal with problems in the general sphere of competitive practices."[44] The district courts similarly exercise broad discretion in determining what kind of decree "will best remedy the conduct [they have] found to be unlawful . . . . This is no less true in antitrust cases."[45] The broad authority of the Commission and the district courts to remedy violations of the FTC Act and the other antitrust laws includes "mandatory selling on specified terms and compulsory licensing at reasonable charges."[46]

Courts have blessed compulsory licensing orders in the past,[47] including at least one crafted by the Commission.[48] Following that precedent, the Commission has ordered licensing of intellectual property to remedy antitrust violations in litigated cases.[49] If prospective only (which Complaint Counsel agree it should be), such a compulsory licensing order is not "compensatory." Moreover, as discussed below, if the order attempts to replicate the "but for" world – *i.e.*, the circumstances that would exist had Rambus not engaged in its deceptive course of conduct – such an order is not "punitive." It would simply stop Rambus from continuing to exploit its illegally acquired monopoly power in violation of Section 2 and terminate the anticompetitive effects of the deceptive course of conduct by which it acquired that monopoly power.

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[43] 343 U.S. at 473.

[44] *Id.*

[45] United States v. Microsoft Corp., 253 F.3d 34, 105 (D.C. Cir. 2001) (*en banc*).

[46] United States v. Glaxo Group, 410 U.S. 52, 64 (1973). *See also* Besser Mfg. Co. v. United States, 343 U.S. 444, 447 (1952) ("compulsory patent licensing [on a fair royalty basis] is a well-recognized remedy where patent abuses are proved in antitrust actions and it is required for effective relief"); Am. Cyanamid Co., 72 F.T.C. 623, 690 (1967) (requiring licensing at a specified, non-zero royalty rate), *aff'd,* Charles Pfizer & Co. v. FTC, 401 F.2d 574 (6th Cir. 1968).

[47] *See* United States v. Nat'l Lead Co., 332 U.S. 319, 349 (1947) (upholding compulsory licensing remedy); United States v. United Shoe Mach. Corp., 110 F. Supp. 295, 351 (D. Mass. 1953) (same).

[48] Am. Cyanamid Co v. FTC, 363 F.2d 757, 772 (6th Cir. 1966) ("assuming the facts found by the Commission to be supported by substantial evidence, the Commission had jurisdiction to require as a remedy the compulsory licensing of tetracycline and aureomycin on a reasonable royalty basis.").

[49] *See* Grand Calliou Packing Co., Inc., 65 F.T.C. 799 (1960), *rev'd in part on other grounds sub nom.*, La Peyre v. FTC, 366 F.2d 117 (5th Cir. 1966); Am. Cyanamid Co., 63 F.T.C. 1747 (1963) – an early ruling in the series of *American Cyanamid* cases cited in footnotes 46 and 48.

B.

Complaint Counsel ask the Commission to enjoin Rambus from enforcing its pre-1996 patents with respect to JEDEC-compliant products.[50] In effect, Complaint Counsel request that the Commission order royalty-free compulsory licenses for Rambus's pre-1996 patent portfolio for those firms practicing JEDEC's standards. Complaint Counsel argue that this remedy – "far from being extreme – merely restores, six years later, the competitive conditions that should have prevailed" had Rambus not engaged in deception.[51] Moreover, Complaint Counsel argue that imposition of royalty-free compulsory licenses is well within the Commission's broad discretion to restore competition and to deny Rambus the benefits of its illegal conduct.[52] We agree that the Commission has that authority.

Rambus argues that the Commission lacks the power to order any form of royalty-free licensing.[53] In support of this proposition, Rambus quotes *Hartford-Empire Co. v. United States*[54] that "it is difficult to say that, however much in the past such defendant has abused the rights thereby conferred [by a patent], it must now dedicate them to the public."[55] Rambus also quotes from *United States v. National Lead*,[56] in which the Supreme Court stated that reducing "all royalties automatically to a total of zero … appears, on its face, to be inequitable without special proof to support such a conclusion."[57] Thus, Rambus would have us rule out a royalty-free licensing remedy, however limited, as a matter of law. We do not agree that the Commission is precluded from imposing such a remedy as a matter of law.

Compared to the extensive treatment of liability standards, antitrust courts have devoted relatively little attention to the question of remedies. The comparatively few modern cases that have addressed remedies have provided limited guidance about the suitability of specific cures for illegal monopolization.[58] In general terms, previous decisions have placed non-damage civil

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[50] CCBR at 1-2.

[51] CCBR at 2.

[52] CCBR at 3, 11.

[53] RBR at 7-8; RRBR at 3-4.

[54] 323 U.S. 386 (1945).

[55] *Id.* at 415.

[56] 332 U.S. 319 (1947).

[57] 332 U.S. at 349; *see also* RRBR at 4.

[58] *See* Howard A. Shelanski & J. Gregory Sidak, *Antitrust Divestitures in Network Industries*, 68 U. CHI. L. REV. 1, 45 (2001) ("The jurisprudence of the Sherman and Clayton Antitrust Acts does not enunciate grand principles for the design of optimal remedies. One can observe recurrent themes, but they must be teased out of the

remedies on a spectrum. At one end of the spectrum are controls on conduct, which the cases tend to depict as relatively less drastic. At the other end are structural measures such as divestiture, which courts have tended to regard as being more drastic. Compulsory licensing often lies between the two ends of the spectrum, although courts sometimes have likened compulsory licensing to "structural" relief where the licensing at issue enables the licensee to compete against the defendant in the relevant product market.[59] As we discuss below, the cases appear to establish the broad proposition that, as the plaintiff's demands for relief move across the spectrum from less drastic (conduct) solutions toward more drastic (structural) solutions, the plaintiff's duty to establish the need for such remedial intervention increases.

Compulsory patent licensing on a reasonable royalty basis is a well-recognized remedy,[60] yet few litigated decisions have ordered royalty-free compulsory licensing. Each time the Supreme Court has considered royalty-free licensing, it has determined that, under the facts presented, a less powerful remedy would suffice to restore competition.[61] We know of one litigated ruling in which royalty-free licensing was ordered.[62]

Cases such as *Hartford-Empire* have expressed caution about royalty-free licensing,[63] but the Supreme Court has not foreclosed the availability of this form of relief. Two years after *Hartford-Empire*, the Supreme Court in *United States v. Nat'l Lead* explicitly left open the possibility that, under different facts, the remedy of royalty-free licensing might be necessary and

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disparate cases.").

[59] *See, e.g.*, New York v. Microsoft Corp., 224 F. Supp. 2d 76, 186, 244 (D.D.C. 2002) (analogizing the proposed remedy, which included a requirement for royalty-free licensing of software, to a divestiture of assets and therefore as "structural" in nature), *aff'd sub nom.* Massachusetts v. Microsoft Corp., 373 F.3d 1199 (D.C. Cir. 2004). We note that the royalty-free compulsory licensing remedy that we are contemplating here would be more limited because it would apply only to certain JEDEC-compliant technologies; Rambus would be free to charge whatever royalties it wished otherwise.

[60] The availability of compulsory licensing at reasonable royalties is well-established in the Supreme Court's jurisprudence on antitrust remedies. *See Glaxo Group*, 410 U.S. at 62; *Besser Mfg. Co.*, 343 U.S. at 448-49; *Nat'l Lead*, 332 U.S. at 348-49; *Hartford-Empire*, 323 U.S. at 418-19.

[61] In *Hartford-Empire*, for example, the Supreme Court rejected royalty-free licensing as a remedy for Sherman Act and Clayton Act violations arising from a patent pooling arrangement. Concerned that the remedy went "beyond what is required to dissolve the combination and prevent future combinations of like character[,]" 323 U.S. 386 at 414, the Court allowed for a reasonable royalty instead of the requested royalty-free licensing. Similarly, the Court rejected the Government's proposal for royalty-free licensing in *United States v. Nat'l Lead*, a case in which a "proliferation of patents" and related agreements led to the "domination of an entire industry" and a violation of Section 1 of the Sherman Act. 332 U.S. at 327-28. The Court concluded that "licenses at uniform, reasonable royalties" would be sufficient to accomplish the discontinuance and prevention of the illegal restraints and patent misuse at issue. *Id.* at 348.

[62] *See* United States v. Gen. Elec. Co., 115 F. Supp. 835 (D.N.J. 1953).

