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SEGA AND BEYOND: A BEACON FOR FAIR USE ANALYSIS . . . AT LEAST AS FAR AS IT GOES

David A. Rice*

I. INTRODUCTION

Copyright law is firmly established as the preferred means for computer program protection in the United States, Europe, and elsewhere. Both the 1980 amendment to the Copyright Act and the 1991 adoption of the Council Directive on the Legal Protection of Computer Programs followed commission appraisals of alternative means for protection of new technology. In each instance, the commission recommended copyright law as the principal source of protection of computer programs. Multilateral and bilateral initiatives, especially those developed in the United States, encouraged other nations to echo those actions.

While some scholars and courts continue to lament this off-the-shelf solution and champion adoption of a tailored *sui generis* regime, the use of copyright law has proceeded so far that the basic policy choice is now irreversible. The present and future task of scholars, lawyers, judges, and others is to adapt copyright law to protect computer programs. Our common enterprise is to evolve within copyright law a set of "second best," workable rules specific to computer programs.

Decompilation, reverse engineering, and the intermediate copying necessary to those processes present extremely difficult issues of law and policy. Indeed, the practices and issues these processes pose lie at the point of greatest friction in the continuing effort to adapt copyright law to computer programs. The issue on the agenda is no more, and no less, than this: Does adoption of copyright law as the primary means for legal protection of computer programs have the unintended—or perhaps intended—consequence of erecting a high barrier against access to expression-embodied ideas not protected by a program's copyright?

Until recently, fitting copyright to computer programs has presented the broader question of whether, and to what extent, computer programs are protected expression. In *Sega Enterprises Ltd. v. Accolade, Inc.*¹ ("Sega") and *Atari Games Corp. v. Nintendo of*

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1. 977 F.2d 1510 (9th Cir. 1992).

*America, Inc.*² ("Atari"), the court moved on to examine whether the steps necessary for, or consequent to, decompilation of computer programs may be thwarted by enforcement of the program's copyright. This issue typically arises when reverse engineering of a machine-readable or object code version of a program decompiles the code into its human-readable source code equivalent. The assumption, for purposes of this Article, is that reverse engineering is performed to ascertain program-embodied ideas, processes, methods of operation, or other content which is statutorily excluded from the protection of copyright law. A further assumption is that the ultimate objective of reverse engineering is to use the unprotected matter in the independent creation of another computer program. This independently created program may be one of two types. The first type is a program that is compatible or interoperable with the original program or the machine and operating system on which it runs. The second type is one that competes in the same market as the original program.

The European Community Council Directive on the Legal Protection of Computer Programs³ ("Software Directive") addresses this issue in Article 6, a provision adopted after intense debate and long negotiation. The Software Directive comprehensively deals with the legal protection of computer programs by copyright law. Among other things, it addresses the following: the protection of computer programs by copyright law; the scope of computer program copyright protection; the rights comprised in copyright law; proscribed acts under copyright law; the rights of program copy owners; and the provisions not variable by contract law.

The European Community approach to the development of a common and unified regime for protection of computer programs differed significantly from the United States' approach. Instead of enacting a computer program law, Congress chose to marginally amend the 1976 Copyright Act. The amendments did little more than confirm that computer programs are statutory subject matter⁴ and, with the exception of one provision,⁵ left to the federal courts the task of defining the fit between copyright law and computer programs. Congress did not specifi-

2. 975 F.2d 832 (Fed. Cir. 1992).

3. Council Directive 91/250/EEC of 14 May 1991 on the Legal Protection of Computer Programs, 1991 O.J. (L 122) 42 [hereinafter *Software Directive*]. Article 6 represents an evolution from the original recognition in Article 5 of limited use rights directed to, *inter alia*, adaptation of a program necessary to its utilization. This original use right was analogous to the right stated in 17 U.S.C. § 117 (1988).

4. Section 101 of the Copyright Act defines "computer program" as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." 17 U.S.C. § 101 (1988).

5. *Id.* § 117.

cally address the decompilation and reverse engineering issues, as did the Europeans in Article 6 of the Software Directive. Congress left those issues, like most others, for judicial consideration and resolution within the general framework and applicable provisions of the Copyright Act.

This Article focuses on recent court decisions involving intermediate copying incident to decompilation and, to a lesser extent, the Software Directive. The central claim of this Article is that the United States Court of Appeals for the Ninth Circuit's opinion in *Sega* erred in the direction of cautious limitation. The court's holding stated conditions under which intermediate copying for purposes of disassembling or decompiling⁶ object code is a fair use as a matter of law. This Article contends that those conditions will not long stand as limits on permissible copying and decompilation. This contention has an important corollary: to wit, the compromise embodied in Article 6 of the Directive on Legal Protection of Computer Programs gives advocates of strong protection more, not less, protection in the European Community than in the United States.

II. SCOPE OF COPYRIGHT AND ACCESS TO UNPROTECTED CONTENT OF COMPUTER PROGRAMS: AN INTRODUCTION TO THE LEGAL LANDSCAPE

A. *The Continuing Evolution of Computer Program Copyright Law in the United States*

The court in *Computer Associates International, Inc. v. Altai, Inc.*⁷ ("*Computer Associates*") held that achievement of compatibility with machines and programs is an external factor that may preclude or limit copyright protection for some elements of computer programs.⁸ Two other recent decisions recognize that section 107 of the Copyright Act permits, under limited circumstances, the unauthorized making of an intermediate copy of a computer program for the purpose of analyzing and studying its object code.⁹ These decisions acknowledge that making a copy literally infringes the copyright owner's exclusive right

6. For reasons of exposition only, the use of "disassembly" or "decompilation" throughout the Article represents both decompilation and disassembly. "Disassembly" is the more correctly descriptive term from the computer science perspective, though decompilation has come into wide use in legal writing as a common or equivalent term.

7. 982 F.2d 693 (2d Cir. 1992).

8. *Id.* at 708-09 (citing 3 MELVILLE B. NIMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 13.03[F][3], at 13-66 to 13-71). Three circuit courts noted this proposition with approval. See *Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823 (10th Cir. 1993); *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am., Inc.*, 975 F.2d 832 (Fed. Cir. 1992).

9. *Sega*, 977 F.2d at 1518; *Atari*, 975 F.2d at 843.

to make copies, yet conclude that this act of intermediate copying is a noninfringing fair use in at least some circumstances.¹⁰ Decompilation and reverse engineering of the program code to ascertain unprotected ideas embodied in the program was the approved purpose of copying in each case, where knowledge of the nonstatutory matter was necessary to achieve interoperability or compatibility between an independently created program and the reverse engineered program, or a machine on which it ran.¹¹ There are strong connections between the specific issue presented in these two cases and the scope of the copyright protection issue addressed in cases ranging from *Apple Computer, Inc. v. Franklin Computer Corp.*¹² ("Franklin"), through *Whelan Associates, Inc. v. Jaslow Dental Laboratories, Inc.*¹³ ("Whelan"), and *Plains Cotton Cooperative Ass'n v. Goodpasture Computer Services, Inc.*,¹⁴ to *Computer Associates*,¹⁵ *Lotus Development Corp. v. Borland International, Inc.*¹⁶ ("Lotus"), *Apple Computer, Inc. v. Microsoft Corp.*,¹⁷ and *Gates Rubber Co. v. Bando Chemical Industries, Ltd.*¹⁸ ("Gates"). *Sega* and *Atari* clearly demonstrate this connection. In each case, the courts found it absolutely essential to deal with the issue of what was, and was not, copyright protected expression in the original program.¹⁹ Less clear, but equally important, the cases suggest another connection that presents a new generation of issues. *Sega* and *Atari* hold that others may legitimately seek to discover, without consent, what *Computer Associates*, *Lotus*, *Gates*, and other decisions found unprotected by copyright law.

Regardless of how computer program copyright protection evolves following *Computer Associates*,²⁰ the trend is away from gross differentiation and toward refined differentiation between unprotectable and protectable elements of a computer program.²¹ This separation of ideas,

10. *Sega*, 977 F.2d at 1518; *Atari*, 975 F.2d at 843-44.

11. *Sega*, 977 F.2d at 1527-28; *Atari*, 975 F.2d at 843-44.

12. 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984); *see also* *Apple Computer, Inc. v. Formula Int'l, Inc.*, 725 F.2d 521 (9th Cir. 1984).

13. 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987).

14. 807 F.2d 1256 (5th Cir.), *cert. denied*, 484 U.S. 821 (1987).

15. 982 F.2d 693 (2d Cir. 1992).

16. 799 F. Supp. 203 (D. Mass. 1992).

17. 799 F. Supp. 1006 (N.D. Cal. 1992), *modified*, 821 F. Supp. 616 (N.D. Cal. 1993).

18. 9 F.3d 823 (10th Cir. 1993).

19. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1519-20, 1528 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am., Inc.*, 975 F.2d 832, 839-41 (Fed. Cir. 1992).

20. The mode of analysis articulated in *Computer Associates* has been either utilized or favorably noted in several important decisions. *See, e.g., Sega*, 977 F.2d at 1524; *Atari*, 975 F.2d at 839; *cf. Lotus Dev. Corp. v. Borland Int'l, Inc.*, 831 F. Supp. 223, 232 (D. Mass. 1993); *Lotus*, 799 F. Supp. at 214-15.

21. For other cases that demonstrate this trend, *see, e.g., Brooktree Corp. v. Advanced Micro Devices, Inc.*, 977 F.2d 1555 (Fed. Cir. 1992); *Brown Bag Software v. Symantec Corp.*,

processes, methods of operation, and other unprotectable subject matter from their expression secondarily identifies the nature and extent of program content that wholly lacks legal protection under copyright law. These items may still be patentable or qualify for state trade secret law protection. If protected by patent law, the program will be disclosed,²² and yet not generally usable by others regardless of how they acquire knowledge of the information in the program. Patent-protected programs are rare, despite solid indication that software-related patents have become, and increasingly will be, obtainable.²³ The lack of patent protection leaves most extra-statutory matter either wholly unprotected because it is in the public domain or qualified only for protection under state trade secret law.²⁴

Decompiling to discover such information is feasible only if there is a computer program copy that can be used as input. The threshold act of making that copy facially provides a statutory basis for seeking injunctive relief and perhaps damages for copyright infringement.²⁵ Decompilation of object code to reconstruct the equivalent of original source code makes yet another copy of the original, copyrighted work. Focusing on the copying that is essential to decompilation and reverse engineering offered Sega and Nintendo two advantages. First, this strategy offered the prospect of establishing copyright infringement based on a single act of literal copying. Second, the strategy provided a means for protecting program-embodied ideas and technological know-how that otherwise lacked, or only enjoyed defeasible, legal protection.

The strategy of showing infringement by the making of an exact, intermediate object code copy permitted the parties to avoid involvement in more difficult and expensive litigation. In light of cases such as *Computer Associates*, a strategy not based on literal copying would

960 F.2d 1465 (9th Cir.), *cert. denied sub nom.* BB Asset Management, Inc. v. Symantec, Inc., 113 S. Ct. 198 (interim ed. 1992); *Ashton-Tate Corp. v. Ross*, 728 F. Supp. 597 (N.D. Cal. 1989), *aff'd*, 916 F.2d 516 (9th Cir. 1990); *see also Microsoft*, 799 F. Supp. at 1022; *Manufacturers Technologies, Inc. v. Cams, Inc.*, 706 F. Supp. 984 (D. Conn. 1989); *Digital Communications Assocs., Inc. v. Softklone Distrib. Corp.*, 659 F. Supp. 449 (N.D. Ga. 1987).

22. 17 U.S.C. § 112 (1988).

23. The number of software-related patents issued by the Patent and Trademark Office is increasing. The recent Federal Circuit decision, *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992), promises to further open the door to securing software-related patents.

24. "Content" is used in this context to connote something that stands alone or as a combination of known subject matter. Trade secret law protects the latter, not just the former. *See, e.g., Integrated Cash Management Servs., Inc. v. Digital Transactions, Inc.*, 920 F.2d 171 (2d Cir. 1990).

25. *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511 (9th Cir. 1993), *cert. dismissed*, 114 S. Ct. 671 (interim ed. 1994); *see also Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am., Inc.*, 975 F.2d 832 (Fed. Cir. 1992).

have a lower probability of success on the merits. Most copyright litigation requires indirect proof of infringement, including proof of substantial similarity between the original and the allegedly infringing works. Under *Computer Associates*, the final step of comparison for purposes of determining if substantial similarity exists requires a comparison of the allegedly infringing work with the expressive elements of the original program that remain after filtering out ideas and other unprotected elements of that program.²⁶ Merely reaching the point in litigation where this comparison occurs can be complicated and expensive. In addition, the likelihood of prevailing based upon post-filtration comparison is much lower than the likelihood of prevailing when the only issue of fact is whether the defendant made an unauthorized exact copy.

Moreover, the filtration process for determining substantial similarity requires the separation of protectable expression from nonstatutory matter embodied in a program. As courts employ increasing judicial care to exclude any such nonstatutory matter from the protection of copyright law, the issues addressed in *Sega* and *Atari* gain critical importance. The importance arises since the elements excluded from copyright protection by cases such as *Computer Associates* receive little, if any, independent legal protection. Therefore, strategically enforced, copyright law may offer a means for shielding content that is otherwise ineligible for copyright protection. Where intermediate copying is known or suspected to have occurred, the better strategy is to seek a judicial determination that making an unauthorized copy for purposes of decompiling and reverse engineering a computer program infringes the program's copyright. The availability of injunctive relief as the primary remedy also has the effect of blocking access to program-embodied content that is not protected by copyright law.

The prospect of shielding embodied ideas through enforcement of copyright protection is a byproduct of the policy choice to use copyright law to protect computer programs. The dual benefit that copyright law offers the copyright owner in this instance is not, as some suggest,²⁷ either an intended or generic consequence of copyright law. This dual benefit is a fruit, sweet to some and bitter to others, of the forced adaptation of copyright law to computer programs, and *vice versa*. The very body of law which expressly excludes ideas from its protection also

26. See also *Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823 (10th Cir. 1993); *Brown Bag Software v. Symantec, Inc.*, 960 F.2d 1465 (9th Cir.), cert. denied sub nom. BB Asset Management, Inc. v. Symantec, Inc., 113 S. Ct. 198 (interim ed. 1992); *Sega*, 977 F.2d at 1525; *Atari*, 975 F.2d at 839.

27. Arthur R. Miller, *Copyright Protection for Computer Programs, Databases, and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 978 (1993).

seems to insulate ideas used in copyrighted computer programs from discovery.

Two federal appellate courts recently have held that unauthorized exact copying of a computer program is, in at least some instances, a noninfringing fair use under section 107 of the Copyright Act. The Ninth Circuit opinion in *Sega* contains the most extensively developed judicial analysis on this issue. Discussion both at the University of Dayton School of Law Symposium, "Copyright Protection and Reverse Engineering of Software," and in this Article address the court's conclusion that "where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law."²⁸ The implications of this proposition rightly occupy our attention, as well as the attention of United States' courts and the Member Nations of the European Community.

B. European Community Council Directive on the Legal Protection of Computer Programs

The European Community Council Directive on the Legal Protection of Computer Programs ("Software Directive") establishes a regime of computer program copyright. In scope, it closely resembles the law of the United States in limiting protection of copyright to expression and denying copyright protection to ideas.²⁹ Still, because it focuses on computer programs, the Software Directive differs from our Copyright Act in many respects. Computer programs are the object of all Software Directive statements with respect to the rights of program owners, and of lawful possessors of program copies. This focus on computer programs is nowhere more evident than in Article 6, which specifically states that decompilation without consent may be a noninfringing use.

Article 6 of the Software Directive both requires and limits Member Nation legislative recognition of a right of a licensee of a program copy, or other person authorized to use a program copy, to reproduce and subject a computer program to study and analysis for the purpose of obtaining information. These requirements are limited, however, to where those acts "are indispensable to obtain the information necessary to achieve the interoperability of an independently created program

28. *Sega*, 977 F.2d at 1528. In the same vein, the court elsewhere stated: "[W]hen the person seeking the understanding has a legitimate reason for doing so and when no other means of access to the unprotected elements exists, . . . disassembly is as a matter of law a fair use of the copyrighted work." *Id.* at 1514.

29. See generally Software Directive, *supra* note 3, art. 1.

with other programs. . . .”³⁰ The Software Directive specifically authorizes decompilation, disassembly, or other reverse engineering of program code in circumstances in which “the information necessary to achieve interoperability has not previously been readily available” to the licensee or other person having a right to use the program.³¹ This right or privilege may not be expanded by national legislation,³² and the parties may not negate it by contract.³³

C. Convergence

Two different approaches led the United States and the European Community toward a seemingly common view. Recent federal court decisions that make unauthorized copying for purposes of program decompilation a noninfringing fair use coincide with the policies and provisions set forth in Article 6 of the Software Directive. The *Sega* holding and the terms of Article 6 express similar factual conditions for lawful exercise of the right to make and subject an unauthorized copy to decompilation and reverse engineering. Where applicable, the privilege under both sources of law exists as a matter of right. Still unanswered is whether United States courts will enforce contractual limitation of the privilege or will, by statutory and policy analysis, parallel the prohibition against contractual exclusion expressed in Article 9(1) of the Software Directive.³⁴

These developments, leading to similarities in United States and European protection, evidence a convergence reached through distinctly different decision-making processes. The following substantive analysis of decompilation and reverse engineering of computer programs under United States copyright law presents limits on the possibilities of convergence through the differing processes. This analysis shows that the means that have permitted United States law to move toward the European position could take United States law beyond the limits of Article 6 of the Software Directive without first securing legislative approbation.

30. Software Directive, *supra* note 3, art. 6(1).

31. Software Directive, *supra* note 3, art. 6(2)(b).

32. Software Directive, *supra* note 3, art. 6(3).

33. Software Directive, *supra* note 3, art. 9(1).

34. Software Directive, *supra* note 3, art. 9(1). On the enforceability of contract-based restrictions in United States law, see David A. Rice, *Public Goods, Private Contract and Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering*, 53 U. PITT. L. REV. 543 (1992).

III. LEGAL CONTEXT OF THE INTERMEDIATE COPYING AND DECOMPILATION DECISIONS

A. Computer Programs: Protected Expression and Unprotected Ideas, Processes, Procedures, and Methods of Operation

The cornerstone in each court's opinion was that ideas not protected by patent law are in the public domain and may not be withdrawn by the use of other laws. The underlying principle is expressed in many contexts, most prominently in *Baker v. Selden*³⁵ and section 102(b) of the Copyright Act. The principle also finds expression in recent Supreme Court decisions dealing with Supremacy Clause limits on state protection of ideas and their applications. In *Kewanee Oil Co. v. Bicron Corp.*³⁶ ("Kewanee"), the Court sustained the constitutionality of state trade secret law, not as a means for securing industrial technology for exclusive use, but as a means for maintaining ethical standards and proscribing theft and breach of trust. Federal laws do not enable these means through creation of exclusive rights in patentable or unpatentable subject matter. Indeed, the Court in *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*³⁷ ("Bonito Boats") later held that state law that crosses the line from protecting ethical standards to protecting technology creates a conflict with patent law and policy and, therefore, federal law preempts the state law.³⁸ A point common to the two decisions was that the right to discover trade secrets through reverse engineering was an outcome-critical datum, as the Court held in *Kewanee*.³⁹ Moreover, the Court struck down the statutory prohibition against reverse engineering of boat hull designs in *Bonito Boats*.⁴⁰

Copyright law is both a companion of, and deferential to, patent law. The merger doctrine codified in section 102(b) of the Copyright Act,⁴¹ and related principles developed by the courts,⁴² exclude from copyright protection all subject matter included within the broad reach of section 101 of the Patent Act.⁴³ The public policies underlying those

35. 101 U.S. 99 (1879).

36. 416 U.S. 470 (1974).

37. 489 U.S. 141 (1989).

38. *Id.* at 168.

39. *See* analysis of *Kewanee* in Rice, *supra* note 34, at 577-86.

40. 489 U.S. at 155-57, 159-64, 166-68.

41. 17 U.S.C. § 102(b) (1988).

42. Other factors recognized as limitations on computer program copyright include elements dictated by considerations of efficiency and those dictated by external factors, most commonly operating systems and computer hardware. *Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823 (10th Cir. 1993); *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 707-09 (2d Cir. 1992); *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832 (Fed. Cir. 1992).

43. 35 U.S.C. § 101 (1988).

exclusions are further manifested in the copyright law principle that limits the scope of copyright protection in functional or utilitarian works. So-called "thin protection" limits the use of copyright law to impair access to, and use of, utilitarian or functional expression—that which is textual or otherwise expressive in form, but behavioral or result-producing in its use.⁴⁴ The full panoply of these rules increasingly has been applied with rigor in actions involving alleged infringement of computer program copyrights.⁴⁵

B. Access to Unprotected Subject Matter

Sophistication in the application of copyright principles resulted from difficult cases involving alleged infringement of nonliteral expression contained in copyrighted computer programs. Exact reproduction of all, or substantial parts of, a computer program present comparatively easy cases. Except to the extent that a copied program contains elements in which idea merges with its expression or copied expression consists of material in the public domain, copyright law protects the whole of the original, and the copied program's unauthorized reproduction constitutes infringement.⁴⁶ This protection of the whole original program provided the basis for Sega and Nintendo to utilize copyright law to block intermediate copying. Intermediate copying is a threshold step in the process of reverse engineering of computer programs for the purpose of discovering ideas and other program-embodied content to which copyright protection does not extend. Focusing on the making of an unauthorized exact copy offered the simplest and surest route to obtaining relief for infringement of copyright. Injunctive relief available upon proof of infringement⁴⁷ holds out the secondary benefit of shielding program-embodied ideas that are not themselves copyright-protected.

