FAIR USE FOR COMPUTER PROGRAMS AND OTHER COPYRIGHTABLE WORKS IN DIGITAL FORM: THE IMPLICATIONS OF SONY, GALOOB AND SEGA

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* Professor of Law, University of Pittsburgh School of Law. This Article is dedicated to Professor L. Ray Patterson in honor of his steadfast commitment to a conception of copyright as a regulatory regime in which the rights of users are to be balanced against the rights of publishers and authors so as to foster the production and dissemination of knowledge. The author wishes to acknowledge the contributions made to this Article by her research assistant Jim Weinberg. She also thanks Robert J. Glushko, Dennis S. Karjala, Jessica Litman, Jerome H. Reichman, and Lloyd Weinreb for their insightful comments on earlier drafts of this Article.

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I. INTRODUCTION

Fair use has historically served as a flexible and adaptable mechanism for balancing the interests of copyright owners, their competitors or potential competitors, and the public to fulfill the larger purposes of copyright law which have traditionally been understood to be promoting the production and dissemination of knowledge. Given this history, it is perhaps surprising how little use has been made, until very recently, of fair use as a defense to software copyright infringement claims, especially considering the high volume of such litigations in the past dozen years.

The most plausible explanation for the dearth of software related fair-use cases is that the first decade of software litigation concentrated on more fundamental questions, such as whether copyright

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1 See, e.g., L. Ray Patterson, Free Speech, Copyright and Fair Use, 40 VAND. L. REV. 1 (1987) (hereinafter Patterson, Free Speech) (discussing fair use as a balancing mechanism for mediating among the interests of authors, publishers, and the public in order to fulfill the underlying purposes of copyright law).

2 There were a few cases in the first decade of software copyright litigations in which fair-use defenses were raised, although they were not given much attention. See, e.g., Allen-Myland, Inc. v. International Business Machs., 746 F. Supp. 520 (E.D. Pa. 1990) (holding that database of IBM-authored software kept on behalf of IBM customers to whom AMI provided modification services was not fair use), recon. denied, 770 F. Supp. 1004 (E.D. Pa. 1991). It may also be that, with the presumption against fair use when defendants have commercial purposes that the Supreme Court established in Sony Corp. of America v. Universal City Studios, 464 U.S. 417 (1984), software copyright defendants have, until recently, been reluctant to raise fair-use defenses since most of the litigated cases have involved commercial competitors. See infra note 63 (concerning the Sony presumption of unfairness when defendants have commercial purposes).

There has also been remarkably little discussion of fair use in the ample law review literature on copyright protection for computer programs. Two notable exceptions are Leo J. Raskind, The Uncertain Case For Special Legislation Protecting Computer Software, 47 U. PITT. L. REV. 1131 (1986) (noting absence of fair-use analysis in computer software copyright cases) and Stephen K Tapp & Daniel E. Wanat, Computer Software Copyright Issues: Section 117 and Fair Use, 22 MEM. ST. U. L. REV. 197 (1992) (taking narrow view of usefulness of fair use in computer software cases). See also Pamela Samuelson, Modifying Copyrighted Software: Adjusting Copyright Doctrine to Accommodate a Technology, 28 JURIMETRICS J. 179 (1988) (hereinafter Samuelson, Modifying Software) (analyzing adequacy of current defenses, including fair use, to copyright infringement action); Pamela Samuelson, Computer Programs and Copyright's Fair Use Doctrine, 36 COMM. OF THE A.C.M. 19 (Sept. 1993) (evaluating fair use and how the courts have dealt with it in recent decisions).
protection could be had for all manner of programs\(^3\) and what scope of protection was available to programs from copyright law.\(^4\) Although the latter set of issues is still in the process of refinement, there is now more clarity on what aspects of software can be protected by copyright law and what test should be used to judge infringement than was true a few years ago.\(^5\)

This Article aims to explore the potential new terrain for fair-use defenses in software copyright cases that has opened up in the aftermath of two Ninth Circuit Court of Appeals decisions, *Lewis Galoob Toys v. Nintendo of America*\(^6\) and *Sega Enterprises, Ltd. v. Accolade, Inc.*\(^7\) Because of the importance of *Sony Corp. of America v. Universal City Studios*\(^8\) as a precedent not only for the Ninth Circuit's *Galoob* and *Sega* decisions, but also because of its implications for other potential software copyright disputes, Section I of this Article will focus on the United States Supreme Court decision in *Sony*. In *Sony*, a majority of the Court ruled that Sony's sale of videotape recording machines did not constitute contributory copyright infringement because of substantial noninfringing uses that consumers could make of the machines, including use of them to record programs for viewing at a later time.

At the heart of the contest between the parties in *Sony* was a very fundamental difference in conception about the nature of copyright law. Universal viewed copyright primarily as a property-rights regime. Sony viewed copyright more as a regulatory regime in which interests of copyright owners were to be balanced against the interests of other commercial participants in the marketplace and of the public at large so as to achieve the larger purposes of

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\(^3\) See, e.g., Apple Computer v. Formula Int'l, Inc., 725 F.2d 521 (9th Cir. 1984) (holding that operating-system programs are protectable by copyright law); NEC Corp. v. Intel Corp., 10 U.S.P.Q.2d (BNA) 1177 (N.D. Cal. 1989) (holding that microcode is protectable by copyright law).


\(^5\) In the past year, Computer Associates International v. Altai Inc., 982 F.2d 693 (2d Cir. 1992) has emerged as the leading case on scope of protection issues and on the appropriate test for infringement in software copyright cases. See Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992) (endorsing Altai); Atari Games Corp. v. Nintendo of Am., 975 F.2d 832 (Fed. Cir. 1992) (endorsing Altai).

\(^6\) 964 F.2d 965 (9th Cir. 1992), cert. denied, 113 S. Ct. 1582 (1993).

\(^7\) 977 F.2d 1510 (9th Cir. 1992).

copyright law.⁹

Universal would have had the Court strictly adhere to the text of the copyright statute and enforce its property rights under that statute. Those who used Betamax machines to copy Universal's movies from broadcast television had violated the exclusive right granted to copyright owners by the statute to control the reproduction of their works. Because Congress had not adopted a general private-use exception to this exclusive-rights provision and because the prior fair-use case law did not support Sony's fair-use claim, Universal argued that its property rights had to be enforced.¹⁰

Sony, and ultimately a majority of the Supreme Court, conceived of the dispute very differently. Sony asserted that Congress had not expressed an intention to give copyright owners exclusive rights to control the sale of uncopyrightable works, such as its Betamax machines. This argument drew upon traditional principles of copyright law harkening back to Baker v. Selden, which caution courts to be vigilant to ensure that copyright claimants do not use their copyrights to gain de facto monopolies greater than those intended by Congress.¹¹ When, as in Sony, new technology presented an issue that could not be readily answered from the copyright statute, the regulatory view of copyright would have courts go back to first principles to determine which result would best achieve the societal purposes of copyright law.¹² Sony is an important decision because of its endorsement of the regulatory

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⁹ See generally Patterson, Free Speech, supra note 1 (contrasting regulatory and property views of copyright). See also Samuelson, Modifying Software, supra note 2, at 200-04 (interpreting Sony as endorsing regulatory view of copyright). For an interesting if ahistorical analysis of copyright as a property rights regime, see Wendy J. Gordon, An Inquiry into the Merits of Copyright: The Challenges of Consistency, Consent, and Encouragement, 41 STAN. L. REV. 1343 (1989).

¹⁰ The dissenting opinion in Sony reflects this view of copyright law. See Sony, 464 U.S. at 463-75 (Blackmun, J., dissenting).


¹² The regulatory conception of copyright for which Sony was arguing "considers the uses consumers need or want to make of a copyrighted work, balancing their interests against those of copyright owners. This more flexible, open model of copyright is guided by the statute, not chained to it." Samuelson, Modifying Software, supra note 2, at 202-03.
conception of copyright.  

Section II will discuss the implications of Sony for a number of situations in which private noncommercial copies might be made of computer programs. There is a very considerable gap between the view widely held among the consuming public that private noncommercial copying of any copyrighted work (including software) is acceptable behavior and that held by software industry associations such as the Software Publishers Association (SPA), which seem to regard any unauthorized copying of software as piracy. As long as the Sony decision remains good law, there will be room for some fair-use copying of software by consumers, although less perhaps than some of them might wish.

Section III will review the Sega and Galoob rulings. In Galoob the court ruled that Galoob's product for altering certain aspects of the play of Nintendo videogames made only fair and noninfringing uses of Nintendo's works. In Sega, the court ruled that Accolade's disassembly of Sega programs to determine how to make videogames that would be compatible with the Sega videogame console made fair use of Sega's copyrighted games. This section will show the influence of Sony on both the Galoob and Sega rulings. Like

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14 See U.S. CONGRESS, OFFICE OF TECHNOLOGY ASSESSMENT, INTELLECTUAL PROPERTY RIGHTS IN AN AGE OF ELECTRONICS AND INFORMATION 122 (1986) [hereinafter OTA REPORT].

15 See, e.g., SOFTWARE PUBLISHERS ASSOCIATION, WHITE PAPER ON SOFTWARE PIRACY (1992) [hereinafter SPA WHITE PAPER] (setting forth SPA's views as to what constitutes software piracy without mention of copyright's fair-use defense and discussing its antipiracy strategies). The SPA actively lobbied for enactment of criminal provisions to make the copying of ten or more programs over a six month period having a collective value of $2500 or more a felony. The legislation eventually enacted was seemingly broadened to make ten infringements of any copyrighted work a felony. See Pub. L. No. 102-561, § 1, 106 Stat. 4233 (codified at 18 U.S.C. § 2319 (1988)). The SPA is now sponsoring advertising campaigns featuring a picture of a set of handcuffs with the caption, "This is the hardware you can get for free if you make copies of software." They also maintain a "hotline" so that employees or household members can report unauthorized copying, based upon which the SPA will have probable cause to conduct a raid (which they describe as an "audit") to determine whether and how much unauthorized copying has been done. The felony provisions have substantially aided the SPA's efforts to improve compliance within the business community that accords with its view of software copyright law.

16 See infra notes 74-96 and accompanying text.

Sony before them, they reflect a view of copyright as a regulatory legal regime.

Section IV will discuss the implications of the Sega decision for a number of potential disputes between software developers and their competitors or would-be competitors who seek to gain access to or make use of functional aspects of programs. Although the Ninth Circuit in Sega indicated that decompilation or disassembly of computer programs is not per se lawful, it is nonetheless consistent with Sega to say that fair use may be available when decompilation or disassembly is done for other legitimate purposes apart from obtaining access to interface information. Because Sega also involved a claim of fair use concerning the reproduction of a segment of program code necessary to achieve interoperability, it may open up opportunities for other fair-use defenses when competitors borrow functional elements of existing programs. This is not, of course, to say that Sega can be construed as making all competitive borrowing legal. But fair-use balancing is needed in the mediation of many kinds of software copyright disputes, and Sega provides a framework for doing such balancing.

Section V will explore the implications of the Ninth Circuit's Galoob decision for a number of situations in which users of digital versions of copyrighted works might raise fair-use defenses if charged with infringement because they took advantage of the opportunities that the digital medium and the electronic information tools now afford them to use those works in ways that have been unimaginable for works embodied in traditional media such as print. When enacting the Copyright Act of 1976, Congress expected that the fair-use defense would evolve over time in response to challenges posed by new technologies. Galoob has aided this evolution in a manner that balances the legitimate interests of copyright owners in obtaining a fair return for their

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18 Sega, 977 F.2d at 1518-20.
contributions to the culture and the public interest in having access to and the ability to make reasonable use of electronic information tools.

II. SONY AS A FAIR-USE CASE

Sony is an important precedent for many situations in which fair-use defenses might be asserted in software copyright cases. Private noncommercial copiers of computer programs would obviously rely on it. Because of its direction, that when new technologies present questions for which copyright law has no certain answers the law should be construed in light of its fundamental purposes, Sony has significance for many situations in which competitors are seeking access to functional elements of software or in which users may make use of digital tools to perform certain kinds of operations on the contents of copyrighted works. 21

A. SOME BACKGROUND ON FAIR USE AND THE SONY CASE

Fair use has never been popular with publishers of copyrighted works. 22 This is chiefly because it is often used to limit the scope of exclusive rights publishers would enjoy if fair use did not exist. 23 Courts have often relied upon fair use to resolve disputes when recognition of broad rights in publishers or authors would

21 It is a fair observation that, to some extent, Sony cuts both ways because of its dicta concerning a presumption against fair use when a subsequent user has a commercial purpose. See supra note 2. Software copyright defendants have tended to be commercial competitors.


23 In the Continental European authors' rights tradition, there is no such thing as a "fair use" defense to an infringement action because of the firmer hold natural-rights (i.e., a property-oriented) theory has in this tradition as contrasted with the more utilitarian tradition of American law. There is, however, a right of "fair quotation" in the Continental tradition. See, e.g., SAM RICKETSON, THE BERNE CONVENTION FOR THE PROTECTION OF LITERARY AND ARTISTIC WORKS: 1886-1986, at 489 (1987).
have frustrated achievement of the societal purposes of copyright law. In the American tradition, the ultimate purpose of copyright is not the maximization of financial rewards to copyright owners (which is what publishers would generally like it to be), but fostering the creation and dissemination of literary and artistic works in order to enhance the public's access to knowledge. The grant of exclusive rights to authors enabling them to reap a portion of the value derived from their creative contributions is a means to this larger end.

The copyright statute directs consideration of four factors when fair use is asserted as a defense to a claim of copyright infringement. Although courts often consider only these four factors in ruling on fair-use defenses, the text of section 107 indicates an openness to consideration of other factors, which would seem to include the fairness of the defendant's conduct.

The first statutory fair-use factor is the purpose and character of the copier's use of the copyrighted work. The preamble to the fair-use provision gives examples of kinds of uses that are contemplated as potentially fair. These include "criticism, comment, news reporting, teaching, scholarship or research." The text of the first factor provision also makes clear that "whether [the] use is of a commercial nature or is for nonprofit educational purposes" is also important.

The second fair-use factor focuses on the nature of the copyrighted work. It is somewhat difficult to state concisely the principle

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See, e.g., Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1975) (proclaiming that the "ultimate aim" of U.S. copyright law is to stimulate artistic creativity for the general public good).


Weinreb, supra note 27, at 1138.


Id.
underlying this factor. One can, however, say that, in general, the scope of fair use tends to be somewhat broader if the work is of a factual or functional nature than if it is artistic or fanciful.\textsuperscript{31} Whether the work is published or unpublished, or in or out of print, is also typically considered in the analysis of the nature-of-the-work factor.\textsuperscript{32} Although this factor is often ignored or underemphasized in fair-use cases,\textsuperscript{33} in some cases it plays a crucial role.\textsuperscript{34}

The third fair-use factor considers the amount and substantiality of the portion used in relation to the work as a whole. Substantiality is judged not only quantitatively but qualitatively as well. A quantitatively small amount of copying may be qualitatively substantial.\textsuperscript{35} Even so, it is generally true that the more a second comer takes, the less likely fair use is to be found.

The fourth factor considers the effect of the use upon the potential market for or the value of the copyrighted work. Although from reading the text of the fair-use provision, one might get the impression that the purpose of the use was the most important of the fair-use factors, the courts often seem to regard the "harm" factor as the most outcome-determinative.\textsuperscript{36}

The principal charge against Sony in the lawsuit brought by Universal City Studios and Walt Disney Productions was that of contributory copyright infringement.\textsuperscript{37} Universal claimed that Sony had sold Betamax machines knowing that its customers would use the machines to make unauthorized copies of copyrighted

\textsuperscript{31} See, e.g., Dratler, supra note 26, at 303 (nature of work has impact on work's protection).


\textsuperscript{33} See, e.g., Dratler, supra note 26, at 262-85 (complaining about failure of Court to address nature-of-the-work factor in Sony and about Court's analysis of factor in Harper & Row).

\textsuperscript{34} See, e.g., Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992) (discussed infra notes 121-143 and accompanying text).

\textsuperscript{35} See, e.g., Harper & Row, 471 U.S. at 565 (taking "heart of book" is qualitatively substantial although quantitatively small).

\textsuperscript{36} Id. at 566. Yet, it is also true that courts inclined to regard a use as fair will sometimes understate the potential for harm to markets, see, e.g., Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 452-54 (1984), while those inclined to regard the use as unfair will sometimes overstate the potential for harm, see, e.g., Salinger v. Random House, Inc., 811 F.2d 90 (2d Cir. 1987), cert. denied, 484 U.S. 890 (1987).

\textsuperscript{37} Sony, 464 U.S. at 417.
television programs, including those of Universal and Disney movies and other programs produced by these firms. This copying, Universal asserted, infringed its copyrights. Some of Sony's ads for the Betamax machine exhorted prospective customers to buy a Betamax machine to copy their favorite programs. Only when customers got home and opened the box to take out their new purchase would they find a cautionary note about possible copyright infringements.