[63] *See Hartford-Empire*, 323 U.S. at 414-15 (stating reservations about the imposition of royalty-free licensing and concluding that royalty-free licensing was not warranted in the case at hand).

appropriate.[64] Thus, the Commission has previously declared, and we agree, that "where the circumstances justify such relief, the Commission has the authority to require royalty-free licensing."[65]

Although the Commission has the authority to require royalty-free licensing, the exercise of that power is subject to important limits. The courts, speaking in varying terms, have insisted on "special proof" for such remedies. This requirement is not well-specified in the cases. In the formative decision on this point, *United States v. Nat'l Lead*, the Supreme Court found that the "special proof" needed to justify royalty-free licensing was lacking, but the Court did not elaborate upon the meaning of this term.[66] Although the parties' briefs provide no insights on this point, Complaint Counsel stated at oral argument that "special proof" means "proof of the competitive conditions [that] would have existed absent the conduct in question that would not have resulted in any enforcement of the patent."[67] Accordingly, Complaint Counsel ask us to find that the "special proof" requirement is satisfied here by evidence that they believe demonstrates that Rambus would have received no royalties at all in the "but for" world. Without embracing a precise definition of "special proof," we agree that, before ordering royalty-free licensing, Complaint Counsel must show that this form of relief is necessary to restore the competitive conditions that would have prevailed absent Rambus's misconduct. We discuss whether Complaint Counsel have met that burden in Part III of this Opinion.

Rambus, on the other hand, argues that "the burden to justify a remedy that would restrict Rambus's ability to license its patents is heavier than the burden to establish liability."[68] In

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64 *United States v. Nat'l Lead*, 332 U.S. at 349. *Compare Schine Chain Theatres*, 334 U.S. at 128-30 (endorsing the availability of structural remedies of divestiture or dissolution to cure illegal monopolization).

65 *Am. Cyanamid Co., supra* at n.46. In a number of consent orders, the Commission has accepted the prohibition of enforcement of patents as a remedy. For example, in *Dell Computer Corp.*, 121 F.T.C. 616, 620-22 (1996) and *Chevron Corp.*, 140 F.T.C. 100 (2005), *available at* http://www.ftc.gov/os/decisions/docs/volume140.pdf (Aug. 2, 2005), the Commission approved consent orders that prohibited enforcement of patents against those practicing a standard. *See also* Eli Lilly & Co., 95 F.T.C. 538, 546-52 (1980) (ordering royalty-free licensing of patents); Xerox Corp., 86 F.T.C. 364, 373-83 (1975) (same). In addition, in the context of alleged violations of Section 7 of the Clayton Act, the Commission has approved consent orders that require divestiture or licensing of, or place other limitations on, patent rights. *See, e.g.*, Cephalon, Inc., 138 F.T.C. 583, 604 (2004), *available at* http://www.ftc.gov/os/decisions/docs/volume138.pdf.

66 In *United States v. Nat'l Lead,* the Court observed that the growing strength of royalty-paying licensees demonstrated that royalty-free licenses were not essential to their ability to compete. 332 U.S. at 351. In contrast, the district court in *General Electric*, 115 F. Supp. at 844, found that, in light of GE's vast arsenal of patents and the narrow cost margins that prevailed in the market for lamps and related parts, smaller firms would be unable to gain a foothold in the market if they had to bear any licensing fees. Therefore, the court determined that royalty-free licensing was necessary to restore competition. *Id.*

67 Oral Argument before the Commission on the Issue of Remedy (Nov. 15, 2006), at 23.

68 RBR at 7; *see also* RRBR at 6.

support of this proposition, Rambus cites *United States v. Microsoft Corp.*,[69] in which the D.C. Circuit held that "structural relief, which is 'designed to eliminate the monopoly altogether . . . require[s] a clearer indication of a *significant causal connection* between the conduct and creation or maintenance of the market power.'"[70] Most recently, in *Massachusetts v. Microsoft Corp.*,[71] the D.C. Circuit, affirming the district court's refusal to order royalty-free licensing, held that requiring Microsoft to license Internet Explorer on a royalty-free basis, as sought by the Commonwealth of Massachusetts, was a "de facto" divestiture that would require a more "significant causal connection."[72] Collectively, the case law appears to indicate that the farther remedies expand beyond simple prohibitions against future anticompetitive conduct (with divestiture at the other outer end), the stronger the proof that is needed to justify the remedy.

We reaffirm that the Commission has the authority to order royalty-free licensing when the factual circumstances justify it. With the guiding principles of the case law discussed above firmly in mind, we turn to determining the appropriate remedy in this case based on the record before us. Having found liability, we want a remedy strong enough to restore ongoing competition and thereby to inspire confidence in the standard-setting process. At the same time, we do not want to impose an unnecessarily restrictive remedy that could undermine the attainment of procompetitive goals.[73]

III.

A.

The question, then, becomes whether Complaint Counsel are correct that we should order royalty-free licensing here. Complaint Counsel contend that they have offered "special proof" that justifies requiring Rambus to license its technology royalty-free. Specifically, according to Complaint Counsel, enjoining enforcement of the relevant patents against JEDEC-compliant products is appropriate because, absent Rambus's deception, JEDEC would have selected

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69 253 F.3d 34 (D.C. Cir. 2001).

70 *Id.* at 111 (*quoting* 3 PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW: AN ANALYSIS OF ANTITRUST PRINCIPLES AND THEIR APPLICATION, ¶ 653b at 91-92) (2d ed. 2002) (emphasis in original)); *see also* AREEDA, ¶ 653c at 100 n. 8 ("Compulsory licensing of intellectual property rights could . . . constitute 'structural' relief, particularly when intellectual property rights make up a significant part of defendant's output.").

71 373 F.3d 1199 (D.C. Cir. 2004).

72 *Id.* at 1233.

73 Op. at 3, 33. The Commission has stressed the contribution of intellectual property to innovation and consumer welfare, and has cautioned against unwarranted antitrust enforcement activity that might undermine the patent system's incentives for innovation. *See* FED. TRADE COMM'N, TO PROMOTE INNOVATION, THE PROPER BALANCE OF COMPETITION AND PATENT LAW AND POLICY, ch.1 at 2 (2003).

alternative technologies – including alternatives with inferior performance – in lieu of paying royalties, thus leaving Rambus with no claim to royalties.[74]

Rambus, however, contends that there is no basis for the Commission to assume that Rambus – had it disclosed its patents – would have been left with no claim to royalties. According to Rambus, JEDEC selected, and thereby showed a preference for, Rambus technologies after serious and searching consideration of the alternatives.[75] Furthermore, Rambus contends, JEDEC also would have preferred Rambus's technologies in the "but for" world in which Rambus had disclosed its patent position.[76] At most, according to Rambus, JEDEC would have requested a commitment to license on reasonable and nondiscriminatory ("RAND") terms, and Rambus would have had no real choice but to comply.[77] Thus, according to Rambus, because Rambus would have received royalties for its patented technologies, Complaint Counsel lack adequate support for their contention that "a zero-royalty remedy flows directly from Rambus's misconduct."[78]

We recognize that Rambus's unlawful conduct makes it difficult to reconstruct the "but for" world, as is typically the case when a party has violated the antitrust laws. We conclude, however, that Complaint Counsel have not satisfied their burden of demonstrating that a royalty-free remedy is necessary to restore the competition that would have existed in the "but for" world – *i.e.*, that absent Rambus's deception, JEDEC would not have standardized Rambus technologies, thus leaving Rambus with no royalties.

We have examined the record for the proof that the courts have found necessary to impose royalty-free licensing, but do not find it. Our liability opinion identified two realistic possibilities for what would have occurred had Rambus not engaged in deception of JEDEC members: either (i) JEDEC would have chosen alternative technologies, or (ii) JEDEC would have incorporated Rambus's technologies into the standard but would have demanded, as a pre-condition of adopting Rambus's technology, that Rambus agree to license the technology on RAND terms.[79] There is evidence in the record to support both possibilities.

As to the first possibility, it is true that if JEDEC had chosen to include other, non-Rambus technologies, its members would have paid no royalties to Rambus. But that does not mean that incorporating those technologies rather than the Rambus technologies would have

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[74] CCBR at 4-5.

[75] RBR at 8, 11.

[76] RBR at 10; RRBR at 9.

[77] RRBR at 10.

[78] CCRBR at 6.

[79] Op. at 74.

been costless. Because Rambus's cost analysis was faulty,[80] and Complaint Counsel did not provide a cost-benefit comparison of the available technologies, we do not know what the costs might have been. We do know, however, that without knowledge that payment of royalties to Rambus would be required, JEDEC found the Rambus technologies desirable and chose them for the JEDEC DRAM standards. On the current record, we can neither confirm nor reject the possibility that JEDEC would have preferred Rambus's technologies over the alternatives, even with some reasonable royalty. Yet, for purposes of supporting the need for a zero-royalty remedy, it was Complaint Counsel's burden to show that Rambus would not have received reasonable royalties in the "but for" world.