Lacking the beacon of precedent, trial courts in two cases ruled in favor of the plaintiffs based on a simple proposition: copying is copying, and unauthorized copying infringes the section 106(1) exclusive right

44. *Computer Assocs.*, 982 F.2d at 707-09.

45. *Computer Assocs.*, 982 F.2d at 712; *Brooktree v. Advanced Micro Devices*, 977 F.2d 1555 (Fed. Cir. 1992); *Sega*, 977 F.2d at 1524-25; *Atari*, 975 F.2d at 839-40; *Brown Bag Software v. Symantec, Inc.*, 960 F.2d 1465 (9th Cir.), *cert. denied sub nom.* BB Asset Management, Inc. v. Symantec Corp., 113 S. Ct. 198 (interim ed. 1992); *Apple Computer, Inc. v. Microsoft, Inc.*, 799 F. Supp. 1006 (N.D. Cal. 1992), *modified*, 821 F. Supp. 616 (N.D. Cal. 1993); *Ashton-Tate Corp. v. Ross*, 728 F. Supp. 597 (N.D. Cal. 1989), *aff'd*, 916 F.2d 516 (9th Cir. 1990).

46. *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511 (9th Cir. 1993), *cert. dismissed*, 114 S. Ct. 671 (interim ed. 1994); *Computer Assocs.*, 982 F.2d at 706; *Atari*, 975 F.2d at 839-40.

47. Most importantly, preliminary injunctive relief is available when a party establishes likelihood of success on the merits. The pure, exact-copying infringement action makes establishment of likelihood of success quick and certain.

to reproduce a copyrighted work.⁴⁸ The appellate courts in *Sega* and *Atari* reversed, since literal enforcement of copyright law achieved de facto protection beyond that which the Copyright Act ordinarily secured. Preclusion of copying necessary to decompile and reverse engineer a computer program effectively shielded program-embodied ideas, processes, procedures, and methods of operation from identification and consideration for use in the development of other computer programs. At least in the circumstances presented by these cases, preclusion of copying had the secondary consequence of restricting competition with the owner of copyright by creators of noninfringing, completed programs. Against this background, the courts considered the application of section 107 of the Copyright Act and concluded that acts of intermediate copying constituted fair use.

C. Section 106 and Section 107 of the Copyright Act: Fair Use of Copyrighted Works

Sega and *Atari* were decided under section 107 of the Copyright Act and against a backdrop of judicial struggles with its application. Congress had spoken, statutorily recognizing fair use as a defense to what otherwise would constitute infringement of a copyright owner's exclusive rights under section 106. Although it left application of the provision to the courts on a case-by-case basis, Congress offered guidance in the form of an illustrative statement of fair use purposes and required courts to consider four non-exclusive factors in fair use analyses. Section 107 thus provides:

Notwithstanding the provisions of sections 106 . . . the fair use of a copyrighted work, including such use by reproduction in copies . . . for purposes such as criticism, comment, news reporting, teaching, . . . scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to consider shall include —

- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole;
- (4) the effect of the use upon the potential market for or value of the copyrighted work.⁴⁹

48. *Sega Enters. Ltd. v. Accolade, Inc.*, 785 F. Supp. 1392, 1396-97 (N.D. Cal.), *modified*, No. C-91-3871 BAC, 1992 U.S. Dist. LEXIS 16132 (N.D. Cal. Apr. 8, 1992), *and modified*, 977 F.2d 1510 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am. Inc.*, Nos. C-88-4805-FMS, C-89-0027-FMS, C-89-0824-FMS, 1991 U.S. Dist. LEXIS 5519 (N.D. Cal. Mar. 27, 1991).

49. 17 U.S.C. § 107 (1988).

Courts encountered manifest difficulties in interpreting and applying the section. In one of the two cases that reached the Supreme Court, the district court found fair use and a divided court of appeals reversed. The Supreme Court, by a five-to-four decision, overturned the appellate court's reversal.⁵⁰ In the second case, the district court rejected a fair use defense and a divided court of appeals reversed. The Supreme Court, again by a five-to-four majority, overturned the appellate court's reversal.⁵¹ Still other widely-noted cases have followed a similar course, though not always reaching the Supreme Court.⁵² Two disappointing experiences of trying to fathom the correct application of section 107 led one trial judge, Judge Leval, to formulate and publish lessons learned.⁵³ This venture drew a scholarly critique by Professor Lloyd Weinreb.⁵⁴

The Supreme Court did not make lesson-drawing easy for Judge Leval and other judges. Lower courts bound to follow the Supreme Court in its adherence to congressional direction found the experience a bit confusing. The statutory directive to include consideration of four nonexclusive factors did not deter the majority in *Sony Corp. of America v. Universal City Studios*⁵⁵ ("*Sony*") from limiting its consideration of the statutory factors⁵⁶ or the majority in both *Sony* and *Harper & Row Publishers, Inc. v. Nation Enterprises*⁵⁷ ("*Harper & Row*") from weighing factors serially, but not as a set. Although neither Congress nor precedent dictated, the *Sony* majority read the law previously developed by lower federal courts as establishing rebuttable presumptions that commercial use of a work is not a fair use and that noncommercial use is a fair use.⁵⁸ Further, while the *Sony* Court

50. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984).

51. *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539 (1985).

52. *New Era Publications Int'l, ApS v. Henry Holt & Co., Inc.*, 695 F. Supp. 1493 (S.D.N.Y. 1988), *aff'd on other grounds*, 873 F.2d 576 (2d Cir. 1989), *cert. denied*, 493 U.S. 1094 (1990); *Salinger v. Random House, Inc.*, 650 F. Supp. 413 (S.D.N.Y. 1986), *rev'd*, 811 F.2d 90 (2d Cir.), *cert. denied*, 484 U.S. 890 (1987).

53. Pierre N. Leval, *Toward a Fair Use Standard*, 106 HARV. L. REV. 1105 (1990).

54. Lloyd L. Weinreb, *Fair's Fair: A Comment on the Fair Use Doctrine*, 106 HARV. L. REV. 1137 (1990).

55. 464 U.S. 417 (1984).

56. One commentator asserted that the Supreme Court did not consider either the second or the third prescribed factors in its analysis. Jay Dratler, *Distilling the Witches' Brew of Fair Use in Copyright Law*, 43 U. MIAMI L. REV. 233, 287-88 (1988). An argument can be made that the Court at least briefly touched on the second factor and effectively assumed that the third factor weighed entirely in favor of Universal City Studios, given that home videotaping of television programs reproduced the programs in their entirety. See Pamela Samuelson, *Fair Use for Computer Programs and Other Copyrightable Works in Digital Form: The Implications of Sony, Galoob and Sega*, 1 J. INTELL. PROP. L. (forthcoming 1994).

57. 471 U.S. 539 (1985).

58. *Sony*, 464 U.S. at 449.

determined that copying the entirety of a work might be fair use at least if the purpose is noncommercial, in *Harper & Row*, the Court held that copying (including quotes of conversations) three hundred out of more than 20,000 words from a book for a commercial purpose did not constitute fair use.⁵⁹

The *Harper & Row* Court pronounced that the fourth factor is the most important,⁶⁰ despite legislative history that clearly indicates that Congress deliberately chose not to attach relative weights to statutory factors stated in the section. Linking the fourth factor to the first factor and reiterating the *Sony* statement that commercial use is presumptively unfair, *Harper & Row* also clarified the term “commercial use” in baffling rather than illuminating terms. The Court stated that “the profit/nonprofit distinction is not whether the sole motive of the use is monetary gain but whether the user stands to profit from exploitation of the copyrighted material without paying the customary price.”⁶¹ Finally, at least for now, *Harper & Row* left observers to ponder whether inclusion of a use within one of the “purposes such as” clause of section 107 establishes a presumptive, or stronger, case of fair use defense than might exist for types of uses not listed.⁶²

The limited excursions of the Supreme Court into fair use and interpretation of section 107 have evoked strong criticism. The decisions also have produced confusion among the federal appellate and trial courts. The congressional objective of codifying the court-developed fair use doctrine and providing guidance for its application has led to truly anomalous consequences. The Supreme Court decided one case without considering all of the mandatory factors while attaching presumptive significance to profit-making use, even though none of the statutory factors indicates what weight should be given to any factor-relevant datum. Similarly, *Sony* confined the statutorily-required consideration of potential market impact to the effect of the use on the market for the original work, required proof by a preponderance of evi-

59. *Harper & Row*, 471 U.S. at 569.

60. *Id.* at 561.

61. *Id.* at 562. In other words, “commercial use” includes news reporting and other public-benefiting activities from which a profit is earned. The test of whether those or any other activities constitute a “commercial use” is whether the user will earn a profit without paying a license fee or other compensation for use. Only an authorized use, however, with payment of appropriate compensation, can escape the *Sony* presumption of unfair use where the user stands to earn a profit. This restriction suggests that the owner of copyright has extraordinary power to deny all use, except that which is not-for-profit, for example in cases where the intended use is in a critical or disputing commentary.

62. *Id.* at 561 (use not included in list perhaps not deserving of strong fair use protection). The Supreme Court recently put the issue to rest when it stated that the purpose of the listing is to illustrate, not limit, types of copying that may be fair. *Campbell v. Acuff-Rose Music, Inc.*, 114 S. Ct. 1164, 1170 (1994) (Kennedy, J., concurring).

dence as to any such effects, and alleviated that burden only by indicating that intended use for commercial gain may give rise to a presumption of the likelihood of potential harm.⁶³ Yet, within a year, *Harper & Row* substantially broadened the application of the economic effect factor. Without distinguishing between commercial and noncommercial use, the Court stated that the potential market impact of the use included any potential adverse effect on the marketability of, in this instance, first serialization rights by copyright owners of other works.⁶⁴ Against this backdrop of general confusion in the federal trial and appellate courts, the Ninth and Federal Circuits, respectively, decided *Sega* and *Atari*.⁶⁵

IV. A CLOSER LOOK AT RECENT DEVELOPMENTS IN THE UNITED STATES

A. Introduction

This section presents in some detail the analyses upon which the federal courts in *Sega* and *Atari* determined that a person who lawfully possesses a copy of a computer program may make intermediate copies necessary to decompilation and reverse engineering of program object code. Points reviewed include the legal bases found for recognition of this as a noninfringing fair use under section 107 of the Copyright Act, the purposes considered sufficient for invoking the privilege, and the limits established on the exercise and on the use of the fair use defense of what is learned in the study and analysis of a copyrighted computer program.

63. 464 U.S. at 451.

64. 471 U.S. at 459. The Court's position is not indefensible. Fair use analysis is policy-based and the particular use may be so generic that its recognition as a fair use might establish a widely-applicable limitation of section 106 exclusive rights. The problem in this instance is that the statement cannot simply be made. The statement must be reconciled with language in *Sony* that the Court clearly intended to guard against speculation about whether and to what extent, a particular use may produce market harm. At best, the *Harper & Row* account of potential effects on the market for other works and their economically exploitable derivations should have been treated as another, fifth, permitted factor. Wrapping this broader consideration into what *Harper & Row* characterized as the single most important factor for consideration in fair use analysis is, first, at odds with the statutory language, which specifically focuses on the market for the particular work. Second, it moves necessarily speculative appraisal into what the Court regarded as the core assessment.

65. The experience of judges has led several of them to write on the subject. Notable commentaries include Leval, *supra* note 53. The current focus of the fair use controversy is on the parody use of a work. See *Acuff-Rose Music Co. v. Campbell*, 972 F.2d 1429 (6th Cir. 1992), *rev'd*, 114 S. Ct. 1164 (interim ed. 1994).

B. Sega Enterprises Ltd. v. Accolade, Inc.

The United States Court of Appeals for the Ninth Circuit recognized in *Sega Enterprises Ltd. v. Accolade, Inc.*⁶⁶ that Accolade's use was commercial in purpose and character and that "the fact that copying is for a commercial purpose weighs against a finding of fair use."⁶⁷ Still, the court rejected Sega's claim that copying Sega's object code for the commercial purpose of providing competing game cartridges conclusively established that Accolade's use was unfair.⁶⁸

The court also rejected other arguments for exclusion of Accolade's fair use claim. Specifically, the Ninth Circuit bluntly rejected, as verging on the frivolous, the argument that section 117 expresses a determination that the only fair uses of computer programs are those specified by that section.⁶⁹ In addition, the court found erroneous Sega's claim that enactment of section 906 of the Semiconductor Chip Act⁷⁰ in 1984 showed that Congress did not intend computer program object code decompilation to be recognized as a fair use. The court found Congress' failure to amend the Copyright Act to authorize decompilation necessary to reverse engineering when it enacted the reverse engineering authorization in section 906 to be wholly irrelevant.⁷¹ Congress, according to the *Sega* court, enacted *sui generis* protection for masks works because the essentially utilitarian articles fit within neither patent nor copyright protection, even though programs fixed in semiconductor chips were, and remain, protected by copyright law.⁷² The provision for reverse engineering reflected prevailing practices and expressed needs in the particular industry, not a determination that a separate statute was necessary because decompilation is impermissible under the Copyright Act.⁷³ Similarly, the court concluded that the statutory language and legislative history of the Chip Act provided no support for the claim that failure to amend the Copyright Act to add a provision that paralleled section 906 expressed an intent that the Copyright Act be interpreted as precluding computer decompilation and disassembly.⁷⁴

Focusing on application of section 107, the Ninth Circuit noted that the presumption that a commercial use is not a fair use is rebutta-

66. 977 F.2d 1510 (9th Cir. 1992).

67. *Id.* at 1522.

68. *Id.*

69. *Id.* at 1520-21.

70. 17 U.S.C. § 906 (1988).

71. *Sega*, 977 F.2d at 1521.

72. *Id.*

73. *Id.*

74. *Id.*

ble. Based upon consideration of countervailing factors, the court in fact concluded that the first factor weighed in favor of finding fair use even though the purpose and character of Accolade's use was commercial.⁷⁵ This conclusion had two bases. The first basis recognized that Accolade's purpose was to allow consumers to use its own game programs on the Sega Genesis III game player console through writing and using interface code necessary to making its games interoperable with the Genesis III.⁷⁶ While it made an intermediate copy of Sega's object code, the court emphasized that Accolade did so for the purpose of studying functional elements about which necessary information was unavailable without reverse engineering.⁷⁷ The court viewed Accolade's use as narrowly focused, non-exploitative, and of minimal significance as a commercial use.⁷⁸

The intention to compete, as opposed to market effects of the use,⁷⁹ ordinarily would seem to counter this conclusion. The Ninth Circuit concluded, however, that the public benefit resulting from a commercial use is a factor worthy of consideration even if the objective and consequence of the use is economic gain.⁸⁰ The court viewed the increase in availability of independently created game programs resulting from Accolade's achievement of functional compatibility as serving the copyright policy of promoting the creation and dissemination of original works as a public benefit.⁸¹ Taking into account its determination that intermediate copying alone was of minimal commercial significance and on considering public benefits resulting from Accolade's use, the court found that Accolade successfully rebutted the presumption created by commercial use. Therefore, the first factor weighed in favor of a finding of fair use.⁸²

Consideration of the closely related fourth factor extended the court's finely drawn analysis. Importantly, the Ninth Circuit stated that evaluation of the effect of a use on the potential market for the first work "accommodates the distinction between the copying of works in order to make independent creative expression possible and the simple exploitation of another's creative efforts."⁸³ The court recognized the fourth factor, which has been characterized as the most impor-

75. *Id.* at 1522-23.

76. *Id.* at 1522.

77. *Id.* at 1522-23.

78. *Id.*

79. Market effects are considered under the fourth section 107 factor.

80. *Sega*, 977 F.2d at 1523.

81. *Id.*

82. *Id.*

83. *Id.*

tant,⁸⁴ as possibly being dispositive where the use “effectively usurped the market for the copyrighted work by supplanting that work.”⁸⁵ The court distinguished this use, however, from a use that merely facilitates entry into the market for goods of the same type as the copyrighted work.⁸⁶ Critical to the court’s analysis was that Accolade sought to market independently created game programs. While recognizing that this might affect the market for other Genesis III compatible programs, the Ninth Circuit emphasized that Accolade’s games generally were not so similar to Sega’s that they were likely to supplant them in the market.⁸⁷ More pointedly, the court stated that the existence of some potential market effects “cannot constitute a strong equitable basis for resisting the invocation of the fair use doctrine” because use of copyright protection to make competition impossible is at odds with the copyright policy of generally promoting creative expression.⁸⁸ Overall, the court concluded that the critical fourth factor also weighed in favor of fair use.⁸⁹

A major, and likely controversial, part of the *Sega* analysis focused on the nature of the copyrighted work. Under the second factor, the court found that case law clearly indicated that the level of protection differed for various types of copyrighted works, so the court concluded that the computer programs had to be addressed in this light. Consistent with *Computer Associates*,⁹⁰ the court took into account the utilitarian, or task-accomplishing, character of computer programs and the fact that some program elements “are dictated by the function to be performed, by considerations of efficiency, or by external factors such as compatibility requirements and industry demands.”⁹¹ The court credited Sega’s point that Accolade engaged in “wholesale copying” in making intermediate copies,⁹² but emphasized that the nature of computer programs made decompilation essential to gain access to and to study unprotected ideas and functional elements of this type of work.⁹³ The Ninth Circuit rejected Sega’s contention that Accolade had not

84. *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 566 (1985).

85. *Sega*, 977 F.2d at 1523 (citing *Harper & Row*, 471 U.S. at 567-69).

86. *Id.*; see also *Lewis Galoob Toys, Inc. v. Nintendo of Am., Inc.*, 964 F.2d 965, 970-71 (9th Cir. 1992), *cert. denied*, 113 S. Ct. 1582 (interim ed. 1993); S. REP. NO. 473, 94th Cong., 1st Sess. 65 (1975).

87. *Sega*, 977 F.2d at 1523.

88. *Id.* at 1523-24.

89. *Id.* at 1524.

90. *Id.* (citing *Computer Assocs. Int’l, Inc. v. Altai, Inc.*, 982 F.2d 693 (2d Cir. 1992)).

91. *Id.* at 1525.

92. *Id.* This “wholesale copying” is principally a third factor point, but the *Sega* court considered it under the second factor in a way that weighed the “other side of the coin” implications of the datum.

93. *Id.* at 1526.

demonstrated that other means for ascertaining these unprotected elements were not available.⁹⁴ The court especially emphasized that “*translation* of a program from object code into source code cannot be accomplished without making copies of the code.”⁹⁵ Since the internal interface procedures were not externally observable and were distributed only in object code that was contained in game cartridges and was, in any event, not readable by humans, the nature of the copyrighted work was found to require intermediate copying as a step in ascertaining the unprotected elements of the copyrighted works.⁹⁶ The copyright policy expressed by section 102(b) was relevant here, although the court rejected it as an independent basis for a privilege to make intermediate copies for purposes of decompilation and reverse engineering. Specific to this consideration, the Ninth Circuit noted that the Genesis III console was not patented. The court emphasized that *Bonito Boats* teaches that securing a patent is the sole way for achieving a monopoly over an “idea or functional principle underlying a work.”⁹⁷ The court found, ultimately, that the second factor supported a finding of fair use.

The court determined that only the third factor weighed against fair use, yet the Ninth Circuit’s reasoning behind not heavily weighing this factor against fair use is almost certain to be as controversial as its second factor reasoning. Full and exact copying clearly established that the quantitative extent and qualitative substantiality of copying weighed against fair use by *Accolade*.⁹⁸ However, the court discounted the significance of this factor in relation to the others because of the limited ultimate use by *Accolade*.⁹⁹ This conclusion was as novel and significant as the court’s examination and consideration of the nature of computer programs under the second factor. Rather than looking only to the copying, which the Ninth Circuit characterized as the direct use, the *Sega* court took into account and discounted for what it called *Accolade*’s ultimate use of the copied work.¹⁰⁰ The interplay between the treatment of this factor and the first factor in the particular circumstances seems unusual, but not unlike the more common interplay between the first and fourth factors in commercial use cases.

The court recognized that its determination that *Accolade*’s use constituted a fair use could be viewed as “incongruous” by those famil-

94. *Id.*

95. *Id.*

96. *Id.*

97. *Id.*

98. *Id.*

99. *Id.* at 1526-27.

