

*Article****The Ghost In The Machine:¹ MAI Systems Corp. v. Peak Computer, Inc. and the Problem of Copying in RAM******Bradley J. Nicholson*** †**Table of Contents**

I. Introduction. 147

II. The Operation of RAM in a Computer. 148

III. The Copyright Act, its Legislative History, and pre-*MAI* Case Law. 150IV. *MAI Systems, Inc. v. Peak Computer, Inc.* 157V. Post-*MAI* cases. 163VI. Analysis of *MAI v. Peak*. 165 A. *MAI's* Dilemma. 166 B. *MAI* Created Rights For the Copyright Owner That Go Beyond the Traditional Protection of Copyright. 167

VII. Conclusion. 175

I. Introduction

In *MAI Systems Corp. v. Peak Computer, Inc.*,² the Ninth Circuit considered a highly significant issue in computer copyright law: whether a software program loaded into a computer's random access memory ("RAM") is a "copy" for purposes of the Copyright Act.³ Unfortunately, the court viewed the question narrowly, and ignored the statutory purpose of copyright. As a result, the court concluded that the image of a software program in RAM is a potentially infringing "copy." In so doing, the court endowed the copyright owner with a broader bundle of rights than those to which it was entitled. The copyright owner not only gained copyright protection over the operation of its program in RAM, but also obtained a form of trade secret protection preventing others from reading and using copies of its software.

Contrary to the holding in *MAI*, this article will attempt to show that a software program, when loaded into RAM, should not constitute an infringing copy under the Copyright Act. First, the article will discuss how RAM operates in a computer, and distinguish between temporary memory and permanent storage.⁴ Second, it will review the Copyright Act, its legislative history, the views of CONTU,⁵ and the cases discussing RAM prior to *MAI*.⁶ Third, the article will examine *MAI Systems v. Peak Computer* and its progeny.⁷ Fourth, it will analyze *MAI's* holding and demonstrate that the decision gives unprecedented and unjustified powers to computer copyright owners. In effect, *MAI* gives copyright owners a form of trade secret protection when a copyrighted software program is licensed pursuant to an agreement which prohibits "copying" by unauthorized parties, such as competing computer maintenance organizations.⁸ If versions in RAM are defined as copies, these licensing provisions prevent use of the program by third parties which the licensee might hire to work on the licensee's computers. The article concludes that the blurring of the lines between copyright and trade secret by the court in *MAI* may be corrected by finding that loading software into RAM does not create a "copy" for purposes of the Copyright Act, or that if the image in RAM is a "copy," that it is not an infringing one.⁹

II. The Operation of RAM in a Computer

Information in computer software programs consists of a series of positive and negative charges, which represent a binary language called object code.¹⁰ At any particular time, software programs exist in at least one of three places in a computer: loaded into a memory device, residing in storage, or being processed by the central processing unit ("CPU").¹¹

The memory devices of most computers are in the form of RAM (random access memory), ROM (read only memory), or a combination of both.¹² Both ROM and RAM are integrated circuits, commonly referred to as "chips."¹³ Information in RAM consists of evanescent electrical pulses.¹⁴ Information stored in RAM can be changed simply by writing in new information, or erased by turning off the computer.¹⁵ In contrast, the information stored in ROM cannot be changed because it is imprinted when the chip is manufactured and cannot be changed thereafter.¹⁶ Because RAM can be changed or rewritten easily, and will lose all of its information if the RAM chip loses power, it is known as "volatile" memory.¹⁷

Storage holds information that the computer user does not need immediately, but might need at some time in the future.¹⁸ Instead of integrated circuits, storage consists of magnetic media, usually a floppy disk or a hard disk.¹⁹ Unlike information in RAM, which takes the form of weak, transient electrical pulses, information in storage is more stable, transformed into magnetic charges on the floppy or hard disk.²⁰ A computer operates by reading magnetically stored information (in binary code) from permanent storage, translating it into electrical pulses in RAM, and then transferring it to the CPU, which performs the calculations called for by a particular program and relays the answers as necessary to other parts of the system.²¹

III. The Copyright Act, its Legislative History, and pre-MAI Case Law

The Constitution promotes the progress of science and the useful arts by providing an incentive to write literary works and discover inventions.²² "The purpose of affording copyright protection is to grant valuable rights to authors thereby encouraging the production of literary and artistic works of lasting public benefit."²³ These valuable rights come in the form of a limited monopoly over reproduction of the owner's work, serving "more or less in the nature of a reward for his genius and industry, as well as for the encouragement of others."²⁴ The primary purpose of copyright, however, is to give the public maximum access to an author's work; rewarding the author is only a secondary consideration.²⁵ It is for these reasons that the copyright owner has the exclusive right to "reproduce a work in copies," or to distribute the work to the public.²⁶

The Copyright Act itself sheds little light on the issue of whether a software program in RAM is an infringing copy under the Copyright Act. The Copyright Act defines "copies" as "material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device."²⁷ The Copyright Act then carefully defines the term "fixation": "A work is 'fixed' in a tangible medium of expression when its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."²⁸

Unlike the Copyright Act, which makes no mention of RAM, the legislative history of the 1976 Copyright Act alludes to RAM by referring to computer memory.²⁹ The House Report, which has been highly influential in elucidating copyright law, discussed RAM without mentioning it by name, and concluded that a copy in RAM is not a "copy" for purposes of the Copyright Act. "[T]he definition of 'fixation' would exclude from the concept purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other cathode ray tube, or captured momentarily in the 'memory' of a computer."³⁰

Before *MAI*, some commentators thought that the issue was settled: a computer program in RAM did not constitute a copy under the Copyright Act.³¹