Complaint Counsel suggest that the evidentiary gap can be closed because Rambus would not have issued the commitment to license on RAND terms required by JEDEC and EIA regulations. Complaint Counsel point to evidence that shows that Rambus did not want to license technology on RAND terms and that it even made statements that offering RAND terms was contrary to its business model.[81] Rambus, however, had not disclosed its patents at the time of these statements. An unwillingness to comport with JEDEC policy while pursuing a hold-up strategy is not necessarily indicative of how Rambus would have acted after disclosure, when hold up no longer was attainable.

It is hardly surprising that Rambus would rather have the freedom to choose what license fees to charge than to be required to license on RAND terms. Indeed, Rambus was so desperate to avoid having to license on RAND terms that it chose to deceive JEDEC rather than to succumb. But that also shows how desperate Rambus was to have its technology incorporated into the standard. Rambus does not manufacture anything; it innovates, obtains patents, and then

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[80] Although Rambus presented its analysis of relative costs and performance characteristics of the relevant Rambus technologies and their alternatives, the Commission found Rambus's calculations "fraught with uncertainty and potential for error" and concluded that Rambus had failed to demonstrate that alternatives would have been more expensive or that JEDEC would have standardized Rambus's technologies even if Rambus had disclosed its patent position. Op. at 94.

With respect to these and other evaluations of the evidence in the record – both here and in the July 31, 2006, liability opinion – the Commission, "to the extent necessary or desirable, exercise[s] all the powers which it could have exercised if it had made the initial decision." 16 C.F.R. 3.54(a). Thus, in particular, any Commission citation to any trial testimony, exhibit, or deposition segment – either in this opinion or in the July 31, 2006, opinion – constitutes a determination by the Commission that the cited testimony, exhibit, or deposition segment is relevant, material, and reliable evidence, and therefore admitted into the record of this proceeding. 16 C.F.R. 3.43(b). Each such determination shall be conclusive, with respect to determining the contents of the record of this proceeding, notwithstanding any objection or response thereto registered by either Complaint Counsel or Counsel for Respondent. The Commission also has determined that all exhibits listed on the Joint Exhibit Index filed by Complaint Counsel and Counsel for Respondent on September 29, 2003, whether or not marked as "pending," are admitted into the record of this proceeding, with any objections and responses thereto as to any exhibit marked "pending" going to the weight to be accorded that exhibit, rather than to its admissibility.

[81] CCRBR at 10.

licenses.[82] To conclude that, had Rambus "come clean," it still would have refused JEDEC's demand for RAND terms because it preferred licensing according to its own terms, is to conclude that Rambus, faced with two choices it did not like, would have chosen the path that resulted in no royalties from SDRAM and DDR and other technologies becoming the industry standard.[83] This is hard to square with the fact that "[r]oyalties are the lifeblood of Rambus"[84] and its reiterated objective of "get[ting] royalties from competitive memory."[85] Further, the record suggests that despite its protestations, Rambus was indeed willing to cater to the demands of powerful buyers,[86] and JEDEC, *ex ante*, was a very powerful potential source of business.[87] Given JEDEC's ability to turn to alternatives to Rambus's patented technologies and the historic importance of JEDEC standards to industry success, a choice by Rambus to forgo participation in the JEDEC standard at a reasonable royalty rate is not easily assumed without stronger evidence than Complaint Counsel have presented.[88]

Both dissents express the view that Rambus would not have offered a RAND commitment because Rambus's proprietary DRAM technology, RDRAM, was a "flagship" product, and Rambus would not have torpedoed its flagship to secure royalties on SDRAM and DDR SDRAM.[89] Nothing in the record, however, suggests that SDRAM and DDR SDRAM would have foundered if Rambus had withheld its four patented technologies.[90] If the Rambus technologies in SDRAM and DDR SDRAM came at a royalty equal to their value-added, so that improved performance carried with it commensurately higher cost, it is not clear why RDRAM would have been disadvantaged by their adoption. Moreover, the record suggests that Rambus

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[82] Op. at 7.

[83] *See* Teece, Tr. 10740-46.

[84] CX 2106 at 221 (deposition transcript at 220) (Farmwald FTC Dep.) (*in camera*). *See also* Farmwald, Tr. 8095, 8150, 8248; RX 82 at 18.

[85] CX 5110 at 2.

[86] For example, Rambus licensed its RDRAM technology at rates quite favorable to Samsung, a significant market participant. In the Samsung RDRAM license, the applicable royalty rate drops to zero five years after shipment of the 500,000th unit, provided that more than 10 million units had been shipped. CX 1592 at 23.

[87] *See* Op. at 78-79 (noting "the historical record of the predominant market position of DRAMs compliant with the JEDEC standards"). JEDEC was a "broad-based organization that included essentially all the DRAM manufacturers and their largest customers." *Id.* at 78.

[88] *See* Teece, Tr. 10740-46 (testifying that Rambus had economic incentives to offer RAND assurances in a "but for" world in which it had already disclosed its patent position).

[89] Rambus developed RDRAM as a proposed solution to the computer hardware industry's "memory bottleneck problem." *See* Op. at 6-7.

[90] Rambus documents evince a belief that development of SDRAM was inevitable. *See, e.g.,* CX 672 at 1 ("SDRAMs will happen.").

was proceeding on *two* tracks – developing RDRAM *and* pursuing royalties through SDRAM/DDR SDRAM[91] – and it seems unlikely that Rambus would have abandoned the latter track at the very time that royalties could have been secured.

As to the second possibility – that JEDEC would have standardized Rambus's technologies upon receipt of a RAND commitment – the evidence shows, and in the liability opinion the Commission found, that JEDEC was reluctant to incorporate patented technologies.[92] JEDEC's minutes state, "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."[93] This, too, is hardly surprising, given that all firms would strongly prefer to use technology without the cost of license fees. The minutes do not, however, state that the committee will *not* standardize a patented technology, and the basic JEDEC and EIA documents repeatedly spell out procedures under which patented technologies may be accepted.[94]

Moreover, the record identifies several occasions in which JEDEC incorporated patented technologies into some standards after securing agreement from the patent holder that the technologies would be licensed on RAND, or specific-royalty, terms: (1) JEDEC retained Texas Instruments's ("TI") Quad CAS patented technology in 1993 after TI provided written assurances complying with EIA patent policy[95]; (2) JEDEC selected Motorola patented technology for the SDRAM standard in 1992 after Motorola provided a letter offering RAND assurances[96]; and (3) JEDEC approved Digital Equipment Corporation's patented technology for an MPDRAM standard in 1990 after DEC agreed to license at a 1% royalty rate.[97] In addition, JEDEC's

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[91] *See, e.g.*, CX 1267 (1995 Rambus document, identified at Diepenbrock, Tr. 6129-31, headed "IP Strategy" announcing, with equal weight, in one column a "Defensive" strategy built around protecting RDRAM and in the other column an "Offensive" strategy based on "[f]ind[ing] key areas of innovation in our IP that are essential to creating a competing device to [RDRAM]" and "claim[ing] these areas as broadly as possible within the scope of what we invented"); CX 543 at 16-17 (June 1992 Rambus business plan identifying the marketing of RDRAM as the number one strategy while simultaneously articulating a strategy of capturing royalties from SDRAMs by "be[ing] in a position to request patent licensing (fees and royalties) from any manufacturer of Sync DRAMs").

[92] Op. at 74-75.

[93] JX 5 at 4 (emphasis added).

[94] *See* CX 208 at 19 (JEDEC's Manual of Organization and Procedure, JEP 21-I) (stating 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 is known to the formulating committee[,] subcommittee, or working group" and specifically providing for including patented technologies on receipt of a written RAND assurance) (emphasis added); *see also* EIA publications EP-7-A, CX 207a at 8, and EP-3-F, CX 203a at 11 (containing similar provisions).

[95] JX 25 at 5-6.

[96] JX 13 at 9-10, 136.

[97] JX 1 at 6, 24.

DRAM Task Group chairman, Gordon Kelley, testified that in "several instances[,]" JEDEC ceased consideration of alternatives once a RAND commitment letter on a patented technology had been received.[98] We have considered that on one occasion JEDEC rejected a technology known to be covered by a Rambus patent.[99] But that occurred nearly a year *after* Rambus had left JEDEC, leaving JEDEC with no way to impose the RAND requirement.