Because there must be an underlying infringement before someone can be found liable for contributory infringement, Universal identified consumers who used the Betamax machine to copy programs off-the-air as the underlying infringers. To aid in the assessment of this claim, a representative owner of a Betamax machine who used his machine for time-shifting and for librarying

38 Unlike the federal patent and trademark statutes, the copyright statute does not have a contributory infringement provision. Sony, 464 U.S. at 434-35. Although courts had previously recognized the existence of contributory copyright infringement, see, e.g., Kalem Co. v. Harper Bros., 222 U.S. 55 (1911), Universal's argument against recognition of any private-use privilege under the Copyright Act of 1976 relied heavily on the argument that Congress had put every copyright rule it intended for courts to use in the text of the 1976 Act. Yet, there was no mention of contributing infringement in the 1976 Act, although contributory infringement provisions exist in the federal patent and trademark statutes. Thus, a problem Universal may have had in persuading a majority of the Court to the strict statutory approach it wanted the Court to take in interpretation of the exclusive rights and fair-use provisions, 17 U.S.C. §§ 106, 107 (1988), was that if the Court had taken a very strict statutory approach to analyzing the claims in the case, Universal might have lost because of the failure of Congress to include a contributory infringement provision in the statute. Once the Court looked beyond the statute to find a standard for contributory infringement, a majority of the members of the Court seemed willing to take a broader view of fair use as well. See Samuelson, Modifying Software, supra note 2, at 202-04.

There was also a direct infringement claim against Sony and some retail establishments that sold Betamax machines which used them to make copies of programs to test or illustrate use of the machine. There were also several other state and federal law claims in the case. See Universal City Studios v. Sony Corp. of Am., 480 F. Supp. 429, 432 (C.D. Cal. 1979), rev'd, 659 F.2d 963 (9th Cir. 1981), rev'd, 464 U.S. 417 (1984).

39 Universal argued that the contributory infringement standard from certain trademark cases (i.e., providing the instrumentality for infringement with constructive knowledge it will be used to infringe) should be adopted for judging contributory copyright infringement. The Supreme Court majority questioned whether this was the proper contributory infringement standard for trademark law, but went on to give reasons for rejecting the adoption of a trademark standard in copyright cases. See Sony, 464 U.S. at 439 n.19.

40 Sony, 480 F. Supp. at 436.

41 Id.
purposes was added as a defendant in the lawsuit. It was in this odd way that the issue of whether private noncommercial copying of copyrighted works infringed copyrights in these works was first brought to the United States Supreme Court.

Ordinarily, private noncommercial copiers are virtually immune from copyright infringement suits. This is partly because private copying is generally difficult for copyright owners to detect. Even when private-use copying can be detected, copyright owners are likely to decide that it is not worth the expense of litigation or potential bad publicity to reach individual private copiers. Nevertheless, publishers have long regarded private-use copying as infringement, notwithstanding their awareness that the public tends to regard noncommercial copying as noninfringing. Consequently, Sony was widely regarded as an important test case on this issue.

Sony's main defense to the contributory infringement claim relied on the fact that there were many noninfringing uses of its Betamax machines, the most substantial of which was to make copies of programs for time-shifting purposes, a use which Sony argued was fair and noninfringing. Sony argued that the Court should borrow the "staple item of commerce" doctrine from patent law and relieve Sony of the contributory infringement charges because of the substantial noninfringing uses of the Betamax machine.

Because Universal's arguments for infringement in the Sony case
parallel the kinds of arguments that software publishers would likely make in any case involving private-use copying of computer programs, a brief review of those arguments is in order.

B. UNIVERSAL'S ARGUMENTS AGAINST FAIR USE

Universal asserted that the those who copied its programs off-the-air with a Betamax machine were making intrinsic rather than productive uses of the copyrighted works. Productive uses bring a new work, such as a critical review that quotes from a copyrighted novel, into the world, thereby adding to the corpus of knowledge, which furthers the ultimate purpose of copyright law. An intrinsic use merely consumes the work in the same way as if a copy had been purchased. Universal pointed to the preamble of the fair-use provision of the copyright statute which gives many examples of productive uses as favored uses, by which Congress had expressed its intention that productive uses, not intrinsic or consumptive ones, should qualify as fair use.

Universal argued that the second fair-use factor also weighed heavily against a finding of fair use. The works about which Universal and Disney were concerned were fanciful entertainments. Many copyright cases have regarded works of entertainment as having a narrow scope of fair use, and if this principle had been applied in *Sony*, it would have certainly weighed against a finding of fair use.

The factor that seemed most likely to doom Sony's fair-use defense was the third fair-use factor, which concerns the substantiability of the taking. Those who used Betamax machines to copy television broadcasts tended to copy the whole work. Universal made much of the fact that fair use had never previously been found when the whole of a copyrighted work had been copied. This certainly had to count against a finding of fair use.

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46 The Ninth Circuit Court of Appeals opinion in *Sony* gave substantial weight to this factor. *See Sony*, 659 F.2d at 970-72.
47 See Dratler, *supra* note 26, at 289-91 (insisting that productive uses were intended by Congress to be favored).
48 *See, e.g.*, Walt Disney Prods. v. Air Pirates, 581 F.2d 751 (9th Cir. 1978).
49 The Ninth Circuit opinion in *Sony* was heavily influenced by this argument. *See Sony*, 659 F.2d at 973.
Although conceding that it had as yet suffered no identifiable harm to the market for its movies from this copying, Universal noted that harm to the market is often difficult to show in copyright cases. Universal offered both evidence and theories as to a number of potential harms to its future markets from Betamax copying. Universal noted that courts have often presumed harm from the mere fact of copying, in order to be solicitous of copyright owners' need to maintain exclusivity to protect potential markets from future harms.

Universal reasoned that copyright owners had been given the exclusive right to reproduce their works in copies, that users of the Betamax machine were making unauthorized copies of copyrighted movies, and that neither the fair-use defense nor any of the other special privilege provisions of the copyright law immunized private-use copying. Had Congress meant to privilege private-use copying, Universal argued, it would have explicitly said so.

C. THE SUPREME COURT'S FAIR-USE ANALYSIS IN SONY

In an opinion atypical of the copyright case law on fair use, a majority of the Supreme Court rejected nearly every argument made by Universal in the Sony case. Although this opinion has been much criticized by copyright scholars, I regard it as con-
taining considerable wisdom about the role of copyright as a regulator of the competing interests of copyright owners, other commercial providers, and the general public. Taking a regulatory approach to resolving a hotly contested case involving a new technology issue is particularly appropriate when copyright claimants make unprecedented claims about the reach of their rights, as they did in Sony. The majority opinion in Sony is a critically important precedent for what I regard as the correct decisions in two other new technology cases, namely the Sega and Galoob decisions discussed in Section III.65

Sony was atypical of fair-use case law in part because the Court viewed the dispute in a broader context than the statutory fair-use factors would have dictated.66 The Court observed, for example, that to grant relief to Universal would interfere not only with Sony's ability to sell Betammax machines, but also with the public's ability to have access to this desirable new technology as well as with the interests of the many copyright owners who either welcomed or did not mind the copying of their programs off-the-air by owners of Betammax machines.67 It would be equivalent to interpreting the statute as giving Universal the exclusive right to control the sale of Betammax machines.68 The Court decided this went further than the statute provided or than Congress had intended.69

65 Sega Enters., Ltd., v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992); Lewis Galoob Toys v. Nintendo of Am., 964 F.2d 965 (9th Cir. 1992), cert. denied, 113 S. Ct. 1582 (1993). See infra notes 97-143 and accompanying text.
66 The majority opinion did not even begin to discuss fair-use issues until Section IV-B of the opinion. Much of the important analysis in the case is to be found in Sections II and III which discussed the nature of copyright law and the contributory infringement doctrine. As noted above, supra note 27 and accompanying text, the text of the fair-use provision indicates that other factors besides the four named factors can be considered in judging whether a fair use has been made of the copyrighted work.
67 Sony, 464 U.S. at 442-46.
68 "It seems extraordinary to suggest that the Copyright Act confers upon all copyright owners collectively, much less the two respondents in this case, the exclusive right to distribute VTRs [video tape recorders] simply because they can be used to infringe copyrights." Id. at 441 n.21.
69 "The Court of Appeals' holding that respondents are entitled to enjoin the distribution of VTRs, to collect royalties on the sale of such equipment or to obtain other relief, if affirmed, would enlarge the scope of respondents' statutory monopolies to encompass an article of commerce that is not the subject of copyright protection. Such an expansion of the copyright privilege is beyond the limits of the grants authorized by Congress." Id. at 421.
The Court was impressed by the many noninfringing uses that could be made of Betamax machines. Betamax machines could be used for such things as showing homemade movies. They could also be used to copy programs from broadcast television that were uncopyrighted. In addition, they could be used to copy programs whose copyright owners did not object to off-the-air copying by owners of Betamax machines. The most substantial use of the Betamax machine, however, was to copy programs for later viewing when owners were unable to watch a program at the time it was scheduled for broadcast. This practice was known as time-shifting. Sony argued that this practice was also noninfringing under the fair-use doctrine.

In analyzing whether home copying of programs off-the-air for time-shifting purposes was fair or unfair, the Court began with the observation that the purpose of a Betamax owner's copying of programs off-the-air was private and noncommercial. The Court decided that courts should presume private noncommercial copying to be fair. Only if there was some demonstrable likelihood of harm to the market for the copyrighted work from private noncom-

In this and other passages, e.g., id. at 429, there is an antitrust-like flavor to the Court's analysis of congressional purposes for copyright. But Sony was far from the first decision to have regard for the competitive consequences of its ruling. Concerns that copyright law not be interpreted to give patent-like protection date back to cases such as Baker v. Selden, 101 U.S. 99 (1879), discussed infra notes 184-187 and accompanying text.

In explaining its reasons for importing the "staple item of commerce" doctrine of patent law into copyright jurisprudence, the Court spoke of the "historic kinship" between patent and copyright law, Sony 464 U.S. at 439, and public-policy concerns that had historically been recognized in both bodies of law about efforts by holders of these rights to extend the monopolies beyond that which Congress had intended. Id. at 441-42.

Id. at 423.

Id. at 449.

Id. The Sony decision has been much criticized for its unprecedented creation of a presumption of fairness when private noncommercial activity was involved and of unfairness for defendants with commercial purposes. See, e.g., Dratler, supra note 26; Weinreb, supra note 27. As Dratler notes, neither presumption was necessary to resolve the issues in the case. Id. at 263-64. Of the two presumptions, the one that presumes unfairness from commercial purposes has proved the most troublesome in subsequent case law. See, e.g., Acuff-Rose Music, Inc. v. Campbell, 972 F.2d 1429 (6th Cir. 1992) (reversing District Court finding of fair use primarily because District Court had treated commercial nature of 2 Live Crew's parody of "Pretty Woman" as cutting against fair use, instead of following Sony's presumption of unfairness), cert. granted in part, 113 S. Ct. 1642 (1993). I am among those who hope that the Supreme Court will use the opportunity this case presents to eliminate the presumption against unfairness when the defendant has some commercial purpose.
commercial copying should the presumption of fairness be overcome.\textsuperscript{64}

Concerning the second fair-use factor, the Court seemed to think it too did not disfavor fair use because Universal had chosen to have its copyrighted movies shown on broadcast television.\textsuperscript{65} Universal had, of course, been handsomely compensated for doing so and had known that viewers would get to see the programs "for free." The fees which Universal could command for television broadcasts of its movies depended on having large audiences. Time-shifting simply allowed those who wanted to view a movie broadcast between nine and eleven p.m. to see it at another time when circumstances conspired to make contemporaneous viewing impossible.\textsuperscript{66}

Time-shifters typically copied the whole of a broadcasted movie, and ordinarily this would strongly disfavor a finding of fair use.\textsuperscript{67}

\textsuperscript{64} A challenge to a noncommercial use of a copyrighted work requires proof either that the particular use is harmful, or that if it should become widespread, it would adversely affect the potential market for the copyrighted work. Actual present harm need not be shown; such a requirement would leave the copyright holder with no defense against predictable damage. Nor is it necessary to show with certainty that future harm will result. What is necessary is a showing by a preponderance of evidence that some meaningful likelihood of future harm exists. If the intended use is for commercial gain, that likelihood may be presumed. But if it is for a noncommercial purpose, the likelihood must be demonstrated.

\textsuperscript{65} Sony, 464 U.S. at 450-51. The Court regarded a prohibition on private noncommercial uses having no demonstrable effect on the market for the work as "merely inhibit[ing] access to ideas without any countervailing benefit." Id. at 450-51.

\textsuperscript{66} Id. at 449. As other scholars have noted, the Sony decision does not contain an extensive analysis of the second fair-use factor. See, e.g., Dratler, supra note 26, at 264 (insisting that Court ignored second factor altogether). The Court was surely too cryptic about the nature-of-the-work factor, but it does mention "the nature of a televised copyrighted audiovisual work . . . [which enables a viewer to see such a work] which he had been invited to witness in its entirety free of charge. . . ." See Sony, 464 U.S. at 449. The District Court opinion had given more extensive analysis of broadcasting as part of its discussion of the nature of the work factor. See 480 F. Supp. at 452-53. The points elaborated in the text following this note are the essential points made in the District Court opinion which I infer the Court meant to adopt as its own.

\textsuperscript{67} Id. at 449-50.

\textsuperscript{68} Id. at 450. All that the Court said about the substantiality issue was that although the copying of the whole work would ordinarily militate against fair use, other factors (chiefly the fact that time-shifting merely lets viewers see at a later time that which they could have watched without charge at the scheduled time) caused copying the whole of the work not to have its ordinary effect.
But the time-shifted copy itself was ephemeral. Once the time-shifted program had been viewed, owners of Betamax machines typically taped over the program the next time they wanted to make a time-shifted copy of another program.

Concerning the harm factor, the Court observed that Universal and Disney admitted that no harm to the market had yet occurred. Although they offered evidence about the potential for future harms to their markets, the Court accepted the District Court's characterization of this evidence as quite speculative. Speculation of this sort was not enough, the Court decided, to overcome the presumption of fairness that arose from the private noncommercial purpose of the copying.

The Court saw nothing in the Copyright Act to indicate "that the elected representatives of the millions of people who watch television every day have made it unlawful to copy a program for later viewing at home, or have enacted a flat prohibition against the sale of machines that make such copying possible." Perhaps Congress would "take a fresh look at this new technology" and decide to regulate it, but seeing no sign that Congress had chosen to regulate it yet, and given the substantial noninfringing uses of the Betamax machine, the Court concluded that Sony should not be held liable for contributory infringement.

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68 The Court mentions the ephemeral character of time-shifted copies as part of its assessment of the harm factor. See Sony, 464 U.S. at 453 n.39 (stating that temporary recording for time-shifting purposes will not harm public interest in theatrical exhibitions).

69 Id. at 452.

70 Id. at 452-54. Universal made several arguments about potential harm: that time-shifting would reduce the size of live audiences on which Nielsen ratings tend to be based, that it would reduce the demand for television rebroadcasts of movies, and that it would reduce the likelihood that people would go out to see a movie because they had seen a time-shifted copy of it.

71 Id. at 454.

72 Id. at 456. The trial court in Sony also noted that the legislative history of the Copyright Act of 1976 indicated that Congress intended that the fair-use doctrine should evolve to deal with new technology issues. Sony, 480 F. Supp. at 456.

73 For a discussion of alternative grounds for the Sony decision, see, e.g., Weinreb, supra note 27, at 1155-58 (arguing that Sony was correct because uses challenged in case were widely regarded as fair) and Wendy J. Gordon, Fair Use As Market Failure: A Structural and Economic Analysis of the Betamax Case and Its Predecessors, 82 COLUM. L. REV. 1600 (making an economic argument for finding fair use in Sony).
III. THE IMPLICATIONS OF SONY FOR PRIVATE NONCOMMERCIAL COPYING OF COMPUTER PROGRAMS

While it is easy to question the estimates made by industry associations as to the extent of unauthorized copying of software or of revenues lost thereby, no one doubts that a considerable amount of unauthorized copying exists. The SPA seems to regard every unauthorized copy of a computer program as an infringing copy. Members of the general public disagree and act as though fair use broadly privileges private and noncommercial copying of programs. Considered below are some examples of situations as to which many consumers would argue that fair use should be found.

A. A COPY AT THE OFFICE, A COPY AT HOME

It is a common practice for people to purchase one copy of a program, such as a word-processing package, and load it onto a computer at home as well as onto an office computer. One can hardly blame software publishers for preferring that their customers buy two copies of the software instead of just one, but that does not necessarily mean the second copy is an infringing copy.

The arguments that the SPA would make, if litigating a case of this sort, would parallel the argument that Universal made in Sony. The first factor would disfavor a finding of fair use, in their view, because it would be a nonproductive, intrinsically consumptive use. The SPA would also argue that the nature-of-the-work factor would disfavor fair use. Software, they would argue, is an unpublished work by virtue of "shrink-wrap license agreements," which typically contain many restrictions on uses that may be made of programs and which assert that consumers are not owners.

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74 Estimates of the number of unauthorized copies tend to be unreliable because no one really knows the extent of private-use copying done by individuals. Estimates of lost revenues are unreliable because they tend to be based on these unreliable estimates about the number of private-use copies made and because they also assume that each copy displaces a sale. See, e.g., OTA REPORT, supra note 14, at 197-204.

75 See, e.g., SPA WHITE PAPER, supra note 15.

76 See, e.g., OTA REPORT, supra note 14, at 209.
of copies of the programs contained on the purchased disk.\textsuperscript{77} The amount copied would be the whole work, which always cuts against a finding of fair use. The copy would also displace a second sale of the software, in the SPA's view. Furthermore, "shrink-wrap agreements" routinely inform consumers that they are only entitled to load the software onto one computer.