Another passage from the House Report deserves mention. In discussing fixation, it states that "[u]nder the bill it makes no difference what the form, manner, or medium of fixation may be—whether it is in words, numbers, notes, sounds, pictures, or any other graphic or symbolic indicia, whether embodied in a physical object in written, printed, photographic, sculptural, punched, *magnetic*, or any other *stable form*."³² Two points should be made here. First, storage devices, such as hard disks or floppy disks, are magnetic. RAM, on the other hand, is not magnetic but electronic.³³ Second, magnetic storage is stable,³⁴ while electronic memory such as RAM is volatile and transient.³⁵

Recent amendments to the Copyright Act confirm that copyright protection extends to computer programs.³⁶ These amendments also permit the users of a computer software program to lawfully make a copy if such a copy is an essential step in the utilization of the computer, or if the copy is for archival purposes.³⁷ These amendments are the fruit of the National Commission on New Technological

Uses of Copyrighted Works ("CONTU"), a body appointed by Congress to investigate and comment on the appropriate scope of copyright for computer technology.³⁸ In the 1976 Copyright Act, Section 117 froze computer copyright standards until Congress had a chance to entertain CONTU's recommendations.³⁹ In 1978 CONTU released its Final Report and Congress codified most of its recommendations with small but significant revisions.⁴⁰

CONTU took apparent exception to the language in the House Report excluding from the definition of "fixation" reproductions "captured momentarily in the 'memory' of a computer."⁴¹ In response to the House Report, the CONTU Report stated:

The text of the [Copyright Act of 1976] makes it clear that the placement of a copyrighted work into a computer . . . is the preparation of a copy. . . . Because works in computer storage may be repeatedly reproduced, they are fixed and, therefore, are copies⁴²

This statement from the CONTU Report is ambiguous because it refers to computer storage without defining or distinguishing it from memory.⁴³

Cases before *MAI* said little about RAM. While a few cases have suggested that loading a program into RAM creates a copy, none of them specifically concluded after a thorough analysis of the law and the facts that a computer program in RAM was an infringing copy under the Copyright Act. Such cases include *Vault Corp. v. Quaid Software Ltd.*,⁴⁴ *Bly v. Banbury Books, Inc.*,⁴⁵ *ISC-Bunker-Ramo Corp. v. Altech, Inc.*,⁴⁶ *Apple Computer, Inc. v. Formula Int'l, Inc.*⁴⁷ *Micro-Sparc, Inc. v. Amtype Corp.*,⁴⁸ however, deserves scrutiny because it is the only case before *MAI* to devote more than a few sentences to the issue.

In *Micro-Sparc*, the court was required to apply Section 117 to a "typing service."⁴⁹ The plaintiff was the publisher of *Nibble* magazine. This magazine published software source code, and purchasers of the magazine were invited to type the programs manually into their computers. The defendant, Amtype, offered a typing service to assist purchasers of the magazine. For a small fee, Amtype sold to magazine purchasers (and only magazine purchasers) a disk which contained all the programs which were printed in that issue of *Nibble*.⁵⁰ In order to sell such disks, Amtype had to type the programs onto a master disk, then make floppy disk copies of the master disk. People who purchased *Nibble* were owners of their copy of the software, and Amtype only sold disks to people who had purchased the magazine. The issue was whether the owner of a copy of *Nibble* could authorize Amtype's making of another copy on a disk under Section 117.⁵¹

The court noted that Section 117(a) provided that a copy could be made "as an essential step in the utilization of the computer program in conjunction with a machine."⁵² The court went on to note, based on the CONTU Report, that loading a program into memory entailed the creation of a copy.⁵³ The court stated that the copy created in the computer's memory could be used to create other copies.⁵⁴

Despite the reference to computer memory, the court's ruling was based on much narrower grounds. Rather than concluding that the copy in the computer's memory was an infringing copy, the court concluded that the copyright violation was putting the copy of the *Nibble* program on the disks which were distributed to others. Section 117(1) "does not permit a *Nibble* purchaser to authorize the defendant to put the programs on a disk for him."⁵⁵ The offending conduct was that defendant created "a disk copy that the purchaser then uses to input the programs."⁵⁶ Hence, the court concluded only that the disk storage copy was an infringement; the reference to RAM was merely dicta.

The court's conclusion is quite reasonable from an economic perspective. In selling *Nibble*, Micro-Sparc was selling software in printed form. Since Micro-Sparc owned the copyright of that software, it was entitled to copy and distribute it for its own economic gain in whatever form it might take, whether printed as source code or copied on magnetic disk.⁵⁷ Micro-Sparc was entitled, if it desired, to distribute and sell copies of its software on disk.⁵⁸ By copying, then distributing, the software code, Amtype stole Micro-Sparc's sales of *Nibble*'s software on disk. Thus, Micro-Sparc was harmed by Amtype's appropriation of part of the market for its software. A copy which existed solely in RAM, however, would not cause such a market injury. As we shall see, the *MAI* court's conclusion required a significant leap from the holding in *Micro-Sparc*.

IV. *MAI Systems, Inc. v. Peak Computer, Inc.*

MAI involved the activities of an independent service organization ("ISO"). Computers, whether they are laptops, personal computers, or mainframes, require some level of maintenance. Such maintenance can include cleaning hard disks, cleaning the inside of the computer case, or replacing electrical connections. Sometimes extraneous data appears in computer data files and must be removed; this is often the result of a "virus."⁵⁹ Computer owners often need to add peripheral devices to expand the capabilities of their

computers, including adding more or larger CD-ROM drives, hard drives, or floppy disk drives, installing "boards" or "cards" to enhance the performance of monitors, or to add a modem. An ISO can perform some or all of these "upgrading" tasks. Because computer problems may not be obvious through a visual inspection, ISOs must often use software that comes with the computer in order to diagnose and repair problems or install hardware, software, or peripherals. Such software is often called diagnostic software or utilities software. Even after the simplest repair, an ISO may need to start up the computer using the operating system software, the most basic software in the computer, merely to ensure that the computer still operates properly.