Complaint Counsel cite to the testimony of multiple JEDEC members that they likely would have opposed using the technologies in question and instead selected alternatives had they known of Rambus's patent applications.[100] While this testimony has some persuasion, it is ambiguous at times and – because it is based on a "but for" hypothetical – necessarily speculative, albeit sincere. The testimony of market participants, especially customers, is always important in the Commission's decisions. But we must look not only to what these members say they *would* have done, but also at what they actually have done. Here, the evidence shows that JEDEC members agreed to incorporate patented technologies into the SSO's standards in several instances, described above.

We reiterate that we agree with our colleagues Commissioner Rosch and Commissioner Harbour that the Commission has the authority to order royalty-free licensing. We also respect their differing conclusion regarding the "but for" world, construction of which is no simple or certain task. If we shared their assessment of the facts on this issue, we might well have endorsed a more powerful form of relief. We conclude, however, that while there is some evidence that supports the possibility that JEDEC would have chosen alternative technologies, Complaint Counsel have not met the burden of demonstrating that restoring the competition that would have existed in the "but for" world requires that Rambus license its technology with no compensation.

B.

We therefore are left with the task of determining the maximum reasonable royalty rate that Rambus may charge those practicing the SDRAM and DDR-SDRAM standards.[101] Royalty rates unquestionably are better set in the marketplace, but Rambus's deceptive conduct has made

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[98] G. Kelley, Tr. 2708-09.

[99] *See* Op. at 74 n.403 (describing JEDEC's reaction to a proposal for a "loop-back" clock system).

[100] CCBR at 5.

[101] Rambus argues that "if the Commission wishes now to replicate the conditions that would have existed in the but-for world, it should enter an order requiring Rambus to license the four relevant technologies to manufacturers of SDRAM or DDR SDRAM-compliant devices on RAND terms – that is, the terms on which Rambus would have been obligated to license those technologies if it had given a RAND commitment when it was a member of JEDEC." RBR at 14. To simply order Rambus to henceforth license on RAND terms undoubtedly would be fruitless, however. We already know that Rambus's views about what RAND terms would be differs from the views of the licensees. Consequently, if we do not set the maximum rate now, we will simply invite more disputes that we likely will have to resolve eventually.

that impossible. Although we do not relish imposing a compulsory licensing remedy, the facts presented make that relief appropriate and indeed necessary to restore competition.

There is no direct evidence as to what royalty rates would have resulted from *ex ante* SDRAM negotiations among the parties had Rambus not engaged in the unlawful conduct. Naturally, adjudicators rarely if ever have such direct proof of the "but for" world before them.[102] An antitrust remedy, however, can be adequate even if knowledge of the "but for" world is imperfect. As the Supreme Court explained in *J. Truett Payne Co. v. Chrysler Motors Corp.*, "the vagaries of the marketplace usually deny [courts] sure knowledge of what [an antitrust] plaintiff's situation would have been in the absence of the defendant's antitrust violation."[103] Indeed, to require the kind of detailed and concrete proof of injury that is available in other contexts would allow a wrongdoer to benefit from the uncertainty that its own unlawful conduct has created.[104]

Consistent with JEDEC policies and practices for the adoption of patented technologies in standards determinations, and our own findings in the liability opinion,[105] we conclude that in the "but for" world Rambus's royalty rates would have been negotiated under the constraint of a RAND commitment. A reasonable royalty "is or approximates the outcome of an auction-like process appropriately designed to take lawful advantage of the state of competition existing ex ante . . . between and among available IP options."[106] The parties agree that the "*ex ante* value of a technology is the amount that the industry participants would have been willing to pay to use a technology over its next best alternative prior to the incorporation of the technology into a standard."[107]

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[102] Even if we had a more complete record, we would not be able to apply a simple formula to predict "but for" royalties. In a "but for" world, the parties would have arrived at a rate on the basis of a number of factors that are not easily quantifiable – *e.g.*, the respective negotiating skills and strengths of the parties and their respective business plans. *Cf.* Georgia Pacific Corp. v. U.S. Plywood Corp., 318 F. Supp. 1116, 1121 (S.D.N.Y. 1970) (economic significance of the factors relevant to establishing a reasonable royalty for purposes of calculating infringement damages cannot be "automatically transduced into their pecuniary equivalent"), *aff'd as modified*, 446 F.2d 295 (2d Cir. 1971).

[103] 451 U.S. 557, 566 (1981). *Accord* Conwood Co. v. U.S. Tobacco Co., 290 F.3d 768, 794 (6th Cir. 2002).

[104] *J. Truett Payne Co.*, 451 U.S. at 566-67 (citing Bigelow v. RKO Radio Pictures, Inc., 327 U.S. 251, 264-65 (1946)).

[105] Op. at 97 (finding that JEDEC and EIA policies would have prohibited standardization of Rambus's patented technologies absent a RAND commitment).

[106] Daniel G. Swanson and William J. Baumol, *Reasonable and Nondiscriminatory (RAND) Royalties, Standards Selection, and Control of Market Power*, 73 ANTITRUST L.J. 1, 57 (2005).

[107] RBR at 12 (quoting Complaint Counsel's Proposed Finding of Fact No. 2965 at 388).

The adoption of Rambus's technologies for the standard shows that JEDEC believed that – putting royalties aside – Rambus's technologies were superior to alternatives. JEDEC members likely would have been willing to pay some amount reasonably reflecting that superiority. It is also true, however, that the record does not permit us precisely to quantify the closeness of substitution between Rambus's technologies and the alternatives and the degree to which those alternatives would have entailed higher costs to achieve the same level of DRAM performance, higher costs in the form of decreased DRAM performance, or both.[108]

Lacking this information, we nevertheless consider and balance evidence that:

1. Alternative technologies were available, and it likely would have been possible for members to design around Rambus's patents, albeit possibly with some higher cost;[109]

2. Absent any royalties, JEDEC members preferred Rambus's technology;

3. JEDEC had a stated preference for open, patent-free standards,[110] and its members were highly cost-sensitive;[111] and

4. Rambus, despite its preference to avoid RAND commitments, had a strong economic incentive to do what was necessary to ensure that its technology was incorporated into JEDEC's standards.[112]

In determining what royalty rates likely would have resulted from *ex ante* SDRAM negotiations, the Commission may look to real-world examples of negotiations involving similar technologies. Rambus agrees that this is the correct approach, noting that "the best way to determine these [RAND] rates is by examining rates for other comparable licenses in the industry."[113] Complaint Counsel seem to agree, at least by implication, because they argue that the October 2000 Samsung SDRAM/DDR SDRAM license agreement and the March 2005

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[108] As discussed in our liability opinion, the evidence that Rambus provided was flawed and unreliable. Op. at 82-96.

[109] *Id.* at 76, 82-96.

[110] *See, e.g.*, JX 5 at 4; CX 203a at 11; CX 207a at 8; CX 208 at 19.

[111] *Id.* at 74-75.

[112] *See, e.g.,* Teece, Tr. 10341-46. *See also* CX 2106 at 221 (deposition transcript at 220) (Farmwald FTC Dep.) (*in camera*) ("[r]oyalties are the lifeblood of Rambus"); CX 5110 at 2-3 (Rambus's business objective was "get[ting] royalties from competitive memory").

[113] RBR at 16. As discussed below, Rambus disagrees with our specific application of the approach taken herein, but it nonetheless endorses the general methodology.

Infineon SDRAM and DDR SDRAM license agreement with Rambus indicate that the highest possible royalty rate in the "but for" world would be less than 0.25% on JEDEC-compliant DRAMs.[114] Similarly, the court in *Georgia Pacific*, a seminal source regarding the methodology for calculating a reasonable royalty owed to patent holders following a finding of infringement, identified several factors potentially pertinent to that exercise, including, prominently, "the rates paid by the licensee for the use of other patents comparable to the patent in suit."[115] That court looked to multiple factors, seeking to exercise "a discriminating judgment reflecting its ultimate appraisal of all pertinent factors in the context of the credible evidence."[116]

C.

The Commission will extrapolate *ex ante* SDRAM and DDR SDRAM royalty rates using as its starting point the RDRAM license agreements found in the record. As we explained in our liability opinion, beginning in 1990, Rambus offered to license its RDRAM technology to manufacturers of DRAM chips and DRAM-compatible microprocessors, and it sought to "position RDRAM as the *de facto* standard."[117] RDRAM failed to achieve significant market success, however, as industry participants instead turned to standards promulgated by JEDEC – which they hoped would represent a better value proposition.[118] RDRAM royalty rates nevertheless serve as an extraordinarily useful benchmark because they are the product of individual, arm's-length negotiations between Rambus and manufacturers of DRAM chips and DRAM-compatible components for the use of all of the technologies at issue in this case, and more.[119] The manufacturers were aware early on that Rambus claimed patent protection for the

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[114] CCBR at 19-20.