A consumer-oriented analysis might begin with a characterization of the copying as a private noncommercial act which under \textit{Sony} is presumptively fair.\textsuperscript{78} The nature of the work could also be argued to favor fair use, because software is an odd sort of product.\textsuperscript{79} Unlike a book which one can readily carry back and forth between one's office and home so that one need not buy two copies to have one at each place, it is simply infeasible to expect someone to transport software in a similar way. As a practical matter, it makes no sense to load the software onto one's office computer hard disk in the morning, erase it before going home that night in order to take a copy of it home so that one can load it onto the home computer that evening, and delete it from the home computer the next morning so that it can be taken back to the office computer. Yet these acts would be equivalent to taking a book back and forth from home to office. As for the shrink-wrap license restrictions, they are often unavailable to be read until after the software is purchased and are of questionable enforceability. Moreover, courts have recently rejected arguments that mass-marketed software is an unpublished work.\textsuperscript{80}

It would, of course, cut against a finding of fair use that one would be copying the whole of the copyrighted program, but the \textit{Sony} case shows that this is not necessarily dispositive. Concerning the harm factor, one might argue that this kind of copying is expected by many software developers and is largely unobjection-

\textsuperscript{77} See, e.g., Jessica Litman, \textit{Copyright and Information Policy}, \textit{Law \& Contemp. Probs.}, Spring 1992, at 185, 194-201 (discussing this and related theories).

\textsuperscript{78} See supra note 14 and accompanying text.

\textsuperscript{79} See, e.g., \textit{Sega Enters., Ltd. v. Accolade, Inc.}, 977 F.2d 1510, 1524-26 (9th Cir. 1992) (discussing respects in which software is unusual subject matter for copyright protection as part of fair-use analysis of nature-of-the-work factor).

\textsuperscript{80} For reasons supporting this objection, see, e.g., Lewis Galoob Toys v. Nintendo of Am. 964 F.2d 965, 970-71 (9th Cir. 1992) (rejecting Nintendo's assertion that its computer game cartridge was unpublished work), \textit{cert. denied}, 113 S. Ct. 1582 (1993); \textit{Sega}, 977 F.2d at 1526 n.9 (citing \textit{Galoob}); and Litman, \textit{supra} note 77.
able (although developers might not necessarily want to admit this in public), especially if no more than one copy of the software is being used at any one time.\textsuperscript{81} Furthermore, it is not necessarily true that if unable to make a second copy of the program for one's second computer, one would buy a second copy of the program. Given the high costs of many software packages, consumers might be more likely to work longer hours at the office and use the home computer for games or otherwise avoid a second purchase. One might also argue that the home copy can be regarded as a backup copy of the program while one is at the office, which can be justified either under the fair-use doctrine or under the special software backup provision of the copyright law.\textsuperscript{82}

B. MAKING A COPY TO TEST THE FUNCTIONALITY OF A PROGRAM

An even stronger argument for fair use could be made if one made a copy of a program to test its functionality, that is, to see if it will really do what one needs it to do. Someone may borrow a copy of a program from a friend to test it for a couple of hours and may be so happy with it that he buys a copy of the program the next morning (or deletes the copy after the test reveals that the hype on the package was just that).\textsuperscript{83}

The SPA can be expected to view this unauthorized copying as infringing. It too involves making a copy of the whole of the program for an intrinsic purpose in violation of the shrink-wrap restriction. The SPA might liken a defense of such copying to the strained argument that might be made by someone who stole a

\textsuperscript{81} Borland International sells software with a shrink-wrap license expressing this view. See, e.g., Weinreb, \textit{supra} note 27, at 1158 (suggesting that widespread perception that use is fair should carry weight in fair-use analysis).

\textsuperscript{82} 17 U.S.C. § 117 (1980 & Supp. 1993). It is interesting to observe that efforts by software developers to "copy-protect" their products, through the distribution of object code containing segments of code which prevented duplication of the product, were so unpopular with consumers that market factors caused developers to abandon this strategy.

\textsuperscript{83} Some software developers make their products available as "shareware" and explicitly authorize making a copy of a program to test it out on the expectation that if the user likes the software, he or she will send money to the developer. Some major commercial producers of software sometimes make promotional copies of some software available for periods of time sufficient to test it out or offer demo disks to allow consumers to test out some part of the functionality of the product before buying it.
candy bar that his taking of it was not theft because he later left money on the counter of the store from which it was taken. The harm comes from the unauthorized appropriation, in the SPA's view.

One might counter that software is the kind of product that one cannot really inspect before one buys it in the way one can, for example, browse a book before purchasing it. The copy made to test the program's functionality would be as ephemeral as the time-shifted copy in *Sony*. Further, by either purchasing a copy of the program thereafter or destroying the test copy, one would not be harming the market or potential market for the copyrighted work.

**C. LENDING A COPY TO A FRIEND**

Another common kind of private noncommercial copying of software arises from lending a disk to a friend who thereafter makes a copy from the disk. The SPA could be expected to argue that not only is the friend who makes a copy from the lent disk an infringer of the software copyright, but the one who did the lending can be reached as a contributory infringer, for he or she must have known of the significant likelihood that the friend would make a copy of the program. Some copyright scholars, most notably Professor Patterson, might argue that no infringement should be found in this kind of case, a result consistent with the views of the general public.

Before discussing how this kind of copying might be treated under the *Sony* decision, it is worth pointing out that a number of countries have explicit private-use privileges in their copyright law.

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84 The Court in *Sony* rejected as oversimplistic an argument that private noncommercial copying of copyrighted works was akin to arguing that taking a valuable item of jewelry from a store was not theft because the wearer only intended to make use of it in his or her home. *Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 450 n.3 (1984).*

85 Other examples of private-use copying likely to be viewed as fair under *Sony* would include making a copy of a program for use on a backup computer if the primary computer is being repaired and loading a copy onto another computer if necessary to give one access to a program functionality that one has paid for but which one's usual computer does not allow one to exploit (e.g., loading a word processing program onto a computer used exclusively for printing documents when the computer on which words are processed has no printing facility). Other examples are discussed *infra* in Section IV.
United States copyright law has no general private-use privilege, although as Sony indicates, private-use copying can be dealt with under the fair-use doctrine. Professor Patterson has pointed out that American copyright law has principally been concerned with controlling the behavior of commercial competitors who would, in the absence of copyright, make and distribute multiple copies of the whole or substantial portions of a first author's work. Because commercial competitors of this sort make unfair use of the copyright in the first work, they routinely are and should be found liable for copyright infringement.

Patterson points out that the fair-use doctrine arose from, and is principally invoked in, cases in which a second author incorporates a portion of the first work into a subsequent work. Even though the publisher of the second work may make some use of the first work's copyright by its commercial reproduction of portions of the first work in its multiple copies of the second work, the second publisher's use of the first author's copyright may nonetheless be a noninfringing fair use. Patterson distinguishes this kind of fair use of a first author's copyright interests from the kinds of private and noncommercial uses that a consumer might make of his copy of the work. Even if a consumer's ordinary use of his or her copy of a work involves copying it for personal use, Patterson regards such copying as noninfringing because it does not involve

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86 See Paul Geller, International Copyright Law (1992) (discussing, among others, the French private-use privilege at FRA-116-119, the Italian personal-use privilege at ITA-68.1-69, and the Japanese private-use privilege, at JAP-52-53). See also Ricketson, supra note 23, at 479-87. Ricketson does not believe that other nations' private-use privileges would cover the kind of private-use copying discussed in the text. See id. at 486.

87 See Patterson, Free Speech, supra note 1, at 37. See also L. Ray Patterson & Stanley W. Lindberg, The Nature of Copyright: A Law Of Users' Rights 12-14 (1991) (distinguishing among the author's interest in his or her "work" which may be represented by the manuscript, the "copyright" interest arising from creation of the work, rights which are often assigned to a publisher for its use in making and distributing multiple copies of the work, and the consumer's interest in a physical object embodying the work, that is, in his or her "copy" of it).

88 See Patterson, Free Speech, supra note 1, at 37-40.

89 An example of a fair noninfringing use of the copyright would be quoting a portion of the first work when necessary to understanding some point made in the second work.

90 See Patterson, Free Speech, supra note 1, at 37-48. The "one copy in the office, one copy at home" is an example of the kind of ordinary uses of a copy of a copyrighted work that Patterson regards as acceptable. Id.
use of the author's copyright, but only use of the consumer's own copy of the work.\footnote{Although private noncommercial copying is sometimes discussed under the rubric of fair use, as it seems to have been in Sony, Patterson regards this as a corruption of the fair-use doctrine. \textit{Id.} at 40.}

While Patterson makes a forceful historical argument for the proposition that private noncommercial copying should be regarded as noninfringing as an ordinary use of a consumer's copy of the work,\footnote{\textit{Id.} at 13-36. \textit{See also} L. Ray Patterson, \textit{Understanding Fair Use}, \textit{LAW \\& CONTEMP. PROBS.}, Spring 1992, at 249, 250-60 (discussing origins and current status of fair use and right to copy).} it is fair to say that the \textit{Sony} majority opinion did not go that far. The Court in \textit{Sony} did, of course, create a presumption in favor of fair use when the copying was for private noncommercial purposes, but it did not rule that all private noncommercial copying should be regarded as a fair use.

Had the Court gone on to rule that copying movies off-the-air for librarying purposes was noninfringing, one could have made a reasonably persuasive argument that, under \textit{Sony}, making a private noncommercial copy of a piece of software from a friend's copy should also be regarded as fair use.\footnote{Even this would not be an easy argument. \textit{Sony} could arguably be distinguished as a case in which a copy was made of a program broadcast "for free" on television, a form of distribution which is not typical for software, except among those who distribute their programs as "shareware." Software developers are also more dependent on the sale of copies to individuals for their revenues than are movie producers whose most substantial revenues derive from exhibitions in theaters and for whom sales of individual copies to consumers tends to represent a small (although perhaps growing) proportion of income.} But given that the Court was deeply split over fair use even as to copying for time-shifting purposes—only five members favored finding fair use in the case and four opposed it—there is reason to doubt that the Court would have regarded copying for librarying purposes as a fair use.

Librarying would certainly have changed the fair-use calculus as to the third and fourth factors. A reason that the Court seems to have decided that home copying of a movie off-the-air with a Betamax machine was fair use was that the copy was ephemeral. A libraried copy of a movie would have a more permanent character, as would the copy of software made from a friend's disk. Although at the time \textit{Sony} was decided there was not a substantial
market in videocassettes, such a market exists today. A libraried copy of a movie made off-the-air today might displace the sale of a videocassette. However, one can still argue, with respect to a VCR copy of a movie and with respect to a copy of software made by a friend, that one should not blindly assume that every private-use copy displaces a sale or harms the market for the copyrighted work. However, the Sony majority conceived of the possibility that private noncommercial copying could have a demonstrable effect on the market for a copyrighted work. When it did, the Court seemed inclined to regard the presumption of fairness arising from the private noncommercial purpose as likely to be overcome.

IV. THE EMERGENCE OF FAIR USE IN THE SOFTWARE COPYRIGHT CASE LAW: GALOOB V. NINTENDO AND SEGA V. ACCOLADE

Two recent software copyright cases have given serious and favorable attention to fair-use defenses. They are Lewis Galoob Toys v. Nintendo of America and Sega Enterprises, Ltd. v. Galoob Industries, Inc. Dratler suggests that the Sony majority opinion underestimated the potential harm to Universal's market because unrestrained home copying impacted the videocassette market that developed after Sony. Dratler, supra note 26, at 280. Dratler does not seem to have thought about the possibility that the Sony decision may, in fact, have contributed to the growth of the videocassette market. Having been unable to persuade the Court to stop the sale of videotape machines, Universal and other producers of copyrighted movies had economic incentives to cash in on the extraordinary market opportunities that had come to exist by virtue of the installed base of these machines in consumers' homes by releasing cassettes of their movies for direct sale to consumers and for sale to the burgeoning video rental outlet market.

See supra note 83. The friend who makes a copy from a lent disk may well decide to buy a copy of the software later in order to have the user manual, have the benefit of services offered by the developer, get upgrades, or pay the developer for the benefit he or she has received when he or she has the resources to do so. If the friend does not later purchase a copy, it is difficult under Sony to argue that this kind of private copying is fair use.

Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 450-51 (1984). Copyright lawyers today are unlikely to advise clients that private noncommercial copying of copyrighted works is lawful. But it is worth noting that few of them would have predicted that Sony would win against Universal in the Sony case either.

For reference to a few other software cases in which the courts have not taken fair-use defenses seriously, see supra note 2.

Acclade Software, Inc. Both were decided by the Ninth Circuit Court of Appeals. Both rely heavily, although by no means exclusively, on the Sony decision, and both reflect a more regulatory than proprietary approach to copyright. Sega, in particular, exhibits concerns, as did Sony, about interpretations of copyright that would extend the copyright monopoly beyond the bounds intended by Congress.

A. GALOOB V. NINTENDO

Nintendo charged Lewis Galoob Toys with contributory copyright infringement because Galoob's Game Genie was designed to alter certain aspects of the play of Nintendo videogames. When attached to cartridges in a Nintendo Entertainment System, the Game Genie could be programmed to do such things as increase the number of lives of a particular videogame character. The Game Genie accomplished these changes by intercepting certain signals from the Nintendo program and substituting other signals in the place of the Nintendo signals. Nintendo's theory was that Galoob provided consumers with a device knowing that the consumers would use it to alter the audiovisual sequences of the

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100 Lewis Galoob Toys v. Nintendo of Am., 964 F.2d 965 (9th Cir. 1992), cert. denied, 113 S. Ct. 1582 (1993). Nintendo also claimed direct infringement based on Galoob's use of the Game Genie to create altered play of Nintendo programs in the course of testing the product and marketing it to show what the Genie could do. See Lewis Galoob Toys v. Nintendo of Am., 780 F. Supp. 1285, 1289 (N.D. Cal. 1991), aff'd, 964 F.2d 965 (9th Cir. 1992), cert. denied, 113 S. Ct. 1582 (1993). The court rejected this claim as well. Id.

101 Galoob, 780 F. Supp. at 1289 n.2. The trial court noted that there were many interactive devices available in the marketplace which could be used to bring about or alter the play of Nintendo videogames. Some of these devices, for example, permitted the play of the games to be speeded up or allowed the user to skip lower levels of the game. Id. at 1288.

102 The Game Genie had two modes: a set-up mode in which the user could program the Genie to alter specific aspects of the game, and a game play mode which implemented the player's selections. During the set-up mode, the TV screen displayed the set of choices available to the user who was able to enter between one and three codes for altered play of the game. Although the book accompanying the Game Genie contained 1660 codes for possible changes to the play of Nintendo games, only three temporary changes could be made to the play of a Nintendo game at any one time. Id. at 1288-89.
Nintendo games, thereby creating unauthorized derivative works.103

Both the District Court and the Ninth Circuit had substantial doubts about Nintendo's derivative work theory. The District Court pointed out the ephemeral nature of the changed play of the Nintendo games104 and the fact that only a small number of changes could be made to the play of a game at any one time.105 The trial court also likened the modifications made through use of the Game Genie to children altering the play of a copyrighted board game, a use which Nintendo conceded would not infringe any copyright.106 The District Court pointed out that

[b]ecause of the technology involved, owners of videogames are less able to experiment with or change the method of play, absent an electronic accessory such as the Game Genie. This should not mean that holders of copyrighted video games are entitled to broader protections or monopoly rights than holders of other types of copyrighted games. . . . Having paid Nintendo a fair return, the consumer may experiment with the product and create new variations of play, for personal enjoyment, without

103 17 USC § 106(2) (1988). Nintendo relied on Midway Manufacturing Co. v. Artic International, Inc., 704 F.2d 1009 (7th Cir.), cert. denied, 464 U.S. 823 (1983), to support its derivative work theory. In Midway, the court ruled that the commercial distribution of a circuit board that speeded up the play of videogames created an infringing derivative work of the copyrighted games.

104 Galoob, 780 F. Supp. at 1291. It is difficult to reconcile this rationale with the subsequent Ninth Circuit ruling in MAI Systems Corp. v. Peak Computer, Inc., 991 F.2d 511 (9th Cir.) (holding that temporary copy of program in RAM was sufficiently fixed to be infringing copy), petition for cert. filed, 62 U.S.L.W. 3396 (U.S. Oct. 26, 1993) (No. 93-809). Richard Stern has pointed out that the derivative work right can be infringed by an ephemeral instance of the work, as in a public performance of a choreographic work. Richard H. Stern, The Game Genie Case: Copyright in Derivative Works Versus Users' Rights, 3 ENT. L. REV. 104, 105-06 (1992).

105 Galoob, 780 F. Supp. at 1291. This is a more persuasive rationale for rejecting Nintendo's derivative work claim, for the altered play was likely so insubstantial a variation on the play of the games that the Copyright Office would have refused to consider it a derivative work had Nintendo sought to register the altered game as a separate work.

106 Id.
creating a derivative work.\textsuperscript{107}

The Ninth Circuit, on the other hand, quoted from legislative history and the statutory definition of derivative work as indicating that Congress had meant for the derivative work right to be invoked only when a second work incorporated expression from the first work, as when a screenplay implements the plot of a novel.\textsuperscript{108}

However, even assuming the Game Genie did bring about an unauthorized derivative work, neither court thought infringement should be found because they were persuaded by Galoob's fair-use defense.\textsuperscript{109}

\textsuperscript{107} Id. See also id. at 1294, 1298 (holding that amount and substantiality of fair use does not weigh against fair use when game user has right to use entire game).