ISOs compete in a highly lucrative industry coveted by many computer manufacturers. While ISOs perform some work on personal computers, the bulk of their work concerns computer systems manufactured for certain specialized business applications, such as business accounting and inventorying.⁶⁰ Significantly, the manufacturers of such computer systems often sell the hardware outright, but only license the software.⁶¹ The maintenance of such computers is a highly lucrative endeavor, one that the manufacturers want to reserve for themselves.⁶² Hence, software licenses often restrict use of the software to bona fide employees of the licensee.⁶³ Such licenses restrain competition in the service market by restricting ISOs' access to software which they must use in order to perform their services.⁶⁴

MAI Systems Corporation originally manufactured computers and wrote its own software. By 1993, however, MAI's business was limited to servicing its computers and software.⁶⁵ MAI's software licenses permitted its customers to use the software for their own internal information processing, including loading the software into RAM, but prohibited third parties, such as an ISO, from loading MAI software into RAM.⁶⁶

Peak Computer was formed in 1990 as an ISO which maintained MAI computers for over one hundred clients in Southern California.⁶⁷ MAI sought an injunction preventing Peak Computer from servicing MAI computers.

The district court granted summary judgment and injunctive relief to MAI. The judgment and injunctions prevented Peak Computer, an ISO, from using MAI's copyrighted computer software while engaged in their computer maintenance business.⁶⁸ On appeal, the Ninth Circuit ruled that any copying by third parties was outside the scope of the license and was therefore infringing.⁶⁹ Though Peak Computer had conceded that in maintaining its customers' computers, it used MAI operating system software "to the extent that the repair and maintenance process necessarily involve[d] turning on the computer to make sure it is functional and thereby running the operating system,"⁷⁰ it disputed that its "copying" violated the Copyright Act. In particular, Peak argued that the copy in RAM is not "fixed" for purposes of the Copyright Act.⁷¹

The court reviewed the Copyright Act's definitions of "copies" and "fixed,"⁷² and concluded that the copy in RAM was sufficiently fixed under the Act because Peak failed to adduce facts to prove that the copy in RAM was not fixed.⁷³ MAI had moved for summary judgment, arguing that once a Peak technician boots an MAI computer and loads the operating software into RAM, the technician is able to view a "system error log" which diagnoses problems in the computer. The court found that this argument proved "that the representation created in the RAM is 'sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.'"⁷⁴ Peak failed show that a factual controversy over this argument existed, and thus fell into the federal procedural pitfall that a party opposing summary judgment may not rest upon mere allegation or denials but "must set forth specific facts showing that there is a genuine issue for trial."⁷⁵ Given this narrow procedural posture, MAI arguably stands only for the proposition that a copyright defendant must elicit factual support for arguments in its defense or summary judgment will be granted to the copyright owner plaintiff.

The court went on, however, to establish that a software program loaded into RAM is fixed. The court primarily relied on *Apple Computer, Inc. v. Formula Int'l, Inc.*,⁷⁶ which concerned the granting of contempt sanctions against Formula for violating a preliminary injunction forbidding it from copying and selling ROM chips⁷⁷ containing Apple software. Formula had argued that Section 117 precluded it from being held in contempt, because the chips were a new copy created as an essential step in the utilization of the Apple computer program in conjunction with a computer, but the court concluded that Section 117 did not condone Formula's activities, because Section 117 applies only to a computer owner's ability to make copies to assist its own use of the software, and Formula was selling the software to others.⁷⁸ As an alternative holding, *Apple Computer* found that Section 117 also did not apply because its requirement that the "new copy" be "created as an essential step" in the utilization of the copyrighted program "implies that the type of copying authorized by the statute must be no more permanent than is reasonably necessary."⁷⁹ The court found that Formula's method of copying violated that requirement because the purchaser of a diskette desiring to utilize the programs on the diskette could arrange to copy the programs into RAM instead.⁸⁰ In other words, copying in ROM was not "essential" because copying into RAM was an alternative. The court in MAI, however, drew on the following passage in *Apple Computer* for the proposition that a copy made in RAM is potentially infringing:

RAM can be simply defined as a computer component in which data and computer programs can be temporarily recorded. Thus, the purchaser of [software] desiring to utilize all of the programs on the diskette could arrange to copy [the software] into RAM. This would only be a temporary fixation. It is a property of RAM that when the computer is turned off, the copy of that program recorded in RAM is lost.⁸¹

While the *Apple Computer* court concluded in this alternate holding that encoding a software program into a ROM chip is more permanent than loading it into RAM, the *MAI* court used this language to support its conclusion that RAM copying is fixed and thus constitutes copyright infringement. *Apple Computer's* reference to fixation, however, was merely a vague assumption.

After quoting from *Apple Computer*, *MAI* concluded: "While we recognize that this language is not dispositive, it supports the view that the copy made in RAM is "fixed" and qualifies as a copy under the Copyright Act."⁸² Although the court admitted that it had found no case specifically holding that the copying of software into RAM creates a copy under the Copyright Act, it wrote that "it is generally accepted that the loading of software into a computer constitutes the creation of a copy under the Copyright Act,"⁸³ referring the reader to *Vault Corp. v. Quaid Software Ltd.*,⁸⁴ *Nimmer on Copyright*,⁸⁵ and the CONTU Report.⁸⁶

The *MAI* court sounded a nervous note-"[w]e recognize that these authorities are somewhat troubling since they do not specify that a copy is created regardless of whether the software is loaded into the RAM, the hard disk or [ROM]"-before concluding that because "the copy created in the RAM can be 'perceived, reproduced, or otherwise communicated,' we hold that the loading of software into the RAM creates a copy under the Copyright Act."⁸⁷ The court affirmed the district court's grant of summary judgment and the permanent injunction.⁸⁸