100. *Id.*

iar with fair use in other contexts. The court reiterated that computer programs differ in important aspects from more traditional literary works and proffered that those differences were facts and circumstances to which a fair use analysis must respond.¹⁰¹

Equally important, the court drew upon the foundations of the fair use doctrine in invoking the policies underlying the statute. Almost as an additional factor that overarched all others, the court considered the familiar policy of private incentive to creation for the purpose of securing the public benefit of the dissemination of creative works.¹⁰² Sega's arguments that its investment of effort, time, and money in development of the Genesis system and compatible game cartridges were factors to be weighed in an equitable fair use analysis were discounted by reference to *Feist Publications, Inc. v. Rural Telephone Co.*¹⁰³ ("*Feist*") and its rejection of the sweat-of-the-brow justification for copyright.¹⁰⁴

Although finding Accolade's use was fair, the Ninth Circuit followed a classic, though often ignored, tradition by tailoring its holding to the facts of the case. Clearly stating that it was unwilling to recognize a blanket privilege to make intermediate copies for the purpose of program object code decompilation and reverse engineering,¹⁰⁵ the court concluded that "where disassembly is the only way to gain access to ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, *as a matter of law*."¹⁰⁶ Even so, the court cautioned, ultimate use is limited to ascertained ideas and functional elements; taking and using protected expression revealed by decompilation or disassembly remains subject to a claim for copyright infringement.¹⁰⁷

C. *Atari Games Corp. v. Nintendo of America, Inc.*

*Atari Games Corp. v. Nintendo of America, Inc.*¹⁰⁸ featured a far less extensive Federal Circuit analysis of intermediate copying for purposes of decompilation and reverse engineering as a fair use. An interesting sidelight is that the court dealt with the fair use defense *sua sponte* after first affirming the district court's determination that

101. *Id.* at 1527.

102. *Id.*

103. 499 U.S. 340 (1991).

104. *Sega*, 977 F.2d at 1527.

105. *Id.* at 1519-20.

106. *Id.* at 1527-28 (emphasis added).

107. *Id.* at 1528.

108. 975 F.2d 832 (Fed. Cir. 1992).

Nintendo likely would succeed in showing infringement by Atari.¹⁰⁹ The prologue to the court's section 107 analysis set forth the core policies of copyright law, especially the interests of promoting the dissemination of ideas and encouraging others to "build freely upon the ideas and information conveyed by a work."¹¹⁰ Furthermore, the court drew attention to the limits of copyright as expressed in section 102(b) and in binding authority.¹¹¹ This background established the base for stating that "[t]he Copyright Act permits an individual in rightful possession of a copy of a work to undertake necessary efforts to understand the work's ideas, processes, and methods of operation. This permission appears in the fair use exception to copyright exclusivity."¹¹²

The court's analysis, like the Ninth Circuit's in *Sega*, placed emphasis on the fact that computer programs are a product of technological innovation and the teaching that "[w]hen technological change has rendered its literal terms ambiguous, the Copyright Act must be interpreted in light of [its] basic purpose."¹¹³ This emphasis made the nature of the copyrighted work, the second of the section 107 factors, the court's focus and starting point—an echo of the Ninth Circuit's extensive examination of the significance of the technology for purposes of applying section 107 in light of copyright policy.¹¹⁴ The Federal Circuit concluded, without analysis beyond the foundation it had laid, "[w]hen the nature of a work requires intermediate copying to understand the ideas and processes in a copyrighted work, that nature supports a fair use intermediate copying."¹¹⁵ Next, the court stated "reverse engineering object code to discern the unprotectable ideas in a computer program is a fair use."¹¹⁶

The balance of the analysis was cryptic. Within a single paragraph, the Federal Circuit dealt with the first, third, and fourth factors. The core of the analysis of each factor was an emphasis that fair use intermediate copying and reverse engineering is limited to discerning ideas and other unprotected subject matter only. This emphasis was directly expressed in statements that this use "does not justify extensive efforts to profit from replicating protected expression" or constitute "an

109. *Id.* at 842.

110. *Id.* (quoting *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 349 (1991)).

111. *Id.* (citing *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141 (1989); *Arythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992)).

112. *Id.*

113. *Id.* at 843 (quoting *Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156 (1975)).

114. *Id.* at 843.

115. *Id.*

116. *Id.*

invitation to misappropriate protectable expression.”¹¹⁷ Specific to the first and fourth factors, the court declared that “fair use in intermediate copying does not extend to commercial exploitation of protected expression.”¹¹⁸ The articulated points closely tracked the *Sega* reasoning, yet the opinion lacked a close factor-by-factor analysis generally expected in this ground-breaking decision. This lack of an explicit analysis most likely reflected the fact that the court’s fair use discussion was not merely *sua sponte* (and presumably unbriefed), but dictum, because the court determined that improper conduct by Atari in acquiring a copy of Nintendo’s 10NES program made Atari’s possession not rightful.¹¹⁹

V. SCOPE OF RIGHT TO MAKE AND DECOMPILE PROGRAM COPY

The Software Directive and recent judicial decisions, most specifically *Sega*, combine recognition of a right to make and decompile a computer program with actual or apparent limitations. A literal reading of both Article 6 and the *Sega* holding indicates that the law makes ideas embodied in computer programs *inaccessible* except where: (1) the ideas are disclosed to the public by the copyright owner; (2) the ideas are ascertained through observation of program behaviors;¹²⁰ (3) other means of access to the ideas are provided or authorized by the copyright owner; or (4) the progenitor of invention, i.e. necessity, justifies reverse engineering for the purpose of ascertaining those ideas critical to the creation of an otherwise original, interoperable program. Article 6 of the Software Directive prohibits Member Nations from expanding the privilege created by that Article while other provisions make it impermissible to contractually derogate the provisions of Article 5(3) or Article 6(3).¹²¹

Distribution of a program in machine-readable object code and registration for copyright under the special deposit rules of the U.S. Copyright Office limits cases of disclosure to those in which deliberate action leads to general or limited disclosure. While it is true that much can be discerned from close observation of program behaviors, there is much detail that ordinarily is not determinable or inferable from be-

117. *Id.*

118. *Id.*

119. *Id.*

120. Software Directive, *supra* note 3. Article 5(3) of the Software Directive separately establishes this method of ascertaining ideas. *Id.* art. 5(3). The drafters originally proposed Article 6 as an extension of the text and content of Article 5(3), but gave Article 6 separate status before adoption of the final version of the Software Directive. *Id.* art. 6. Critics of *Sega* generally claim that observation is permissible, and should be the limit of the legally permissible means of ascertaining ideas.

121. Software Directive, *supra* note 3, art. 9(1).

havior observation. Some operating system and application program developers do provide information, or access to information, to selected third parties. These third parties include, but are not limited to, independent developers of applications for an operating system and creators of applications that enhance the use—and the market position or prospects—of an application program. This controlled sharing of ideas embodied in a program typically is pursuant to a nonexclusive license that authorizes some, and prohibits other, uses of the program code and ideas embodied therein.

Necessity, the fourth means of information acquisition validated by recent United States judicial decisions and Article 6 of the European Council Directive on the Legal Protection of Computer Programs (Software Directive), creates a privilege to gain access to program content without consent of the copyright owner. Recognition of the privilege responds to the fact that copyright enforcement can effectively shield ideas and other unprotected matter embodied in a computer program, but not protected by copyright law. Viewed in broadest terms, this privilege corrects for market failures or externalities that result in information access not being provided or made available under one the first three alternatives.

Bounding the right to copy and decompile was the focus and product of extensive debate and negotiation leading to the May, 1991 adoption of the Software Directive.¹²² The proper interpretation of the specific language of the Article continues to draw much attention and to generate controversy.¹²³ There has been too little time to date for comparable dissection and debate of the *Sega* holding and reasoning so far as it speaks of conditions under which intermediate copying and decompilation constitute a noninfringing fair use as a matter of law. *Sega* can be variously read as stating that the listed conditions always must be met, as stating that the listed conditions must be met in order to be entitled *as a matter of law* to make and decompile a program copy, or as merely stating the holding in terms of the adjudicated facts. This Article later explores these alternative views of the *Sega* holding in the analysis of the prospective implications of *Sega* and *Atari*. The sole purpose here is briefly to fill out the dimensions of recent develop-

122. See Paul B. Arenas, Comment, *Implementation, Compliance and Enforcement: The European Community Directive for the Legal Protection of Software*, 5 TRANSNAT'L LAW 803, 815-16 (1992); Paul G. Hidalgo, Comment, *Copyright Protection of Computer Software in the European Community: Current Protection and the Effect of the Adopted Directive*, 27 INT'L LAW 113, 139-40 (1993); Charles R. McManis, *Intellectual Property Protection and Reverse Engineering of Computer Programs in the United States and the European Community*, 8 HIGH TECH. L.J. 26 (1993); Note, *Intellectual Property Law for Reverse Engineering Computer Programs in the European Community*, 9 COMPUTER & HIGH TECH. L.J. 248, 255-57 (1993).

123. Note, *supra* note 122, at 250-51.

ments as a basis for their discussion in the immediately following parts of this Article.

VI. LITERAL COPYRIGHT: THE CASE AGAINST DECOMPILATION AND REVERSE ENGINEERING

A. *Taking the Copyright Act Literally*

At least five arguments in favor of prohibiting reverse engineering are anchored in the amended text of the 1976 Copyright Act and the subsequent congressional inaction.¹²⁴ The first position argues that the statute does not condition copyright on disclosure or on providing access to the content of protected expression. The second argument maintains that section 106 grants copyright owners not only an exclusive right to reproduce, but also a right to authorize reproduction and to deny permission to reproduce. The third argument states that Congress' failure to act, except for the amendment to section 117, indicates that Congress chose not to limit computer program copyright to prevent enforcement of copyright to shield program content not protected by the statute. The fourth position maintains that nothing in the legislative history of either the 1976 Act or the computer amendments of 1980 indicates that Congress intended computer programs to have protection that differed from that of other literary works. The fifth, and final, argument notes that nothing in the legislative history of section 107 or the 1980 amendments suggests that Congress considered decompilation or reverse engineering of computer programs, or making unauthorized copies incident thereto, to be a fair use.

The first argument lacks all but superficial appeal. The issue is not, as it has been characterized,¹²⁵ whether disclosure or provision of access is a precondition of copyright protection. The protection issue is whether a copyright may be used affirmatively to prevent access to ideas, processes, methods of operation, principles, or other work-embodied subject matter that section 102(b) expressly denies copyright protection.

The weakness of the second argument is equally evident. This argument speaks narrowly to so-called intermediate copying and asserts that section 106(1) vests a copyright owner with absolute authority to permit or deny any and all reproduction. This proposition is sheer soph-

124. A sixth argument, raised by Sega in *Sega*, is not included here because it depends on finding Copyright Act meaning from the 1984 enactment of the Semiconductor Chip Protection Act. See *infra* notes 177-81 and accompanying text. The claim, in essence, is that inclusion of a reverse engineering privilege in the *sui generis* chip protection act established that Congress understood that decompilation and reverse engineering, an industry-wide practice in the semiconductor chip industry, was impermissible and could not be accommodated under the Copyright Act.

125. See Miller, *supra* note 27.

istry. This argument disassociates fair use from unauthorized use, and excises from section 106 and section 107 their complementary cross-references.

The third argument rests on the proposition that congressional inaction shows an intention that ownership of a computer program copyright supports legal enforcement of statutory rights for the purpose of shielding program-embodied material excluded from copyright protection by section 102(b). This proposition sets up a conflict between congressional intention implied from a failure to act, speak, or enact and congressional intention expressed in an historically deep-rooted, statutory provision that states "[i]n no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, [or] method of operation . . . regardless of the form in which it is . . . embodied in such work."¹²⁶ This provision continues that whether or not this content can be withdrawn from or shielded against the domain of ideas historically "is the province of letters-patent, not copyright."¹²⁷ Given the conflict between an expressed and an implied congressional intention, there is nothing to the third argument. Straightforward statement of the argument¹²⁸ would doom it to swift judicial burial.

The fourth argument further belies the third. The claim that nothing in the legislative history of the 1976 Act and its amendments indicates that Congress intended computer programs to have protection different from that of other literary works ignores the consequence common to each claim. Making computer programs invulnerable to decompilation and reverse engineering effectively gives computer programs substantially greater protection than other literary works. The essence of the third claim, for example, is that Congress impliedly intended that computer programs, by virtue of their technological attributes, receive—from nominally equal application of copyright to all literary works—two elements of protection. The first element is protection of expression, in common with books and other traditional literary creations. The second element is something additional: the right to use copyright to insulate program-embodied material, not entitled to the protection of copyright, from being known, studied, or used by competitors and others. Rejection of this argument is not grounded in any argument that the content of computer programs must be disclosed because disclosure is inherent in the dissemination of most other

126. 17 U.S.C. § 102(b) (1988).

127. *Baker v. Selden*, 101 U.S. 99, 102 (1879).

128. The essence of the claim is that Congress impliedly intended that computer programs, by virtue of their technological attributes, receive—from nominally equal application of copyright to all literary works—far greater protection than books and other traditional literary creations.

literary works. The point is no more, and no less, that the protections common to all literary works are for statutory subject matter only.

The fifth argument, alone, recognizes that section 107 operates as a limitation on section 106. It accepts that section 107 exists, but asserts that it is inapplicable in this context. The basis for this claim is that nothing in the legislative history of the 1976 Act or its amendments specifically affirms that decompilation or reverse engineering of computer programs, or making unconsented copies incident thereto, is, or may be, a fair use. The nature of this argument is that the statute does not permit judicial application of the fair use doctrine to any use not dealt with by the courts prior to 1976 if that use was not foreseen and remarked upon by committees or members of Congress when enacting section 107 or later legislation. The claim, on its face, is at odds with the equitable origins and adaptive case-by-case development of the fair use doctrine. More important, this argument neglects the existing legislative history. Among other things, the recorded history indicates awareness that courts will be called upon to apply the fair use doctrine in cases involving developing or new technologies.¹²⁹ Appreciation of this and similar factors led Congress to statutorily recognize fair use as a limitation on section 106 rights and to set forth analytical guidelines thought to be suitable for case-by-case use in the highly variable circumstances in which the doctrine might eventually be applied.¹³⁰

Whether intermediate copying necessary to computer program decompilation and reverse engineering actually is a fair use is a much different question from the question addressed in the preceding paragraph. *Sega* and *Atari* concluded that it is a noninfringing use in at least some circumstances. The following section speaks to a recent and prominent criticism of this view.

B. Criticism of the Fair Use Analysis in Sega and Atari

Professor Arthur R. Miller authored perhaps the most widely read, and potentially most influential, critique of the fair use analysis.¹³¹ Professor Miller, a CONTU Commissioner, expresses deep concern that reverse engineering of program code is, in at least some instances, not so much a means for discovery of program-embodied ideas and processes as it is a cloak for taking and commercially using propri-

129. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 66 (1976).

130. *Id.*

131. See generally Miller, *supra* note 27. Among other important critiques is Anthony L. Clapes, *Confessions of an Amicus Curiae: Technophobia, Law and Creativity in the Digital Arts*, 19 U. DAYTON L. REV. 903 (1994); see also Christopher W. Hager, Note, *Apples and Oranges: Reverse Engineering as a Fair Use After Sega v. Accolade and Atari v. Nintendo*, 20 RUTGERS COMPUTER & TECH. L.J. 259 (1993).

etary expression and other subject matter of a proprietary nature.¹³² Thus, he views decompilation and study of program code as diminishing the protection of copyright in a consequential, not merely formal, sense.

Professor Miller's critique is part of a broader response to CONTU critics. He addresses four arguments made against strong copyright protection for computer programs, including the arguments that literal application of copyright unjustifiably prevents access to program content not protected by copyright and creates barriers to achieving public benefits through standardization efficiencies.¹³³ The "access" and "standardization" criticisms are the primary and secondary themes in Professor Miller's discussion of *Sega* and *Atari*.

Prior to dealing specifically with those cases, Professor Miller generally responds to access-proponent arguments. He argues that computer programs are quite similar to musical compositions, untranslated foreign language writings, and other works that the ordinary observer cannot decipher without translation, performance, or execution by experts to whom the work is decipherable or comprehensible.¹³⁴ He then observes that a computer program clearly contains protectable expression "independent of its output."¹³⁵ The first point does not speak in any way to use of copyright to foreclose access. Assertion of the second point is truly baffling. This proposition also says nothing about access and, most confusingly, seems to equate a program's internal components with its output.

Professor Miller also asserts that copyright law does not require that protected expression must be communicated to or understandable by any given audience.¹³⁶ He notes, specific to this contention, that deposit is not a strict condition of copyright protection.¹³⁷ He further states that the Copyright Office adopted a regulation that permits partial deposits in connection with registration of computer program copyrights and provides further relief as necessary when deposit would dis-

132. Miller, *supra* note 27, at 1014, 1027.

133. Miller, *supra* note 27, at 989-90. The two other arguments against strong protection to which Professor Miller speaks are the following: (1) strong protection extends copyright to the protection of functionality, not just expression; and (2) judges and other actors are not competent to understand sufficiently the technology, its creators, and the industry to apply properly the law of copyright to the technology.

134. Miller, *supra* note 27, at 989.

135. Miller, *supra* note 27, at 989.

136. Miller, *supra* note 27, at 989.

137. Miller, *supra* note 27, at 989. In support of this contention, Professor Miller cites 17 U.S.C. § 407(a) (1988), which specifically states that compliance with its provisions is not a condition of copyright protection. *Id.* The purpose of the provision is to set forth requirements for deposit in connection with the registration, not the existence, of copyright.

close program-embodied trade secrets.¹³⁸ True, the ultimate aim of copyright law is dissemination for the benefit of the public, not patent-like public disclosure of ideas, processes, and methods of operation themselves. Further, copyright protection exists irrespective of its registration, and partial deposit facilitates registration without risk of losing state law protection for program-embodied trade secrets through disclosure. Yet absolutely none of this speaks, in the end, to affirmative use of copyright protection and its partial deposit rule to make otherwise lawful conduct unlawful. Nor does this argument face the fact that trade secret and other embodied know-how discovery through third party reverse engineering is lawful and defeats trade secret protection.¹³⁹ A necessary consequence of accepting this argument is a failure to acknowledge the implications of the Supreme Court decisions in *Kewanee*¹⁴⁰ and *Bonito Boats*.¹⁴¹ Rather, the argument leaves, for at least non-expert readers, the inference that the special deposit regulation was intended to establish a regime of federal trade secret protection for computer programs. This inference is, of course, not correct. The regulation is a tailored response to potential state law consequences of meeting a disclosure requirement where relaxing the requirement does not compromise a critical element of applicable federal law.¹⁴²

Professor Miller constructs much of his specific critique of *Sega* and *Atari* on this foundation, and he often builds the structure erected on this base in much the same style. His preliminary description of decompilation and its uses is an example of the latter. This description begins by soundly distinguishing decompilation as a process for re-rendering object code into a human-readable form and reverse engineering as a process of analysis and study in which decompilation is but one of the tools that might be used.¹⁴³ He follows this with a quite accurate statement that “reverse engineering” is “a term that embraces the creation of a functionally equivalent work—often for the purpose of selling it as a less expensive commercial substitute for the original.”¹⁴⁴ This proposition, unfortunately, is footed to a statement that selectively lists “legitimate” uses of reverse engineering specific to computer programs, a list that unsurprisingly omits the use recognized by the *Sega* and

138. Miller, *supra* note 27, at 989-90.

139. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476 (1974).

140. *Id.*

141. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141 (1989).

142. In contrast, disclosure is central to patent law and its policy. It is the *quid pro quo* for gaining statutory protection. *Kewanee*, 416 U.S. at 480-81.

143. Miller, *supra* note 27, at 1014.

144. Miller, *supra* note 27, at 1014.

Atari decisions. This omission powerfully intimates that, as a general matter, it is established that reverse engineering for the purpose of creating and selling a competitively-priced functional equivalent of the original item—in this instance a computer program—is legally or ethically “illegitimate.”¹⁴⁶ Professor Miller cites no authority to support what any student of United States intellectual property law would instantly recognize to be a patently untenable implication as a matter of law.¹⁴⁶

This flawed table-setting is followed by a second, and last, introductory paragraph which distills to the following points: (1) decompilation infringes one or more exclusive rights of the copyright owner;¹⁴⁷ (2) reverse engineering, as a separate and distinct process, violates the same exclusive rights when the product of reverse engineering is sub-

145. Professor Miller distinguishes between reverse engineering for the purpose described in the text and “[l]egitimate uses of reverse engineering,” uses such as “recreating lost source code and debugging programs.” Miller, *supra* note 27, at 1014 n.174.

146. The major issue in the current debate is whether reverse engineering of computer programs is legitimate for all purposes, some purposes, or no purposes. A flat declaration of what is and what is not legitimate is, in that circumstance, statement of a conclusion, not of a fact. It is a statement that has substantial potential to mislead readers not intimately familiar with the body of law that gives meaning to the concept of “reverse engineering”—state trade secret law. That body of law makes no distinction of the kind implied by Professor Miller, and its allowance of reverse engineering as a lawful means of trade secret discovery was actually decision-critical to state law withstanding constitutional challenge in *Kewanee*. 416 U.S. at 476, 480-81, 490.

Indeed, the United States Supreme Court in *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141 (1989), further held that a state legislature may not permit some, and prohibit other, methods of reverse engineering product-embodied know-how or trade secrets. Relative to the present topic, the object of the specific reverse engineering method that Florida impermissibly outlawed was *exact* reproduction of subject matter not protected by patent or copyright.

147. Professor Miller writes, “The process of decompilation, particularly when paper versions or other ‘intermediate’ copies of the protected work are produced, violates the copyright proprietor’s exclusive rights to copy, reproduce, and, in many cases, the rights to translate or to prepare other derivative works.” Miller, *supra* note 27, at 1024. The direct statement is that decompilation violates statutory rights of a copyright owner, *particularly* where it results in the making of a paper or digital copy. This interpretation, perhaps, was not the intended meaning. Most certainly, no right is violated unless decompilation results in making a copy—the right to copy and the right to reproduce listed by Professor Miller are synonymous, not distinct. Further, the “right” to translate is within the statutory right to reproduce; it is neither a separate right nor included within the right to prepare a derivative work.