\textsuperscript{108} Galoob, 964 F.2d at 967-69. The Ninth Circuit contrasted Galoob's conduct with that in Mirage Editions, Inc. v. Albuquerque A.R.T. Co., 856 F.2d 1341 (9th Cir. 1988), cert. denied, 489 U.S. 1018 (1989), in which the defendant's physical incorporation of prints from the plaintiff's book onto ceramic tiles was held to be an infringement of the derivative work right. The principal defense in Mirage was that no infringement should be found because the plaintiff's copyright interests had been satisfied by defendant's purchase of books containing the prints. Considering the weight given in Galoob to the right of purchasers to do as they wish with their copies of works, it is somewhat more difficult to reconcile Mirage and Galoob than the Ninth Circuit's opinion might suggest.

For a discussion of the intended scope of the derivative work right, see, e.g., MELVILLE NUMMER & DAVID NIMMER, NIMMER ON COPYRIGHT § 8.09[A] (1992) (expressing view that derivative work right may be superfluous). See also Pamela Samuelson, Allocating Ownership Rights in Computer-Generated Works, 47 U. Pitt. L. Rev. 1185, 1209-1221 (1986) [hereinafter Samuelson, Allocating Ownership Rights] (discussing broad and narrow conceptions of the derivative work right and expressing the author's agreement with the interpretation of the derivative work theory adopted by the Ninth Circuit in Galoob). The Ninth Circuit regarded the Seventh Circuit decision in Midway as having "stretched" the concept of derivative works when ruling that the sale of chips that would speed up the play of plaintiff's videogames was infringing. Galoob, 964 F.2d at 969 (citing Midway Mfg. Co. v. Artic Int'l, Inc., 704 F.2d 1009, 1014 (7th Cir.), cert. denied, 464 U.S. 823 (1983)). Without indicating whether Midway was correctly decided, the Ninth Circuit indicated that stretching the concept of derivative work any further would chill innovation and impede the free flow of information. Id. The court mentioned add-on software as examples of beneficial advances that should not be impeded (citing Christian H. Nadan, Note, A Proposal to Recognize Component Works: How a Teddy Bears on the Competing Ends of Copyright Law, 78 CAL. L. REV. 1633 (1990)). Galoob, 964 F.2d at 969. See also Lotus Dev. Corp. v Paperback Software Int'l, 740 F. Supp. 37, 78-79 (D. Mass. 1990) (suggesting that add-on software would be noninfringing).

\textsuperscript{109} See Galoob, 780 F. Supp. at 1292-98; Galoob, 964 F.2d at 969-72. Interestingly, neither court gave any weight to the fact that the Game Genie had no purpose other than to change the play of Nintendo games. That the ruling in Galoob was by no means
Under Sony, the Ninth Circuit was required to ignore Galoob's obvious commercial purpose in marketing the Game Genie. The alleged underlying infringers in Galoob were consumers who used the Game Genie to alter the play of Nintendo games in the privacy of their homes. The court, therefore, invoked the Sony presumption of fairness because consumers were making private and noncommercial uses of the allegedly contributorily infringing device.

The court rejected Nintendo's argument that fair use should not be found because of the unpublished nature of the works. Insofar as Nintendo's claim was that it had not published derivatives of the sort the Game Genie produced, its argument was misplaced. The question was whether the games that Nintendo had distributed were published or unpublished. The answer to that question was clear: Nintendo had published millions of copies of its games to anyone willing to pay the purchase price. The court also observed that the logic of Nintendo's argument would virtually eliminate fair-use defenses for subsequently created works.

Inevitable is evidenced by the fact the trial court granted Nintendo's motion for a preliminary injunction and the appellate court had affirmed this ruling. Galoob, 780 F. Supp. 1286.

Nintendo had tried to argue that Galoob's purposes were commercial enough to give rise to the Sony presumption of unfairness and also that unproductive uses were being made of its work, which Nintendo argued also weighed against fair use. Id. at 1293 n.6. This was rejected by the court for the obvious reason that Sony had also had a commercial purpose in distributing the Betamax machine, yet the court focused its fair-use analysis on the purposes of owners of Betamax machines. Galoob, 964 F.2d at 970. The trial court rejected the productive-use argument, saying that Sony had minimized the importance of productive uses. Galoob, 780 F. Supp. at 1293 n.6.

By arguing that the versions of its games produced by use of the Game Genie were unpublished works, Nintendo had hoped to invoke Harper & Row's virtual presumption against fair use in cases involving unpublished works. Id. at 970-71. See infra note 133 and accompanying text for a discussion of the more general arguments that have been made by software publishers that their works are unpublished.

Nintendo's other argument on the second fair-use factor emphasized the creative nature of its games and pointed to cases in which artistic and fanciful works have been given a narrow scope of fair use. It is interesting to note that the trial court opinion does not discuss this argument at all. The appellate court does not mention it in the part of the opinion where it discusses the second fair-use factor, and only refers to it in a concluding portion of the opinion as the most persuasive of Nintendo's arguments on the fair-use issue. Id. at 972.
Finding the substantiality of the alterations to Nintendo's games through use of the Game Genie to be lesser in quantity and quality than the copying in Sony, the court in Galoob regarded this factor as disfavoring Nintendo's fair-use defense as well.

In reliance on Sony, the court thrust the burden onto Nintendo to demonstrate some meaningful likelihood of harm arising from use of the Game Genie. One of Nintendo's harm arguments focused on the Game Genie's interference with Nintendo's game quality control system which Nintendo asserted it had to maintain in order to prevent a collapse of the videogame market. Nintendo's other principal harm argument was that the Game Genie interfered with Nintendo's opportunities for marketing altered games. The court was not persuaded by either argument, pointing out that Nintendo had no plans to market versions of its games containing alterations of the sort that the Game Genie produced. The factor that may have most swayed the court on the harm issue, however, was that consumers could only use the Genie if they had already bought Nintendo games, which meant that the Game Genie did not displace sales of the Nintendo programs.

B. SEGA V. ACCOLADE

Sega sued Accolade for copyright infringement because Accolade made copies of Sega programs in the course of trying to develop

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115 Galoob, 780 F. Supp. at 1293. Nintendo's argument concerning the substantiality factor cannot be discerned from the published opinions. Its argument may have been that Galoob's use of the Nintendo games should be regarded as qualitatively substantial because it affected the play of so many different Nintendo games and because the alterations affected key aspects of the play and important characters in the games.

116 Id. The appellate opinion seems to have accepted the trial court's analysis on this point. See Galoob, 964 F.2d at 971.

117 Galoob, 964 F.2d at 971. The trial court opinion has a much more extensive analysis of Nintendo's harm theories. See Galoob, 780 F. Supp. at 1295-98.

118 Galoob, 964 F.2d at 971-72. See generally DAVID SHEFF, GAME OVER: HOW NINTENDO ZAPPED AN AMERICAN INDUSTRY, CAPTURED YOUR DOLLARS, AND ENSLAVED YOUR CHILDREN (1993) (detailing early collapse of videogame market and how Nintendo revived it through restrictive licensing and other quality control procedures).

119 Galoob, 964 F.2d at 971-72. The fourth fair-use factor is concerned not simply with present harms to present markets, but with "the effect of the use upon the potential market for or value of the work." 17 U.S.C. § 107(4) (1988 & Supp. IV 1993).

120 Galoob, 780 F. Supp. at 1294; Galoob, 964 F.2d at 971. This issue came up repeatedly in both the trial and appellate court opinions.
games that would operate in Sega's Genesis machines. Accolade admitted "disassembling" Sega programs (an act which necessarily involves copying) in order to gain access to information about how to construct games that would be compatible with Genesis machines. This was information that Sega made available to other game developers only under restrictive licensing agreements and for which licensees had to pay.

Sega was not claiming that any of Accolade's games contained expression from Sega programs, except as to one short sequence of initialization code.

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121 Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992). In order for programs to interoperate with other programs or with hardware, the programs must be constructed to accept and receive certain inputs in accordance with a precise set of protocols. The aspects of programs that allow them to interact and interoperate with other programs or machines are known as "interfaces." Program interfaces are, in effect, information equivalents to the standard configuration for plugs and plug sockets by which people routinely cause electrical equipment to interoperate.

122 Programs are generally written in human-readable source code form, and then transformed by compiler or assembler programs into a machine-readable form, generally referred to as object code. Programs are most often commercially distributed in object code form. But many programs are now available that permit the disassembly or decompilation of object code into a more human-readable form. See Sega, 977 F.2d at 1514-15 n.2. The issue of the legality of disassembly or decompilation of a competitor's program had been the subject of much disagreement among intellectual property professionals for years before the Sega case raised it in litigation. For a concise history of this controversy, see Litman, supra note 77, at 196-201.


124 The Ninth Circuit's October 20, 1992 opinion in Sega did not address the claim of infringement based on reproduction of a short sequence of initialization code because Sega had not emphasized it in its briefs or argument. The court's amended opinion addressed this "belated" claim in a footnote. The court ruled that reproduction of this short sequence of code was noninfringing, offering several rationales for this ruling: that it was a fair use and/or because the code sequence was too functional or short to be protectable by copyright. Sega, 977 F.2d at 1524 n.7. A subsequent trial court opinion has interpreted this aspect of the Sega ruling as an instance of an idea/expression merger. See Atari Games Corp. v. Nintendo of Am., 1993 U.S. Dist. LEXIS 8183 (N.D. Cal. April 15, 1993). Although this may be an acceptable interpretation of Sega, it is worth noting that the Ninth Circuit did not mention the merger doctrine. See infra notes 184-187 and accompanying text for a
Rather, the claim was that the intermediate copying of the program to determine how to construct a program that would work in the Genesis machine was itself infringing. Sega sought to stop distribution of Accolade games on the ground that as the final result of an unlawful disassembly process, it was an infringing derivative work; the fruit, so to speak, of the poisonous tree of disassembly. Accolade's principal defense was that this intermediate copying of Sega's code was a fair use.

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1 Sega's principal defense was that this intermediate copying of Sega's code was a fair use.


3 The trial court granted Sega's request for an injunction not only against further disassembly of Sega's programs but also against Accolade's distribution of games embodying information derived from the disassembly process. See Sega, 785 F. Supp. at 1402. For a critique of Sega's "fruit of the poisonous tree" argument, see Brief Amicus Curiae of the American Committee for Interoperable Systems at 12-14, Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992) (No. 92-15655) [hereinafter ACIS Amicus Brief] (citing authorities and reasons why this theory is erroneous). The prominent copyright scholar Professor Paul Goldstein, of Stanford Law School, was a signatory to this brief.

4 Accolade raised three other defenses: that intermediate copying should be excused because the final product sold on the market was noninfringing; that decompilation was always excusable in order to get access to functional elements that were unprotectable under 17 U.S.C. § 102(b); and that 17 U.S.C. § 117, which allows copying of computer programs in order to use them in a computer or to have a backup, could be construed to permit decompilation. The Ninth Circuit rejected all three of these defenses. Sega, 977 F.2d at 1518-20.

5 In addition to the ACIS Amicus Brief, supra note 126, the Computer and Communications Industry Association submitted a brief amicus curiae in support of Accolade's position in Sega, as did eleven professors of copyright law. See Brief Amicus Curiae of Eleven Copyright Law Professors in Sega Enterprises, Ltd. v. Accolade, Inc., 33 JURIMETRICS J. 147 (1992) [hereinafter Law Professor Amicus Brief]. Signatories to the law professor brief were: Ralph S. Brown, Yale Law School; Stephen L. Carter, Yale Law School; Peter A. Jaszi, The American University; Dennis S. Karjala, Arizona State University (principal author); David L. Lange, Duke University; Peter S. Menell, University of California at Berkeley; L. Ray Patterson, University of Georgia; Leo J. Raskind, University of Minnesota; Jerome H. Reichman, Vanderbilt Law School; David A. Rice, Rutgers NewHouse Center for Law & Justice; and Pamela Samuelson, University of Pittsburgh. See also Last Frontier Conference Report on Copyright Protection of Computer Software, 30 JURIMETRICS J. 15 (1989) (reporting that ten intellectual property scholars had reached consensus that kind of intermediate copying done in Sega should be regarded as fair and noninfringing use of copyrighted program at conference sponsored by Arizona State University College of Law's Center for
Sega sought to invoke the Sony presumption against fair use by characterizing the purpose of Accolade's use as commercial.\textsuperscript{129} The appellate court, however, perceived Accolade as having made copies of the Sega program in order to study it and discern how to make compatible but otherwise quite different and original programs to run on Sega machines. Accolade's development of new noninfringing programs contributed to achievement of the main goals of the copyright system of encouraging the "growth of creative expression" and introducing new independently created works into the market.\textsuperscript{130} These legitimate purposes overcame the Sony presumption of unfairness.\textsuperscript{131}

The appellate court regarded the nature-of-the-work factor as favoring a finding of fair use as well. With a brief citation to Galoob,\textsuperscript{132} the Ninth Circuit dispensed with Sega's argument that the unpublished nature of the work disfavored a finding of fair use.\textsuperscript{133} The court focused instead on the nature of computer

Law, Science, and Technology). Signatories to this report were: Donald S. Chisum, University of Washington; Rochelle Cooper Dreyfuss, New York University; Paul Goldstein, Stanford University; Robert A. Gorman, University of Pennsylvania; Dennis S. Karjala, Arizona State University; Edmund W. Kitch, University of Virginia; Peter S. Menell, Georgetown University; Leo J. Raskind, University of Minnesota; Jerome H. Reichman, Vanderbilt University; and Pamela Samuelson, University of Pittsburgh.

\textsuperscript{129} Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510, 1522 (9th Cir. 1992). See also Atari Games Corp. v. Nintendo of Am., 975 F.2d 832 (Fed. Cir. 1992) (also ruling that decompilation in order to develop compatible videogames would be fair use of copyrighted program). The Ninth Circuit opinion in Sega indicates that the Atari Games opinion "is consistent both with our analysis and with the result we reach." Sega, 977 F.2d at 1513-14 n.1.

\textsuperscript{130} Sega at 1523.

\textsuperscript{131} Id. at 1522-23. The Ninth Circuit rejected the District Court's conclusion that it was feasible to reverse engineer without making disassembly copies. Id. at 1525-26.

\textsuperscript{132} Id. at 1526 n.9 (citing Galoob, 964 F.2d at 970, discussed supra notes 100-120 and accompanying text).

\textsuperscript{133} Sega had sought to invoke the virtual presumption of unfairness for cases involving unpublished works deriving from the Supreme Court's decision in Harper & Row Publishers v. Nation Enterprises, 471 U.S. 539 (1985). Id. at 1526 n.9. Professor Litman traces the theory of software as an unpublished work to William Patry. Litman, supra note 77, at 194. Litman also discusses the efforts of some major software producers to promote this view during congressional hearings on proposed amendments to copyright's fair-use provision that would make clear that the unpublished status of a work did not preclude a finding of fair use. Id. at 193-201. Congress has since amended §107 to make clear that the unpublished nature of a work is not a bar to finding fair use. See 17 U.S.C. §107 (Supp. IV 1993).

There are at least three respects in which one might argue that programs such as Sega's games should be treated as unpublished works. For one thing, Sega distributes only object
programs as utilitarian works. Such works, the court observed, contain many functional elements that are not protectable by copyright law. Some of these unprotectable elements cannot be discerned by the user when running the program. The court recognized that it is sometimes necessary to make intermediate copies of a program in order to get access to unprotected elements of programs, such as information necessary to make a compatible program.

The court was disturbed by the implications of Sega's argument, observing that "If disassembly of copyrighted object code is per se an unfair use, the owner of the copyright gains a de facto monopoly
over the functional aspects of his work—aspects that were expressly denied copyright protection by Congress."\(^{137}\) To enjoy a lawful monopoly over the idea or functional principle underlying a work, said the court, "the creator of the work must satisfy the more stringent standards imposed by the patent laws."\(^{138}\)

Although Accolade had copied the whole of the Sega program, the Ninth Circuit thought it had done so only as an intermediate step in the process of developing a noninfringing program. The court cited Sony for the proposition that even copying the whole work did not preclude a finding of fair use.\(^{139}\) Accolade's use of the intermediate copy was so limited that this factor was "of very little weight."\(^{140}\)

Sega's effort to place the burden on Accolade to show lack of harm to Sega's market or potential markets was unavailing.\(^{141}\) Nor was the court persuaded by Sega's assertions that harm to its market flowed from the fact that Accolade's games directly competed with Sega-produced and Sega-licensed games.\(^{142}\) Noninfringing works often compete in the marketplace to appeal to consumer choices. If consumers preferred Accolade's games to those produced by Sega or its licensees, that might hurt Sega's market. As long as Accolade produced its own creative programs, however, Accolade should be regarded as engaging in the kind of competition that copyright law is supposed to encourage.\(^{143}\)

\(^{137}\) Id. at 1526 (citing 17 U.S.C. § 102(b) (1988)).

\(^{138}\) Id. See also Atari Games Corp. v. Nintendo of Am., 975 F.2d 832, 842 (Fed. Cir. 1992) (arguing that society should be free to exploit ideas and processes of copyrighted work and that authors do not hold exclusive rights to entire contents of literary work).

\(^{139}\) Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510, 1527 (9th Cir. 1992).

\(^{140}\) Id.

\(^{141}\) Sony indicates that presumption of harm arises from a commercial use. Sony Corp. of Am. v. Universal City Studios, 464 U.S. 417, 451 (1984). However, since the Ninth Circuit was persuaded that Accolade's principal purpose was to do legitimate research, the presumption of harm was not invoked by the court in Sega.

\(^{142}\) One plausible harm argument that seems not to have been made by Sega was that Sega typically charges a fee for giving game developers access to information about how to make games compatible with the Genesis console. Accolade's activities undermined this licensing system to some degree.