MAI Systems v. Peak Computer has been criticized on three main grounds: it failed to consider the doctrine of fair use,⁸⁹ ignored the doctrine of copyright misuse,⁹⁰ and made only cursory allusion to the computer end-user's rights under Section 117.⁹¹

V. Post-*MAI* cases

Two cases since *MAI* have considered and followed its conclusions. One case involved *MAI Systems* and competing ISOs again, this time in the Eastern District of Virginia.⁹² Following the publication of *MAI Systems v. Peak Computer*, *MAI* sent cease and desist letters to various ISOs which competed with *MAI* for service and maintenance of *MAI* computers.⁹³ When the ISOs sued *MAI* for antitrust claims and requested a preliminary injunction, *MAI* responded with a copyright infringement counterclaim.⁹⁴

In granting summary judgment to *MAI* on its copyright counterclaim, the court performed its own analysis of whether loading into RAM constitutes a copy under the Copyright Act, and concluded in the affirmative.⁹⁵ The court rejected arguments that the electrical impulses were insufficiently "material" to qualify as an object under the definition of "copies" because the program in RAM takes up RAM space, and because the program in RAM, while imperceptible to the unaided eye, can be perceived "with the aid of a machine or device."⁹⁶

The court rejected the argument that RAM copying failed to meet the fixation requirement. The ISOs argued that because a program in RAM is only captured momentarily in the memory of a computer, it is too transient and ephemeral to meet the fixation requirement.⁹⁷ The court rejected the argument, countering that once the program is loaded into RAM, "useful representations of the program's information or intelligence can be displayed on a video screen or printed out on a printer."⁹⁸ Hence, the court reasoned, the program in RAM is "stable enough to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration."⁹⁹

The court also found, as a factual matter, that the computers in question were turned on for at least several minutes. The court then imagined a hypothetical situation in which a computer is left on for a period of months or years, or for the life of the computer. "In this event, the RAM version of the program is surely not ephemeral or transient; it is, instead, essentially permanent and thus plainly sufficiently fixed to constitute a copy under the Act."¹⁰⁰ The court viewed the problem as one of line drawing, yet did not feel compelled to seek out just where to draw the line between fixed and unfixed.¹⁰¹ The court found support for its conclusion in *MAI Systems Corp. v. Peak Computer, Inc.*,¹⁰² *ISC-Bunker-Ramo Corp. v. Altech, Inc.*,¹⁰³ *Micro-Sparc, Inc. v. Amtype Corp.*,¹⁰⁴ and *Apple Computer, Inc. v. Formula International, Inc.*¹⁰⁵ Finally, the court rejected the contention that copying is a term of art in the computer industry that does not imply that loading into RAM creates a copy, because the Copyright Act, not industry usage, define the scope of copyright protection.¹⁰⁶

The second case involved *Triad Systems Corporation*, a computer manufacturer, in its lawsuit against a competing ISO, *Southeastern Express Co.*¹⁰⁷ Shortly after the Ninth Circuit decided *MAI*, *Triad* moved for summary judgment on its copyright claim. The court was

bound to follow the teaching of *MAI*, and found that "*MAI* stands for the general proposition that a 'copy made in RAM is 'fixed' and . . . a copy under the Copyright Act.'"¹⁰⁸ The court observed that

[T]he copyright law is not so much concerned with the temporal "duration" of a copy as it is with what that copy does, and what it is capable of doing, while it exists. "Transitory duration" is a relative term that must be interpreted and applied in context. This concept is particularly important in cases involving computer technology where the speed and complexity of machines and software is rapidly advancing, and where the diversity of computer architecture and software design is expanding at an ever-increasing rate.¹⁰⁹

The court decided that whether an operating system (or other software) made an ephemeral or a permanent copy in RAM in a Triad computer was irrelevant, because it is the "functional equivalent of a longer lasting copy in other computer systems."¹¹⁰

In *MAI* the copyright owner achieved something very valuable: the right to exclude ISOs from competing in the market for maintenance and service of computers, where the ISOs could only compete by using the proprietary software residing in the customers' computers. In essence, the copyright owner won the right to prevent, and collect damages for, their customers' disclosure of the copyright owner's computer software to third parties. Granting the copyright owner the right to prevent access and use under the authority of copyright law, however, conflicts with the basic purposes of the Copyright Act.

VI. Analysis of *MAI v. Peak*

MAI's conclusion that loading a program into RAM creates an infringing copy for purposes of the Copyright Act is not convincing. Loading into RAM should not create an infringing copy because such a "copy" is often insufficiently stable to meet the statutory definition. More importantly, however, *MAI* contravenes the purposes of copyright law, because it gives to computer copyright owners broader rights than those enjoyed by other copyright owners. Under *MAI*, computer copyright owners enjoy a powerful combination of trade secret and copyright protection which permits them, for example, to deny third parties access to programs in the possession of licensees and to sue the third parties for operating those programs.