None of this is to say that decompilation does not ordinarily, if not even always, involve reproduction of the original program. Indeed, decompilation likely will involve more than one reproduction, for example, making a copy not specifically authorized by the copyright owner for use as input in the process of decompilation and making a copy, similarly not specifically authorized, by what Professor Miller describes as “re-rendering” the object code input into an output of human-readable source code equivalent. The objections stated in the preceding paragraph go not only to the conjunctive listing of the same rights several times so as to lend the impression that several rights, rather than one, are infringed, but also to the potential substantive confusion that may be sown by the grammatical structure of the quoted sentence.

stantially similar to the original work.¹⁴⁸ Non-expert readers might well wonder what more could be asked, especially where the directly following discussion of decompilation and fair use (1) restated these points and (2) in no way made clear that “fair use” is a copyright law limit on the rights that the copyright law otherwise vests in a copyright owner.¹⁴⁹ This especially is so given that Professor Miller does not make it clear, in this context, that the courts in *Sega* and *Atari* made it abundantly clear that practitioners of reverse engineering may not use the fruits of their access and labors to create works in which the expression is substantially similar to expression in the original work.

The subsequent, more direct, discussion of *Atari* and *Sega*¹⁵⁰ explains Professor Miller’s conclusion that, while the decisions narrowly restricted intermediate copying for the purpose of decompilation, the courts wrongly decided that the acts in question constituted fair use under section 107. The treatment of whether section 107 permits intermediate copying necessary to access heavily emphasizes that the underlying act of copying trenches upon a copyright owner’s exclusive rights

148. Miller, *supra* note 27, at 1024. Professor Miller states, “The separate process of ‘reverse engineering’ seems to violate the same rights, particularly the exclusive right to prepare derivative works, when the product of the reverse engineering is substantially similar to that of the original copyright proprietor’s work.” *Id.* at 1014. The “product” of which Professor Miller writes is not further defined, but presumably means some end product rather than the one generated by decompilation since he writes here that reverse engineering itself infringes copyright. It is most difficult to see how the process, as Professor Miller’s primary thought states, infringes in a manner distinct from how decompilation—as an integral element of that or any other endeavor—alone might infringe. As to a product, such as a computer program, that is created based upon what is discerned through reverse engineering, the product would not infringe, of course, if the substantial similarity is limited to ideas, processes, and the like, which section 102(b) of the Copyright Act expressly excludes from copyright protection. Further, even if a resulting computer program does infringe copyright because it is substantially similar to the original work in its expression, it is more correct to state that the resulting work rather than the process of studying the original is the product that infringes.

149. Section 106 expressly provides that the rights it defines as being comprised in copyright are subject to the provisions of section 107, 17 U.S.C. § 106 (1988), and section 107 begins its recognition of “fair use” with the statement, “Notwithstanding the provisions of Section 106.” *Id.* § 107. Fair use, in short, transforms what ordinarily would infringe into a noninfringing use.

150. This discussion was preceded by a preliminary statement that earlier cases appear to “establish a presumption that decompilation itself is an infringement, independent of any finding of substantial similarity between the defendant’s final product and the original.” Miller, *supra* note 27, at 1014. It is, of course, a predicate to consideration of the section 107 “fair use” defense that some act infringing a section 106 exclusive right has been shown or admitted, whether the infringement is copying by creating re-rendered source code equivalent through decompilation or the unauthorized reproduction of an object code copy of the program for use as input in the process of decompilation. This point will be discussed further, *infra*, especially with respect to Professor Miller’s questioning, at several points, how the *Sega* and *Atari* courts could even consider the possibility that reproduction of copy is a non-infringing fair use. This consideration is problematic since the courts already had stated that making an “intermediate copy” without copyright owner authorization constituted infringement of the section 106(1) exclusive right to reproduce, or authorize others to reproduce, the original work.

under section 106. No attention is given to ensuring that readers understand that copyright and patent law create limited exceptions to the broader right to freely use and copy ideas and their expression. More narrowly, Professor Miller thematically stresses that section 106 rights are exclusively the copyright owner's and silently dismisses that, under the Copyright Act, "exclusive" also means "only" and that all section 106 rights to exclude are expressly stated to be further subject to section 107 through section 120 limitations. Viewing *Sega* and *Atari* through this two-dimensional lens unsurprisingly leads Professor Miller to conclude that use of section 107—or any legal authority—to permit decompilation or access unlawfully "deprives" copyright owners of rights¹⁵¹ or secures claimed social benefits "at the expense of copyright owners."¹⁵²

This appropriation-like critique is not limited to alleged reduction, or taking, of rights in expression. Professor Miller also points out, and inferentially decries, that decompilation or disassembly presents a risk "that the protection of 'trade secrets' embedded in computer programs would be impaired if . . . they could be decompiled freely."¹⁵³ This statement masks the general understanding that reverse engineering is universally recognized as a lawful means for discovering trade secrets. This recognition was a fact critical to the Supreme Court determination that federal patent law does not preempt state protection of trade secrets.¹⁵⁴ Similarly, *Bonito Boats* preempted a state statutory prohibition against use of the most efficient means for reverse engineering unpatented boat hull designs even though the statute did not prohibit all means of reverse engineering.¹⁵⁵ The same mode of argument echoes in Professor Miller's other comments. For example, Professor Miller expresses puzzlement, if not disbelief, that the *Sega* court would even consider whether reverse engineering or decompilation was a fair use once the court had stated that making the program copy that was to be decompiled was an infringement.¹⁵⁶ Yet the statutory defense and the cross-references between sections 106 and 107, have relevance only when it is first shown or admitted that copyright infringement has occurred.

151. Miller, *supra* note 27, at 1021.

152. The quoted language is, in fact, part of Professor Miller's discussion of the "standardization" issue, which immediately follows his discussion of the "access" issue. Miller, *supra* note 27, at 1029. The complaint is, however, one also made in his "access" discussion. See *id.* at 1021, 1022.

153. Miller, *supra* note 27, at 1026.

154. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 476, 480-81, 490 (1974).

155. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 158-62 (1989).

156. Miller, *supra* note 27, at 1018, 1019 n.193.

At another point, Professor Miller cites Register of Copyright Ralph Oman as having “candidly . . . expressed the view that the end product of decompilation ‘contains the core of the expression of the original.’”¹⁵⁷ Professor Miller directly followed this reference with a statement that:

[A]n exemption for decompilation denies owners of program copyrights the statutorily provided exclusive right that all copyright owners have to authorize reproductions, adaptations, and translations of their works, as well as the right to refuse authorization for any reason—including a belief that a reproduction, adaptation, or translation would have an adverse effect on the market for their own original and derivative works. These equities are too easily ignored by decompilation advocates.¹⁵⁸

The obvious flaw in this argument, and the flaw in the bulk of Professor Miller’s discourse, is that it treats section 107 as being subject to section 106, not *vice versa*.

Professor Miller expresses great concern that those who reverse engineer will go beyond using non-statutory matter that is discovered, and use copyright-protected expression in a manner that is difficult to detect.¹⁵⁹ Yet elsewhere in his article, he argues against replacing copyright law with *sui generis* statutory protection. This argument is based, in part, on his conclusion that the reported decisions show that “the idea-expression dichotomy has proven an excellent tool for distinguishing a work’s expressive content from its unprotectable features.”¹⁶⁰ Although critical of *Computer Associates*,¹⁶¹ Professor Miller emphasized commonalities between the decision and otherwise differing decisions and expressed support for sticking with copyright protection.

157. Miller, *supra* note 27, at 1027 (quoting *Computers and Intellectual Property: Hearings before the Subcomm. on Courts, Intellectual Property, and the Administration of Justice of the House Comm. on the Judiciary*, 101st Cong., 2d Sess. 287 (1990) (testimony of Register of Copyright Ralph Oman)).

158. Miller, *supra* note 27, at 1027.

159. Miller, *supra* note 27, at 1027, 1029.

160. Miller, *supra* note 27, at 1013; *see also id.* at 1035.

161. This criticism seemingly would extend to other decisions that more closely resemble *Computer Associates* than they do *Whelan* or the district court decisions in *Lotus Dev. Corp. v. Borland Int’l, Inc.*, 831 F. Supp. 223 (D. Mass. 1993); *Lotus Dev. Corp. v. Borland Int’l, Inc.*, 799 F. Supp. 203 (D. Mass. 1992); *Lotus Dev. Corp. v. Paperback Software, Inc.*, 740 F. Supp. 37 (D. Mass. 1990). For some unstated reason, Professor Miller takes these unreviewed decisions as the other most significant cases dealing with the scope of computer program copyright and the test for infringement of computer program copyright. His treatment of *Brown Bag Software v. Symantec, Inc.*, 960 F.2d 1465 (9th Cir.), *cert. denied sub nom. BB Asset Management, Inc. v. Symantec Corp.*, 113 S. Ct. 198 (interim ed. 1992), is confined to a footnote in which he reconciles the result with *Whelan* without speaking to *Sega’s* preference of the *Computer Associates* approach over that of *Whelan*. Miller, *supra* note 27, at 1001 n.112. As to this trend, *see Gates Rubber Co. v. Bando Chemical Indus., Ltd.*, 9 F.3d 823 (10th Cir. 1993).

Professor Miller's specific concern appears to be with the effects of *Computer Associates*, approvingly invoked in *Sega* and *Atari*. His conclusion that "decompilation places an unprecedented burden on the program copyright owner to discover and prove infringement"¹⁶² shows this concern to be the foundation for his case. The basis for Professor Miller's conclusion is that disguised copying will be the result of permitting reverse engineering of computer programs and, simultaneously, adopting the analytical paradigm of *Computer Associates*. This possibility, in Professor Miller's view, burdens copyright owners with "increased difficulty and cost of proving substantial similarity."¹⁶³ He thus proposes a proscription against computer program decompilation as a partial solution to problems created by *Computer Associates*.¹⁶⁴ This proposal, he explains, cuts off "infringement at [its] source."¹⁶⁵

Translation of Professor Miller's proposal into copyright terms requires holding that it is not a fair use (1) to make an unauthorized copy for use as input in the process of decompilation or (2) to make a source code equivalent copy by decompiling computer program object code. His proposal attempts to secure one of the two objectives that *Sega* and *Nintendo* sought to fulfill in suing *Accolade* and *Atari*. Focusing on intermediate copying, or creation of a source code equivalent copy, is a straightforward and less expensive cost alternative to full litigation of a claim that depends on proof of substantial similarity. Mere proof that decompilation occurred, and that it was not for a narrow purpose authorized by section 117, presumably would be a sufficient basis for inferring infringement. This inference follows from the fact that the process of decompilation requires either intermediate copying, re-creation of source code equivalent, or both.

A bright line does have undeniable attractions. Prohibiting intermediate copying would make a copyright owner's monitoring of the market for infringing uses far simpler and less costly. Moreover, where making an intermediate copy could be shown, proof of infringement by exact copying is elegantly clean and relatively inexpensive. One can make the same claims for according creative works absolute protection in all instances, however, by repealing sections 107 through 120 of the Copyright Act. Heralding the advantages to copyright owners of deny-

162. Miller, *supra* note 27, at 1027.

163. Miller, *supra* note 27, at 1027. Professor Miller emphasizes, in this context, the prospect that the savvy imitator can seek to disguise what was done by masking changes, although nonconsequentially, in literal code, data structure, and other program elements. *Id.* at 1029 n.230 (quoting STEERING COMMITTEE FOR INTELLECTUAL PROPERTY ISSUES IN SOFTWARE, NATIONAL RESEARCH COUNCIL, INTELLECTUAL PROPERTY ISSUES IN SOFTWARE 78 (1991) (statement of Peter Schneider of International Business Machines)).

164. Miller, *supra* note 27, at 1027.

165. Miller, *supra* note 27, at 1027-28.

ing a fair use privilege to make and decompile computer programs is insufficient to support the proposition. The threat posed by carefully disguised taking, a prospect Professor Miller specified to his "access" critique,¹⁶⁶ exists with or without extension of fair use to decompilation. The courts presumably are neither less qualified, nor disabled, to apply the idea-expression analysis championed by Professor Miller where the claim is that the decompiler misappropriated protected expression. Adoption of a bright-line rule might avoid the need for using the full-blown analysis required in cases such as *Computer Associates*, but that benefit simply is not a sufficient basis for permitting use of copyright to shield unprotected matter.

This analysis suggests that the aims of Professor Miller's proposal can be, and ought to be, expressed in different and more inclusive terms. Professor Miller's own exposition shows that he directs his approach toward creating an easy-to-prove, easy-to-win category of cases as a means for relieving some copyright owners from the burden, expense, and uncertainties of proving infringement by a program created with the aid of knowledge gained through decompilation and analysis of the plaintiff's program.

The second aim is to put copyright to the purpose of shielding that which section 102(b) excludes from the protection of copyright. Professor Miller never asserts this, yet attention to his presentation makes his awareness of, and interest in, this effect quite apparent. The most obvious indication of this second aim is Professor Miller's lament that, among other things, permitting decompilation and reverse engineering would make code-embodied trade secrets vulnerable to discovery and loss.¹⁶⁷ This statement, as already noted, is unremarkable. The argument merely puts computer programs on the same footing as other unpatented technology. Professor Miller repeatedly counters what he characterizes as the "access" claim with the argument that ideas, processes, and other unprotected matter embodied in a computer program can be ascertained by the less intrusive means of observation of program behavior and outputs.¹⁶⁸ This response resonates with his market-specific discussion of *Sega* and *Atari*, in which he argued that Accolade and Atari did not have to take what belonged to Sega and Nintendo. Professor Miller contends that competition in the game market was open to them by becoming a Sega or Nintendo licensee or by

166. Miller, *supra* note 27, at 1027.

167. Miller, *supra* note 27, at 1026.

168. Miller, *supra* note 27, at 1015, 1029.

designing, manufacturing, and marketing competing game player consoles.¹⁶⁹

The first of the arguments, that it is sufficient that more primitive and less reliable means of "reverse engineering" exist, blithely ignores that *Bonito Boats* forthrightly rejected this line of reasoning on the ground that it was at odds with fundamental policies expressed in intellectual property and competition laws.¹⁷⁰ The arguments likewise overlook that the courts in *Sega* and *Atari* concluded that the alternative means actually were not sufficient to the purpose.¹⁷¹

The second argument, "[y]ou can enter both markets," similarly has extraordinary intellectual property and competition policy and law implications. Among other things, this argument vests absolute control over game market competition based on the use of copyright law, not patent law, to insulate program content not protected by copyright (and, in most instances, not by patent). Further, this claim permits copyright protection to be used to unify the console and game markets, thereby making it difficult—if not impossible—for any entity other than a large, well-capitalized entity to enter either market.

Both arguments, and the policy perspectives they express, invert the priority between intellectual property and competition policy and law. Copyright and patent law carve limited exceptions to the overarching policies favoring competition and free use of ideas. They create property rights, subject to limitations, as a means to socially beneficial ends. Patent protection, subject to formidable standards, affords limited monopoly rights in useful inventions and discoveries while copyright protection, subject to far lower qualifying standards, creates limited monopoly rights in original expression of ideas. The norm, however, is public access to and use of all ideas or knowledge not covered by an unexpired patent and freedom of all to engage in and protect their orig-

169. Miller, *supra* note 27, at 1020.

170. Justice O'Connor wrote in *Bonito Boats* "[t]hat the Florida statute does not remove all means of reproduction and sale does not eliminate the conflict with the federal scheme." *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 158 (1989). At another point, the Court in *Bonito Boats* states, with objection to the consequence, "[i]t is difficult to conceive of a more effective method of creating substantial property rights in an intellectual creation than to eliminate the most efficient means for its exploitation." *Id.* at 164.

171. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1520 (9th Cir. 1992); *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832, 836, 843-44 (Fed. Cir. 1992). It may be that substantial knowledge can be gained, in some cases, from observing the behavior of a program at the human interface and carefully noting how differing inputs generate different screen display and other outputs. The prospect of gaining much knowledge is far less when the program operates at the internal application-machine interface, invisible or transparent to the user. This invisible operation occurs, not just with a specifically definable category of free-standing programs, but with programs within programs, i.e., modules and subroutines of larger "user application" programs.

inal expression irrespective of whether others have engaged in similar expression.

Professor Miller's claims have a very different emphasis. His claim is that intellectual property law, at least in this area, recognizes and particularizes rights subject only to limits that are clearly delineated. Competition policy, generally, only fills gaps because the realm is one in which exclusion of others is the norm. This position is wholly inconsistent with recent policy-based analyses in *Bonito Boats*¹⁷² and *Feist*.¹⁷³ With respect to his second argument, it also is at odds with competition policy and market definition principles enunciated in *Eastman Kodak Co. v. Image Technical Services, Inc.*¹⁷⁴ ("*Eastman Kodak*").

Professor Miller draws, at other points, on sources extrinsic to the Copyright Act. One instance involves his presentation of CONTU's recommendation and Congress' enactment of amended section 117 as showing that CONTU and Congress each "dealt explicitly with the question of whether there were any circumstances under which someone lawfully in possession of a computer program properly might copy or modify it" and that Congress, per the recommendation of CONTU, created very narrow and specific exceptions to a copyright owner's exclusive right to make copies or reproductions.¹⁷⁵ Alas, there is strikingly—and historically—no indication that either Congress or CONTU had envisioned the circumstances at issue in *Sega* and *Atari*. Far more important, no evidence is noted, and no evidence exists, to show that Congress intended section 107 to have no application to computer programs. The *Sega* court readily perceived this lack of consideration. The court examined this very argument, advanced by Sega, and flatly rejected it as verging on the frivolous.¹⁷⁶

More peripherally, Professor Miller argues that Congress' choice of *sui generis* statutory protection for semiconductor chip mask works, after it enacted the 1980 Computer Program Amendment to the Copyright Act, tends to show that intermediate copying for the purpose of reverse engineering is impermissible.¹⁷⁷ He claims that Congress chose to enact a *sui generis* system of protection for mask works instead of emphasizing that copyright protects chip-embodied computer programs primarily, if not solely, because copyright law lacked recognition of a

172. 489 U.S. 141 (1989).

173. *Feist Publications, Inc. v. Rural Telephone Co.*, 499 U.S. 340 (1991).

174. 112 S. Ct. 2072 (interim ed. 1992).

175. Miller, *supra* note 27, at 1023.

176. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1520-21 (9th Cir. 1992).

177. Miller, *supra* note 27, at 1023-24.

right to reverse engineer.¹⁷⁸ Professor Miller supports this contention by an unconventional interpretation of a House Committee Report statement that the Chip Act does not change the copyright protection otherwise available to chip-embodied software.¹⁷⁹ He argues that this statement, most likely, was not intended to preserve copyright protection for chip-embodied computer programs, but to prevent the Semiconductor Chip Act "from being interpreted as creating a right to decompile any and all computer programs that happen to be stored in chips."¹⁸⁰ No authoritative commentary on the statute exists to suggest or support this "turned-on-its-head" interpretation. The Ninth Circuit, in *Sega*, similarly concluded that the argument was groundless.¹⁸¹

Consistent with the overall tenor of his article, Professor Miller's case-specific critique is primarily a defense of strong protection for computer programs. He stakes his critique on a literal application of section 106, without its express subordination to section 107. While he sometimes speaks to how the courts in *Sega* and *Atari* applied section 107, he prefaces this discussion with a presentation of section 107's four factors in a manner that might lead a reader to understand that they are the only, rather than necessary, factors to be considered.¹⁸² He critiques principally *Sega*'s more fully developed application of the four factors, concedes that the analyses have "some merit," but concludes that they are "not fully persuasive."¹⁸³

Specific to section 107, Professor Miller unsurprisingly emphasizes that *Sony* established a presumption of unfairness for any commercial use and notes that the court in *Sega*—as did the court in *Atari*—characterized the defendant's use as commercial.¹⁸⁴ In this connection, Professor Miller particularly criticizes the *Sega* analysis that distinguished Accolade's ultimate use from the initial use of making a full, exact copy to use in the processes of decompilation and reverse engineering. His criticism is that the court recognized that making an intermediate copy was unauthorized and necessarily entailed making a copy of the full program. He found it internally inconsistent and implausible that the court could thereafter conclude that Accolade had not infringed *Sega*'s copyright.¹⁸⁵ This argument, of course, demon-

178. Miller, *supra* note 27, at 1024.

179. Miller, *supra* note 27, at 1024.

180. Miller, *supra* note 27, at 1024.

181. See *supra* notes 70-73 and accompanying text.

182. Miller, *supra* note 27, at 1017.

183. Miller, *supra* note 27, at 1015-16.

184. Miller, *supra* note 27, at 1018. Professor Miller, however, somewhat overstates the presumption as "a strong presumption" just prior to quoting the actual language of the Court in *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417, 451 (1984). *Id.* at 1019 n.193.

185. Miller, *supra* note 27, at 1019 n.193.

strates Professor Miller's thematic and fundamentally untenable argument: a use that infringes section 106 cannot be transformed into a noninfringing use by section 107.