\(^{143}\) "[A]n attempt to monopolize the market by making it impossible for others to compete runs counter to the statutory purpose of promoting creative expression and cannot constitute a strong equitable basis for resisting the invocation of the fair use doctrine." Sega, 977 F.2d at 1523-24. The court pointed out that consumers typically buy many games for their Sega machines, so that it was far from clear that Sega's sales were affected by the availability of
C. THE IMPORTANCE OF SONY FOR THE GALOOB AND SEGA DECISIONS

Sony had a profound influence on both the Sega and Galoob decisions. Indeed, it is difficult to imagine either case having been decided in the same way had the dispute in Sony been decided in Universal's favor. All three decisions reflect a perception of copyright as a regulatory regime in which the public interest must be taken into account in the balancing of interests among participants in commercial markets.

The influence of Sony on the Ninth Circuit's Galoob decision is easily discerned. The invocation of the dual presumptions of fairness and of lack of harm arising from the private noncommercial nature of the alleged infringing conduct is the most obvious respect in which Sony was an important precedent in Galoob. But this was by no means all the Galoob court derived from Sony. The Ninth Circuit also noted that

*Sony* recognizes that a party who distributes a copyrighted work cannot dictate how that work is to be enjoyed. Consumers may use a Betamax to view copyrighted works at a more convenient time. They similarly may use a Game Genie to enhance a Nintendo Game cartridge's audiovisual play in such a way as to make the experience more enjoyable.\(^{144}\)

Thus, *Galoob*, like *Sony*, gives substantial weight to the interests of consumers in having access to and the ability to use new electronic information tools that enhance their enjoyment of copyrighted works.\(^ {146}\) Harkening back to Professor Patterson's terminology, one might characterize the Game Genie as extending the ordinary uses consumers could make of their copies of copy-
righted works.\textsuperscript{148} Because consumers were not using the copyright or engaging in competitive activity, no infringement was or should have been found. The implications of Galoob for other electronic information tools for extending ordinary uses consumers can make of their copies of copyrighted works will be explored in Section V.

The Sony opinion was also an important precedent for the ruling in Sega, although in different ways than Sega had hoped. Notwithstanding Sony's dual presumptions of unfairness if the user's purpose was commercial and of harm from a commercial use, the Ninth Circuit relied upon other facts about Accolade's purposes and the potential market effects of Accolade's actions in deciding that the first and fourth fair-use factors actually favored Accolade, not Sega.\textsuperscript{147} Only the third factor was said to weigh in Sega's favor, and it did so only weakly.\textsuperscript{148} Sony was obviously a crucial precedent for Accolade's argument that fair use could be found even when the whole of a work was copied.\textsuperscript{149}

Less obvious, perhaps, was the importance of Sony as a precedent cautioning that courts should be circumspect when construing the reach of copyright to deal with new technology issues that the courts had not addressed before.\textsuperscript{150} The court cited Sony for the proposition that when a new technology presented an issue that rendered application of copyright law uncertain or ambiguous, courts should construe that law in light of its basic purposes.\textsuperscript{151} Thus, the Sega decision, like Sony, reflects the view that courts should consider the impact its ruling would have on fulfillment of

\textsuperscript{148} See discussion of Patterson articles, supra notes 90-92 and accompanying text (regarding fair uses consumer can make of copyrighted work).
\textsuperscript{147} Sega, 977 F.2d at 1527.
\textsuperscript{148} Id.
\textsuperscript{149} Sega seems to fulfill the prediction made some years ago by Professor Leo Raskind that the reverse engineering privilege of the Semiconductor Chip Protection Act (S.C.P.A.), 17 U.S.C. § 906(a), might have broader implications for unfair competition law and for applications of the fair-use doctrine in copyright law. See Leo J. Raskind, Reverse Engineering, Unfair Competition, and Fair Use, 70 MINN. L. REV. 385, 387 (1985). Sega had sought to use the special reverse engineering privilege of S.C.P.A. to argue that absent a special statutory privilege of this sort in copyright law, infringement should be found. The Ninth Circuit rejected this argument. Sega, 977 F.2d at 1521.
\textsuperscript{150} Sega, 977 F.2d at 1527 (The court recognized that computer software "presented a relatively unexplored area in the world of copyright law.").
\textsuperscript{151} Id.
the ultimate societal and constitutional purposes of copyright as an important component in judging whether a particular use is fair.\textsuperscript{152} In addition, much the same concern is exhibited in \textit{Sega}, as in \textit{Sony}, that courts should be vigilant to ensure that copyright owners not obtain an undue extension of their statutory monopoly beyond that which Congress had intended.\textsuperscript{153}

V. THE IMPLICATIONS OF \textit{SEGA} FOR OTHER SOFTWARE COPYRIGHT DISPUTES

Although the \textit{Sega} decision is so recent that its influence on other decisions has been minimal,\textsuperscript{164} it is readily apparent that this decision may have broad implications for other copyright decisions involving computer programs. \textit{Sega} will certainly be an important precedent for future cases in which competitors or consumers claim fair use for their decompilation or disassembly of software for purposes other than obtaining compatibility information. The decision may have more indirect but nonetheless important implications for other situations in which second comers may wish to make use of certain functional elements of software or otherwise to make unauthorized uses of software which they have acquired in the marketplace.

A. THE IMPLICATIONS OF \textit{SEGA} FOR OTHER DECOMPILATIONS OR DISASSEMBLIES OF COMPUTER PROGRAMS

\textit{Sega} makes clear that when decompilation or disassembly of a mass-marketed program is a necessary step in the development of a compatible computer program, such intermediate copying will be privileged under the fair-use doctrine. Whether decompilation or disassembly undertaken to gain access to other unprotectable elements of programs should be regarded as fair use is a question

\textsuperscript{152} \textit{Id.}

\textsuperscript{153} \textit{Id.} at 1526.

\textsuperscript{164} The Ninth Circuit's \textit{Sega} decision has influenced decisions in the dispute between two other videogame competitors, Atari Games and Nintendo. \textit{See} Atari Games Corp. v. Nintendo of Am., 975 F.2d 832 (Fed. Cir. 1992) (interpreting \textit{Sega} as suggesting that, under the appropriate factual setting, copyright misuse may be viable defense against claim of copyright infringement).
the court did not address directly.

Those who urged the Ninth Circuit to rule in Sega's favor can be expected to give the decision the narrowest of constructions. They will likely view Sega as no broader—and potentially narrower—than the European Community's Directive on Copyright Protection for Computer Programs, which treats decompilation of a computer program as copyright infringement except to the extent necessary to obtain information needed to construct an interoperable program. The potential for Sega to be narrower than the EC Directive arises from the fact that the EC Directive does not permit enforcement of contractual restrictions on decompilation for purposes of achieving interoperability. Because there is no comparable limitation in the United States copyright law and because of the Ninth Circuit's deference to licensing restrictions in another recent software copyright decision, those who oppose decompilation and disassembly will likely look to licensing restrictions as a way to stop decompilation for all purposes, including that of gaining access to interface information.

\[155\] See supra note 125 (listing supporters of Sega's position on fair use).


\[157\] Id.

\[158\] MAI Sys. Corp. v. Peak Computers, Inc., 991 F.2d 511 (9th Cir. 1993), petition for cert. filed, 62 U.S.L.W. 3396 (U.S. Oct. 26, 1993) (No. 93-809). In this case, the Ninth Circuit ruled that making a temporary copy in the RAM of a second computer of a computer program that had been licensed for use on only one computer was an infringement. No fair-use defense was apparently raised in the case. Rather, Peak was defending the action by asserting that a temporary copy in RAM didn't satisfy the fixation requirement necessary for it to be a "copy" within the statutory definition. Peak argued that it could thus not be a violation of the exclusive right to reproduce the work in copies. Peak also sought to justify its copying under § 117, but the Ninth Circuit ruled that this provision did not apply to Peak because it was a licensee rather than an owner of a copy of MAI's program. This ruling has potentially devastating implications for the market for third-party support services for software. See Brief Amicus Curiae of Independent Service Network International In Support of Petition For Rehearing With Suggestion of Rehearing En Banc, MAI Sys. Corp. v. Peak Computer Inc., 991 F.2d 511 (9th Cir. 1993) (No. 92-55363).

Leaving aside for the moment the question of whether licensing can effectively reverse the results of Sega, it is worth considering how broad or narrow the ruling may be when the product being decompiled or disassembled is mass-marketed software for which licensing restrictions are, as a practical matter, infeasible.

The Ninth Circuit emphasized in Sega that someone who raises a fair-use defense for decompiling or disassembling another firm's program must have a legitimate purpose for this activity and that no other means of access to the information must be available. However, the court did not explicitly limit the scope of permissible decompilation to those situations in which decompilation is needed to obtain access to information necessary to permit development of an interoperable program. It simply gave the search for interface information as an example of a legitimate purpose. Although the Ninth Circuit rejected Accolade's argument that decompilation should always be regarded as noninfringing conduct, it is possible to envision a number of situations in which fair-use defenses might still have reasonable prospects for success consistent with the Sega ruling.

If, for example, decompilation was the only way to obtain information needed to correct an error in the program or was otherwise necessary to permit the owner of a copy of a computer program to make adaptations to make the software usable for its intended purposes, this should be permissible under the fair-use

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160 Although licensing restrictions on decompilation or disassembly may be given effect when they are the bargained product of a negotiation, it is worth pointing out that fair-use defenses are not necessarily unavailable simply because the work is licensed. See infra notes 166, 171 and accompanying text. It is also conceivable that a firm with a dominant position in the market might be regarded as misusing its copyrights, or as acting unfairly in the context of a fair-use defense, if it prohibits all forms of access to interface information. See generally Paul Goldstein, *Infringement of Copyright in Computer Programs*, 47 U. PITT. L. REV. 1119, 1126-30 (1986) (predicting that copyright misuse doctrine might be called upon to resolve some computer program copyright disputes, including some involving operating system programs; also predicting a rise in successful fair-use defenses in computer program cases).

161 Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510, 1514 (9th Cir. 1992).

162 Id. at 1519-20.

The copyright statute explicitly gives owners of copies of programs the right to make adaptations to their copy of the software. Unless one has access to the source code of the software or other extensive documentation about the internals of the software, decompilation may be the only way to get access to the text of the program to obtain information necessary to fix an error in the software that has caused it to malfunction.

Congress would surely not have given owners of programs the right to make adaptations to software, while at the same time denying users access to the information that would make it possible to perform those adaptations. Pro-consumer principles from the *Sony* case, as well as pro-competition policies from the Ninth Circuit ruling in *Sega*, would support finding fair use when decompilation was necessary to permit an error to be corrected or to make other reasonable adaptations.

Decompilation might also be a fair use under *Sega* if necessary to enable a firm to determine whether a competitor's product infringed the copyright in its product such as copying of nonliteral

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164 See, e.g., Pamela Samuelson, *Reverse-Engineering Someone Else's Software: Is It Legal?*, IEEE SOFTWARE, Jan. 1990, at 94. The Ninth Circuit in *Sega* decided it need not decide whether § 117 permits only adaptations for uses intended by the copyright owner, as Sega argued, or for the consumer's range of uses. *Sega*, 977 F.2d at 1520 n.6. The court did note, however, that the Fifth Circuit Court of Appeals had interpreted § 117 as not restricting the range of intended uses to those intended by the copyright owner. See Vault Corp. v. Quaid Software, Ltd., 847 F.2d 255, 261 (5th Cir. 1988).

165 See 17 U.S.C. § 117 (1988) (providing defense to infringement claim if owner of copy of computer program makes or authorizes making of some adaptations to copy).

166 In recognition of the legitimate concerns of users for access to source code or other documentation for purposes such as fixing errors in the event that the software's developer is either unwilling or unable to provide maintenance services, it is becoming more common for software developers to agree to escrow source code and documentation with a third party so that such access can be had. See, e.g., Kevin Deasy & Anne C. Martin, *Licensing of Intellectual Property Rights Needed For Software Support: A Life Cycle Approach*, 28 JURIMETRICS J. 223 (1988) (discussing planning for software support through licensing arrangements to provide access and rights to source codes and other software related documentation).

167 See Vault, 847 F.2d 255 (striking down portions of Louisiana statute purporting to validate shrink-wrap restrictions on such things as making back up copies, decompilation, and modification of software, finding statute and restrictions it permitted to be in conflict with federal copyright policy).

168 As with decompilation to obtain interface information, *Sega* would seem to direct a court in ruling on this kind of fair-use defense to consider whether the error correction information was available other than by decompilation.
elements of the program’s internal structure. ¹⁶⁹ Decompilation would not be necessary if infringement was apparent from the copying of user interface elements, but it may sometimes be necessary to detect nonliteral infringement. It is very likely that the Ninth Circuit would regard good faith efforts to detect infringement as legitimate purposes under Sega. ¹⁷⁰

Even those who have been most adamant that commercial decompilers such as Accolade should be regarded as infringers have often been willing to admit that decompilation of program code should sometimes be permissible under copyright law’s fair-use doctrine. ¹⁷¹ The example generally cited is that of a computer scientist who decompiles a program in order to discover an innovative technique embodied in the program that has not been publicly disclosed. ¹⁷² The purpose of the copying would be for noncommercial research purposes. As in Sega, the key factor concerning the nature of the protected work would be that it was distributed in object code, a form of the program in which the contents are inaccessible except through decompilation or disassembly. The whole of the work would likely be copied, but as in Sega, the copy would be intermediate in nature and no harm to market interests of copyright concern would occur. ¹⁷³

¹⁶⁹ See, e.g., E.F. Johnson Co. v. Uniden Corp. of Am., 623 F. Supp. 1485 (D. Minn. 1985) (plaintiff had decompiled defendant’s program to determine whether it infringed).

¹⁷⁰ By being so restrictive about decompilation (making it available only to get access to interface information), the EC Directive would seem to deprive owners of copyrights in computer programs of an effective technique for protection of their rights under copyright law.

¹⁷¹ See, e.g., Allen R. Grogan, Decompilation and Disassembly: Undoing Software Protection, 1 COMPUTER LAW. 1 (Jan. 1984) (arguing decompilation not published or done for financial gain, and undertaken by computer science students in attempt to learn programming techniques could constitute fair use); Duncan M. Davidson, Common Law, Uncommon Software, 47 U. PITT. L. REV. 1037, 1092-99 (1986) (stating that fair-use doctrine allows researcher to analyze certain programming techniques and other ideas as long as information gained is not used for competitive or public purposes).

¹⁷² See sources cited supra in notes 171 and 125.

¹⁷³ Davidson argues that the computer scientist should be forbidden to publish the results of his research because this publication would destroy the trade secret status of the technique which would harm the developer’s market interests. Davidson, supra note 171, at 1092-93. It is worth noting that decompilation for scientific research purposes is not permissible under the EC Directive. The Directive goes so far as to forbid member states from using fair use or similar privileges to grant broader rights to decompile software than that granted by the directive for gaining access to interface information. See Article 6 of EC
A seemingly harder fair-use question is posed if a commercial developer of software decompiles a program to get access to an unpatented algorithm embodied in it and then uses this algorithm when developing a competing program.

Some may argue that such a commercial developer should be treated as an infringer on the ground that an algorithm is part of a program’s “structure, sequence, and organization” that should be protectable by copyright law. Unless no other algorithm could be used for a particular function, the reproduction of the algorithm would be claimed as an appropriation of expression. Under this theory, two claims of copyright infringement would arise. One would arise from the appropriation of an expressive algorithm. A second would arise because the decompilation itself would not be fair since a decompilation to get access to expression would not seem to be a legitimate purpose under Sega.

Even if a court regarded the algorithm as an unprotectable element of a program, those who disfavor decompilation would likely argue that competitive decompilation to get access to an algorithm is unfair. They would tend to emphasize two things: the commercial nature of the developer's purpose and the harm that would arise from letting a competitor take a free ride on an innovator's work.

A developer who decompiled a competitor's program to get access to an algorithm would certainly have a strong commercial motive for its decompilation. The Ninth Circuit said it employed the

Directive, supra note 156. The Directive would also seem to regard a publication of interface information properly obtained by decompilation as infringing conduct except to the extent it permitted use of the interoperable program. It is more difficult to imagine an American court forbidding a lawful decompiler from publishing information or other unprotectable elements of a program in an article or other independently created original work.

174 The principal case seeming to recognize copyright protection for the structure, sequence and organization of programs is Whelan Associates v. Jaslow Dental Laboratories, 797 F.2d 1222 (3d Cir. 1986), cert. denied, 479 U.S. 1031 (1987). Some have argued that because algorithms are as valuable as code (if not more so), copyright law should protect them as well. See also, Virginia Johnson, Note, Copyright Protection for Computer Flow Logic and Algorithms, 5 COMPUTER/L.J. 259 (1984).

175 This result would be consistent with Whelan, which has, however, been much criticized for having an overbroad view of the scope of copyright protection in computer programs. Whelan, 797 F.2d 1222. See Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992) and Computer Assocs. Int'l v. Altai, Inc., 23 U.S.P.Q.2d (BNA) 1241 (2d Cir. 1992) (rejecting Whelan approach as overbroad).
Harper & Row presumption of unfairness when the defendant had a commercial purpose in Sega. However, the court in that case treated the presumption as a relatively weak one that was easily overcome by a disassembler's research purposes. Other courts have treated the Sony presumption of unfairness for commercial purposes as a very strong one, and perhaps the Ninth Circuit would do so in a different case. If the second developer uses the algorithm in a subsequently developed competing program, the second developer may have taken a partial free ride on innovation from the first firm's work, which courts generally disfavor. If the decompiler's software is a competitive substitute for the first firm's software, some would argue this gives rise to a stronger potential for harm to the first firm's market than was true in Sega.