[115] 318 F. Supp. at 1120. *Accord* Mobil Oil Corp. v. Amoco Chems. Corp., 915 F. Supp. 1333, 1354 (D. Del. 1994) (noting that parties' experts agreed that the price of comparable technology was of primary importance in determining a royalty rate); *see also* Mahurkar v. C.R. Bard, Inc., 79 F.3d 1572, 1579 (Fed. Cir. 1996) (noting that the task of calculating reasonable royalty is simplified when the record shows an established rate for "related patents or products").

[116] *Georgia Pacific*, 318 F. Supp. at 1120-21.

[117] Op. at 8.

[118] *Id.*

[119] *See* Op. at 115 n.624 ("RDRAM royalties cover all four of the technologies at issue in this proceeding, as well as additional proprietary technologies. *See, e.g.*, Horowitz, Tr. 8547-48; RX 2183; RX 81 at 8."); CX 2092 at 132 (Crisp *Infineon* Trial Tr.) (*in camera*) (stating that the ideas added to Rambus patent applications for the mode register and for programmable CAS latency were ideas **[redacted**]. Rambus has acknowledged this point. *See* Rambus Response to Complaint Counsel's Proposed Findings of Fact No. 723 at 285 (stating that "[w]hen first developed, RDRAM technology contained . . . the use of registers on the DRAM to store latency values, a variable burst length for data transfers, dual edge clocking in a synchronous memory device, and on-chip DLL or PLL.").

RDRAM technologies,[120] and there was no lock-in at the time these agreements were negotiated. In our effort to restore competitive conditions to those that would have prevailed in the "but for" world, for the reasons described above, we deem the RDRAM license agreements as the best available evidence from which to base our estimate of the likely "but for" results of negotiation.[121]

During the 1990s, Rambus licensed its proprietary RDRAM technologies at high-volume rates averaging 1-2% for use in DRAM chips,[122] with the rates declining significantly over time and with increases in the number of shipped units.[123] In the Samsung RDRAM license, for example, the rate drops to zero five years after shipment of the 500,000th unit, provided that more than 10 million units had been shipped.[124]

Rambus argues that 2% was its "standard rate" for RDRAM licenses, and that even this standard rate was an introductory, promotional rate reflecting an investment in the future. However, the 1-2% average RDRAM rate is corroborated by a November 1998 e-mail by Rambus CEO Geoff Tate (observing that three DRAM companies were "at 1% long term" and expressing the hope of *raising* their long-term rates to join three other "biggies" at 1.5%)[125] and by a November 2000 Rambus slide presented by Tate that reflects the company's desire to "drive royalties from *1-2% average* to 3-5%".[126] These documents not only confirm the 1-2%

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[120] *See, e.g.*, G. Kelley, Tr. 2504; Kellogg, Tr. 5053; Bechtelsheim, Tr. 5828-29, 5841-42; Lee, Tr. 6610-11; RX 279 at 8.

[121] Rambus cites evidence of royalty rates for other semiconductor technologies as a basis for an appropriate remedy. RBR at 18-20. We examined this evidence in our liability decision and determined that Rambus had provided no basis for treating the referenced licensing arrangements as comparable to licenses for the technologies here at issue. Op. at 114-15 n.624 (quoting Rambus CEO Geoffrey Tate's testimony that comparing royalty rates for different technology licenses mixes "apples and oranges" because "[t]he royalty rate for one patent and the royalty rate for another patent, even in the [semiconductor] industry, can vary tremendously based on the value of the patent and the applications involved"). Clearly, RDRAM, with the *same* technologies at issue in this case, offers a superior point of comparison than the disparate semiconductor technologies cited by Rambus.

[122] *See* RDRAM licenses included in the record – CX 1592 (Samsung); CX 1600 (Hyundai); CX 1609 (Mitsubishi); CX 1612 (Amendment to Hyundai); CX 1617 (Siemens); CX 1646 (Micron); RX 538 (NEC).

[123] Although Commissioner Rosch's dissenting opinion correctly notes that *initial* royalty rates set by the RDRAM licenses sometimes were higher, SDRAM and DDR SDRAM have been high-volume products for several years. *See* Rapp Tr. 10248-49; CX 2112 at 310-11 (deposition transcript at 309-10) (Mooring FTC Dep.) (*in camera*). Our goal – restoring competition – thus requires that we look to the royalties that the RDRAM licenses required for the later years in the life of a high-volume product.

[124] CX 1592 at 23.

[125] CX 1057.

[126] CX 1391A at 33 (emphasis added).

average,[127] but reveal that that average held steady for the long term, not just for an introductory period as Rambus claims. Indeed, four alternative Rambus projections all assume RDRAM royalties of **[redacted]** on DRAM chips for each year from **[redacted]**.[128]

In making the required "discriminating judgment reflecting [our] ultimate appraisal of all pertinent factors in the context of the credible evidence,"[129] we must consider several factors, each of which points to a reasonable royalty rate lower than the typical RDRAM royalty. First, Rambus's RDRAM licenses covered substantially more technologies than those relevant here;[130] consequently, the royalties that Rambus collected for RDRAM provide too high an estimate of a reasonable royalty for just a subset of the RDRAM technologies.[131] Second, RDRAM royalty rates typically declined substantially for high volumes and with the passage of time; for Samsung, a significant DRAM producer,[132] the rates ultimately declined all the way to zero. Given the success of SDRAM and DDR SDRAM and the years that have passed since their introduction, we must take full account of the pattern of discounts specified in RDRAM licenses for high volumes and out-year production. Third, there is substantial evidence that market participants viewed the RDRAM royalties as too high for RDRAM to achieve a major presence in the market. For example, Intel regarded a royalty of less than .5% as appropriate for

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[127] *See also* CX 1751 (*in camera*), a 1997 Rambus compilation in Rambus Vice President for Intellectual Property Joel Karp's notebook, showing high-volume RDRAM rates **[redacted redacted**].

[128] *See* CX 527-30 (*in camera*) (identified in the Joint Exhibit List as "Rambus spreadsheet re: 2000-2005 Royalty scenarios"). Rambus also argues that RDRAM rates were artificially constrained because an agreement giving Intel any proceeds from RDRAM licenses in excess of 2% eliminated any incentive for Rambus to negotiate for a higher royalty rate. *See* RBR at 22. For present purposes, however, the important point is that Rambus was unable to achieve even a 2% royalty across the market – many licensees negotiated rates below that level for high-volumes and out-years. *See* Op. at 115 n.624. The alleged arrangement with Intel would not explain why Rambus licensed RDRAM for less than 2%.

[129] *Georgia Pacific*, 318 F. Supp. 1116 at 1120-21.

[130] *See, e.g.*, Farmwald, Tr. 8115-18, 8270, 8275-77; Horowitz, Tr. 8619-25, 8646-47; RX 81 at 6-14; CX 1451. Indeed, Rambus has argued that "RDRAM technology in the early 1990s included numerous inventions," Rambus Response to Complaint Counsel's Finding of Fact No. 717 at 282, and Rambus has criticized Complaint Counsel for suggesting that a change from the four patented technologies in DDR SDRAM would require "anywhere near the magnitude of change required for the industry to switch to RDRAM" or "anywhere near the time involved" for switching to RDRAM. *See* Rambus Response to Complaint Counsel's Proposed Findings of Fact No. 2557 at 1032-1033, No. 2564 at 1037 (describing RDRAM as "an entirely new DRAM architecture").

[131] In terms of the criterion that both parties would apply, the additional technologies included in RDRAM licenses would have increased "the amount that the industry participants would have been willing to pay to use [RDRAM] over its next best alternative" and hence would have increased its *ex ante* value. *See supra* note 106 and accompanying text.

[132] *See* CX 1057 (e-mail from Rambus CEO Tate describing Samsung as one of the "biggies").

commodity RDRAM,[133] and JEDEC JC-42.3 subcommittee minutes from March 1997 reflect broad-based misgivings regarding RDRAM royalty rates.[134] Again, a rate below the RDRAM royalty range is appropriate for market-dominating products such as SDRAM and DDR SDRAM.[135] Finally, because it is Rambus's own unlawful conduct that prevents perfect replication of the "but for" licensing picture, plausible doubts should be resolved against Rambus.[136] Together, these factors point to a reasonable royalty substantially below the 1-2% RDRAM range.