A. *MAI*'s Dilemma

The terms of the Copyright Act and its legislative history support the proposition that loading a software program into RAM does not create an infringing copy. The key is the definition of fixation. The copy of a software program in RAM should not be viewed as fixed for several reasons. As noted earlier, the electrical impulses in memory chips are "evanescent" in contrast to the magnetically fixed information in storage.¹¹¹ RAM, furthermore is not stable but volatile, and cannot survive the loss of power.¹¹² Storage, on the other hand, is permanent and indubitably represents a "copy" under the Copyright Act.¹¹³

MAI concluded that the image in RAM is "fixed" because a portion of a copy of a program may rest in RAM for some period of time and is perceivable by means of a device. While this is true, such reasoning does not take into account how the computer functions, but considers the computer at rest, when it is essentially idling. Yet the operation of the computer, rather than its state when not in use, is a more realistic view of computer operation. It should dictate whether operation of a software program in RAM is of "transitory duration." When a computer is in operation and commands are being entered, software code may appear in RAM (and disappear from RAM) at high speed. This is consistent with the House Report's conclusion that a temporary appearance of a copy of a computer program in memory is not fixed.¹¹⁴

The *MAI* court had several alternative ways to answer the question of fixation. Sometimes versions of software programs in RAM are fixed; this counseled finding that they are "copies." Sometimes these versions are not fixed; this counseled finding that they are not copies. There was a third alternative that *MAI* did not consider: the problem of fixation could be treated as an issue of fact.¹¹⁵ It is just as well, however, that the court did not consider this alternative, for such an inquiry would require highly technical expert testimony about the operation of the computer in question, what parts of the program were used, which portions of code were fixed in RAM, and for how long, and what the nature of damages might be. This would have been an extremely untidy solution that would extend copyright trials, forestall summary judgments, and create greater unpredictability in litigation. *MAI* simply picked a practical alternative, that fixation would be presumed in all cases. But it did so without considering the nature of the rights that it was granting to *MAI*, and this was its mistake.

B. *MAI* Created Rights For the Copyright Owner That Go Beyond the Traditional Protection of Copyright

Loading a software program into RAM should not be deemed an infringement. Such an interpretation creates rights broader than copyright protection is intended to afford. *MAI* achieves this unprecedented level of protection by finding that disclosure or use

through loading a software program into RAM, when contractually prohibited, amounts to a copyright violation. Unfortunately, *MAI* uses the copyright laws to give a copyright owner the rights of a trade secret owner by creating a method for restricting the disclosure and use of copyrighted works.¹¹⁶ *MAI* thus creates a copyright violation out of merely reading and using information.¹¹⁷ By extending the copyright owner's right beyond the scope of a normal copyright, *MAI* federalized what might otherwise be a contractual matter of confidentiality between the copyright owner/licensor and the licensee.¹¹⁸ It does so, moreover, without allowing the defendant the benefit of trade secret defenses.¹¹⁹

The purpose of copyright law is to secure for copyright owners the right to reproduce copies of their works as a reward to encourage the creation and dissemination of their works and ideas.¹²⁰ The intent is to give the copyright owner a royalty for each copy of the work, say, a book. The statutory purpose is no different for computer programs. CONTU evaluated different schemes that might promote the statutory purpose of ensuring creation and broad distribution of computer programs in a competitive market, and concluded that, because the cost of developing computer programs is far greater than the cost of their duplication, they are likely to be disseminated only if "the creator may spread its costs over multiple copies of the work with some form of protection against unauthorized duplication of the work."¹²¹ CONTU did not contemplate a revenue stream to the copyright owner based on use, but on the proliferation of permanent copies.

Copyright law traditionally prohibits copying but encourages disclosure and use. Although a game is copyrighted, there is no copyright violation in playing that game. A painting is copyrighted, but there is no infringement in appreciating its beauty. One may borrow a book, read that book, and give it back to the owner of that copy without incurring copyright liability. Copyright law is not supposed to act as a tool to prevent disclosure and use of copyrighted works. Indeed, the reverse is true: A prime purpose of copyright is to promote dissemination of works.¹²² Access to the copyrighted work is at the heart of the public benefit of dissemination.¹²³ When copyright law is used to restrict access to a work, rather than promote dissemination, the protection of copyright should no longer apply because such a restriction is beyond its purpose.¹²⁴

Courts have emphasized that promoting access to computer programs is part of the public policy concern inherent in providing copyright protection to computer programs.¹²⁵ Programmers, for example, should be free to view the operation, if not to read the source code, of copyrighted programs and use the ideas embodied in them in preparing their own works without appropriating protected expression.¹²⁶ Yet, according to *MAI*, accessing and using a computer program on the computer of the rightful possessor of a licensed program is copyright infringement. *MAI* thus inhibits dissemination of works, contrary to copyright policy, because it allows restrictions on access and use based on copyright liability.

The dilemma of *MAI* lies partly in the nature of computer architecture, computer memory, and the information encoded in software programs. The statutory contradiction arises when in order to gain access to and use a copyrighted work one must "copy" the work. Copying, in this case, is not something distinct from access to and use of the work, it *is* access to and use of the work. When "copying" is the only means of access, it should not be punished as a copyright infringement.¹²⁷ As noted above, *MAI*'s holding is analogous to creating copyright liability for reading a book.

The other part of *MAI*'s dilemma lies in the *MAI* software license and its ability to exploit the "copying" of a software program into RAM in order to create a potential cause of action against third parties for reading and using the software.¹²⁸ The combined effect of "copying" into RAM and the ability to set the terms of license restrictions gives a software copyright owner the ability to sue third parties for copyright infringement when all that the third party has done is assist a rightful possessor of the software by servicing its computer.¹²⁹ *MAI* gives the software copyright owner the ability to sue under the copyright law for disclosure and use, so long as it has tailored its software licenses to exclude potential competitors from using its software. In this manner, *MAI* gives software manufacturers a way to regulate use of their software as a trade secret under the auspices of copyright law.¹³⁰

Several federal courts, however, have disallowed the leveraging of copyright law to establish trade secret protection over software in the area of decompilation or disassembly of computer programs.¹³¹ Decompilation is a step in the reverse engineering of software, analyzing an existing program to create a compatible or competing software program.¹³² The legality of decompilation of software, whether such decompilation is characterized as for research purposes, for creating compatible add-on programs, or for creating wholly competing software programs has been the subject of debate for some time. Decompilation of software is a form of copying that has been characterized as "intermediate" in nature, because the aim of legitimate decompilation is to analyze the program rather than proliferate and distribute verbatim copies.¹³³ Some have suggested that the text of the Copyright Act rejects any general freedom to decompile.¹³⁴ "If however, one considers that the purpose of copyright is to promote the creation and dissemination of knowledge, it will follow that . . . if decompilation is necessary in order to get access to knowledge, it should be noninfringing."¹³⁵ Claiming that the intermediate copy is an infringing one, some software manufacturers have attempted to use the rubric of copyright law to deny access to those who wish to understand the workings of their software. This is an excellent example of leveraging copyright into trade secret

protection.¹³⁶ Several federal courts have employed the copyright fair use doctrine to find that the use in question was fair, effectively denying the use of copyright to obtain trade secret protection.¹³⁷ In circumstances such as those in *MAI*, courts should also deny the copyright owner's attempt to leverage copyright into trade secret protection in order to prevent use of the software.