Further criticisms of the *Sega* court's application of the first and, closely related, fourth factors of section 107, passingly touch upon the court's treatment of the fourth factor and strongly attack the policy analysis introduced in the Ninth Circuit's discussion of the fourth factor. Both lines of criticism emphasize what Professor Miller characterizes as the "standardization" (or, synonymously, "interoperability") assault on copyright. First, Professor Miller asserts that it is impossible to know *a priori* whether the public interest will be served by permitting competition with *Sega* in the market for Genesis III-compatible games,¹⁸⁶ and asserts that Congress legislated its answer in section 106. Professor Miller's bewildering analysis starts with identifying a section 107 factor and concludes with a statement that wholly ignores the express interrelationship between sections 106 and 107.

Professor Miller's address of the second factor consists of a rejection of the Ninth Circuit's treatment of computer programs as a type of work any different than a novel or any other literary work. The *Sega* court's characterization of computer programs as highly functional and utilitarian in character, though expressive and entertaining (in this instance) in their use, is presented as reducing copyright protection for expressive elements in order to assure access to unprotected elements of a work.¹⁸⁷ That contention is true only if one accepts the alternative: copyrighted programs are entitled to protection against any and all copying even if the actual effect is to make copyright a shield for unprotected content and use of expression. This alternative solution would clearly place computer program copyright law on a different level from copyright law for other nonfunctional, literary works.

Professor Miller's strongest criticism is directed at the third factor's analysis in *Sega*. Again, the focus is on the fact that the defendant literally copied the entire program in the course of intermediate copying. How can it be, asks Professor Miller, that taking the entire program—and taking it literally—does not conclusively establish that *Accolade's* use was not fair?¹⁸⁸ The Ninth Circuit recognized this argument when it stated that their decision not to adopt Professor

186. Miller, *supra* note 27, at 1020. Presumably, inability to know this market impact with some degree of confidence constitutes grounds for permitting use of copyright to deny entry into the market by independent creators of game programs if they cannot obtain knowledge, without reverse engineering, of unprotected information necessary to make the games run on a proprietary system.

187. Miller, *supra* note 27, at 1021.

188. Miller, *supra* note 27, at 1018.

Miller's view may seem incongruous to those who espouse a traditional view.¹⁸⁹ Professor Miller acknowledges the court's response, characterizes it as "minimiz[ing]," and states here, and elsewhere, his inability to comprehend how recognizing that intermediate copying involves wholesale copying does not, as a matter of law, establish that use as unfair.¹⁹⁰

Overall, Professor Miller's critique primarily consists of arguing alternative views of how the courts might have viewed the facts, casting "fair use" decompilation as a deprivation of copyright owners' statutory rights, and introducing a later-elaborated contention that the decisions wrongly assume that "standardization," or "interoperability,"¹⁹¹ generally is a social benefit in a technology-based environment.¹⁹² As to the latter contention, he finishes by expressing the position that, even where it can be shown that standardization or interoperability are beneficial, permitting decompilation is not justified because the market itself will achieve what is warranted.¹⁹³ Upon all, he concludes:

Given the evidence of congressional intent, the lack of a demonstrated necessity for permitting decompilation, the adverse economic impact its acceptance would have on the authors of computer programs subjected to decompilation, and the fact that the practice impairs the owner's traditional rights under American law, any significant acceptance of decompilation would be inconsistent with the existing statute and long-standing copyright philosophy.¹⁹⁴

The fundamental problem with Professor Miller's critique as a whole, and his concluding observation in particular, is that disallowing decompilation creates *de facto* proprietary rights in ideas, processes, and other subject matter that are ineligible for either copyright or patent protection. Contrary to Professor Miller's assertion, there is no traditional right to such protection under American law. Even more certain, there is no basis in the American legal experience for dual protection against both disclosure and discovery for a period far exceeding the term of a patent. Similarly, Professor Miller's repeated assertions that any recognition of decompilation is inconsistent with the existing statute have been shown not to withstand scrutiny. Finally, and fundamentally most important, it is patently wrong to claim that making copyright law a bulwark against the use of expression-embodied ideas is consistent with long-standing copyright philosophy or to claim that it is

189. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1527 (9th Cir. 1992).

190. Miller, *supra* note 27, at 1018.

191. Professor Miller treats the terms as synonymous. Miller, *supra* note 27, at 1029.

192. Miller, *supra* note 27, at 1030-32.

193. Miller, *supra* note 27, at 1035.

194. Miller, *supra* note 27, at 1031-32.

inconsistent with that philosophy to dismantle any such antithetical barrier.¹⁹⁵

VII. APPRAISAL OF SEGA AND ATARI: INTERMEDIATE COPYING FOR PURPOSES OF DECOMPILATION AND REVERSE ENGINEERING AS "FAIR USE"

A. *Fitting Copyright to Computer Programs—Not Vice Versa*

Debates about recent decisions such as *Computer Associates* and *Sega* tend to express differing approaches to copyright protection of computer programs. Expressed views undoubtedly spring from differences of philosophy. For example, commentators will disagree on the issues of open versus proprietary systems or strong versus limited copyright protection. The expressed views manifest different approaches to how computer program copyright law ought to be viewed in dealing with fashioning a fit between copyright protection and the technology.

The preceding part, which focused on criticisms of *Sega* and its import, was styled "literal copyright" objections to recognition of intermediate copying for the purpose of decompilation as a noninfringing fair use.¹⁹⁶ Examination of the range of statute-based arguments and Professor Miller's case-focused arguments shows the weaknesses of even rigid or literal application of the statute as a basis for stifling such use. Many of the claims, in fact, abjure literal application of the statute in that they ignore the existence of section 107, or treat it as marginal rather than integral to section 106.

The true flaw in these arguments is far more fundamental than specific analysis and response can possibly show. This flaw is that the approach, arguments, and reasoning proceed from the premise that computer programs must be fit to copyright law, rather than adapt copyright law to protect computer programs. The effort to present computer programs as no different than novels, plays, and other literary forms long known and protected by copyright law is, first, misguided, and second, ahistorical. The definition of "computer program" in the Copyright Act makes the first point self-evident. The self-evidence of the first point is not simply because the definition describes a computer

195. This is the clear, strong policy message of *Baker v. Selden*, 101 U.S. 99 (1879), and its reflection in section 102(b). It may be, as Professor Miller and the *Sega* decision agree, that section 102(b) does not directly provide a basis for recognizing a right to decompile and reverse engineer. That is not the purpose of the provision; like section 102(a), it exists only to define the subject matter of copyright. In this regard, it sets forth a long-standing central policy of copyright law. The central policy is so fundamental that Professor Miller's forceful assertion about long-standing copyright philosophy constitutes nothing less than a truly stunning inversion of core principles.

196. See *supra* notes 124-95 and accompanying text.

program in terms of both writing and behavior.¹⁹⁷ Setting the definition against common conceptions or definitions of the various other types of literary works protected by copyright law makes the differences apparent.

Sounding this theme also is ahistorical. Copyright law expanded over the past two centuries to cover a steady stream of new types of works with respect to which incentive for creation was thought to be necessary in order to encourage creation and dissemination. Principles of application clearly do vary, despite what advocates of strong copyright protection for computer programs claim.¹⁹⁸ Even among classic writings, it is well recognized that factual works which perform the "function" of disseminating information and knowledge receive less complete protection than fictional works.¹⁹⁹ Written or printed forms, though expressive of underlying ideas, receive only limited protection even though some authorities certainly viewed "literal" copyright as providing full and robust copyright protection—at least until *Baker v. Selden*²⁰⁰ addressed the implications of the commercialization of copyright-protected standard business forms.²⁰¹ Similarly, the fair use doctrine, now more than a century old, historically served as a tool for judicial refinement of the application of copyright law where literal application of the statute ill served, not advanced, the public policies underlying copyright law's creation of authorial rights.²⁰²

The choice of copyright law for legal protection of computer programs, now essentially irreversible, reflected a judgment that copyright fit and, among the alternatives, best fit the nature and character of computer programs. The selection of copyright law left open a broad range of questions about the scope and particulars of computer program copyright protection. Judicial struggles with the law, not just the technology, from the earliest to the most recent decisions testify to this ambiguity as to scope and particulars. Rare is the reported case in which courts have enjoyed the luxury of literal, robotic application of off-the-shelf rules.

The point in all of this is simple. Beginning with *Franklin* and continuing through *Sega* and future cases yet untitled, the lawyering

197. For further discussion of this first point, I recommend Randall Davis, *The Nature of Software and Its Consequences for Establishing and Evaluating Similarity*, 5 SOFTWARE L.J. 299 (1992) (describing computer programs as a combination of text and behavior, for many purposes a more useful and graspable paradigm than expression and idea).

198. See, e.g., Miller, *supra* note 27, 986-87, 1021-22; Anthony L. Clapes, *supra* note 131; Hager, *supra* note 131.

199. Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 348-49 (1991).

200. 101 U.S. 99 (1879).

201. *Id.* at 104.

202. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 66 (1976).

and adjudicative enterprise is to fashion a fit of copyright law to computer programs as computer programs—not as digitally stored texts readable on a screen display rather than in printed text. CONTU pushed well beyond its initial charge to address copyright issues related to translation and storage of texts or information in digital form. CONTU successfully recommended that Congress adopt a definition of “computer program” that described the new category of literary work in terms of behavior, not just in terms of text. CONTU’s final report was not unanimous, especially with respect to the scope of copyright protection for computer programs as functional as well as expressive works. It is remarkable that any person would claim, in the face of this division among CONTU’s members and the uncertainty about computer program copyrightability that prevailed in the Copyright Office as well as industry prior to 1980, that computer programs are protected by copyright law in the same manner as a novel. Further, considering the judicial struggle of fitting copyright protection to computer programs ever since 1980 makes the claim not merely remarkable, but truly astounding. Regardless of whether one favors the policies *Sega* and *Atari* emphasize, they are integral to this continuing process of fitting copyright protection to computer programs rather than computer programs to copyright law.

B. The Decision-making Context

*Brooktree Corp. v. Advanced Micro Devices, Inc.*²⁰³ is peripheral to this symposium, yet it illustrates three important points. First, access gained through reverse engineering opens the door to legitimate use of discerned ideas *and* to illegitimate copying of expression. Second, legal recognition of a right to reverse engineer copyright-protected computer programs has potentially high legal process costs. Specifically, this legal recognition creates yet another context in which distinction between ideas and their expression is decision-critical and indeterminate. Third, fact-intensive adjudication is attended by even greater than usual uncertainty where the subject matter is technology that is not easily understood by judges and juries. Reported decisions in information technology infringement litigation seldom leave one free of doubt about whether the trier-of-fact achieved the justice ideal.²⁰⁴

Sega and *Atari* amplify those three points and introduce additional case-specific factual issues. Each court recognized a limited right

203. 977 F.2d 1555 (Fed. Cir. 1992) (interpretation of Semiconductor Chip Protection Act provision on reverse engineering of mask works).

204. One is left, in more homely terms, with this set of questions. Was the story, as completed by the jury, nonfiction—true fact? Or, did the legal process transform fact to fiction or fiction to fact?

to make and reverse engineer a computer program copy. Each court expressed this right as a limitation on a copyright owner's rights when the defendant is either established to or assumed to have made an unauthorized copy of plaintiff's computer program. Significantly, neither of the courts found reverse engineering itself a questionable practice or the use of program-embodied ideas, processes, procedures, or methods of operation themselves improper. The courts confined the focus in each decision to the alleged infringing act of making an intermediate copy as necessary input in the process of decompilation or disassembly of computer program object code or making a copy of source code equivalent by decompiling object code.²⁰⁵

Strict application of the statute directed the conclusion that unauthorized creation of a copy or copies facially constituted infringement. Although section 102(b) excludes embodied ideas from the protection by a work's copyright,²⁰⁶ it does not directly implement this fundamental principle by, for example, speaking to the rights comprised in copyright or to conduct that constitutes infringement. The Ninth Circuit decision in *Sega* thus not surprisingly rejected Accolade's plea that the court find in section 102(b), a right to make an intermediate copy for the limited purpose of identifying ideas embodied in the program through reverse engineering and study of the program.²⁰⁷

Still, it is beyond peradventure that the business objectives of the *Sega* and *Nintendo* litigation included prevention of access to and use of program-embodied ideas. This potential protection of ideas does not suggest that the actions lacked justification under copyright objectives. Focusing on making exact intermediate copies offered advantages over establishment of infringement through proof of substantial similarity of expression in the material ultimately used in the Accolade and Atari game cartridges.²⁰⁸ Still, statutory protection against use of protected

205. In addition, some authorities contend that the decompiled or disassembled version is itself an unauthorized copy of the original program source code. Reverse engineering does not yield an exact copy of that code, yet the aim and outcome of the process is production of a full equivalent of the original high level code. Generating this output and fixing it in a tangible medium of expression is claimed to constitute nonliteral reproduction of the source code version of original program.

206. Section 102(b) of the Copyright Act states, "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work." 17 U.S.C. § 102(b) (1988).

207. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1519-20 (9th Cir. 1992).

208. This claim was made in both *Sega* and *Atari*. *Sega* amended its initial complaint to add the claims for infringement by making intermediate copies. Similarly, *Atari* involved claims for copyright infringement based on use of program content and by making intermediate copies.

expression in the Accolade and Atari game cartridges does exist, a fact quite evident from the proceedings on remand in *Atari*.²⁰⁹

The important point is that the circumstances presented an opportunity, through copyright law, to shield program-embodied content not otherwise protected by copyright. Copyright law, in this instance, appeared to place an untraversable moat around this subject matter. This artifact of the often lamented bad fit of copyright law to computer programs made the very body of law that expressly excludes ideas from its protection a ready legal means for preventing access to and study of the unprotected ideas. Decompilation is feasible only if there is a computer program copy that can be used as input and, in addition, those processes reconstruct a copy of original source code equivalent. Making an input copy and a reconstructed source code copy provided statutory bases for claiming infringement of the copyright, and the availability of injunctive relief against infringement offered protection for copyrightable matter and program-embodied non-statutory subject matter.

The potential statutory sources of relief from such infringement liability are the program copy-owner adaptation privilege²¹⁰ and the 1976 Act codification of the equitable "fair use" doctrine.²¹¹ Without

209. *Atari Games Corp. v. Nintendo of Am. Inc.*, Nos. C 88-4805 FMS, C 89-0027 FMS, 1993 U.S. Dist. LEXIS 8183 (N.D. Cal. Apr. 15, 1993) (patent and copyright order), *summ. j. granted*, Nos. C 88-4805 FMS, C 89-0027 FMS, 1993 U.S. Dist. LEXIS 6786 (N.D. Cal. May 18, 1993), *mot. granted, mot. denied*, Nos. C 88-4805 FMS, C 89-0027 FMS, 1993 U.S. Dist. LEXIS 8864 (N.D. Cal. June 30, 1993).

210. *See* 17 U.S.C. § 117 (1988). Section 117 provides:

Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:

- (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
- (2) that such new copy or adaptation is for archival purposes only and that all such archival copies are destroyed in the event that continued possession of the computer program shall cease to be rightful.

Id.

211. *See id.* § 107 (1988 & Supp. IV 1992). Section 107 provides:

Notwithstanding the provisions of sections 106 and 106A, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching . . . scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include—

- (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
- (2) the nature of the copyrighted work;
- (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
- (4) the effect of the use upon the potential market for or value of the copyrighted work.

exception, however, courts have concluded that the section 117 adaptation privilege has only limited application to reverse engineering. Courts confine use of section 117 to legitimize reverse engineering to instances in which decompilation or disassembly is an essential step in adapting a program for use in conjunction with a computer.²¹² Fair use under section 107 thus emerged as the principal basis for seeking and obtaining judicial recognition that intermediate copying in conjunction with reverse engineering of a computer program is a fair, noninfringing use of a copyrighted program.

C. *Sega Enterprises Ltd. v. Accolade, Inc.*:²¹³ *Fitting Copyright Law to its Subject Matter*

Judicial recognition of a right to make and decompile an unauthorized intermediate copy of a copyrighted computer program broke new ground in the law of computer program copyright and in fair use analysis under sections 106 and 107 of the Copyright Act. The courts' consideration of the scope and limits of a copyright owner's rights moved development of the law beyond, but importantly built upon, the long-debated subject of the scope and limits of copyright protection in computer programs. The specific analyses were strongly directed by, and set within the framework of, initial exposition of policies underlying copyright law and expressed in judicial decisions applying the statute and those policies.

Placing its fair use analysis within this framework brought a far different perspective to the Ninth Circuit's analysis than would wooden application of the four section 107 factors and selective application of their judicial interpretations. The difference in possible applications is evident from comparison of the district court and Ninth Circuit opinions in *Sega*. Rote application of the third factor, together with off-the-shelf application of the *Sony* presumption that commercial use is an unfair use, alone virtually compels a determination that the use is unprivileged. Facially, the combination is so potent that finding even the slightest adverse impact on the potential market for the copyright work makes that disposition almost inevitable. This disposition of the use as unprivileged likely would be so even if the work was found, under the second factor, to be a factual work, compilation, or principally func-

Id.

212. See *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1520-21 (9th Cir. 1992).

213. 977 F.2d 1510 (9th Cir. 1992).

tional work entitled only to "thin" copyright protection. This was the issue presented to the Ninth Circuit on appeal.²¹⁴

The far different approach adopted by the Ninth Circuit led to reversal and a precedent whose importance transcends its factual context. In contrast to what most courts and commentators tend to draw from the Supreme Court's opinion in *Sony*, the Ninth Circuit extracted the following, less obvious, lessons. Copyright monopoly must not be extended beyond its statutory scope. New technologies may require use of copyright policies to illuminate how the statutory text should be applied. Fair use historically has served as a means for adjusting copyright to time-revealed implications of new copyright-implicating technologies. Commercial use creates a rebuttable presumption of unfair use. Exact copying of a work in its entirety does not conclusively establish that a use is unfair. Finally, commercial use may justify a presumption of adverse potential effects on the market for the copyrighted work, but the presumption is rebuttable and its strength may vary with the ultimate outcome of the analysis under the first section 107 factor, the provision under which *Sony* attached presumptive significance to a commercial use.

The first two points are far more strongly emphasized and developed in *Atari*,²¹⁵ but the *Sega* opinion makes it clear that its analysis was driven by respect for the policy considerations stated in the first two points. Upon completion of its section 107 factors analysis, the Ninth Circuit openly expressed appreciation that its "result may seem incongruous at first flush" and then explained that the outcome was a product of having to fit copyright protection to the particular subject matter—computer software.²¹⁶ Observing that the subject area is still relatively unexplored, the *Sega* court emphasized that fair use expresses the public policy underlying the Act—stimulating artistic creativity for the public benefit by the means of securing a fair return for authors' creative labors.²¹⁷ Noting that computer programs are distributed in object code which limits or precludes access to program-embodied ideas and functional elements, the court stated that protection of object code gives a copyright owner "a de facto monopoly over those ideas and fundamental concepts."²¹⁸ Rather than solely relying on this

214. See *Sega Enters. Ltd. v. Accolade, Inc.*, 785 F. Supp. 1392 (N.D. Cal. 1992), modified, No. C-91-3871 BAC, 1992 U.S. Dist. LEXIS 16132 (N.D. Cal. Apr. 8, 1992), and modified, 977 F.2d 1510 (9th Cir. 1992).

215. *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832, 842-43 (Fed. Cir. 1992).

216. *Sega*, 977 F.2d at 1527.

217. *Id.* (citing *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 432 (1984)).

218. *Id.*

being at odds with section 102(b), the court invoked *Feist* in opining that “[this] result defeats the fundamental purpose of the Copyright Act—to encourage the production of original works by protecting expressive elements of those works while leaving the ideas, facts, and functional concepts in the public domain for others to build on.”²¹⁹ The court rejected Sega’s claim that copyright law secured protection for works based on the author’s considerable investment, invoking *Feist*’s strong rejection of the “sweat-of-the-brow” justification for copyright protection. The court thus concluded that Sega’s argument against fair use must be rejected and that “[t]he equitable considerations involved weigh heavily on the side of public access.”²²⁰

Within the framework of this context and copyright policy sensitivity, the court more specifically assessed Accolade’s use under the four section 107 factors. Proceeding from that base, the court utilized a refined, rather than rote, application of those factors and their interpreting judicial precedents. A review of the court’s analysis²²¹ highlights how the Ninth Circuit took into account, throughout its consideration of the factors, the character of computer programs as works protected by copyright law. While this consideration of the character of computer programs was central to the second factor analysis, the consideration also was particularly evident in the court’s application of the first and third factors to the facts presented by the case.²²²

The Ninth Circuit accounted, under the first and third factors, for the fact that the very nature of computer programs may require copying of the whole in order to access and study embodied ideas, processes, procedures, and methods of operation not protected by copyright.²²³ The importance of this consideration for the third factor is obvious and pivotal. The court’s singular focus on the quantitative, not just qualitative, extent of unauthorized copying ordinarily makes copying of the whole virtually presumptive; copying all appropriates all in more traditional literary work cases. Eschewing rote application of such a presumption and focusing on the technological necessity of copying the whole in order to extract content not protected by copyright was a critical step in the court’s application of section 107, as Congress intended,²²⁴ to resolve issues presented by the emergence of new technologies.