On the other hand, RDRAM licenses, in addition to requiring per-unit royalties, obligated licensees to make up-front, lump-sum payments of licensing fees.[137] We deem it appropriate to trade off compensation payable up-front and compensation based on future usage, with an increase in one compensating for a decrease in the other. For purposes of our remedial Order, we couch Rambus's compensation entirely in terms of per-unit royalties, with no up-front licensing fees. Although we have accounted for up-front licensing fees by increasing slightly our estimate of the maximum royalty rates consistent with restoring competition, our remedy's coverage of a substantially shorter period than the RDRAM licenses and its exemption of a substantial portion of Rambus's JEDEC-compliant business, suggest that the adjustment should be small.[138]

Thus, starting at 1% – apart from the Samsung arrangement, the lower end of the RDRAM licensing range – and accounting for the factors presented above, we find that a maximum royalty rate of .5% for DDR SDRAM, for three years from the date the Commission's Order is issued and then going to zero, is reasonable and appropriate.[139] We also find that a

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[133] *See* CX 952; CX 961.

[134] *See* JX 36 at 7 ("Some Committee members did not feel that the Rambus [RDRAM] patent license fee fit the JEDEC requirement of being reasonable.").

[135] One Rambus document, CX 960, reflects Rambus CEO Tate's insistence that royalties on infringing DRAMs exceed royalties on RDRAM. By its terms, the document deals with a license of "all of our present and future patents for use for any infringing dram," a substantially more extensive license than at issue here. In any case, Tate's statement came in 1997, when Rambus was still pursuing its hold-up strategy. *See* Op. at 47. Rambus's preferences when hold-up was in the offing are not good evidence of royalties achievable in a "but for" world in which *ex ante* disclosure had occurred.

[136] 3 AREEDA, ANTITRUST LAW ¶ 653c.

[137] RDRAM licenses required up-front license fees ranging from $1.25 million (CX 1646 at 10-11, 20) to $5.5 million (CX 1617 at 11, Siemens license) for use of Rambus technology in DRAMs.

[138] The RDRAM licenses ran (or were renewable without additional license fees) for the life of Rambus's patents. *See, e.g.,* CX 1592 at 31; CX 1600 at 17; CX 1609 at 15; CX 1617 at 16; CX 1646 at 17; RX 538 at 33. The RDRAM licenses contained no limitation comparable to our remedy's exclusion of DDR2 SDRAM.

[139] Complaint Counsel suggest that appropriate downward adjustments to RDRAM royalties yield a royalty rate of 0.1%, but it is not clear what assumptions they have made to support this calculation. Further, we cannot accept Complaint Counsel's arguments in favor of a maximum royalty rate of 0.25% or less drawn from

corresponding .25% maximum rate for SDRAM is appropriate. Halving the DDR SDRAM rate reflects the fact that SDRAM utilizes only two of the relevant Rambus technologies, whereas DDR SDRAM uses four.[140] Moreover, Rambus's quality-adjusted cost comparison data indicate that alternatives to its two SDRAM technologies would add *less than half* the cost of alternatives to the four Rambus technologies in DDR SDRAM.[141] Applying Rambus's own cost figures to Rambus's own analytical paradigm – which looks to "the amount that the industry participants would have been willing to pay to use a technology over its next best alternative"[142] – we find the .25% maximum rate for SDRAM to be both reasonable and fully supported. As with DDR SDRAM, this maximum rate would go to zero three years after the date the Commission's Order is issued.

It is true that we cannot calculate to the penny the downward adjustment from 1%. Yet these royalties certainly are within the range of reasonableness in approximating the result drawn from what we know of the *ex ante* negotiating positions of Rambus and the other JEDEC members. The royalty rates take account of the relevant parties' preferences (*i.e.*, JEDEC's cost-sensitivity and preference for open, patent-free standards on the one hand, and Rambus's disinclination to agree to RAND terms on the other hand). They reflect appropriate downward adjustments from the prevailing RDRAM rates based on the nature and extent of the technology

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extrapolations from terms of known or reported Rambus agreements with Samsung and Infineon. Neither the agreements nor the facts on which Complaint Counsel premise their extrapolations are in the record, and in each instance cited Rambus was at the most disadvantageous stage of its infringement litigation – *i.e.*, when it had lost its case at the trial court level.

Rambus, on the other hand, argues that it should be allowed to charge a royalty rate in excess of 2.5% – the rate agreed to in the "other DRAM" clause of the 1995 Hyundai-Rambus license agreement. RBR at 17-18. This is hardly a realistic estimate of reasonable royalty rates in the "but for" world: the Hyundai rate was not accepted by anyone other than Hyundai, and, at least according to Rambus, it was not even retained by that firm. *See* CX 1878 (Rambus answer and counterclaim alleging infringement by Hyundai for using Rambus technologies in JEDEC-compliant products); Hynix Semiconductor Inc. v. Rambus Inc., 2006 WL 565893 at *3-4 (N.D. Cal. 2006) (finding of fact describing Rambus position that the "other DRAM" provision has been superseded and no longer is in effect). Thus, from a market perspective, the Hyundai rate was neither broadly accepted nor sustained. Moreover, the 2.5% figure may have been inflated as a result of trade-offs with other aspects of the license. For example, Rambus's SDRAM and DDR/SDRAM licenses normally include up-front licensing fees of $3 million, and Rambus RDRAM licenses required licensing fees varying from $1.25 million to $5.5 million. The Hyundai license, CX 1600 at 11, conferred a license for purposes of RDRAM memories for a licensing fee of $2 million, with no additional license fee for rights covering SDRAM and DDR/SDRAM – so that Hyundai received its SDRAM and DDR/SDRAM license without having to make the normal $3 million up-front payment. Similarly, there may have been trade-offs between the royalties payable by Hyundai for various uses of RDRAM technologies (and the dates and volume levels specified for setting those royalty rates) and the 2.5% royalty payable by Hyundai on other DRAMs. Such trade-offs, within a single license agreement, could have affected the "other DRAM" rate.

[140] Op. at 9-12; CX 1363 at 3.

[141] Rapp, Tr. 9832, 9852. The Commission has questioned the accuracy of Rambus's cost data, but we have not suggested that this relationship is invalid. Op. at 95 n.532-33.

[142] RBR at 12.

at issue, and prevent Rambus from benefitting from the uncertainty that its unlawful actions generated. They also follow the negotiated RDRAM agreements pursuant to which the applicable royalty rate declined over time.[143] Setting a maximum royalty rate that is applicable for a period of three years before dropping to zero follows from the Samsung RDRAM agreement in particular; lends temporal and rate certainty to this remedy; and requires that the royalty rate decline to zero before the relevant patents expire, according to Complaint Counsel, in 2010.

The Commission also must determine an appropriate maximum royalty rate for memory controllers and other components that use the relevant Rambus technologies in complying with JEDEC's SDRAM and DDR SDRAM standards. The RDRAM licenses in the record, cited above, either set a royalty of between 3% and 5% (but 2 to 3% for NEC[144]) for the use of Rambus technologies in memory controllers, microprocessors, and other non-DRAM components, or they leave the rates open for future negotiation, generally specifying a maximum of between 3% and 5%. That is more than double the large-volume royalties for DRAMs. The SDRAM licenses charge **[redacted]** for the DRAM and **[redacted]** for the SDR Controllers; the DDR SDRAM licenses charge less **[redacted]** for the DRAMs and **[redacted]** for the DDR Controllers.[145] In addition, the record contains several exhibits that appear to provide Rambus's internal revenue projections based on anticipated royalties and licensing fees. In each, the stated royalty rate for RDRAM Controllers is **[redacted]**, exactly **[redacted]** that for RDRAM devices.[146]

Based on this evidence, we adopt a coefficient of two for determining the maximum royalty rate for memory controllers and other non-memory-chip components that use the relevant Rambus technologies. For such products compliant with the SDRAM standard, this yields a maximum royalty of .5%, dropping to zero after three years; for such products compliant with the DDR SDRAM standard, this yields a maximum royalty of 1%, again dropping to zero after three years.

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[143] *See, e.g.*, CX 1592; CX 1600; CX 1609; CX 1612.

[144] *See* RX 538 at 22.