The reasons for seeking copyright protection to vindicate trade secret concerns are manifold.¹³⁸ If one can achieve the same end result, copyright offers numerous advantages over trade secret protection. These advantages include: (1) certain access to federal courts arising from exclusive federal jurisdiction;¹³⁹ (2) readily available injunctive relief and nationwide service of such an injunction;¹⁴⁰ (3) the impounding and destruction of infringing materials;¹⁴¹ (4) damages measured by the plaintiff's lost profits as well as the defendant's profits;¹⁴² (5) statutory damages if actual damages are difficult to prove;¹⁴³ (6) recovery of costs and attorney's fees;¹⁴⁴ and (7) the threat of criminal prosecution for willful infringers.¹⁴⁵ In addition, a copyright infringement lawsuit (even if it seeks trade-secret level protection) is not amenable to trade secret defenses, *e.g.*, that the plaintiff inadequately protected the confidential status of its claimed trade secret.¹⁴⁶ Indeed, copyright infringement is far easier to prove than trade secret misappropriation, because a copyright plaintiff need not prove that the defendant knew that the item was improperly acquired.¹⁴⁷

MAI's approach extends trade secret-like protection beyond that of actual trade secrets in one important way. A trade secret loses its status as a trade secret when it is publicly disclosed. By contrast, copyright provides protection regardless of public disclosure. This protection lasts, for an individual, fifty years after the death of the owner, or for a corporation, 100 years from creation of the work or seventy-five years from publication.¹⁴⁸ Leveraging a trade secret into a copyright claim means that the copyright owner's cause of action to prevent disclosure and use will not end upon disclosure, and that the "trade-secret" copyright claim may still be viable a century after its creation.¹⁴⁹

Depriving copyright owners of the *MAI* cause of action does not destroy any legitimate incentive to create new works. Although preserving royalties for the copyright owner is a major aim of copyright law, a RAM copy need not be deemed infringing in order to preserve sufficient compensation to the copyright owner to ensure an incentive to create.¹⁵⁰ This is because the copy or image in RAM is not a potentially "harmful" copy that might undermine the market value of the copyrighted work.¹⁵¹ The distinction between "memory" and "storage" is crucial in this regard. The copy in RAM is fragile; RAM is called "volatile" memory because information stored in it cannot survive the loss of power.¹⁵² Because of the fragile nature of the RAM copy, the existence of this copy does not suppress demand for additional copies of the work.¹⁵³ The single image in RAM will be used for its task, then the user will inevitably leave the program to use another program, or turn the computer off.¹⁵⁴ A copy in storage would more likely displace demand for the copyrighted work because it is permanent and may foreclose a sale or lease.¹⁵⁵ In such a case, the copyright owner would be deprived of the revenue from sale or lease of the copyrighted work. By contrast, the image in RAM is destroyed when use is finished, and all that remains is the rightful possessor's copy of the program in his or her computer storage. To the extent that *MAI*-granted rights preserve a monopoly over the service market for a particular computer, these rights are illegitimate.

Hence, *MAI*'s protection of disclosure and use is not necessary to deem the RAM copy an infringing copy in order to preserve for the copyright owner an incentive to create new works. The copyright owner receives all the revenue to which it is entitled when it receives license fees and sales revenue for selling or leasing copies of the program in a storage format.¹⁵⁶ While the copyright owner might object that it loses potential revenue from licensing ISOs to use its software, the copyright owner should not be entitled to exclude third parties from using its software, so long as no harmful copying occurs.

Finally, as suggested above, courts may reasonably find that the image in RAM is not a copy because it is often not "fixed."¹⁵⁷ But this is not the only route by which the image in RAM may be deemed not a "copy." The Copyright Act charges that copying which implicates processes or methods of operation is not infringement.¹⁵⁸ In the circumstances discussed here, when copying is the only method for perusing a copyrighted work, then use is closely related to process and method of operation. Copyright cannot protect the process of using a program, only the duplication and proliferation of that program.¹⁵⁹ Use of a process, system, or method of operation does not amount to a copyright infringement.¹⁶⁰ Under the facts of *MAI*, copying is part of the process of accessing, or the method of operating, the software program. For this reason, copyright protection should not reach that process or operation of the otherwise protected computer software.

In sum, *MAI* permits use of copyright to create a trade secret cause of action against a third party who is not allowed to assert trade secret defenses in response. In creating this hybrid cause of action, *MAI* federalized computer trade secret law by creating a federal claim for disclosure and use of computer programs.

VII. Conclusion

This article has argued that loading a software program into RAM should not be deemed to create a potentially infringing copy in the

face of licensing restrictions which seek to impose a trade-secret-like scheme through use of copyright doctrine. This article questions the soundness of *MAI's* conclusion that the image in RAM is a copy. Courts may avoid *MAI's* unprecedented extension of copyright doctrine by finding that there is no copy, or by finding that the image in RAM is a noninfringing copy.