219. *Id.* (citing *Feist Publications, Inc. v. Rural Tel. Serv. Co.*, 499 U.S. 340, 348-49 (1991); *Atari*, 975 F.2d at 842-43).

220. *Id.*

221. See *supra* text accompanying notes 90-91.

222. *Sega*, 977 F.2d at 1522, 1527.

223. *Id.*

224. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 66 (1976).

Taking this consideration into account under the first factor demonstrated a far deeper appreciation of the implications of the datum. Having a commercial purpose for copying the whole or a substantial part of a work ordinarily seals the fate of a fair use claim. The court took into account Accolade's objective of learning and commercially using only that which copyright does not protect, and recognized that this content could be discerned only by intermediate copying of the entire program. This consideration directed the court's analysis to the essence, not the appearance, of what was commercially at stake. The higher court's departure from the district court's superficial application of the *Sony* presumption served, more than anything else, as the opening into the court's policy-based interpretation, and fact sensitive application, of the panoply of section 107 factors.

D. Copyright and Competition Law and Policy

The *Sega* and *Atari* fair use analyses, together with recent decisions that reject expansive copyright protection for computer programs, have come under attack for being antitrust-like determinations expressed in copyright law terms.²²⁵ The claim of this attack is that market considerations are the province of antitrust, not intellectual property law—except, of course, as section 106 establishes economically valuable rights to exclude, and section 107 makes any use that negatively affects a copyright owner a use that is unfair. The asserted propositions that follow include: (1) copyright law creates and secures private property rights; (2) statutory property rights may not be impaired or impinged by courts; and (3) exercise of those property rights is constrained only to the extent it independently constitutes a violation of antitrust law.

Antitrust law is not, of course, the exclusive expression of competitive market policy and law. Indeed, statutory creation of limited property rights in expression and ideas reflects a recognition that markets for expression, ideas, and other intangible products of human endeavor require intervention to adjust for inefficiencies that are characteristic of markets for public goods.²²⁶ Copyright and patent law creation of property rights makes the value of innovation appropriable through market

225. Miller, *supra* note 27, at 1020; see Clapes, *supra* note 131.

226. Expression, ideas, and know-how exhibit the public goods characteristics of inappropriability—use by one person does not exclude use by another—and indivisibility—use by one person does not diminish the supply available for use by others. See Kenneth J. Arrow, *Economic Welfare and the Allocation of Resources for Invention*, in *THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS* 609, 614-18 (1962) (classic work on inventions and information as public goods); Paul A. Samuelson, *The Pure Theory of Public Expenditure*, 36 REV. ECON. & STAT. 387 (1954) (foundational work on the economics of markets for public

transactions in order to encourage private investment in creative and inventive activity. Yet it is well established that monopoly status, statutory or otherwise, is an instrumental or circumstantial exception to the strong policy favoring competitive markets. Thus, statutorily created rights in invention and expression exist not primarily to reward inventors and creators, but to promote the engagement in inventive and creative activities in order to expand, and broaden access to, knowledge available for use by all.²²⁷ Specific to copyright law, many of the statutory limitations to which the rights created by section 106 are expressly subject preserve freedom to compete in the very markets made feasible by statutory creation of limited property rights. Section 107, particularly, embodies a doctrine developed to check the application of copyright law in a manner that entrenches or expands rightholder protection at the expense of achieving the paramount objectives of expanding, and broadening use of, the public domain of knowledge and ideas.²²⁸ Proponents of the view addressed in this portion of the Article favor the treatment of the production of works, not their dissemination and use, as the principal objective of copyright.²²⁹ The resulting strong proprietary view provides the foundation for reading section 107 as closely cabinizing treatment of an unauthorized use as a noninfringing fair use. This view is pressed foremost through strong, and even exaggerated, invocation of the presumption that a commercial use is not a fair use.²³⁰ Similarly, proponents of this view claim that section 107's fourth factor effectively precludes any commercial use that diminishes the realization of any potential economic benefits of copyright ownership.²³¹

The court in *Sega*, in particular, addressed this argument and its potential implications by distinguishing the specific programs at issue from the game programs that Sega sought to exclude from use on its consoles. The Ninth Circuit gave short shrift to the alleged effects that unauthorized copying of the programs at issue might have on the separate market for game programs.²³² Indeed, it may be that the copyright owner's spotlighting of game program market effects begged this re-

goods); see also William M. Landes & Richard A. Posner, *An Economic Analysis of Copyright Law*, 18 J. LEGAL STUD. 325, 326 (1989); Peter S. Menell, *An Analysis of the Scope of Copyright for Application Programs*, 41 STAN. L. REV. 1045, 1058-59 (1989) (specific to software).

227. Sony Corp. of Am. v. Universal City Studios, Inc., 464 U.S. 417, 429 (1984) (copyright); Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 480 (1974) (patent).

228. BENJAMIN KAPLAN, AN UNHURRIED VIEW OF COPYRIGHT 56-58 (1967); L. RAY PATTERSON & STANLEY W. LINDBERG, THE NATURE OF COPYRIGHT 68, 196-200, 209-10 (1991).

229. See PATTERSON & LINDBERG, *supra* note 228, at 198-99, 208-09.

230. See Miller, *supra* note 27, at 1019-20.

231. Miller, *supra* note 27, at 1019-20; see also Clapes, *supra* note 131.

232. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1522-23 (9th Cir. 1992).

sponse. If nothing else, the Ninth Circuit made clear that copyright enforcement was directed toward vertical extension of statutory protection in one market to exclude or limit competition in another, much broader market.

Reliance on copyright protection for one program to limit or exclude competition in the market for other computer game programs might, indeed, run afoul of antitrust law. Use of technological means, unprotected particulars of which are determinable only at risk of liability for infringing copyright, might well support a finding under *Eastman Kodak*²³³ that market power exists in the market for that program. This finding would open the way to consideration of whether that market power was leveraged to adversely affect competition in the game program market. Moreover, comparable market definition and analysis would be involved in copyright law adjudication of alleged misuse of copyright to exact market advantage not provided by statute.²³⁴

What section 107 requires is, however, quite different. The fourth factor under section 107 focuses on the impact of the allegedly infringing work on the market(s) for the copyright-protected work and its derivatives.²³⁵ This focus markedly differs from the usual antitrust and copyright misuse concern with the use of copyright to restrain competition in markets for other products.²³⁶ *Sega* thus correctly treated actual and potential adverse impact of Accolade's intermediate copying on the market for Sega game programs as largely irrelevant under the fourth factor.²³⁷

Still, the Ninth Circuit did venture into the realm of competition law and policy in a manner that critics of *Sega* protest. In assessing the fairness of Accolade's use, the court took into account the potential adverse effects in the computer games market that would result from upholding Sega's copyright infringement claim. Directing attention to the fact that enforcement of copyright as a means of protecting non-statutory subject matter from being known and used by a games market competitor, the court stated, "[A]n attempt to monopolize the [game] market by making it impossible for others to compete runs

233. *Eastman Kodak Co. v. Image Technical Servs., Inc.*, 112 S. Ct. 2072 (interim ed. 1992).

234. Copyright use was alleged and judicially addressed in *Atari*, but "unclean hands" in Atari's acquisition of a copy of Nintendo's 10NES program was found to bar the claim. *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832, 846 (Fed. Cir. 1992).

235. *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539 (1985).

236. Antitrust violations may consist, of course, of monopolization or an attempt to monopolize the market for a single product. As *Lasercomb of America, Inc. v. Reynolds*, 911 F.2d 970 (4th Cir. 1990), shows, alleged copyright misuse may entail use of a work's copyright to affect competition from independently created works in the copyrighted work's market.

237. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1522-23 (9th Cir. 1992).

counter to the statutory purpose of promoting creative expression and cannot constitute a strong equitable basis for resisting invocation of the fair use doctrine.”²³⁸

This observation, although not outcome-determinative, strongly evidenced appreciation for the fact that it would be antithetical to competition policy in general, and to the dissemination and use objectives of the Copyright Act in particular, to uphold use of copyright to shield unprotected program content in at least this instance. This appreciation was further shown in expression of concern that a failure to treat Accolade’s intermediate copying as a fair use would put the Copyright Act to creating a patent-like shield for ideas and processes that could qualify for neither copyright nor patent protection. The Ninth Circuit clearly understood that this shield could not be accommodated in a system where copyright and patent create limited exceptions to the operation of overarching policies favoring competition and substantially free public exchange and exploitation of knowledge and ideas, including between competitors.²³⁹

This understanding, its expression, and its use by the Ninth Circuit to bring policy illumination and analytical refinement to its application of the four section 107 factors are the critics’ targets. The essence of their complaint is grounded, however, in the misconception that copyright, though not patent law, permits withdrawal of applied knowledge into exclusive possession and use. This view claims that the existence of a property right, even one that is limited in scope, carries a legal right to use it literally for the purpose of indirectly securing economic advantage that its statutory source excludes and that other related bodies of law—patent and competition—would deny.

The point is not to engage the critics on antitrust grounds, but to strongly claim that it is utterly untenable to attempt to disengage copyright and patent law and policy from the competition policies that they embody. While it is conceivable that the same facts that *Sega* and *Atari* presented could be addressed alternatively under antitrust law, the potential is not a sound basis for either ousting or mechanistically (or myopically) applying the fair use doctrine. Following that course would lead courts to ignore not only the historical origins and functions of fair use as a limitation on copyright owner rights, but to disregard as well that the *Sega* and *Nintendo* objective literally was to use copyright to protect what both copyright and patent law make unprotectable. Lack of protectability is not simply a datum or an artifact. It is an expression of a fundamental value and principle underlying both intel-

238. *Id.* at 1523-24.

239. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 156-63 (1989).

lectual property and competition law. Except as limited rights to exclude are created in order to affirmatively advance public interests, ideas and knowledge are in the public domain and freely exploitable by all, including competitors. The fair use doctrine is an expression of fidelity to this precept. Specific to the critics' claim, felicitous application of the doctrine's section 107 embodiment often demands, rather than summarily rejects, attention to the very considerations that they deem relevant only to antitrust analysis.

VIII. LIMITS ON THE RIGHT TO MAKE AND DECOMPILE
INTERMEDIATE COPIES OF COMPUTER PROGRAMS: *SEGA* AND ARTICLE
6 OF THE SOFTWARE DIRECTIVE

A. *Introduction to the Limitations of Sega*

The specific holding in *Sega* roughly tracks Article 6 of the European Community Software Directive in specifying the conditions under which making and decompiling a copy of a copyrighted computer program is permitted as a matter of law.²⁴⁰ The Ninth Circuit held, with respect to gaining an understanding of the "unprotected functional elements" of a computer program, that "when the person seeking the understanding has a legitimate reason for doing so and when no other means of access to the unprotected elements exists, . . . disassembly is as a matter of law a fair use of the copyrighted work."²⁴¹ In the same vein, the court concluded, "where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law."²⁴² This conclusion parallels Article 6 in that it makes program-embodied matter that is not protected by copyright *inaccessible* unless the ideas, process, procedures, or methods of operation: (1) have been disclosed; (2) are ascertained through observing program behaviors; (3) are made available or authorized to be discovered through decompilation by the copyright owner; or (4) are discerned through making and decompiling a program copy when the information is not available through other means and access to the information is necessary to the creation of an otherwise original, interoperable program.

Consistent with setting conditions on fair use copying and decompilation, the Ninth Circuit rejected Accolade's broader claim that unconsented making of an intermediate copy and subjecting it to decompilation is a lawful use *per se*. Accolade's claim was, according to the

240. See *supra* text accompanying notes 29-33.

241. *Sega*, 977 F.2d at 1514.

242. *Id.* at 1528.

court, that making and decompiling a program copy is lawful because section 102(b) does not protect ideas and the distribution of computer programs in object code form makes unprotected content inaccessible to humans.²⁴³ The court responded, "Accolade's argument regarding access to ideas is, in essence, an argument that object code is not eligible for the full range of copyright protection. Although some scholarly authority supports that view, we have previously rejected it based on the language and legislative history of the Copyright Act."²⁴⁴ After reaffirming this line of authority, the court stated:

Nor does a refusal to recognize a *per se* right to disassemble object code lead to an absurd result. The ideas and functional concepts underlying many types of computer programs . . . are readily discernible without the need for disassembly, because the operation of such programs is visible on the computer screen. The need to disassemble object code arises, if at all, only in connection with operations systems, system interface procedures, and other programs that are not visible to the user when operating—and then only when no alternative means of gaining an understanding of those ideas and functional concepts exists.²⁴⁵

Based on this reasoning, the court declared that claims of a right to copy and decompile should be determined on a case-by-case basis under section 107, not as claims of right derivative of section 102(b).²⁴⁶

The following subsection addresses the Ninth Circuit's rationale for rejecting a broad right to make and decompile a computer program copy. Then two subsections that follow extend this analysis by serially examining the court-defined conditions for finding that such use is non-infringing as a matter of law. The conclusion is that the reasoning in the court's rejection of the broad claim is seriously flawed and that the two prescribed conditions cannot long stand.

There are two important implications of these conclusions. First, the limitations of *Sega*²⁴⁷ will not survive as obstacles to unconsented making and decompiling of a computer program copy in the United States. Second, the apparent convergence between United States and European Community law is a temporary phenomenon. The copying-decompiling privilege ultimately will become broader in the United States than it is under Article 6 of the Software Directive.²⁴⁸

243. *Id.* at 1519.

244. *Id.* (citations omitted).

245. *Id.* at 1520.

246. *Id.*; see 17 U.S.C. § 107 (1988 & Supp. IV 1992); *id.* § 102(b) (1988).

247. See *supra* notes 67-107 and accompanying text.

248. See Software Directive, *supra* note 3.

B. Sega's Rejection of a Broad Right to Copy and Decompile

Accolade's assertion of a broad claim and the Ninth Circuit's more tailored fair use analysis proceed from recognition that computer programs embody unprotected ideas, processes, procedures, and methods of operation. The court's fair use analysis and conclusion further accepts Accolade's principal claim that section 102(b) cannot be finessed by wooden and unqualified application of section 106. Following that course creates a copyright shield for program-embodied subject matter that neither copyright law nor patent law protects. Creation of this shield is recognized as an artifact of applying copyright law to a type of work that, by its very character, hides rather than reveals the ideas and functional elements that it both embodies and expresses.²⁴⁹ Equally important to the court is the following extension: unprotected subject matter is not merely expressed, but is operationally functional.²⁵⁰

Rejection of the claimed broad right to copy and decompile and limitation of fair use as a matter of law to circumstances that satisfy the necessity condition was supported by the fact that some, but not all, program-embodied section 102(b) subject matter can be discerned from observation of external behaviors of some programs. The legitimacy of purpose criterion is not similarly grounded in the reasoning advanced for rejection of Accolade's lawful per se claim. Thus, the primary basis for rejection of the broad claim remains the court's perception that Accolade essentially, and wrongly, contended that copyright provides less protection for object code than it does for source code.

The Ninth Circuit's characterization of the broad claim argument reflects that the court failed to grasp the essence of Accolade's argument. The claim is not that object code is unprotected, or less protected, by copyright law. The claim is that fair use of a copyrighted computer program, the object and source code versions of which are protected as a single copyrighted work,²⁵¹ includes use of the program to ascertain what it expresses. The physical characteristics of this particular form of literary work are such that determining what it expresses ordinarily requires making and decompiling a copy of the object code of what copyright law otherwise considers to be a single, or unitary, work. Limitation of users to observation of outputs confines the users' ability to learn only what the unprotected, functional elements cause to be visually expressed or produced.

249. *Sega*, 977 F.2d at 1527.

250. *Id.*

251. *Apple Computer Co. v. Franklin Computer, Inc.*, 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

Although the Copyright Act states that “[c]opyright protection subsists in . . . original works of authorship fixed in any tangible medium of expression . . . from which they can be perceived, reproduced, or otherwise communicated, either directly or with aid of a machine or device,”²⁵² the Act also states that “[i]n no case does copyright protection for an original work extend to any idea, procedure, process, method of operation . . . regardless of the form in which it is . . . embodied in such work.”²⁵³ Whether any such element is legally protectable is, in the federal venue, a question of patent law.

If the uncopyrightable elements also are not patentable, they nevertheless may qualify as a trade secret under applicable state law. Importantly, however, what saves state trade secret law from patent preemption is that trade secret law permits third party discovery through reverse engineering. Denial of a broad fair use right to copy, decompile, and reverse engineer has the practical consequence of establishing, through copyright law, a copyright owner’s right to make unpatentable and uncopyrightable subject matter less vulnerable to discovery than state-protected trade secrets.

This produced the wholly anomalous result of bending copyright law, which statutorily may not be extended to work-embodied ideas and functional elements, to protect such subject matter. The issue becomes one that does not just invoke copyright policy, but one that invokes copyright and patent law and policy together. Refusal to recognize a general right to make and decompile an intermediate copy of an object code computer program elevates copyright protection in a manner that directly conflicts with patent law and policy as articulated in *Kewanee* and *Bonito Boats*. The refusal clearly makes the Copyright Act’s section 102(b) self-subordination to patent law wholly illusory.

How this conflict must be resolved is beyond question. The broad, and relatively thin, copyright monopoly, which itself excludes patentable and related subject matter from its protection, cannot be given effect in a manner that frustrates the law of idea protection to which it expressly defers. The outcome is not determined in this instance by the Supremacy Clause, but by reconciliation of the apparent conflict between companion federal statutes enacted pursuant to common constitutional authority. Mere extension of copyright protection to computer programs cannot be taken as evidencing any intent to set the two statutory systems in such direct conflict by creating an unarticulated exception to section 102(b) that is applicable only to computer programs.

252. 17 U.S.C. § 102(a) (1988).

253. *Id.* § 102(b).

The Ninth Circuit in *Sega* had alternative means available for addressing this point, provided that it first appreciated its existence and import. The first alternative was to recognize the conflict and the lack of expression by Congress that it intended the extraordinary consequence. The failure of Congress to amend section 102(b) in 1980 or to enact some other measure showing an intent to permit use of copyright protection in the manner sought by Sega and Nintendo is far more probative of a lack of intent to significantly alter to what extent the law protects ideas and expression than it is of an intent to permit copyright to be used to shield unpatentable ideas. Directly facing the existence of conflict caused by computer programs as being atypical copyright subject matter would necessitate judicial limitation of the enforcement of section 106 rights so far as necessary to resolve the clash.

The second alternative open to the court was use of section 107 as the foundation for recognition of the lawfulness per se of intermediate copying and decompilation to ascertain the unprotected and the copyright-protected contents of computer programs. Congress recognized that case-by-case adjudication in light of circumstances presented by cases that concerned the significance of technological change for copyright law and policy is fundamental to section 107 and the judicially developed fair use doctrine from which it was derived.²⁵⁴ Access to ideas based on demonstration of necessity is antithetical to the policies underlying copyright law as well as patent law.²⁵⁵ Each body of law is, indeed, an exception to the overarching principle that knowledge and ideas are in the public domain. Knowledge and ideas may be withdrawn from that domain or, in this instance, screened, only pursuant to and subject to the limits of constitutionally bounded exercise of congressional power.²⁵⁶ There simply is no stronger, more compelling case for declaration of a right of fair use as a matter of law than one that presents so fundamental a conflict between the letter of constitutionally rooted copyright law and the policies underlying patent and copyright law.

C. *Legitimacy of Purpose as a Condition of Fair Use*

Taking the *Sega* holding on its face indicates that achievement of interoperability or compatibility with another program or a machine on which it runs is a legitimate purpose for unauthorized making and decompiling of a copy of a copyrighted computer program. Yet *Sega*, though not *Atari*, spoke more broadly, stating that a use is a nonin-

254. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 65 (1976).

255. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141 (1989).

256. *Id.* at 156-57.

fringing fair use when its purpose of seeking access to ideas and functional elements embodied in a program is legitimate. This statement raises two important questions. The first question is what purposes, other than the purpose of Accolade, may be "legitimate"? The second question is should legitimacy of purpose be a criterion that directs business decisionmaking or subsequent adjudication?

The criterion is unsound and unwarranted. At most, a copyright owner should be able to assert and establish under the first factor of section 107 that the purpose and character of the use was not, in terms of copyright policy, for a legitimate purpose. Yet this does no more than restate what *Sega* and *Atari* make absolutely clear: the use of discerned copyright-protected elements, literal or nonliteral, in the ultimate work created by the user is not a legitimate purpose or a lawful consequence.²⁵⁷ There is, as explained, no basis in the American legal tradition for requiring affirmative proof of necessity in order to gain access to and use of ideas.

The conclusion to the second question follows, in part, from consideration of the narrower first question. Looking initially to what likely is a noncontroversial example, there is no doubt that the principles underlying *Sega* "legitimize" the making and disassembly of an intermediate copy for the purpose of determining if the program infringes a copyrighted work of the copier or decompiler, despite the fact that it is access to expression, not ideas, that is sought. The courts have not directly adjudicated the permissibility of this use, and the legitimacy of its purpose. Still, the practice is not unknown or unpracticed. Indeed, engagement in the pursuit was mentioned without adverse comment in *E.F. Johnson Co. v. Uniden Corp. of America*.²⁵⁸ If faced with the issue and the reality that proof of substantial similarity virtually requires a searching look inside a program, a court would not likely call it an unfair use to gain an unconsented, inside look before confronting another with an infringement claim or committing a substantial investment of time and money to fact-intensive infringement litigation.