[145] The SDRAM/DDR SDRAM licenses define "Controllers" broadly to include **[redacted redacted redacted**]. *See, e.g.*, CX 1680 at 22 (*in camera*); CX 1681 at 7 *(in camera*); CX 1687 at 6-7 (*in camera*). Although the licenses in the record involve firms known as DRAM manufacturers, several of those licenses identify specific products of the licensees that pursuant to the licenses qualify, and give rise to royalties, as Controllers. *See, e.g.*, CX 1681 at 7, 34 (*in camera*) (Hitachi license identifying approximately **[redacted]** Hitachi products as SDR and DDR Controllers); CX 1685 at 6 (*in camera*) (NEC license identifying **[redacted]** NEC products as SDR Controllers); CX 1689 at 6 (*in camera*) (Mitsubishi license identifying **[redacted]** Mitsubishi products as SDR Controllers).

[146] *See* CX 527-30 (*in camera*).

We also find it appropriate to define the scope of Rambus royalties when products such as memory controllers become integrated into larger products.[147] Absent some limitation, our remedy could have unintended consequences if product integration were to markedly raise the selling price of the unit subject to the percentage royalty. This is best avoided by articulating a rule that specifies controller royalties in terms of dollars per unit, based on historical experience. Using terms derived from existing RDRAM licenses, our Order limits Rambus to the controller royalties per unit that would result from applying the .5% or 1% royalty rate to the average net sales per unit for SDR Controllers and DDR Controllers, respectively, **[redacted**
[redacted **redacted**
redacted **]**. Such an approach places a cap on these royalties consistent with historical experience and based on reported and verifiable information.[148]

Rambus points out that its RDRAM licenses entailed long-run, co-development efforts with licensees and argues for further compensation on that basis.[149] Given the importance that SDRAM and DDR SDRAM achieved in the market, and the retention of Rambus technologies in DDR2 SDRAM, Rambus already has largely secured the outcome sought by licensees' support without the *ex ante* risk that those efforts might fail.[150] No adjustment on this account appears necessary.

Rambus's RDRAM licenses provided additional compensation in the form of non-exclusive cross licenses and grant-backs.[151] These provisions, however, typically were limited to (i) patented technologies that would block Rambus from using its proprietary RDRAM technologies, and (ii) the licensee's improvements on RDRAM technologies.[152] Given the limited nature of these terms, and subject to those limitations, we will permit Rambus to include comparable provisions in any SDRAM/DDR SDRAM licenses entered under the Commission's remedial Order.

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[147] *See* CCBR at 15.

[148] *See, e.g.*, CX 1687 at 29 (showing licensees' **[redacted]** requirements) (*in camera*).

[149] RBR at 22.

[150] The RDRAM licenses also imposed corresponding duties on Rambus to ensure full technology transfer. *See, e.g.*, CX 1592 at 19-21 (Samsung license stating Rambus technology transfer obligations); CX 1646 at 8-10 (Micron license stating Rambus technology transfer obligations). These obligations would be unnecessary given the long-established nature of the SDRAM and DDR SDRAM standards.

[151] *See, e.g.*, CX 1600 at 16; CX 1609 at 14; CX 1646 at 15.

[152] *See* CX 1600 at 4-5; CX 1609 at 3-4; CX 1646 at 4.

IV.

A.

As discussed above, the Commission has "wide latitude for judgment" in selecting a remedy, subject to the constraint that it must be reasonably related to the violation.[153] Furthermore, the Commission is not limited to merely proscribing unlawful conduct "in the precise form in which it [was] found to have existed in the past."[154] The Commission is authorized to both prohibit the practices that it has found unlawful and – in order to prevent future unlawful conduct – to "fence-in" the violator with provisions that are broader in scope.[155] So long as the remedy has a reasonable relationship to the violation that the Commission has found, the Commission may "close all roads to the prohibited goal," including proscribing conduct that is lawful.[156]

As we explained most recently in *Telebrands Corp.*,[157] in determining the appropriate scope of fencing-in relief, the Commission considers three factors: (1) the seriousness and deliberateness of the violation; (2) the ease with which the violation may be transferred to other products; and (3) whether the respondent has a history of prior violations. No single factor is determinative, but "the more egregious the facts with respect to a single element, the less important is it that another negative factor be present."[158]

We find that Rambus's intentional and willful deception,[159] described in detail in the Commission's liability opinion, is sufficient, without more, to justify broad fencing-in relief. Furthermore, factors such as Rambus's large portfolio of intellectual property and the company's status as a developer and licensor of memory technologies (but not a manufacturer) could increase the incentive for Rambus to attempt to circumvent the Commission's Order. Given these circumstances, we believe that merely prohibiting Rambus from "knowingly" engaging in a deceptive course of conduct as a member of an SSO – as Rambus proposes – would provide

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153 *Jacob Siegel Co.*, 327 U.S. at 612-13; *see FTC v. Nat'l Lead Co.*, 352 U.S. at 428; *Ruberoid Co.*, 343 U.S. at 473.

154 *Colgate-Palmolive Co.*, 380 U.S. at 395 (quoting *Ruberoid Co.*, 343 U.S. at 473).

155 *See, e.g., Colgate-Palmolive Co.*, 380 U.S. at 395; Kraft, Inc. v. FTC, 970 F.2d 311, 326-27 (7th Cir. 1992).

156 *Ruberoid Co.*, 353 U.S. at 473.

157 Telebrands Corp., 140 F.T.C. 278, 334 (2005), *available at* http://www.ftc.gov/os/decisions/docs/volume140.pdf, *aff'd*, 477 F.3d 354 (4th Cir. 2006).

158 Sears, Roebuck & Co. v. FTC, 676 F.2d 385, 392 (9th Cir. 1982).

159 In our liability opinion, we found that Rambus's deceptive course of conduct was "intentionally pursued," Op. at 51, and that Rambus "intentionally and willfully engaged in deceptive conduct." Op. at 68.

inadequate incentive for it to put into place the procedures and policies that are necessary to ensure that its future participation in SSOs is conducted in an honest and forthright manner and that it does not simply circumvent the Commission's Order. The Order provisions described below represent the Commission's efforts to prohibit Rambus from engaging in the practices that we found in our liability opinion to violate Section 5 of the FTC Act, as well as to prevent future related conduct.

B.

Paragraph II of the Commission's Order prohibits Rambus from making any misrepresentations concerning its patents, or applications for patents, to any SSO, or its members, and constrains Rambus from taking any action, or refraining from taking any action, that would lead the SSO, or any of its members, to unknowingly infringe any current or future Rambus patent. Additionally, Paragraph II requires Rambus to abide by any requirement or policy of an SSO in which it participates to make complete, accurate, and timely disclosures. These prohibitions are substantially the same as those set forth in Rambus's proposed order, but the scope of our Order is drawn more broadly to protect the public against a repetition of the same deceptive conduct with respect to other products.

Paragraph III of the Order requires Rambus to employ a compliance officer, who shall be responsible for communicating Rambus's intellectual property rights relating to any standard that is under consideration by an SSO in which Rambus participates. The compliance officer shall also be responsible for verifying the contents of Rambus's periodic reports to the Commission, and to supplement such reports when it is necessary to provide a complete and accurate picture of the status of Rambus's compliance with the terms of this Order. We believe that such a provision is necessary and appropriate to ensure that Rambus will adhere to SSO rules and policies, and to facilitate the Commission's efforts to monitor its compliance with the instant Order.

Paragraphs IV-VII are designed to restore – to the extent possible – the competitive conditions that would have existed but for Rambus's unlawful conduct. Our remedy covers all technologies used in JEDEC-compliant products and protected by patents derived from applications that Rambus filed while it was a member of JEDEC. Rambus contends that our remedy must be limited to the four technology markets that are identified in the Commission's liability decision.[160] However, claims of infringement based on JEDEC-compliant use of any of these technologies would take advantage of the same deceptive conduct – indeed, the same intentional failure to disclose – identified in the Commission's liability decision.[161] That is, the same violation condemned with regard to the four relevant technologies at issue in the liability

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[160] *See* RBR at 9-10.