Since copyright is a statute-based grant of rights pursuant to constitutional authority, a legislative solution would be desirable.¹⁶¹ Section 101 of the Copyright Act could be clarified to state that the image in RAM is not a copy.¹⁶² Alternatively, Section 117 might be modified to state that loading a software program into RAM into the computer of the "rightful possessor" (as *CONTU's* language originally proposed) does not create an infringing copy.¹⁶³ While such a revision might resolve the ambiguity over the kind of copying at issue in *MAI*, it probably would do little to resolve the controversy over RAM copying in connection with the Internet, for example.¹⁶⁴ Statutory clarification could go far to relieve the confusion over copying in RAM.

1 1995 Bradley J. Nicholson.

. John M. Conley & Robert M. Bryan, *A Unifying Theory for the Litigation of Software Copyright Cases*, 63 N.C. L. Rev. 563, 564 (1985) (computer programs are the "ghost in the machine") (citing ARTHUR KOESTLER, *THE GHOST IN THE MACHINE* (1967)).

† J.D., 1990, University of Pennsylvania Law School.; B.A., 1983, Reed College.

2. 991 F.2d 511 (9th Cir. 1993).

3. 17 U.S.C. § 101 (1988 and 1995 supp.).

4. *See infra* notes 10 to 21 and accompanying text.

5. The National Commission on New Technological Uses of Copyrighted Works, a commission appointed by President Ford to make recommendations for the copyright protection of computer software.

6. *See infra* notes 22 to 58 and accompanying text.

7. *See infra* notes 59 to 91 and accompanying text.

8. *See infra* notes 92 to 110 and accompanying text.

9. *See infra* notes 111 to 164 and accompanying text.

10. *Apple Computer, Inc. v. Franklin Computer Corp.*, 545 F. Supp. 812, 813 (E.D. Pa. 1982), *rev'd on other grounds*, 714 F.2d 1240 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984).

11. *Id.*

12. *Stern Elecs., Inc. v. Kaufman*, 669 F.2d 852, 854 n.1 (2d Cir. 1982).

13. ALAN FREEDMAN, *THE COMPUTER GLOSSARY* 96-97, 374 (1991).

14. *See* WINN L. ROSCH, *THE WINN L. ROSCH HARDWARE BIBLE* 135-36, 769 (2d ed. 1992).

15. *Stern Elecs.*, 669 F.2d at 854 n.1.

16. *Id.*

17. *Franklin Computer*, 545 F. Supp. at 813. Memory can consist of both dynamic RAM ("DRAM") and static RAM ("SRAM").

Advanced Computer Servs. v. MAI Sys. Corp., 845 F. Supp. 356, 362 (E.D. Va. 1994). While DRAM must be "refreshed" with an electrical charge lest it lose its information, SRAM does not need refreshing; both, however, will lose their information if the power is turned off. *Id.*

18. ROSCH, *supra* note 14, at 766 ("Essentially an electronic closet, mass storage is the place where you put information that you don't want to hold in your hands but don't want to throw away, either.").

19. *Id.*

20. In comparing the stability of magnetic storage with the volatility of memory, one authority writes:

Magnetic fields have the wonderful property of being static and semi-permanent. On their own, they don't move or change. The electricity used by electronic circuits is just the opposite. It's constantly on the go and seeks to dissipate itself as quickly as possible. The difference is fundamental. Magnetic fields are set up by the spins of atoms that are physically locked in place. Electric charges are carried by mobile particles, mostly electrons, that not only refuse to stay in place but also are individually resistant to predictions of where they are or are going.

...

Despite their different behavior in electronics and storage systems, magnetism and electricity are manifestations of the same underlying elemental force. Both are electromagnetic phenomena. One result of that commonality makes magnetic storage particularly desirable to electronics designers: magnetic fields can be created by the flow of electrical energy. Consequently, evanescent electricity can be used to create and alter semi-permanent magnetic fields just as an all too mortal sculptor can hew a creation that will last for generations.

ROSCH, *supra* note 14, at 768, 769.

21. *Franklin Computer*, 545 F. Supp. at 813.

22. The Constitutional basis for copyright and patent law is the Constitution's command to Congress: "To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries." U.S. CONST., art. I, § 8, cl. 8.

23. NEIL BOORSTYN, COPYRIGHT LAW 3, § 1.2 (1981).

24. *Pearson v. Washingtonian Pub. Co.*, 98 F.2d 245, 248 (D.C. Cir. 1938), *rev'd on other grounds*, 306 U.S. 30 (1939).

25. *Twentieth Century Music Corp. v. Aiken*, 500 F.2d 127, 130 n.6 (3d Cir. 1974), *aff'd*, 422 U.S. 151 (1975).

26. Section 106 provides for five exclusive rights:

Subject to sections 107 through 120, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:

(1) to reproduce the copyrighted work in copies or phonorecords;

(2) to prepare derivative works based upon the copyrighted work;

(3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or lending;

(4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and

(5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural

works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly.

17 U.S.C. § 106.

27. 17 U.S.C. § 101. The Copyright Act defines "device," "machine," or "process," as "one now known or later developed." *Id.* In addition, the 1976 Copyright Act amended Section 102(a) to protect works of authorship which can be reproduced "either directly or with the aid of a machine or device." 17 U.S.C. § 102(a).

28. 17 U.S.C. § 101. The Copyright Act does not define the terms "tangible medium of expression," or "transitory duration."

29. The 1976 Copyright Act included computer programs in the definition of literary works: "'Literary works' are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied." 17 U.S.C. § 101. The House Report accompanying S. 22, which enacted the 1977 version of § 101, opined: "The term 'literary works' . . . also includes computer data bases, and computer programs to the extent that they incorporate authorship in the programmer's expression of original ideas, as distinguished from the ideas themselves." H.R. REP. NO. 1476, 94th Cong., 2d Sess. 54 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5667 [hereinafter House Report]. Original works of authorship, the subject of copyright protection, are defined to include "literary works." 17 U.S.C. § 102(a)(1).