Such arguments, however, are not sound as a matter of copyright law. That is, algorithms are not expressive elements of copyrighted works, and under Sega, it should be as fair for a competing developer to decompile a program to get access to an unpatented algorithm as it now is to decompile to get access to information needed to develop a compatible program.

An algorithm is a finite method or procedure for performing a task. The text of section 102(b) states: "In no event does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept,

176 *Sega*, 977 F.2d at 1522.
178 See Whelan, 797 F.2d at 1237-38 (holding that copyright infringement is not rendered less damaging by fact that infringer expended substantial time and effort in copying original work). See also Miller, supra note 125, at 1026 (disfavoring free use of decompilation due to discrepancy between cost of creating software and cost of duplicating it). It is worth pointing out, however, that a very considerable amount of work is required to disassemble or decompile a program and learn anything useful from it (such as how to develop a compatible program or what algorithm underlies someone's program). But see Feist Publications v. Rural Tel. Serv. Co., 499 U.S. 340 (1990) (allowing defendants to take a free ride on use of unprotectable elements from a plaintiff's work may promote the purposes of copyright law).
179 One reason the Ninth Circuit gave for finding insignificant harm to Sega's market was that consumers buy multiple games; thus, Accolade's games would not necessarily displace sales of Sega's games. *Sega*, 977 F.2d at 1523.
principle or discovery." A plain reading of this provision would indicate that an algorithm embodied in a computer program is unprotectable by copyright law because it is, by definition, a procedure or method embodied in the text of a program.

Further evidence that algorithms are beyond the scope of copyright comes from the legislative history of section 102(b), for both the House and Senate Reports indicate that this provision was added to the statute in response to concerns expressed in congressional hearings that without a provision of this sort, some software developers might try to claim copyright protection for methods and procedures embodied in programs. Section 102(b), say these reports, was "intended to make clear that the expression adopted by the programmer is the copyrightable element in a computer program, and that the actual processes or methods embodied in the program are not within the scope of copyright."

In addition, it appears that the "procedure, process, system, [and] method of operation" language of section 102(b) derives from the landmark Baker v. Selden case and its progeny. Because the organization of the headings and columns in Selden's ledger sheets were constituent elements of the accounting system, Baker did not infringe Selden's copyright when he reproduced this arrangement.

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182 H.R. REP. NO. 1476, 94th Cong., 2d Sess. 57 (1976), reprinted in 1976 U.S.C.C.A.N. 5659, 5670; S. REP. NO. 473, 94th Cong., 2d Sess. 54 (1976). It was Arthur Miller whose testimony expressed concern that without a provision such as § 102(b), copyrights in computer programs would be used to get patent-like protection for valuable aspects of programs, such as methods and procedures. See Copyright Revision Act of 1967: Hearings On S. 597 Before the Senate Subcomm. on Patents, Trademarks, and Copyrights of the Comm. on the Judiciary, 90th Cong., 1st Sess. 197 (1967). After becoming a paid consultant for certain software producers, Miller has converted to the copyright maximalist camp. See Miller, supra note 125.

183 H.R. REP. NO. 1476 at 57; S. REP. NO. 473.

Copyright protected only Selden's explanation of the system. To get exclusive rights for a system, process, or method of operation described in a book, the Court stated that one would have to go to the Patent Office. "To give the author of a book an exclusive property in the art described therein, when no examination of its novelty has ever been officially made, would be a surprise and a fraud upon the public. That is the province of letters patent, not of copyright." Thus, an additional reason why computer program algorithms should not be regarded as expressive elements of programs, notwithstanding the contribution they may make to the structure or organization of the program, is that patents are issuing with frequency now for innovative program algorithms. It would upset the economic balance Congress meant to establish for the patent and copyright systems to allow software developers to use copyright to protect utilitarian elements of programs that are "better left to the more exacting standards of patent . . . law," such as algorithms.

If algorithms are among the "procedures" and "methods" that Congress intended to exclude from copyright protection by enactment of section 102(b), the Sega decision can fairly be read to mean that disassembling or decompiling a program in order to get access to an unpatented algorithm should be regarded as a fair use as

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185 For a discussion of Baker v. Selden as a case in which the arrangement of words was a constituent element of a system, see Pamela Samuelson, A Critique of Lotus v. Paperback, supra note 184 at 226-235. See also Law Professor Amicus Brief, supra note 128, at 6-7; Lotus Dev. Corp. v. Borland Int'l, Inc., 831 F. Supp. 223 (D. Mass. 1993) (characterizing Baker v. Selden as holding that constituent elements of system cannot be protected by copyright law).

186 Selden had failed to get a patent for his bookkeeping system. See Samuelson, Modifying Software, supra note 2, at 231.


The Ninth Circuit used functional requirements for achieving compatibility as an example of the kinds of unprotectable elements in programs that one might need to disassemble object code in order to discern. The Ninth Circuit looked to *Baker v. Selden*, among other cases, for propositions such as that copyright protection did not extend to functional aspects of protected works and that the scope of copyright for functional writings was relatively thin because most of the contents of such works are functional. The court's concern that Sega's copyright not be interpreted as giving it a *de facto* monopoly on the functional concepts embodied in the program also harkens back to themes first developed in *Baker v. Selden* and elucidated further in the *Sony* decision concerning the potential for overbroad interpretations of copyright law that would confer patent-like protection.

If a competing developer claimed fair use for decompiling a program to get access to an innovative unpatented algorithm, the purpose of the use would be identical to that in *Sega*: to understand a functional aspect of the program that was unprotectable by

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190 It would be unnecessary to decompile a program to get access to a patented algorithm because information about the algorithm would be available from the patent. Hence, Sega's requirement that the information not be available except by decompilation or disassembly could not be satisfied.

191 Sega Enters., Ltd. v. Accolade, Inc., 977 F.2d at 1510, 1520 (9th Cir. 1992).

192 Sega made extensive use of Computer Associates International v. Altai, Inc., 23 U.S.P.Q.2d (BNA) 1241 (2nd Cir.), *opinion withdrawn and superseded in reh'g by*, 982 F.2d 693 (2nd Cir. 1992), *on remand*, 832 F. Supp. 50 (E.D.N.Y. 1993), which in turn heavily relied on *Baker v. Selden*. See *Altai*, 23 U.S.P.Q.2d (BNA) at 1251 (characterizing *Baker v. Selden* as "the starting point in [copyright] analyses of utilitarian works"). To characterize decisions such as *Altai* and *Sega* as though they deny "full copyright protection" to programs, as Miller does, *see Miller, supra note 125*, at 1009, is to ignore that there is a long history in copyright law arising from *Baker v. Selden* that has regarded the functional content of utilitarian works as beyond the scope of copyright. Miller's article is not the first time he has ignored this tradition. *See Pamela Samuelson, CONTU Revisited: The Case Against Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663, 727-49 (1984) (discussing utilitarian character of computer programs and why it presented problems for copyright law to rebut CONTU Report's assertion that utility of work had never disqualified it from copyright protection). Miller was the chair of the CONTU subcommittee responsible for studying whether computer programs should be protected by copyright law. *See also* sources cited supra notes 184-185.

193 *Sega*, 977 F.2d at 1524. *See also* sources cited supra note 192.

194 *Sega*, 977 F.2d at 1526.

195 *See supra* notes 44, 59-60 and accompanying text.
copyright law in order to make a new noninfringing program.\textsuperscript{186} The nature of the work would be the same as in \textit{Sega}, for the work would be an object-code form of a program containing functional elements that were unavailable except through decompilation. The whole program would be copied, but as in \textit{Sega}, the copy would be intermediate in nature. The only potential for harm to the market would be that which flows from the development of a new noninfringing work, a kind of harm that \textit{Sega} says does not injure copyright interests.

The real concern of those who oppose decompilation of computer programs—a concern which the Ninth Circuit detected only obliquely, if at all, in the \textit{Sega} case—is that much of the value in a computer program lies in the applied know-how embodied in it.\textsuperscript{187} Much of this know-how cannot be discerned by watching the executable version of the program in operation.\textsuperscript{188} As long as the program is not decompiled, the applied know-how embodied in it can successfully be claimed as a trade secret. If someone can get

\textsuperscript{186} One substantial difference in opinion among those who support the \textit{Sega} decision (see supra note 128 for a list of copyright law professors who urged the court to rule as it did) and those who are critical of its holding (such as Miller, see supra note 125) arises from their very different conceptions of the underlying purpose of copyright law. If one conceives of copyright's purpose as solely being an incentive to the production and commercial distribution of creative works, then it follows that one would be receptive to arguments that a competitor's decompilation to get access to any information embodied in the work might undermine incentives to produce and distribute it. If, however, one considers that the purpose of copyright is to promote the creation and dissemination of knowledge, it will follow that one will be more receptive to arguments that if decompilation is necessary in order to get access to knowledge, it should be noninfringing. \textit{Sega} is more consistent with the latter view than the former, as is \textit{Feist Publications v. Rural Telephone Service Co.}, 499 U.S. 340 (1991). See also \textit{OTA REPORT}, supra note 14; Litman, supra note 77; Patterson, supra note 1; \textit{Patterson & Lindberg}, supra note 87; Samuelson, \textit{Modifying Software}, supra note 2 (all supporting view that purpose of copyright is to promote learning).

\textsuperscript{187} See, e.g., Reichman, supra note 11 and accompanying text.

\textsuperscript{188} The principal reason the Ninth Circuit gave for rejecting Accolade's argument that decompilation should be considered \textit{per se} lawful in order to get access to unprotectable elements of copyrighted software was that many of the unprotectable elements of programs are observable by watching the program in operation, making decompilation unnecessary to get access to these unprotected elements. "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." \textit{Sega}, 977 F.2d at 1520. In fact, a great deal of valuable know-how embodied in programs cannot be discerned by watching programs in operation.
access to the know-how through decompilation, the know-how can no longer be claimed as a trade secret for the obvious reason that it will no longer be a secret (at least as to that person). Nor can it be regarded as expression for copyright purposes\(^{199}\) nor as an invention under patent law.\(^{200}\) The goal of those who have opposed decompilation has been a prophylactic one, to use copyright to stop intermediate copying that threatens to destroy the trade secret status of applied know-how embodied in programs.\(^{201}\)

The Ninth Circuit's decision in *Sega* was correct as a matter of copyright law, for it is no more appropriate for copyright law to be used to protect against acquisition of information embodied in mass-marketed copies of copyrighted works than the Ninth Circuit in *Sega* thought it was to use copyright as a way to get patent-like protection for the functional requirements for making a program compatible with the Sega machine.\(^{202}\) The court's response to the argument that strong protection against decompilation was needed because of the high cost of software development was that it was not consistent with the *Feist* decision in which the Court rejected the "sweat-of-the-brow" theory of originality.\(^{203}\) *Sega* quoted from *Feist* for the proposition that copying facts and other unprotectable elements from copyrighted works is neither unfair nor unfortunate, but rather is the very means by which the purposes of copyright are

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\(^{199}\) See, e.g., Baker v. Selden, 101 U.S. 99, 104 (1879) ("The very object of publishing a book on science or useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated if the knowledge could not be used without incurring the guilt of piracy of the book."). See also *Feist*, 499 U.S. 340 (1991) (regarding copying of facts as promoting purposes of copyright).

\(^{200}\) Generally speaking, applied know-how involves only incremental improvements over the prior art and will not rise to the necessary level of invention to support a patent. See, e.g., Reichman, supra note 11, at 682. See also Karjala, supra note 163 (arguing that it is appropriate to leave incremental know-how in public domain).

\(^{201}\) See, e.g., Grogan, supra note 171; Miller, supra note 125.

\(^{202}\) *Sega* rightly looks to the Supreme Court's decision in *Bonito Boats v. Thunder Craft Boats*, 489 U.S. 141 (1989) for further support for a fair-use privilege for disassembly when necessary to develop an interoperable program. In their amicus brief to the Ninth Circuit, eleven copyright law professors characterized the *Bonito Boats* decision as "recogniz[ing] a competitor's right to reverse engineer unpatented innovation as a fundamental ingredient of the intellectual property balance and the competitive system it regulates." Law Professor Amicus Brief, supra note 128, at 158. See also *Atari Games Corp. v. Nintendo of Am.*, 975 F.2d 832 (Fed. Cir. 1992).

\(^{203}\) *Sega Enters., Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992).
advanced.\textsuperscript{204} \textit{Sega}, in other words, is well-grounded in copyright law and tradition, and its critics are simply wrong about how copyright law should be applied to computer programs.

B. FAIR USE IN OTHER SOFTWARE CASES

The revival of \textit{Baker v. Selden} as a precedent with implications for fair-use defenses when a second comer reproduces functional elements of copyrightable works may be among the most important aspects of \textit{Sega}. All too often \textit{Baker v. Selden} is cited as though it had held only that abstract ideas are unprotectable by copyright law or that when only a small number of ways exist to express a particular idea, idea and expression will be considered to have "merged" and, so as not to give protection to the idea, the constrained expression will either not be protected at all or will be protected only against exact duplication.\textsuperscript{205} Now that the Ninth

\begin{footnotesize}
\textsuperscript{204} Id.
\textsuperscript{205} As Professor Reichman has shown, the idea/expression distinction predated \textit{Baker v. Selden} and does not constitute its contribution to American copyright law:

\begin{quote}
[T]he historical role of \textit{Baker v. Selden} was to override the exclusive reproduction rights in a very particular set of circumstances. These were cases in which the standard defenses (including idea-expression) appeared insufficient to guarantee a third party's right to use functional features embodied in the work because that use seemed to entail an unauthorized reproduction of the protected work, including its actionable subject matter.
\end{quote}


This interpretation of \textit{Baker v. Selden} opens up an alternative way for courts to regard reproductions of information needed to achieve compatibility as noninfringing conduct. This information, when embodied in a computer program, may be characterized as a compilation of information which required creative selection and arrangement, or as a component of the "structure, sequence, and organization" of the program. On such theories has rested the argument that interface information is protectable expression. Although one can conceive of interface information as an instance in which "idea/expression merger" has occurred or as among the elements of a "process" which are unprotectable under section 102(b), it is also possible to regard the reproduction of interface information as a fair use. The purpose of the use would be to create an interoperable but otherwise noninfringing program. The nature of the work would be a functional writing that cannot interoperate with programs or machines without reproduction of these elements. Only the portion needed for interoperability would be reproduced. And no harm to the market of a sort contemplated by copyright
Circuit in *Sega* has recognized that *Baker v. Selden* is a case with important implications for the scope of fair use in cases involving functional writings, it is possible that fair use will come to be used in other kinds of software cases as well.

Consistent with the *Sony* and *Sega* decisions, a court might also regard error correction or other reasonable adaptations of software as noninfringing fair uses of copyrighted software even if the firm that fixed the software was a licensee of the software rather than an owner of a copy of the program. Although the special software provision of the copyright statute confers the right to make adaptations to software on owners of copies of the software, the fair-use defense is not so limited. Fair use is an "equitable rule of reason" of general application for mediating between the interests of consumers and of copyright owners as to uses that can be made of the protected work. Courts would undoubtedly take into account, as part of the fair-use calculus, that the software was licensed, especially if the license contained a term limiting the user's right to modify the software. If, however, the licensor was unwilling or unable to provide prompt service for fixing errors, fair use might well shield the user whose business depended on use of certain software if that user went ahead and would occur through reproduction of interface information so long as the program was otherwise different in expression.

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206 See Foresight Resources Corp. v. Pfortmiller, 719 F. Supp. 1006 (D. Kan. 1989) (applying § 117 notwithstanding the fact that Foresight was a licensee of the software).

207 The CONTU Commission had recommended that the right to make adaptations should be given to "rightful possessors" of copies of programs, *Final Report of the National Commission on New Technological Uses of Copyrighted Works* 12 (Library of Congress, 1979) [hereinafter CONTU Report] but as enacted, the right is given only to owners of copies of programs. For a discussion concerning who, consistent with copyright policy, should be regarded as an "owner of a copy" of a program for purposes of § 117, see Rice, *supra* note 159. Courts may also disregard vendor characterizations of a transaction by which consumer acquires copyrighted software as a "license" transaction. *Id.*

208 See *Sega*, 977 F.2d at 1520-21 (rejecting Sega's argument that § 117, in essence, supplanted fair use with respect to computer software).