A different hypothetical presents quite another foil. Query: Is it a noninfringing fair use to make and decompile an unauthorized copy of a computer program for the commercial purpose of studying and evaluating the internals of a program in order to report on what the examiner ascertains and concludes? Assume that this evaluation is undertaken by a for-profit publisher of a magazine that features, among

257. Any claim of fair use of protected expression in such a work would have to be independently justified. That subject is beyond the scope of this presentation, but the point is noted in light of the fact that uses such as brief quotation from written texts and a variety of other direct uses of expression constitute noninfringing fair use in some circumstances.

258. 623 F. Supp. 1485 (D. Minn. 1985).

other things, descriptive and evaluative reports on individual and competing computer programs. This case, to be clear, must hypothesize more than that to which we already are accustomed. So further assume the emergence and recognition of a professional programmer need and demand for comparative evaluations of the functionality, usability, flexibility, efficiency, and foibles of object-oriented programming systems and tools. Is the purpose of seeking access to object code and its reconstructed source code equivalent “legitimate”?

Intent or purpose aside, conduct that went beyond this hypothetical by including unauthorized print reproduction of discerned program code that is copyright-protected would constitute infringement.²⁵⁹ Although using limited excerpts for purposes of comment might itself constitute a fair use,²⁶⁰ infringement liability for extensive unprivileged reproduction would be consistent with the *Sega* and *Atari* courts’ reaffirmation that it constitutes infringement to use copyrighted expression accessed through disassembly to create a program that is substantially similar in its expression. The hypothesized use does not contemplate this. It simply is in the nature of long-recognized types of fair use of traditional literary works: research, news reporting, comment, and criticism.²⁶¹ The ultimate use, though decidedly commercial, is limited in actual content used and serves a fundamental purpose of copyright law—dissemination of knowledge and ideas.

A related consideration, though not a section 107 first factor, is that the potential impact on the market for the copyrighted work is by neither supplantation nor substitution. The potential effect is no different than that of a product review for an automobile or a refrigerator. Still, the impact could be substantial and, with respect to a product with a narrow market, potentially devastating. The close linkage of the first and fourth factors by the Supreme Court in *Harper & Row* and in *Sony* leads to the introduction of this prospect into the analysis, albeit at the margins, to underscore that the commercial use by the review publisher is one that could substantially diminish realization of the expected rewards that copyright offers as an incentive to creative endeavor.

Copyright law does not, however, secure a right to realization of expectations. Many Broadway productions have folded fast on an avalanche of scathing, or even lukewarm, reviews. Copyright law protects only against use of protected expression in a way that infringes upon statutory rights as defined by section 106 and the related provisions in

259. *Micro-Sparc, Inc. v. Amtype Corp.*, 592 F. Supp. 33 (D. Mass. 1984).

260. 17 U.S.C. § 107 (1988 & Supp. IV 1992).

261. *Id.*

sections 107 through 120. Precluding the review publisher from asserting fair use would do precisely what others have unsuccessfully sought to accomplish by seeking to enjoin publication of critical writings that comment on, and quote from, copyrighted works.²⁶² The purpose of the unauthorized use undoubtedly is one that is legitimate.

The larger question of whether “legitimate purpose” for gaining access to program-embodied ideas and functional elements is a justifiable condition is now less difficult to answer than it first seemed. Other hypothetical cases can be envisioned, but they do not dictate a different outcome. Legitimacy of purpose simply is not a proper test. This test is an artifact of extending copyright law to works whose inherent characteristics make the content of works generally inaccessible to most, if not all, potential “readers.” Limiting fair use access by copying and decompiling a program copy to only those who demonstrate a legitimate purpose turns copyright on its head. It effectively censors access to protected expression and unprotected ideas and functional elements, equally, in the name of protecting only expression from infringing use.

Copyright law does not, of course, condition protection on disclosure. This proposition is frequently invoked to support the claim that there is no basis for general, or even limited, recognition of a fair use privilege to make and decompile a computer program copy without authorization.²⁶³ Use of the point in this context is use out of its realm—an example well-dressed, but ill-suited. The true issue is whether those who wish to invest in gaining access to and understanding both protected and unprotected content may do so, or whether they are foreclosed. If there is any precept of copyright law that does bear on legitimacy of purpose as a proper condition, it is the cornerstone principle that copyright protection exists to promote dissemination of knowledge, ideas, facts, and creative expression. Enabling copyright law to frustrate this policy by imposing a legitimacy-of-purpose condition on those affirmatively seeking access to nonexpressive and expressive content is a truly bold and stunning—but not long dazzling—bit of magic.

D. Necessity as a Condition of Fair Use

Necessity as a condition fares no better. The relevance of necessity is primarily for litigators. While making an exact intermediate copy is remarkably simple and inexpensive, the effort and time required to disassemble or decompile an object code program copy and subject the

262. See, e.g., *New Era Publications Int'l, ApS v. Carol Publishing Group*, 904 F.2d 152, 159-60 (2d Cir.), cert. denied, 498 U.S. 921 (1990).

263. See, e.g., *Miller*, *supra* note 27, at 1028.

reconstructed source code equivalent to careful study and analysis is far from trivial. The initial investment of time, effort, and money in undertaking these processes for a purpose such as achieving program interoperability or compatibility may approach the investment of the copyright owner in creating the program elements with which a second program must be interoperable.²⁶⁴ The long-term cost likely is far greater since maintenance and revision of a program in order to assure continued interoperability with new versions of the original program, other programs, operating systems, or machines ordinarily will require repetition of the entire, costly process.²⁶⁵ It makes no practical sense, and would be economically irrational, to embark on this course if required information is otherwise available and usable. There can be no doubt that, had the option existed, Accolade and Atari readily would have chosen to use available, sufficient information rather than use the more time-consuming and expensive enterprise of decompilation and reverse engineering.

Critical to the decision in *Sega* was the perception that application programs, such as word processing and spreadsheet programs, make ideas and functional elements that they embody externally observable. Presumably excluded from this are elements of those programs, or the programs within those programs, that invisibly interface with operating systems, other programs, and the like. Even so, the observation is sound only within significant constraints. External observation of outputs that follow from a variety of keyboard or other user inputs generates the equivalent of what the law characterizes as circumstantial evidence. While the strength of different bits of evidence may vary, none is more than a fact from which others may be inferred.²⁶⁶ What can be learned by this means falls far short, except in the most rudimentary case, of what must be known to achieve reliable and efficient interoperability with new versions of another program, operating system, or computer.

Access limited to external observation screens from direct examination the program-embodied ideas and functional elements that a third party who wishes to decompile seeks to understand. Even reverse analysis of disassembled or decompiled object code is a laborious and expensive process.²⁶⁷ Allowing federal copyright law to foreclose this

264. See Andrew Johnson-Laird, *Software Reverse Engineering in the Real World*, 19 U. DAYTON L. REV. 843 (1994).

265. *Id.*

266. *Id.*

267. Program-embodied ideas are neither self-revealing nor self-explaining. Compiled programs—object code versions—are stripped and devoid of programmer comments typically included in original source code and unaccompanied by flow charts and other documentation critical to readily understanding a program. Study and analysis of the equivalent of original source code

process, because a far more approximate and much less useful means for ascertaining what program-to-program or program-to-machine interoperation may very precisely require, compels what the *Bonito Boats* Court would not abide in state law: forcing potential competitors in the use of ideas to accept restriction to second best means of deconstructing and studying unpatentable subject matter in order to more fully protect innovators' economic interests.²⁶⁸ Consequentially, the foreclosure accomplishes what the *Bonito Boats* Court ruled: subordinating the potential for achievement of important, public-benefiting advances in the field to protect the economic interest of the inventor or discoverer of subject matter which must depend upon qualification for patent to gain federal protection.²⁶⁹

This issue brings the previously discussed conflict between strong, fundamental principles of patent law and the letter of copyright back to the fore. Resolution of that conflict can be no different in this more focused context. Necessity, moreover, can be presumed even if it is assumed, *arguendo*, that it is not an illegitimate factor. Taking into account the time element alone, it is contrary to common sense and economic rationality to choose the time-consuming route of decompilation and reverse engineering, and the resulting delay of entry into the very market in which an opportunity to compete is sought, unless the choice is dictated by necessity. Similarly, the personnel and financial resource investments consumed in these processes divert human resources from other productive tasks and absorb revenues in a manner that directly impacts the bottom line and the ability to engage in other competitive behavior. If information is otherwise available, this resource-devouring alternative simply will not be pursued. The alternative will be followed, for the most part, when a copyright owner has evaluated the situation and decided that it is most advantageous to force this choice on potential competitors rather than make needed information for a reasonable charge.

The critical inquiry, then, is not availability versus necessity. Intermediate copying, decompilation, and the deconstructive analysis and extraction characteristic of reverse engineering will occur only when it truly is necessary or where the terms of availability are too "steep" or "stiff." "Steep" terms of availability refer to a copyright owner's pricing of information essential to achievement of compatibility at a level so high that it effectively precludes profitable entry of vertically com-

without such aids is a difficult and often lengthy and costly process even with relatively small programs. See *id.* (describing experiment).

268. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 160 (1988).

269. *Id.* at 158-61.

patible programs into the market or, more directly, price competition in the market for horizontally compatible programs.²⁷⁰ “Stiff” terms of availability feature non-price restriction by contract or license terms that limit frequency of use, otherwise constrain market entry,²⁷¹ require cross-licensing that transfers value in independent creations of the licensee, preclude decompilation and reverse engineering the licensor’s program to ascertain its unprotected elements, or foreclose competition in the licensor’s market with independently created programs for a specified term following license expiration or termination.

Subject-to-restriction and monopoly-priced availability of required information differs from nonavailability only in the most literal sense. “Steep” or “stiff” terms of availability may make acquisition of information under contract provisions economically less rational than ascertaining it through decompilation and reverse engineering of a program copy. Copyright ownership, and the potential for its enforcement on the ground that making and decompiling an intermediate copy was not actually necessary, serves as a lever for exaction of an agreement that restricts competition with the licensor in the use of unprotected ideas and functional elements of a computer program. The economic calculus underlying the choice between accepting proffered terms or rejecting them and seeking to discover information through the processes of decompilation and reverse engineering is merely a refined version of the necessity calculus. Rationally, one opts for making and decompiling an intermediate copy when market entry subject to “steep” or “stiff” terms is economically more burdensome than investing substantial time, effort, and resources in information discovery by decompilation, deconstructive analysis, and extraction.²⁷²

The preceding analysis leaves two options. The first, and most rational option, is judicial abandonment of necessity as a requirement. The second option is to vest courts with case-by-case responsibility for *ex post* redetermination of the business decision calculus that led to copying, decompiling, and reverse engineering. Whether the measure of

270. See Gary L. Ignatin, *Let the Hackers Hack: Allowing Reverse Engineering of Copyrighted Computer Programs to Achieve Compatibility*, 140 U. PA. L. REV. 1999, 2042-44 (1987) (defining “vertical” compatibility as program interoperability with another and “horizontal” compatibility as program substitution for another for use under the same operating system).

271. Sega’s license terms would have required Accolade to make Sega the exclusive manufacturer of game programs distributed by Accolade. *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1514 (9th Cir. 1992). Nintendo’s license restricted its licensees to the distribution of five NES console games per year. *Atari Games Corp. v. Nintendo of Am. Inc.*, 975 F.2d 832, 836 (Fed. Cir. 1992).

272. Undoubtedly, the calculus is not precise. The calculation takes into account what is known, and best predictions about unknowns of the future, in a present value estimation of expenditures, opportunity costs, and revenues.

necessity is correctness or rationality, the likelihood in most well presented cases is judicial reaffirmation of the user's business decision. Isolated instances of irrationality may be found, but that cannot justify burdening the majority of rational decisionmakers, taxpayer-funded courts, and the marketplace with the costs of litigation undertaken primarily to limit competition in the use of unprotected ideas, procedures, processes, or methods of operation.

Failure to abandon the necessity criterion is likely to induce other legal challenges to "steep" and "stiff." Professor Marshall Leaffer's presentation and article present one such possibility—the assertion of a claim that a contract term, price or non-price, leveraged by copyright constitutes copyright misuse.²⁷³ An alternative scenario is that the judiciary will be called upon to determine this question: Is the use of contract law to prohibit decompilation and reverse engineering for the purpose of learning the content of a computer program, including content not protected by copyright, preempted by either patent or copyright law?²⁷⁴

The Ninth Circuit's analysis of the first and fourth section 107 factors in *Sega* illuminates, though does not determine, the issue. The court put the focus on ultimate use under the first factor and, under the fourth factor, on whether Accolade's game programs marketed for use on the Genesis III console supplanted use of Sega's games or merely competed with them in the market.²⁷⁵ Those inquiries derive from the fact that the copyright monopoly is limited in two important respects. The monopoly extends only to statutory subject matter, and the copyright owner's rights consist only of those set forth in section 106 (as further specified by sections 107 through 120). This limitation was the foundation of the Supreme Court's reminder in *Sony* that copyright may not be used to extend the copyright owner's limited statutory monopoly.²⁷⁶ The target market in that instance was the market for the means that others used to make unauthorized copies in circumstances where it could be argued that the copies supplanted markets for the original copyrighted works. The target here is competition in the market for a copyrighted program by the marketing of a competing program that incorporates unprotected elements of the copyright owner's computer program.

Establishing prohibitive or competitively unreasonable license terms, and arguing that information availability under those terms

273. Marshall Leaffer, *Engineering Competitive Policy and Copyright Misuse*, 19 U. DAYTON L. REV. 1087 (1994); Charles R. McManis, *supra* note 122.

274. Rice, *supra* note 34.

275. *Sega*, 977 F.2d at 1522-23.

276. *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417, 429 (1984).

makes intermediate copying and decompiling unnecessary, is the obvious competition-protecting response to *Sega*. This response, however, has precisely the same purpose and effect as the ruling *Sega* and Nintendo sought. The response leverages the limited copyright monopoly to restrict or preclude competition in realms beyond protection of the economic value of protected expression itself. One cannot plausibly claim that Congress intended this outcome solely on the basis that Congress did not foresee and foreclose the potential for this in the case of computer programs.

How do we deal with the “steep” and the “stiff”? That issue has troubled European Community analysts following adoption of the Software Directive.²⁷⁷ It has become an issue because showing necessity includes establishing that needed information was not otherwise available. Article 6 of the Software Directive does not say “available on reasonable terms.” Thus, the debate focuses now, in part, on whether “steep” and “stiff” terms of availability can establish both the fact of availability and de facto frustrate the purpose underlying Article 6 recognition of a limited right to copy and decompile.²⁷⁸

Leaving the *Sega* criterion in place and offering an opportunity to obtain judicial reexamination of business decisions introduces competition-impairing uncertainty and risk. While vesting courts with this function would not, itself, present insurmountable difficulties, doing so clearly imposes costs on the legal system, burdens potential competitors, and at least delays public realization of the benefits of competition. As to the courts, the analysis required of judges and juries is not different—though it may be more refined—than that presented above regarding the factual question of necessity. The analytical task is not beyond the competence of judges and juries. The long history of anti-trust law application to unreasonable restraints of trade makes this clear. Yet this history makes it equally evident that adjudication of this kind of fact-intensive issue can be very time-consuming and enormously expensive, which in many instances makes initiation of litigation all that is required to rid the market of competition from new, single-product market entrants.

The central question then is whether the cost is one that the law should impose, and that the judicial process should subsidize. It is not. Again, basic economic principles and common sense equally teach that rational choice will lead to contracting where the combination of price

277. See Vanessa Marsland, *Copyright Protection and Reverse Engineering of Software—An EC/UK Perspective*, 19 U. DAYTON L. REV. 1021 (1994); Jaap H. Spoor, *Copyright Protection and Reverse Engineering of Software: Implementation and Effects of the EC Directive*, 19 U. DAYTON L. REV. 1063 (1994); see also Arenas, *supra* note 122, at 831-36.

278. See Arenas, *supra* note 122, at 831-36.

and use terms appears to offer greater value to an Accolade or Atari than the value offered by resort to market alternatives. One such alternative is investment in wholly independent discovery aided by observing program behaviors. Another alternative is to make, decompile, and reverse engineer a program copy. Subjecting the latter choice to a litmus test of necessity subtly skews the economic calculus. This test of necessity requires business decision-makers to factor into the calculus their estimates of the probability that necessity-focused litigation ultimately will relieve them of liability. This factoring requires probability-based accounting for potential market entry delay costs as well as the litigation expenses.

This is not, as a matter of public policy, a defensible creation of law. It is a high cost and subsidy incurred in order to temporarily aid one class of competitors in their market competition with others. Placed in its best light, such a rule provides for judicial correction of occasional abuse or calculus error. More generally, the rule creates a public subsidy and imposes a private cost for a copyright owner's use of litigation to postpone, if not economically foreclose, competitive market entry. The private cost often is borne by under-capitalized or low-capitalized new market entrants, while established firms' use of the public subsidies under the law forecloses or forestalls competitive market entry.

This review demonstrates that necessity is neither needed, defensible, nor a wise condition for fair use treatment of the unauthorized making and decompiling of a computer program. Copyright law directly protects against use of what is discerned in a manner that infringes limited, economically valuable rights in protected subject matter. Recognition of a right to copy and decompile when necessary clearly is an important advance beyond making the use infringing, thereby allowing copyright law to protect the copyright owner against competition based on the use of statutorily unprotected ideas and functional elements embodied in a program. Retention of the necessity requirement, on the other hand, is not justifiable in either law or economics. Further, retention is not merely harmless error. It has potentially substantial anticompetitive effects that are simply a variant of those incident to a legal prohibition against copying-decompiling.

E. Conclusions About the Sega Limitations

The error in the reasoning and consequences of *Sega's* rejection of a broad right to make and decompile intermediate copies and its creation of limitations of competitor and public access to uncopyrightable and unpatentable ideas and functional elements embodied in computer programs has been shown. United States courts, in their interpretation of the Copyright Act, must—and will—perceive the Ninth Circuit's de-

cision as an important, but flawed, fair use precedent. Error grounded in cautious restraint in addressing issues of first impression is not an uncommon phenomenon. A major difference between the approaches to development of computer program copyright law in the United States and Europe permits United States courts to reexamine, refine, extend, and limit groundbreaking decisions within the context of cases that subsequently present new issues. The Software Directive, on the other hand, freezes development of the law until it is revisited as legislation. This difference in approach is significant in real world terms since judicial abandonment of the criterion during future development of the law will move the United States' law beyond the limits of the European Community Software Directive.

IX. CONTRACT: A VIABLE ALTERNATIVE FOR SECURING PROTECTION OR A FEDERALLY PREEMPTED USE OF STATE LAW?

Some commentators view *Sega* and *Atari* as antitrust-like cases miscast as copyright fair use decisions.²⁷⁹ The related doctrine of copyright misuse was in fact interposed by Atari and rejected by the Federal Circuit in *Atari*.²⁸⁰ Professor Marshall Leaffer's presentation in this symposium examines application of that doctrine as a basis for justification of making and disassembling an intermediate copy of a computer program and finds it both wanting and unruly.²⁸¹ The element critical to invoking either mode of analysis is, of course, the use of contract law to preclude intermediate copying, disassembly, and reverse engineering of computer program copies. The same element raises the issue of whether private parties may use state contract law to negate what *Sega* and *Atari* characterize as a right that exists as a matter of law under federal law.

Article 9(1) of the Software Directive expressly precludes use of contract terms to negate program user rights specified in Articles 5 and 6. Neither *Sega* nor *Atari*, however, speak to the use and enforceability of contract terms that negate what the courts characterize as limited rights that exist as a matter of law. On the other hand, the contemporaneous Ninth Circuit decision in *MAI Systems Corp. v. Peak Computer, Inc.*²⁸² and other federal court decisions suggest that contract-based use restrictions might serve to accomplish what *Sega* and *Atari* found that enforcement of copyright protection may not do.

279. See, e.g., Clapes, *supra* note 131; Miller, *supra* note 27.

280. Atari Games Corp. v. Nintendo of Am. Inc., 975 F.2d 832, 845-47 (Fed. Cir. 1992).

281. See Leaffer, *supra* note 273; see also McManis, *supra* note 122.

282. 991 F.2d 511 (9th Cir. 1993), cert. dismissed, 114 S. Ct. 671 (interim ed. 1994).

The comments in this part are brief. The comments are limited to whether such a use of contract is preempted by federal law. Examination of whether antitrust law or the copyright misuse doctrine render the contract terms unenforceable is left to others, or at least to another occasion. The analysis is not fully presented herein because it is fully set forth in a prior article titled *Public Goods, Private Contract and Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering*.²⁸³

Sega and *Atari* define the limits as well as the scope of copyright owner rights under the interrelated terms of sections 106 and 107 of the Copyright Act. Use of state contract law and its enforcement by state and federal courts to contractually prohibit unauthorized disassembly, decompilation, or reverse engineering of computer program copies necessarily proscribes what both courts concluded: intermediate copying for the purpose of disassembling or decompiling a program and creation of intermediate copies of original source code equivalents incident to the process of disassembly or decompilation were a noninfringing fair use as a matter of law. Concurrently, the same reliance on state law and its enforcement effectively precludes resort to reverse engineering to ascertain the content and application of unpatented program-embodied ideas, processes, or methods of operation. This use of state law precludes copying of a copyright-protected computer program and bars access to learning what unpatented ideas a program embodies and utilizes. Both consequences present serious conflicts with federal law, and the use and enforcement of such contract terms are preempted under both federal copyright and patent law.