[161] Op. at 28-68.

decision (programmable CAS latency, programmable burst length, dual-edge clocking, and on-chip PLL/DLL) could be readily transferred to additional technologies covered by Rambus's undisclosed patent rights.[162] Rambus repeatedly has indicated that it contemplates seeking infringement rulings against JEDEC-compliant uses of technologies other than the four at issue in the liability decision.[163] Consequently, coverage of all technologies used in JEDEC-compliant products and protected by patents derived from applications filed while Rambus was a member of JEDEC is necessary as fencing-in, in order to "effectively close all roads to the prohibited goal, so that [the Commission's] order may not be by-passed with impunity."[164]

Paragraph IV prohibits Rambus from collecting royalties relating to the sale, manufacture or use of any JEDEC-Compliant DRAM or Non-DRAM Products that are greater than those that Rambus is allowed to collect under the terms of the present Order. The purpose of this provision – which applies both to U.S. patents and, with respect to imports or exports to or from the United

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[162] This would include both patents derived from Rambus's original '898 application and those derived from any other applications filed by Rambus prior to its withdrawal from JEDEC. Rambus was hard at work during the period of its JEDEC membership to obtain patent rights on technologies other than those directly at issue in the liability opinion. *See, e.g.*, CX 1949 at 5, CX 711 at 58, and Crisp, Tr. 3247-48 (all relating to source synchronous clocking); CX 1932, CX 3125 at 279-80, (Vincent *Infineon* Dep.) (*in camera*), CX 3126 at 448-52 (Vincent *Infineon* Dep.) (*in camera*), CX 1963 at 4, and Crisp, Tr. 3046 (all relating to low voltage swing signaling); CX 702, CX 734 at 1, CX 1949 at 1, and Crisp, Tr. 3097-99 (all relating to multi-bank technologies); CX 734 at 1 and, CX 738 (both relating to auto precharge technology); CX 691 and Crisp, Tr. at 3190-91 (both relating to externally supplied reference voltage).

[163] *See, e.g.*, CX 1888 (May 2001 Rambus press release noting that "the Virginia case against Infineon [in which the trial court had dismissed infringement claims] involve[d] only four Rambus U.S. patents" but that "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] Court's decision"); CX 1403 at 30 (July 2001 Rambus Presentation stating, "Virginia decision involved only 4 patents; we have many others which are used by SDRAM/DDR."); CX 1371 at 5 (April 2000 Rambus patent licensing presentation to nVIDIA listing numerous alleged "Rambus Innovations" involving technologies beyond the four specifically at issue in the liability decision); CX 1383 at 4 (September 2000 Rambus patent licensing presentation to ATI listing numerous alleged "Rambus Innovations" involving technologies other than the four specifically at issue in the liability decision); CX 1363 at 3 (January 2000 Rambus presentation claiming that DDR SDRAM used a patented Rambus innovation involving "two bit prefetch architecture" as well as alleged Rambus innovations involving two external clocks, low voltage signaling, quadrature data alignment and source synchronous signaling).

[164] *See Ruberoid*, 343 U.S. at 473. *New York v. Microsoft*, 224 F. Supp. 2d 76 (D.D.C. 2002), relied upon by Rambus, RRBR at 7, is fully consistent. In that case, the court shaped its remedy to ensure that Microsoft's exclusionary conduct "broadly" defined was "fully enjoined." *Id.* at 148 (quoting language now appearing in 3 AREEDA, ANTITRUST LAW ¶ 653f at 102-03 (2d ed. 2002)), and stating that in cases involving a monopolist's consummated exclusionary act, "equitable relief beyond a mere injunction against repetition of the act is generally appropriate" and must be tailored with "sufficient breadth to ensure that a certain 'class' of acts, or acts of a certain type or having a certain effect, not be repeated"). The fact that the identical deceptive conduct found in the Commission's liability opinion also infected a broader range of technologies makes these fencing-in principles wholly apposite here.

States, to foreign patents[165] – is to preclude Rambus from continuing to collect monopoly rents with respect to JEDEC-Compliant DRAM or Non-DRAM Products. Paragraph V requires Rambus to make available a worldwide, nonexclusive license – under the relevant U.S. patents only – to make, use, and sell JEDEC-compliant DRAM and non-DRAM products at rates that do not exceed the Maximum Allowable Royalty Rates, as defined and set forth in Paragraph I. To ensure that the Commission's efforts to restore competition are not undermined by the threat of patent infringement litigation, Paragraphs VI and VII prohibit Rambus from enforcing the royalty agreements that would be prohibited by the terms of the instant Order.

Paragraphs VIII through XI contain ancillary provisions that are designed to help the Commission oversee Rambus's compliance with this Order. Rambus is required, for example, to distribute copies of the Commission's Order, make periodic compliance reports to the Commission, and provide the Commission with access to its documents.

Finally, paragraph XII specifies that the Order will sunset in 20 years. As we noted in *Kentucky Household Goods Carriers Association*,[166] a 20-year sunset provision is common to most of the Commission's orders. Respondent, of course, may seek to modify or set aside the Order, pursuant to Section 2.51 of the Commission's Rules of Practice,[167] if at any time prior to the expiration of 20 years it is no longer in the public interest.

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[165] The global nature of the DRAM industry requires that our remedy reach Rambus's enforcement of foreign patent rights with respect to imports and exports to and from the United States. DRAMs often are manufactured abroad, *see, e.g.*, Bechtelsheim, Tr. 5886; Appleton, Tr. 6267; CX 2107 at 15-16, 18-20 (Oh FTC Dep.) (*in camera*), and even when manufacturing occurs in the United States, some steps in the processing frequently take place abroad. *See* Appleton, Tr 6268-70; CX 2107 at 19-20 (Oh FTC Dep.) (*in camera*). Moreover, major DRAM customers often incorporate DRAM chips into their products at foreign manufacturing facilities. *See* Bechtelsheim, Tr. 5886; Appleton, Tr. 6273-74. Because of the geographically dispersed nature of these activities, Rambus could use its foreign patents to collect royalties that would undermine a remedy confined to U.S. patents. *See* McAfee, Tr. 7521.

Although Rambus argues that the Commission lacks authority to extend its remedy to foreign patent rights, it cites no relevant support. RB at 133. For example, *Western Electric Co. v. Milgo Electronic Corp.*, 450 F. Supp. 835, 837 (S.D. Fla. 1978), actually ruled that the court possessed "the power to enjoin a party over whom it ha[d] personal jurisdiction from pursuing [patent] litigation before a foreign tribunal." The Commission's remedy similarly would constrain the patent enforcement efforts of a party over which it has personal jurisdiction. Medtronic, Inc. v. Catalyst Research Corp., 518 F. Supp. 946, 955 (D. Minn. 1981), *aff'd*, 664 F.2d 660 (8th Cir. 1981), supports the proposition that because U.S. and foreign patents confer distinct rights, parties cannot obtain injunctions against foreign claims on the basis of validity and infringement rulings regarding U.S. patents. The Commission's remedy, however does not affect determinations of validity or infringement. Like the *Medtronic* court, which went on to preliminarily enjoin the defendant from pursuing patent enforcement activities abroad, 518 F. Supp. at 956, the Commission's remedy governs only the actions of Rambus.

[166] 139 F.T.C. 420, 434 (2005), *available at* http://www.ftc.gov/os/decisions/docs/volume139.pdf (June 21, 2005).

[167] 16 C.F.R. § 2.51.

C.

We do not believe that the Commission's remedy should extend to Rambus's patents used in products that are compliant with JEDEC's DDR2 SDRAM or succeeding generations of JEDEC standards. There is no doubt that some relationship exists between Rambus's deceptive conduct and its position in the DDR2 SDRAM market. Nevertheless, in our liability decision, we concluded that Complaint Counsel had not proved a sufficient causal link between Rambus's deceptive course of conduct and the DDR2 standard and, indeed, between the issuance of the SDRAM and DDR SDRAM standards and the DDR2 standard (because there was insufficient evidence of lock in).[168] Absent a sufficient causal link, extending our remedy to cover DDR2 SDRAM would not restore competition lost because of Rambus's deceptive conduct. Nor do we believe that "fencing in" justifies extending our remedy to the DDR2 standard (or subsequent generations of JEDEC DRAM standards) under these circumstances. Indeed, absent the necessary causal links, applying our remedy to DDR2 SDRAM could conflict with the warnings in *Jacob Siegel, National Lead,* and *Ruberoid*, discussed above, that the Commission cannot issue an order that is not sufficiently related to the violation.

Commissioner Harbour's dissent emphasizes that the relief ordered – confined to products compliant with JEDEC's SDRAM and DDR SDRAM standards but not reaching products compliant with JEDEC's DDR2 SDRAM standard – will have declining impact as the market progressively shifts to DDR2. This follows not from any policy choice, but rather from the timing of underlying events. Rambus revealed its patents well before the DDR2 SDRAM standard was set, and we were unable to conclude in our liability opinion that in the relevant time frame lock in conferred durable monopoly power over DDR2.[169] Had the evidence demonstrated a sufficient causal link between Rambus's deceptive conduct and JEDEC's standardization of Rambus technologies in DDR2 SDRAM, our relief would have covered products compliant with that standard. The evidence, however, does not carry us that far, and we limit our order accordingly.

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[168] Op. at 110, 114.

[169] Op. at 110-14.