209 See, e.g., Weinreb, *supra* note 27.

210 The nature of the distribution arrangement has been considered as part of the second fair-use factor (concerning nature of the work) in recent Supreme Court decisions. *See*, e.g., *Sony*, 464 U.S. at 449-50 (television broadcast of movies considered as part of nature of copyrighted work factor); *Harper & Row Publishers v. Nation Enters.*, 471 U.S. 539 (1985) (unpublished status of Ford memoirs was considered as part of second fair-use factor).
corrected the bug himself.\textsuperscript{211}

Fair use can also be argued as a basis upon which to shield those who copy interface specifications from another program to achieve compatibility.\textsuperscript{212} In \textit{Sega}, fair use was used not only to excuse disassembly copying by Accolade, but also to excuse Accolade's reproduction of a small segment of code necessary for the interoperation of its game cartridge in the Sega console.\textsuperscript{213}

Relying on \textit{Sega} and \textit{Galoob}, Borland International recently argued that the "key reader" feature of its spreadsheet program made only a fair use of functional elements of the Lotus 1-2-3 user interface.\textsuperscript{214} Borland and Lotus have been in litigation for some years now, principally over Borland's decision to build an "emulation interface" for its competitive spreadsheet program to enable those users who had built up a library of macros developed with Lotus 1-2-3 to continue to make use of their investment in these macros while at the same time switching to the Borland product. In order to permit users to make use of their macro libraries, it was necessary for the Borland emulation interface to reproduce the Lotus 1-2-3 command hierarchy (which was, however, presented in a different manner than Lotus' program). Borland argued this reproduction was excusable principally because the command hierarchy is a fundamental part of the functionality of Lotus' macro system.\textsuperscript{215} Since the copyright statute states that "systems" are

\begin{itemize}
\item \textsuperscript{211} The EC Directive directs member states to permit lawful users of software to do error correction and forbids contractual restrictions that would purport to deprive users of the right to do error correction. \textit{See} EC Directive, \textit{supra} note 156. Although the decompilation privilege of the EC Directive is limited to decompilation necessary to obtain interface information that is unavailable from other sources, one can make a reasonable argument that any decompilation necessary to do error correction would be privileged as a necessary incident to the error correction privilege given in Article 5.1 that cannot be contracted away.
\item \textsuperscript{212} Altai and Sega indicate that interface information and procedures should be "filtered out" of copyright infringement analyses because they are the kinds of elements of programs that Congress meant to exclude from protection by enactment of section 102(b). But if Reichman is correct in suggesting that \textit{Baker v. Selden} created a species of fair use for the reproduction of functional elements of protected works, \textit{see supra} note 11, fair use would simply provide an additional ground for reaching the same result.
\item \textsuperscript{213} \textit{Sega Enters., Ltd. v. Accolade, Inc.}, 977 F.2d 1510, 1524 n.7 (9th Cir. 1992) (rejecting Sega's argument that inclusion of this code was not fair use, although also seeming to suggest that this code was either too functional or too short a sequence to be protectable by copyright).
\end{itemize}
not protectable by copyright law, Borland argued that it had not infringed Lotus’ copyright.

After the trial court ruled that the reproduction of the command hierarchy was an infringement, Borland began marketing a version of its spreadsheet program that no longer made any visual presentation of the Lotus commands. But Borland’s “key reader” feature accepted the same keystrokes to perform the same functions as Lotus 1-2-3, which effectively allowed users to continue to execute macro sequences constructed in accordance with the Lotus command hierarchy. Borland’s fair-use argument posited that its purpose in developing the key reader feature was to permit users to have access to the functionality of Lotus’ macro system. Borland argued that the nature-of-the-work factor favored its fair-use defense, for the Lotus program was a factual or functional work. Both factual and functional works are classes of copyrighted works for which the scope of fair use is generally broader than for artistic works. Borland argued that it had reproduced only as much of the Lotus program as was necessary to allow users to have access to the macro facility. And by developing a new improved spreadsheet program and wholly original code, Borland had contributed to the achievement of the underlying purposes of copyright law in the same manner as Accolade had.

Given Judge Keeton’s prior rulings in litigation involving Lotus 1-2-3, it was not particularly surprising that he ruled against Borland’s fair-use defense to Lotus’ claim of infringement relating to the key reader feature. The court decided that the purpose of Borland’s use was commercial, which under Sony gave rise to a presumption of unfairness. The court seems to have regarded Lotus’ command hierarchy as quite expressive because of the many different ways in which a spreadsheet command hierarchy might

217 Borland relied on Galoob as recognizing interests of users as an important component of fair-use balancing. See Borland, 831 F. Supp. at 241.
216 See, e.g., Borland, 831 F. Supp. at 242; Paperback, 740 F. Supp. at 39. For a critique of Judge Keeton’s Paperback decision, see Samuelson, supra note 184. See also Law Professor Amicus Brief, supra note 128. Like Professor Miller, Judge Keeton seems to have a blind spot about Baker v. Selden.
be constructed.\textsuperscript{220} It characterized what had been copied as a substantial part of the Lotus program.\textsuperscript{221} The court also stated there was clear competitive harm to Lotus' market.\textsuperscript{222}

The First Circuit Court of Appeals may find fault with Judge Keeton's analysis of Borland's fair-use defense for its characterization of Borland's purpose as entirely commercial, for its characterization of the nature of the work as quite expressive, and for its unwillingness to consider user interests in the balancing process, which is difficult to reconcile with many aspects of the \textit{Sega} and \textit{Galoob} decisions. But the First Circuit may also recognize a significant inconsistency in the trial court's opinion. Although rejecting Borland's necessity argument in the fair-use portion of the opinion, Judge Keeton elsewhere indicated once again how critically important an aspect of the functionality of the macro system the command hierarchy is. "To interpret a macro," said the court, "the program must use the Lotus 1-2-3 menu structure. If a program did not have a representation of the 1-2-3 menu hierarchy somewhere within the program code (or in a file used by the code), then there is no way that the program could understand that 'rfc' refers to a path through the menu tree to the specific executable operation that changes a cell or cells' appearance to monetary units . . . .\textsuperscript{223}

The First Circuit may be more receptive to applying the principles of \textit{Baker v. Selden} to judging Borland's use of the Lotus command hierarchy. It may also be more willing to give consideration to user interests in macro compatibility than Judge Keeton has been.\textsuperscript{224}

\section*{VI. IMPLICATIONS OF GALOOB FOR USES OF ELECTRONIC INFORMATION TOOLS ON COPYRIGHTED WORKS}

Galoob's Game Genie is just one example of the extraordinary array of electronic information tools now available in the commer-

\textsuperscript{220} \textit{Id.} at 243.
\textsuperscript{221} \textit{Id.}
\textsuperscript{222} \textit{Id.} at 243-44.
\textsuperscript{223} \textit{Id.} at 230.
\textsuperscript{224} For a software-user-interface case giving attention to user interests, see, \textit{e.g.}, \textit{Synercom Technology, Inc. v. University Computing Co.}, 462 F. Supp. 1003 (N.D. Tex. 1978). \textit{See supra} note 145 and accompanying text regarding \textit{Sony's} and \textit{Galoob's} consideration of user interests.
cial market that permit users to experiment with the plastic nature of works in digital form. By plasticity, I mean the ease with which such works can be manipulated, transformed, and/or inserted into other works. Although many authors might prefer for their works to remain as fixed as they have traditionally been in printed form, the genie of plasticity cannot be pushed back into the bottle. Digital manipulation is here to stay, for the manipulability of digital data is one of the key advantages of the digital medium.

There will unquestionably be many digital manipulations of copyrighted works that cannot be justified as fair use because commercial appropriations of their work will pose too severe a threat to the ability of copyright owners to obtain a fair return. If left unchecked, such appropriations could result in market failure in the production of creative works, the very market failure that the copyright system aims to avoid. But there will just as surely be some uses of these tools that can be justified as fair use under the Sony and Galoob decisions, as this section will endeavor to demonstrate. When developers of electronic information tools expect the tools to be copied, it should be unnecessary to call upon fair use to shelter some digital reproductions or manipulations of copyrighted works.

As the reader will see, in a time of rapid technological change, countries such as the United States with fair-use or fair-dealing provisions in their copyright laws may find it easier to adapt to the challenges that electronic information tools present for regulation of uses that can be made of copyrighted materials. It will often be

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225 See infra notes 231-254 and accompanying text. In the software industry, these kinds of programs are regarded as “tools.” See Reichman, Electronic Information Tools, supra note 19 (for a discussion of the intellectual property implications of the “tool” metaphor).

226 In another essay, I identified the plasticity of works in digital form as one of six characteristics that pose challenges for existing intellectual property regimes. See Pamela Samuelson, Digital Media and The Changing Face of Intellectual Property Law, 16 Rutgers Computer & Tech. L.J. 323 (1990).

227 Digital manipulations can raise more legal problems than copyright infringements. See Tomlinson, infra note 228.


229 See Gordon, supra note 9, at 1435-69.

230 See infra notes 231-233 and accompanying text.
in the public interest for electronic information tools to be available in the marketplace and to be used in ways that do not undermine incentives to engage in creative activity.

A. TOOLS FOR EXPANDING ORDINARY USES OF COPYRIGHTED WORKS

"Clip art" and "clip sound" programs are one class of electronic information tools widely available on the market today that explicitly envision the copying of their components as an ordinary use by consumers. Developers of copyrighted clip-art programs know that consumers expect to use the programs to make copies of the images or sounds contained in the program’s compilation. It is, in fact, to fill consumer demand for such a product that they were developed in the first place. A student might, for instance, clip an image of the Liberty Bell from the program for use in a school report. An adult might clip a picture of someone blowing a trumpet to make an announcement for a slide presentation to clients of her employer.

Consumers who make ordinary use of such programs for their intended purposes would not, in my judgment, even have to look to fair use to justify clipping out a reasonable number of images or sounds for their own purposes. But fair use would surely shield such uses if the issue was ever litigated. What clip-art program developers are concerned about is someone reproducing its clip-art images and putting them into a competing clip-art program.

Somewhat more troublesome from a copyright standpoint, however, is the wide array of software tools that can be used by consumers to do such things as “morph” images from one shape to

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281 Clickart produces a variety of clip-art products for different classes of uses (business, sports, holiday, etc.).


283 See, e.g., Patricia J. Pane, CSC Countersues SPC Over Clip Art; CSC Claims Copyright Infringements by Harvard Graphics Programs, INFOWORLD, June 18, 1990, at 8 (discussing CSC’s countersuit to enjoin SPC from selling three Harvard Graphics products which CSC alleged contained symbols that are substantially similar to symbols created by CSC).
another, change the texture of an image (making it plaid instead of plain white or making a photograph look like a painting by Van Gogh), or digitally excise the head from a person in a photograph and move it onto the head of another figure in the same or a different photograph. All of these "tools" can, of course, be used to infringe copyrights.

Had Universal won its lawsuit against Sony, an argument could have been made that sale of these digital manipulation tools should be enjoined on the theory that the tools' developer should be assumed to have constructive notice that some consumers would use the tools to infringe copyrights. Because these tools are capable of substantial noninfringing uses, the Sony decision would seem to shield their developers from any concern that contributory infringement charges may be brought against them merely because some people may use them to infringe copyrights.

It is, of course, a separate question whether consumers who use these tools to morph images scanned in from a magazine are infringers of a copyright in the photograph. Sony and Galoob would seem to affirm that private noncommercial uses of this sort should be presumed to be noninfringing under the fair-use doctrine.

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234 Gryphon Software's "Morph" product is an example of this. I have seen the product of another electronic information tool that can be used to alter text so that it conforms to a particular dialect of speech (DOD-speak, for example, or Southern lingo).

235 Xaos Tools' "Pandemonium" product can be used for texture alterations.

236 Adobe's "Photoshop" is one of many products that can be used for this purpose. This technique was recently demonstrated in the movie "Rising Sun" to show a police officer that photographs and videotape can no longer be completely trusted as evidence because of the ease with which digital manipulations can be made of them. See also Tomlinson, supra note 228 (assessing impact of manipulation of digital images and sounds).

237 In the aftermath of Sony, it became apparent that copyright owners would not be able to use copyright law to control distribution of other reproductive technologies, such as digital audio tape (DAT) recording machines, because they could be used to make unauthorized copies of sound recordings. DAT machines were particularly threatening to the recording industry because, in undoctored form, they can be used to make perfect copies instead of degraded-quality copies characteristic of other tape-recording devices. A lengthy legislative battle ensued in which the recording industry fought for a variety of technical restrictions on the copying that DAT machines could do. The ultimate outcome of this controversy was to permit DAT machines to be sold but only if they contained a mechanism that prevents perfect copies from being made from the first digital copy made with the aid of the DAT machine. For a discussion of this history, see, e.g., Michael Plumleigh, Comment, Digital Audio Tape: New Fuel Stokes The Smoldering Home Taping Fire, 37 UCLA L. Rev. 733, 761-67 (1990).
As long as the consumer confined his or her use of the morphed image to private noncommercial uses, the potential for harm to the market would not be sufficiently strong to overcome this presumption. One might also look to Patterson's framework for regulating uses of copyrighted works and conceive of these tools as expanding the range of ordinary uses consumers can make of their copies of copyrighted works. As long as consumers do not start making use of the copyright, setting themselves up as alternative publishers of the work, copyright interests should not be implicated.

Another class of software tools that are expected to have a commercially significant future are those that permit a user to "filter" information of interest (or not of interest) to him or her. One use of these systems would be to permit individual customizations of digital information services or products. Through use of a filtering system which the user had "trained" to understand his or her interests, one might, for example, produce a customized version of an electronic newspaper that would weed out sports coverage for those who, for instance, are not interested in sports.

An individual consumer who used such tools to tailor an electronic information product or service for his or her own uses would not need fair use, in Patterson's view, to shield him or her from an infringement claim by the publisher of an electronic information product who wanted to offer its own customization tools to its customers because the tool would merely extend ordinary uses that could be made of a copy of the work by a purchaser of it.

Although electronic filtering may present a closer question than some of the other examples presented above, the Sony approach would at least permit a balancing of interests. Under Galoob, a

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238 A recent issue of a widely read computing professionals' magazine, COMMUNICATIONS OF THE ACM, was devoted to information filtering technologies. See articles in 35 COMMS. ACM 26-84 (December 1992).
240 When information filters allow consumers to tailor what they receive from a publisher, it becomes more difficult to determine what a "work of authorship" is for copyright purposes, for there may no longer be one work that the consuming public will experience. For an excellent discussion of the impact that print technologies had on the social production of knowledge and information products arising from the fact that everyone who got a copy of a book saw the same thing, see ELIZABETH EISENSTEIN, THE PRINTING PRESS AS AN AGENT OF CHANGE (1979).
court might decide not to intervene as long as the user was still paying the standard subscription fee to the publisher of the newspaper. This would undercut the argument that there would be any demonstrable harm to the market for the copyrighted work being filtered. Harm to the market for the publisher's own filtering software would be akin to arguing that sale of the Game Genie was unfair because it had harmed Nintendo's opportunity to market a Game Genie-like product. This was a potential market that the Ninth Circuit seemed to be unwilling to reserve exclusively for Nintendo. The focus of the fair-use inquiry should be on the harm to the market for the copyrighted work, not on its potential impact on the sale of peripheral devices or software capable of interacting with the copyrighted work.

Among the other extensions of ordinary uses of copies of copyrighted works that can be expected to arise from digital technology are these: scanning correspondence, reports, and other documents received by a firm or a person into an electronic repository for storage and/or distribution to appropriate personnel, reformatting electronic documents so that they can be read on a different computer or by different software than that on which they were received by businesses for purposes such as informing the appropriate personnel in sales, marketing, and support divisions of the firm about its contents, or within a law firm, for purposes of keeping the senior and junior partners and the team of associates informed of some development pertaining to a case. This discussion does not address the question of whether it would be lawful to make copies, by scanning or photocopying, of the whole or parts of print magazines or journals whose publishers are known to be sensitive to reproductions of their works. See, e.g., American Geophysical Union v. Texaco, Inc., 802 F. Supp. 1 (S.D.N.Y. 1992) (holding that company's unauthorized photocopying of copyrighted articles was not fair use). Discussion here is focused on the routine copying of texts that no one but a copyright lawyer would ever even think to regard as potential infringements, but which arguably are now that copyright attaches automatically by operation of law to every original work of authorship fixed in a tangible medium of expression. For an insightful discussion about the gap that exists between the general public's notions of copyright and that which underlies the law today, see Jessica Litman, Copyright As Myth, 53 U. PITT. L. REV. 235 (1991).
created, electronic tagging of components of documents so that they can be retrieved in an electronic database based on other attributes than the presence of particular words in the text, and automatic translations of documents when the technology evolves to permit this.

Although the likelihood of litigation over these kinds of ordinary uses of texts is low, it is important for copyright lawyers to be aware that digital technologies provide opportunities for new kinds of uses to be made of works of authorship to which copyright automatically attaches. The Galoob and Sony decisions support the view that neither the tools that extend the uses consumers can make of their copies of works of authorship nor private uses that may be made of them with these tools ought generally to be regarded as raising serious copyright concerns. Copyright law will have ample work to do in regulating efforts to engage in competitive publication activities.

Many software tools exist for doing reformatting of this sort. Software Bridge is one such product.

Most of the electronic databases with which the public is familiar rely on matching of bit sequences for particular words as the primary search mechanism. While this search technique is very useful, it is not the only form of electronic search that some users might want to do. Increasingly, firms are processing documents so that the logical structure of the document can be "tagged" in a way that permits searches in terms of tagged elements or their attribute values. See, e.g., Haviland Wright, SGML Frees Information, BYTE, June 1992, at 279.

Natural language processing has turned out to be more difficult than many earlier enthusiasts had hoped, but millions of dollars continue to be spent to improve natural language translation techniques. Leaving aside the question of whether an automatic translation of books or journals is infringement, I wish to address the question of whether ordinary correspondence or other documents people or firms routinely receive can be translated for ordinary uses. If, for example, I received a letter in Japanese and asked a friend to translate it into English so that I can know what the letter says, I believe I would be making an ordinary and noninfringing use of my copy of the letter to have it translated.