Section 301(a) of the Copyright Act makes it clear that the Act is the exclusive source and delineator of rights in copyrightable subject matter. It specifically states that:

[A]ll legal and equitable rights that are equivalent to any of the exclusive rights within the general scope of copyright as specified by section 106 in works of authorship that are fixed in a tangible medium of expression and come within the subject matter of copyright specified by sections 102 and 103 . . . are governed exclusively by this title. . . . [N]o person is entitled to any such right or equivalent right in any such work under the common law or statutes of any State.²⁸⁴

Contract terms related to copyright subject matter are not generally preempted under section 301(a). Indeed, full realization and implementation of rights under the Act depend upon collateral use of state con-

283. Rice, *supra* note 34. A more brief, but consistent, analysis appears in McManis, *supra* note 122, at 88-95.

284. 17 U.S.C. § 301(a) (1977).

tract law. There is no extant body of federal contract law, either universal or specific to copyright, upon which contracts for the transfer of interests in copyright or copies of copyrighted works, or the display or performance of copyrighted works, draw. Yet dependence on state contract law as the foundation for market transactions does not confer on contracting parties the power to use state law and the courts to accomplish what section 301(a) expressly prohibits and preempts.

The principal question in most section 301(a) cases is whether state law, regardless of whether it is contract, trade secret, or another body of law, merely creates rights in copyrightable subject matter equivalent to those created by the Act or define rights which require proof of a qualitatively different or additional element in order to establish liability.²⁸⁵ The prior article, referred to above, carefully examines the operation of contractual prohibitions against disassembly, decompilation, and reverse engineering, and concludes that the restrictions operate no differently than the section 109(1) exclusive right to copy, or authorize the making of copies.²⁸⁶ Inherent in this type of restriction is a contract-based prohibition against making an intermediate copy necessary or incident to reverse analysis of a program.

Sega and *Atari* declare that a copyright owner may not foreclose this through enforcement of copyright because reading sections 106 and 107 *in pari materia* establishes that making such a copy or copies for the purpose of subjecting a program to reverse analysis is a noninfringing use as a matter of law. The attempt to use contract to circumvent this translates into negating the statutory section 107 limitation of the section 106(1) copyright owner right in a computer program. The effect of using the contractual restriction is to use state law to create qualitatively equivalent rights in copyrightable subject matter that exceed the statutory protection. The conduct that constitutes breach of the contract obligation is precisely that which the statute treats as statutorily actionable infringement—making an unauthorized copy of the program. The case reduces to one in which breach is not shown by proof of qualitatively different or additional elements. It is one in which state law is used to expand the protection that Congress provided for computer programs as copyrightable works. No case or circumstance more clearly trespasses upon the proscription of, and suffers the preemption of, section 301(a).

285. See *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 718-20 (2d Cir. 1992); *Mayer v. Josiah Wedgwood & Sons, Ltd.*, 601 F. Supp. 1523, 1535-36 (S.D.N.Y. 1985). Section 301(a) preemption of contract terms is discussed at length in Rice, *supra* note 34.

286. Rice, *supra* note 34.

Similarly, and succinctly, use and enforcement of the restriction is subject to federal patent law preemption. Although not based in statute, patent law preemption of state law intrusion into its domain is well established. Patent law preemption reaches rights created and enforced under state contract law as well as state statutes, unfair competition law, and general common law.²⁸⁷ The two most important cases for purposes of this Article were not, however, contract law matters. One involved the issue of whether federal patent law generally preempted state trade secret law, and the other concerned preemption of a state statute.

State trade secret law survived patent law preemption in *Kewanee*²⁸⁸ because, *inter alia*, trade secret law makes it lawful to discover trade secrets through the process of reverse engineering products in which trade secrets are embodied.²⁸⁹ The importance of this factor was made absolutely clear in *Bonito Boats*,²⁹⁰ a decision that struck down a Florida statute that prohibited the use of the most efficient and technologically advanced means of reverse engineering while leaving less efficient and more imprecise methods open to use. Distinguishing *Bonito Boats* from *Kewanee*, the Court underscored that trade secret law survived preemption because, while maintenance of secrecy is required, third party engagement in reverse engineering is a lawful means for lifting the veil of secrecy.²⁹¹ Preemption resulted in *Bonito Boats* because the state statute at issue enhanced trade secret law protection by making it unlawful to use an important, and the most effective, means for reverse engineering of boat hull designs.²⁹² This protection, the Court concluded, impermissibly created "rights against the world, similar in scope and operation to the rights accorded a federal patentee"²⁹³ for an unlimited term and without requiring satisfaction of the rigorous standards for obtaining a patent.²⁹⁴

This Article suggested at the outset that the growing tendency of federal courts to distinguish between copyrightable and uncopyright-

287. Among cases in which the Supreme Court has been concerned with preemption or rights created and enforced under state contract law are the following: *Aronson v. Quick Point Pencil Co.*, 440 U.S. 257 (1979); *Lear, Inc. v. Adkins*, 395 U.S. 653 (1969); *Brulotte v. Thys Co.*, 379 U.S. 29 (1964). Although not all decisions resulted in preemption, the Court took up in each instance the issue of whether federal patent law and policy preempted enforcement of contract-based rights created under applicable state law.

288. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470 (1974).

289. *Id.* at 476.

290. *Bonito Boats, Inc. v. Thunder Craft Boats, Inc.*, 489 U.S. 141, 155, 167 (1989).

291. *Id.* at 155.

292. *Id.* at 162-63.

293. *Id.* at 158.

294. *Id.* at 159.

able subject matter makes the lawfulness of intermediate copying for the purpose of, and incident to, disassembly, decompilation, and reverse engineering an especially important issue. It also has been observed that increasingly hospitable treatment of computer program patent applications by the Federal Circuit²⁹⁵ will make the enforceability of contractual prohibitions against reverse engineering a more prominent concern.²⁹⁶ Computer program elements that are not copyright protectable, yet proper subject matter for patent even if they do not fully meet the standards for patentability, constitute precisely the kind of subject matter with which the classic patent preemption cases have been concerned. Attempts to utilize state law to establish protection for that which federal law excludes from the protection of patent as well as copyright will not survive Supremacy Clause challenge. Simply put, federal patent law—as well as section 301(a) of the Copyright Act—stands squarely against general use of contract prohibitions against computer program disassembly, decompilation, or reverse engineering as a means of finessing the application of *Sega* and *Atari*.

Considerations of policy and related intellectual property law form the basis for limiting this claim to a statement that patent and copyright law preempt *general use* of the contractual prohibitions. Importantly, trade secret law survives patent and copyright law preemption especially as a means to protect against breach of trust or resort to theft or fraud. Parties often use contract law to memorialize obligations of trust in connection with providing employees and others with economically valuable and closely guarded knowledge. *Kewanee* recognized that trade secret law generally, not mere use of contract, legitimately serves this function—one that patent law does not comprehend.²⁹⁷ The remand in *Computer Associates* comparably recognized that conduct violating an obligation of confidentiality in connection with making an unauthorized copy of a computer program is a qualitatively significant element additional to that which formed the basis for the claim of copyright infringement. The Second Circuit therefore concluded that section 301(a) did not preempt liability under state trade secret law merely because copying was the means used in breaching a legally-recognized obligation of trust.²⁹⁸

295. See *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053 (Fed. Cir. 1992); *In re Iwahashi*, 888 F.2d 1370 (Fed. Cir. 1989); *In re Grams*, 888 F.2d 835 (Fed. Cir. 1989).

296. McManis, *supra* note 122, at 96.

297. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 489-90 (1974); see also *Bonito Boats*, 489 U.S. at 166-67.

298. *Computer Assocs. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 721 (2d Cir. 1992).

This provides a foundation for judicial recognition of a need and a basis for setting some limits, typically memorialized by contract, on intermediate copying of computer programs for the purpose of disassembling or decompiling program code and subjecting it to reverse engineering analysis. Premarketing, or beta testing of computer programs in original and updated versions, is an essential and established practice in software development. This practice typically entails intensive use and testing of programs and their enhancements by a select group of existing product users or potential users of the product that is being developed. In contrast to the circumstances in *Sega* and *Atari*, limited beta test distribution does not involve general, or open market, distribution of computer program copies. The contrast is one which the Supreme Court arguably recognized, albeit in a form that makes clear the limits of any safe haven. The Court's opinion considered at length both the purpose and market effects of Florida's statutory protection for boat hull designs after they were placed before the public in the marketplace.²⁹⁹ The Court concluded that the statute prevented public, including competitor, exploitation of unpatented or unpatentable "design and utilitarian conceptions embodied in the product itself."³⁰⁰ The Court treated this as an impermissible creation of property rights in unpatentable subject matter while, at the same time, it reaffirmed *Kewanee's* recognition that states may generally regulate market conduct. The Court made clear, however, that neither Florida nor other states may exploit the distinction. Legislative declaration that the purpose of the Florida law was to prevent "unscrupulous" conduct is of no moment if appending such "a conclusionary label . . . merely endorses a policy judgment which the patent laws do not leave the States free to make."³⁰¹

Distributing premarketing beta test copies of computer programs under contract restrictions that prohibit disassembly or decompilation and reverse engineering is wholly congruent with the legal and public policy rationale in *Kewanee*. Yet *Bonito Boats* makes it clear that a state legislature, let alone a private party seeking to contractually "legislate" maximum protection against competition, may not secure "protection beyond that available under the law of unfair competition or trade secret, without any showing of consumer confusion, or breach of trust or secrecy."³⁰² Merely declaring the existence of such an obligation of trust or secrecy ordinarily is not itself sufficient to establish a

299. *Bonito Boats*, 489 U.S. at 158-63.

300. *Id.* at 158; see also *id.* at 167.

301. *Id.* at 164.

302. *Id.* at 167.

relationship characterized by such an obligation.³⁰³ More importantly, *Bonito Boats* made it absolutely clear that means and their effects, not declaration of purpose, constitute the focus in any determination of whether state law is being used to restrict public exploitation of ideas not protected by patent law.

Section 301 of the Copyright Act similarly precludes state creation, through any means, of rights in copyrightable subject matter that are equivalent to or greater than those set forth in section 106. Enforcement of restrictive contract terms that expand the scope of section 106 protection by negating the operation of section 107 as a statutory limitation on section 106 clearly would suffer section 301(a) preemption. Yet it does not follow that use of contractual prohibitions against disassembly or decompilation and reverse engineering in premarketing beta test distribution of computer programs is impermissible. The validity of such restrictions must be determined under patent law and policy, not section 301(a), since the aim of the restrictions is to protect code-embodied ideas and processes. Avoidance of conflict with, and preemption under, section 301(a) is possible if, and only if, those who seek the protection of contract law prior to market distribution themselves reference the issues to patent law and policy. As described above, contract terms legitimately may be used to secure protection of program-embodied ideas and processes during the period of premarketing development, testing, and refinement. Contract law, however, may not be employed to bar public or competitor access to and use of unpatented ideas and processes embodied in programs placed in the market.

Finally, caution and concern for completeness warrant a further point. It does not, and it should not, make a difference whether differences in the nature of programs and their markets dictate or justify differing outcomes in preemption analysis.³⁰⁴ Patent law and policy do not distinguish between ideas and processes embodied in products or computer programs distributed in high volume in the mass market and those distributed in limited volume in special use or niche markets. Any difference, if one exists, is more fundamental to competition law, which independently would make competition-restricting use restrictions contained in mass market, standard form contracts vulnerable to invalidation as impermissible restraints of trade.³⁰⁵ One ought not, in short, simply assume that classic notions of freedom to contract assure the

303. See Rice, *supra* note 34, at 565; David A. Rice, *Trade Secret Clauses in Shrink-Wrap Licenses*, 2 COMPUTER LAW. 17, 19 (1985).

304. Rice, *supra* note 34, at 622-28.

305. Rice, *supra* note 34, at 565.

enforceability of restrictions contained in more fully negotiated commercial market contracts.

X. CONCLUDING OBSERVATIONS

Congress extended copyright protection to computer programs without addressing many issues of application presented by the resulting need to fit established principles to digital technology. Computer programs, a unique unity of text and behavior in both fact and law, and statutory limitation of copyright to protection of expression only are a combination that has presented challenging issues for adjudication. *Franklin* resolved the issue that copyright protection extends to object as well as source code versions of a copyrighted program and set the stage for consideration in *Whelan* of copyright protection of nonliteral as well as literal elements of expression. More recently, *Computer Associates* and *Gates*, among other cases, moved further to formulate approaches to distinguishing protectable from unprotectable computer program elements and refine the test for determining whether protected elements of a program have been infringed. Finally, *Sega* and *Atari* took the further step of considering whether copyright may be used to prevent third-party reverse engineering of computer program object code in order to ascertain program-embodied ideas, processes, and methods of operation that are not themselves protected by copyright law. The specific question in this latest stage of computer program copyright law development is whether copyright law precludes the making of unauthorized intermediate copies of a computer program for analysis and study for the purpose of learning a program's embodied, but uncopyrightable, ideas and functional elements.

The following matrix, Figure 1, graphically represents the sources of intellectual property protection in the United States for expression, ideas, processes, or methods of operation. The indicated sources of protection, and their limits, are displayed in longstanding non-statutory terms: Piracy, Plagiarism, and Public Domain. "Piracy" is here used to connote literal, direct use of expression or ideas of others, while "plagiarism" indicates less direct, less complete invasion of interests that the law protects. "Public domain" accounts for unprotected forms of expression and principles, concepts, ideas, processes, or methods of operation.

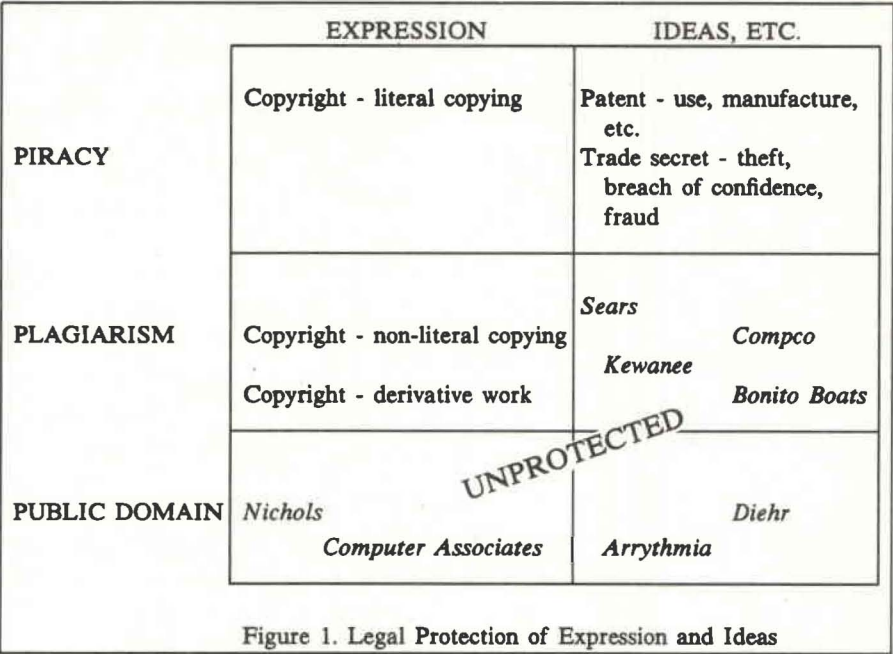
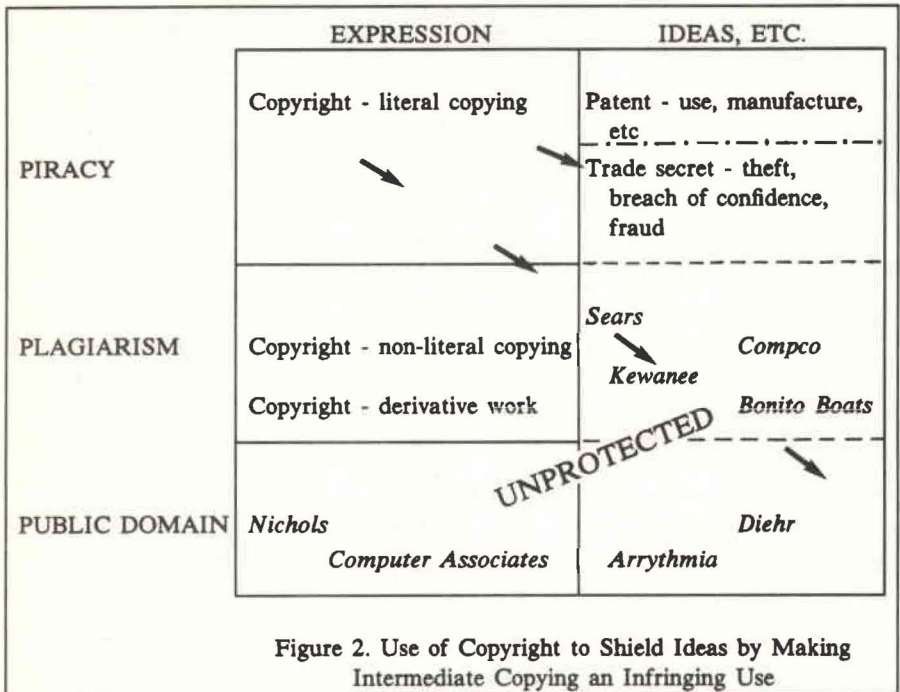


Figure 1 highlights two areas of contest in recent computer program copyright litigation and commentary. The first contested area, at the lower left, consists of expression that is not protected by copyright. The second contested area, the two lower right segments, consists of ideas, processes, and methods of operation that are not protected by patent, trade secrecy, or copyright. Cases such as *Computer Associates*, *Gates*, and *Lotus* deal primarily with whether certain subject matter lies within one of these regions or in the middle right sector of the matrix. The focus in *Sega* and *Atari* shifted to whether subject matter within the two lower right segments can be screened from access and study by enforcement of copyright. The effort by *Sega* and *Nintendo* to enjoin the making of intermediate copies necessary to engagement in the process of reverse engineering is depicted in Figure 2. This figure shows this use of copyright law by insertion of an arrow representing its extension and otherwise altering the diagram by changing some solid lines to dotted lines and by extending a downward-closing line above trade secrets.



The representation in Figure 2 indicates the copyright claim based on making exact, complete copies of a program—an act that Sega and Nintendo alleged to be “piracy.” The flow of the arrow toward the righthand side of the diagram shows that this use of copyright is intended to have the consequence of using a computer program copyright to create an impermeable membrane that shields program-embodied ideas, processes, and methods of operation from direct observation, study, and analysis.

Figures 1 and 2, taken together, clearly show that reliance on copyright law to preclude the making of intermediate copies puts copyright to protecting what neither patent nor trade secrecy protect. Notably, the diagrams demonstrate that reaching a different outcome in *Sega* or *Atari* would have two distinct effects. The first effect would be to make program-embodied trade secrets immune to third-party reverse engineering by making steps necessary to reverse analysis actionable under the body of federal law that protects only expression. The second effect would be to make the same body of law an instrument for masking program use and application of unpatented, or unpatentable ideas, processes, and methods of operation—and even unpatentable subject matter such as concepts and principles. Given the nature of copyright,

those consequences would follow from creation of a computer program fixed in a tangible medium of expression in any instance the work met copyright law's low standard of originality.

Sega and *Atari* held that this use of copyright law is impermissible, at least in circumstances where making intermediate copies is necessary to learning the unprotected computer program, and the purpose for seeking that knowledge is one that is legitimate. This Article contends that the necessity and legitimacy-of-purpose criteria are unsound and unduly restrictive of access to information that computer programs embody. Looking again to Figures 1 and 2, *Sega* and *Atari* state, in effect, that copyright law may be relied upon to make program-embodied trade secrets, as well as matter that falls within the two lower-righthand segments of the diagrams, inaccessible except when it is shown that knowledge of that non-copyrightable subject matter is sought for a legitimate purpose and the insufficiency of other means makes disassembly or decompilation and reverse engineering a necessity.

The diagrams show that the limitations set down in *Sega*, in particular, dramatically change the law of intellectual property for purposes of its application to computer programs. Copyright law, in this instance as well as in what *Sega* and Nintendo sought, serves to provide computer programs far greater protection than that which exists for novels and other literary works. There is no indication that Congress imagined, let alone intended, this extraordinary consequence when it enacted the 1980 Computer Amendments or in any action taken thereafter. Correlatively, there can be no doubt that working so fundamental a change in intellectual property law must be shown to be a product of conscious legislative, judicial, or other decision-maker choice. The significance of the outcome is so great that silence can be not taken to show that it was intended.

Debate over what copyright law does, and does not, serve to protect is a legal battle that rages above the war between contending views of what market protection should be given to computer programs. This analysis speaks primarily to the legal battle and emphasizes that fitting computer programs to copyright rather than copyright to computer programs is likely to produce extraordinary consequences that, in at least some instances, are wholly incongruent with well-established principles of intellectual property and related competition law. Clearly, the appellate courts in *Sega* and *Atari* sensed this, and—using the tools at hand—acted accordingly. What they perceived, however, was limited to what the controversies before them made apparent. They set a proper course, yet stopped well short of where the courts' perceptions inevitably lead.