It is a common practice for habitues of the Internet to make private noncommercial copies of electronic texts by, for example, forwarding copies of messages (an activity which involves making a copy of the text), sending clips from articles to friends, and posting things on electronic bulletin boards or at sites on the net where others can get copies via anonymous file transfer protocols. Private noncommercial copying is generally considered by the community of Internet users to be acceptable behavior, and under Sony, this practice would seem to be fair use. See generally Anne W. Branscomb, Common Law For the Electronic Frontier: Computers, Networks, and Public Policy, Sci. Am., Sept. 1991 at 154. But when the sysop (system operator) of a commercial bbs (electronic bulletin board system) permits or encourages postings of copyrighted materials, such as photographs from Playboy magazine, for the consumption of bbs users, he or she invites copyright infringement actions.
B. TOOLS FOR AIDING THE INTERPRETATION OF OTHER WORKS

Other kinds of software tools permit users to transform digital data from one class of work to another. Because the electronic signals constituting a work in digital form do not know (until the computer and software processing them interprets them) whether they are parts of a song, a picture, a text, a program, or a motion picture, they can, in fact, be more than one kind of work. Some transformations of digital data made with the aid of such tools are useful for aiding interpretation of the data.


In a previous article, I have discussed how copyright law might deal with computer-generated works. See Samuelson, Allocating Ownership Rights, supra note 108. It is worth pointing out that computer-generated works are an example of one class of work (namely a program) being digitally processed to produce a second class of work (a song or a picture, for example). As challenging as computer-generated works are when the work generated is a class of work that is protectable by copyright law as long as the originality requirement is met, it is more difficult when the work generated by the program is not copyrightable (the chip produced by a silicon compiler). A relatively new set of techniques, known as stereolithography, permit computer-aided design of machines, machine parts, and/or tools. It begins with computer graphics models of these items. Simulations can then be done to test their performance. Adjustments to the design can then be made to improve performance, and another simulation done of the adjusted design. Once the model achieves a satisfactory performance in the simulation, the computer can then generate the mold or machine tooling necessary to produce actual instances of the machine, machine part, or tool. This technique reduces significantly the research and development costs involved in manufacturing machine parts. See Real Virtuality: Stereolithography—Rapid Prototyping in 3-D, PROCEEDINGS OF ACM CONF. ON COMPUTER HUMAN INTERACTION, 1990, at 377-78 [hereinafter SIGGRAPH PROCEEDINGS]. See also Reichman, Electronic Information Tools, supra note 19, at 830-38.

A friend of mine once built a laser system that would accept as input signals generated when a sound recording was being played. It would process these data to emit as output patterns of light that could be dynamically displayed on a white wall. Was the pattern of light a derivative work of the copyrighted sound recording? This question is of more than academic interest. A company called 3DO will be releasing a multimedia product this fall which, among other things, produces visual displays of sound recordings. Galoob may make it safe for 3DO to market this particular feature.

An example of digital transformations that can be done with an electronic copy of a work in order to aid its interpretation is demonstrated in the movie "Rising Sun." In that movie, the Los Angeles Police Department (LAPD) authorize someone to make copies of a Japanese company's security videotape in order to try to reconstruct the contents of the original tape on which a murder was recorded. (The original tape had been doctored to edit out the murder and the identity of the murderer.) Perhaps no one but a copyright lawyer would ever have thought of suggesting that if this had been a real case, the LAPD might have to worry about copyright liability for this kind of investigative activity. But they were,
Some examples will illustrate this unique characteristic of the digital medium and how tools can exploit this unique characteristic. At a conference on computer-human interaction a few years ago, I saw a demonstration of a software tool that permitted users to process digital signals representing visual materials to produce sounds that would aid in the interpretation of the visual materials. The first of the two demonstrations given of this tool involved a digitized image of a photograph of a tissue sample which was to be examined in order to detect the presence of cancerous cells. With the aid of the software tool, someone seeking to interpret this image could pass the cursor over different parts of the sample. This caused the tool to process the visual data as sounds. Muscle tissue not only looked different from nerve tissue; it “sounded” different as well. Because it was difficult to detect cancerous cells relying solely on visual cues, it helped to have a second source of information (i.e., the sounds) with which to try to distinguish the “good cells” from the “bad ones.”

A second demonstration of this tool aided the interpretation of a digitized image of a chart. The chart depicted the distribution of men and women in the sciences in terms of their professional rank and salaries. By assigning a deep bass sound to the visual symbol representing males and a high piccolo sound to the visual symbol representing females and then running the cursor over different parts of a digitized image of the chart, one could “hear” (as well as see) how few women had either high ranks or high salaries in the field of science.

Perhaps no one would think to claim copyright in a digitized image of a tissue sample, but someone might very well claim a copyright in the chart. Under Patterson’s approach, one could regard use of this tool to interpret the data as an ordinary use of a copy of the work by a consumer. But even if a copyright claimant

after all, making copies of an arguably original audiovisual work in order to prepare a derivative work of a derivative work which they intended to be a recreation of the original work. For none of these intermediate or the final reconstructed copy had they gotten the company’s permission, and indeed, had they asked for permission, it would likely have been denied.

260 For a paper discussing this system, see Stuart Smith, R. Daniel Bergeron & Georges G. Grinstein, Stereophonic and Surface Sound Generation For Exploratory Data Analysis, SIGGRAPH PROCEEDINGS, 1990, at 125.
of either work expressed an objection to use of the tool, either as the creation of an unauthorized derivative work or as the reproduction of portions of the work in a different medium, I would argue that no infringement of copyright could be found. Under the regulatory framework of the Sony and Galoob decisions, use of the interpretation tool would be a noninfringing fair use, for it would involve a noncommercial research purpose, the nature of the work would be factual, which generally favors fair use, and little or no harm to the market for the work would be likely to arise from the use.

Among the other software tools now available to aid in the interpretation of data are those that allow users to "visualize" scientific data.\(^{251}\) Scientific data are typically collected and represented in textual form, often as a set of numbers corresponding to various data types being collected. One of the most difficult tasks of scientific work tends to lie in conceptualizing a way to represent the data to make it more comprehensible. Scientific visualization tools allow researchers to assign certain shapes and/or colors to certain classes of data. The data are then processed with the aid of the tool to produce visual representations with the assigned attributes. Often, such tools will be used by the person who collected the data and who may claim a copyright in the scientific data compilation by virtue of his or her exercise of judgment in the selection or arrangement of data in the compilation, and of course, no copyright concerns are likely to arise from this use.

Scientific visualization tools can, however, be used by someone other than the original data gatherer. They may also be used to create an alternative visualization, including one that might challenge the interpretation given to them by the data gatherer. As with the previous example, I believe that someone who used such a software tool to make a scientific visualization of the data to aid his or her own interpretation would be making noninfringing

\(^{251}\) See, e.g., Brian Cabral, Imaging Vector Fields Using Line Integral Convolution, SIGGRAPH PROCEEDINGS, 1993, at 263. See also descriptions of panel sessions at SIGGRAPH '93 on Visualization of Environmental Data Sets, id. at 385; How To Lie and Confuse With Visualization, id. at 387.
uses of the data compilation. Principles of fair use could, if necessary, also be used to justify the publication of an article with the challenger's visualization of the data even if the gatherer of the data or a publisher of the data compilation or an article containing a different visualization might object.

C. WORKS THAT INTERACT WITH PREEXISTING WORKS

_Galoob_ involved an electronic information tool capable of interacting with other copyrighted works without appropriating any expression from them. The Ninth Circuit's willingness to regard Galoob's product as noninfringing notwithstanding its dependence on another developer's copyrighted works may have important implications for the legality of a wide range of "add-on" software products, as well as for those who prepare navigational paths through labyrinths of digital texts.

Imagine for a moment that West Publishing Company began commercially distributing a CDROM disk containing all (or virtually all) of the federal copyright decisions from its printed volumes. Imagine that West also offered for sale on a separate disk an electronic casebook, which consisted largely of a set of links

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252 Any copy of the data compilation made during the processing of the data by means of the visualization software would be an intermediate copy of a sort similar to that made in _Sega_, and a necessary step in doing the visualization. As to the question whether the visualization would be a derivative work of a data compilation that satisfied the originality requirement, this raises some of the same quandaries as occurred in _Galoob_. One could argue that since _Feist_ tells us that facts are not protectable by copyright, the visualization is a noninfringing different expression of the data, rather than as a reproduction or derivative work of the data compilation.

253 The previous note has presented the argument that the visualization should not be considered an unauthorized derivative work. Even if it was, principles of fair use would apply, for the use would be for noncommercial research purposes, the nature of the work would be factual, for which the scope of fair use is generally broad, and little or no harm to a commercial market would exist. Still, once the data visualization is published, it goes from the realm of ordinary use to the realm of competitive fair use.


255 The Michie Company has recently begun advertising a CDROM of Pennsylvania court decisions, available in _Pennsylvania Law on Disc_ (Michie).
to portions of the CDROM, as well as some additional commentary, that had been prepared by a copyright professor under contract to West. Now suppose that another copyright professor wanted to prepare an electronic casebook that would interoperate with the West CDROM case compilation. *Galoob* may help to answer the question whether the second casebook author would have to get West's permission to prepare a competing casebook.

This hypothetical is a specific example of a more generic question from the field of hypertext.\(^{256}\) When texts are in digital form, it becomes possible, with the aid of hypertext system software, for users of the texts to create links between one portion of a text and another, between one document and another, or among many documents and portions thereof.\(^{257}\) A set of links made by a user of digital texts can exist as a separate document in a hypertext publishing system. The link document (often described as a web) will consist of a compilation of data identifying the starting and ending points or regions of the material being linked to.\(^{258}\)

Depending on how the hypertext system is designed, it may be possible for other people besides the link author to follow the link path set forth in the link document.\(^{259}\) When the link document


\(^{257}\) See generally PROCEEDINGS OF ACM CONFERENCE ON HYPERTEXT (1987).

\(^{258}\) This resembles a print article consisting of a set of suggestions that its readers should start at the first paragraph on page 50 of a particular book or article and read until the last paragraph on page 56, then go to another book or article and read from the top of page 17 to the end of chapter 2, etc. What is different about the hypertext link document is that a user, in contrast to the reader of the print article, can follow the links automatically rather than having to do the extra work of getting the books and articles and reading them as designated. Also, the link-document author may want compensation for anyone who traverses his or her links, whereas the print bibliographer has no such expectations.

\(^{259}\) One of the interesting things about hypertexts is that users of them can move beyond the passive roles they have had as readers of printed texts to become authors themselves through the construction of links. See generally THEODOR H. NELSON, *LITERARY MACHINES* (1993).
is processed by the hypertext system program, a user who follows the links created by someone else will see the portions of the documents which the link author has designated.

Hypertext linking poses very similar intellectual property rights questions to the ones presented in Galoob. Does the author of a link document infringe copyrights in the works to which links have been created in violation of exclusive rights that copyright law gives to authors to prepare derivative works? Does a user of someone else’s links infringe any copyright interest of the link author? Authors of hypertext links would, of course, like to be free from claims of infringement for linking portions of other authors’ documents yet be able to assert copyright control over traversals of their links by other users.

As was true with Galoob’s Game Genie, the link document would contain no expression taken from the texts of the authors being linked to. Because of this, a court deciding whether a link author had infringed the derivative work rights of authors of the documents to which he had linked would likely doubt that a derivative work had been created under the rationale given by the Ninth Circuit in Galoob.

More than two decades ago, copyright scholars noted the dangerous potential for very broad interpretations of the derivative-work right arising from new technologies. See Panel Discussion among Ralph S. Brown, Jr., Benjamin Kaplan, Dan Lacy, and Caryl Haskins, Property Rights Under the New Technology, reprinted in COMPUTERS, COMMUNICATIONS AND THE PUBLIC INTEREST 189, 205, 210 (Martin Greenberger ed., 1971). See also Ralph S. Brown, Jr., The Widening Gyre: Are Derivative Works Getting Out of Hand?, 3 CARDOZO ARTS & ENT. L.J. 1 (1984) (expressing concern over expansive interpretations of “derivative works”). Galoob was a case in which derivative work rights could have been dramatically expanded, but the Ninth Circuit chose not to do so.

The tricky question here is which of the exclusive rights set forth in § 106 would be violated by a user who traverses the links that a previous user had constructed. It is worth noting that the reader of a printed article who followed the research path set forth in it would not infringe any copyright interest of the article’s author because use of the article would not involve reproduction of it.

Lewis Galoob Toys v. Nintendo of Am., 964 F.2d 965, 967-69 (9th Cir. 1992), cert. denied, 113 S. Ct. 1582 (1993). See supra note 108 and accompanying text. One might consider a link document as a “supplementary work,” rather than as a derivative work. As Professor Kaplan has noted, Congress has rejected the extraordinary suggestion made by some groups that copyright law grant owners of copyrights an exclusive right to prepare supplementary works. See BENJAMIN KAPLAN, AN UNHURRIED VIEW OF COPYRIGHT 100 n.61 (1967).
As in *Galoob*, the court might go on to analyze whether, even assuming a derivative work was created, a fair use might have been made of the copyright in the underlying documents. Often the link author will have an educational or research purpose in constructing links among documents. Works being linked to would often be factual in nature, and little from the pre-existing works would have been appropriated. An important factor in a fair-use assessment would likely be that little, if any, harm could be expected to the market for the works being linked to since the link document would only be usable if the user has access to the underlying documents, access for which the user is likely to have already paid. The Ninth Circuit favored fair use in *Galoob* in part because the Game Genie could be used only in conjunction with Nintendo games for which consumers had already paid.

The user of the link document might be regarded as making an ordinary use of the link document by following its trail from one document to another. Faced with a demand of a link author who wanted compensation for use of his links, the link user might analogize her navigation of the links to the print reader's following of a bibliographic path set forth in a copyrighted article which would, of course, not be infringing, for it would involve use of the knowledge in the article, not a reproduction of it.

Within the regulatory framework of fair use, the link user might argue that her use was private and noncommercial, and may even have been for a research purpose. The link document would be a factual compilation which generally enjoys a narrow scope of copyright protection. However, the whole of the link document would have been copied, for it must be copied in order to be used. The link author would also argue that harm to his market would be evident, for if there is any market for link documents, it will be that provided by users who can be charged for the value to them of saving time by following someone else's path rather than going to the trouble of independently constructing their own link path through digital texts. Fair use, in this example, as in others

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263 That is, the link document would contain information about the starting and ending points from the document to be visited.

discussed in this section, at least provides a framework for balancing the interests of authors and users of digital information tools.

VII. CONCLUSION

When enacting the Copyright Act of 1976, Congress expressed an expectation that the fair-use doctrine would—and should—evolve to deal with challenging questions concerning the application of copyright law posed by new technologies. This expectation has been borne out on numerous occasions in the past decade, including, notably, Sony. The strict property-rights view of copyright for which Universal argued in Sony was rejected by the Court, which instead seemed to view copyright law as more of a regulatory regime aimed at achieving a balance among the interests of copyright owners, the consuming public and other commercial participants in the marketplace, such that the rights granted to authors under the statute should be construed as reaching no further than Congress has intended to achieve this balance. Importantly, the Supreme Court in Sony saw the case as one in which application of copyright law had been rendered uncertain because of a new technology. In such situations, the Court thought the dispute should be resolved by considering, among other things, what result will best promote fulfillment of the ultimate purposes of copyright law. By presuming that private noncommercial uses of copyrighted works are fair uses and requiring evidence of some meaningful likelihood of harm to overcome this presumption, Sony set an important precedent that has implications for many uses of software and digital texts.

The Ninth Circuit’s Galoob and Sega decisions follow in Sony’s footsteps. In Galoob, users’ interests in having access to and the ability to use a device that enhanced their enjoyment of videogames were given substantial weight. Because users of Galoob’s device had already paid Nintendo for the games with which the device could be used, and because the device could only be used in connection with Nintendo games, there was insufficient counterbal-

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265 See supra note 20 and accompanying text (discussing purpose and provisions of fair use in Copyright Act).
ancing evidence of a potential for harm to Nintendo’s market so as to overcome Sony’s presumption that private noncommercial uses of the device were fair and noninfringing. In Sega, a competitor’s need to make intermediate copies of Sega programs in order to gain access to unprotectable information so it could develop its own original noninfringing games for use in Sega’s machines was recognized as an important factor favoring fair use. Even though the intermediate copier’s programs competed with Sega’s in the marketplace, the court perceived no harm of concern to copyright law arising from that use.

Sega would seem to have important implications for many situations in which competitors in the software industry might find it necessary to make intermediate copies of another firm’s software in order to gain access to other kinds of unprotected functional elements of the program. As long as these competitors, like Accolade, construct their own independently developed, new noninfringing programs, their uses should also be privileged under Sega. But Sega would seem to have implications for other kinds of uses of computer programs, and even for the appropriation of valuable functional elements of programs.

Galoob would seem to have implications for judging the fairness of many kinds of private noncommercial uses of programs and digital texts. This Article has presented numerous examples of electronic information tools that enhance or extend the ordinary uses consumers can make of their copies of copyrighted works. As long as such ordinary uses do not undermine the ability of copyright owners to obtain a fair return for their works, they should generally not trigger copyright liability. In these and other circumstances, the fair-use defense provides a flexible and adaptable mechanism with which to balance the interests of copyright owners, their competitors or would-be competitors, and the public when conflicts among their interests arise. As Professor Chafee said some years ago:

The protection given the copyright owner should not stifle independent creation by others. Nobody else should be able to market the work, but we refuse to say nobody else should use it. The world goes ahead because each of us builds on the work of our prede-
cessors. . . . Progress would be stifled if the author had a complete monopoly of everything in his book for . . . [a] long period. Some use of its contents must be permitted in connection with the independent creation of other authors. The very policy which leads the law to encourage his creativeness also justifies it in facilitating the creativeness of others.\footnote{266}

Copyright law will have ample work to do in an age of advanced technologies in regulating the kinds of commercial iterative copying with which it is familiar.