30. House Report, *supra* note 29, at 53, 1976 U.S.C.C.A.N. at 5666 (emphasis added). This comment was made in the context of discussing fixation of live television broadcasts, such as sporting events. *See id.*, 1976 U.S.C.C.A.N. at 5665-66.

31. "[A]n image is *not* fixed if it is merely projected on a screen, captured momentarily on the fading phosphors of a cathode ray tube, or stored in the volatile memory of a computer." JAY DRATLER, JR., INTELLECTUAL PROPERTY LAW: COMMERCIAL, CREATIVE, AND INDUSTRIAL PROPERTY § 5.03[1] at 5-67 (1993).

Although the House Report is not explicit, the word "memory" presumably refers to a computer's volatile random-access memory (RAM), the contents of which are lost when the power is turned off. Other forms of computer memory, such as magnetic storage and read-only memory (ROM), do not lose their contents when power is cut and therefore should be of sufficient permanence to satisfy the definition of fixation. Accordingly, a sentence being written with the aid of a personal computer is not protected by copyright until the moment when the writer or word-processing program first causes it to be recorded on the computer's magnetic hard disk.

Id. at 5-67 n.38; *see also* David J. Loundy, *E-Law: Legal Issues Affecting Computer Information Systems and Systems Operator Liability*, 3 ALA. L.J. SCI. & TECH. 79, 125 n.317 (1993) (any information stored in RAM is missing the required element of "fixation" because the data is lost when the computer is turned off); Richard H. Stern, *Section 117 of the Copyright Act: Charter of the Software Users' Rights or an Illusory Promise?*, 7 W. NEW ENG. L. REV. 459, 462-63 & n.22 (1985) (A "computer program in RAM will *not* be fixed; it will simply be a transitory and ephemeral writing, like a message written in sand. . . . That is not a potentially infringing copy.").

32. House Report, *supra* note 29, at 52, 1976 U.S.C.C.A.N. at 5665 (emphasis added).

33. *See supra* note 14 and accompanying text. Memory, in this discussion, means RAM rather than ROM, since ROM is permanent.

34. ROSCH, *supra* note 14, at 768-69.

35. *See supra* note 17 and accompanying text.

36. 17 U.S.C. § 101 ("A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.").

37. 17 U.S.C. § 117. The full text of § 117 reads:

Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program

to make or authorize the making of another copy or adaptation of that computer program provided:

(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

38. See Pub. L. No. 93-573, § 201, 88 Stat. 1873 (1974) (authorizing CONTU).

39. See 17 U.S.C. § 117 note.

40. See NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS (1978) [hereinafter CONTU Report]. Congress made one important, and rather puzzling change. While CONTU recommended that the rights set forth in Section 117 accrue to "rightful possessors" of computer software, Congress changed "rightful possessors" to "owners" without any comment, thus excluding lessors of computer software from the scope of the rights granted under § 117. Compare *id.* at 12 with 17 U.S.C. § 117.

41. See *supra* note 30 and accompanying text.

42. CONTU Report, *supra* note 40, at 22. The CONTU Report went on to state: "Insofar as a contrary conclusion is suggested in one report accompanying the new law, this should be regarded as incorrect and should not be followed, since legislative history need not be perused in the construction of an unambiguous statute." CONTU Report at 22 n. 111 (citations omitted). Cf. House Report, *supra* note 29, at 53 with the plain language of the statute defining "fixed."

43. The degree of weight which CONTU's statements can be given is debatable, because even "the views of a subsequent Congress form a hazardous basis for inferring the intent of an earlier one." *United States v. Price*, 361 U.S. 304, 313 (1960). This is even more true of the views of a subsequent unelected committee. One court has dismissed the CONTU Report as not possessing the force of legislative history, while other courts have accorded it such status. Compare *Lotus Dev. Corp. v. Borland Int'l, Inc.*, 788 F. Supp. 78, 93 (D. Mass. 1992), *rev'd on other grounds*, 49 F.3d 807 (1st Cir. 1995) ("Nor can we attribute to Congress . . . a manifestation of intent drawn from a supposed legislative history arguably appearing in a CONTU report to Congress. . . . [T]here is no support for treating as legislative history what another person or entity say to Congress.") with *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240, 1252 (3d Cir. 1983), *cert. dismissed*, 464 U.S. 1033 (1984) ("[W]e can consider the CONTU Report as accepted by Congress since Congress wrote into the law the majority's recommendations almost verbatim.") and *Midway Mfg. Co. v. Strohon*, 564 F. Supp. 741, 750 n.6 (N.D. Ill. 1983) ("[T]he CONTU Report reflects the Congressional intent.").

44. 847 F.2d 255 (5th Cir. 1988). "Congress amended the Copyright Act in 1976 . . . to establish that a program copied into a computer's memory constitutes a reproduction." *Id.* at 259. This comment, however, was part of a few preliminary remarks about the Copyright Act and appears to have played no role in the court's ultimate conclusion that 17 U.S.C. § 117 preempted the stricter provisions of Louisiana's software licensing law. The court cited no support for its remark other than a reference to § 102(a). See *id.* at 259 n.6 ("Section 102(a) was amended to protect original works of authorship which can be reproduced 'either directly or with the aid of a machine or device.' 17 U.S.C. § 102(a) (1977).").

45. 638 F. Supp. 983 (E.D. Pa. 1986). *Bly*, however, only restates the plaintiff's argument and refuses to consider the matter: "Plaintiff relies on cases which state that loading a program into a computer's memory involves making a copy and therefore constitutes an infringement of a copyright on the program." 638 F. Supp. at 985 (citing *Williams Elecs., Inc. v. Arctic Int'l, Inc.*, 685 F.2d 870, 876-77 (3d Cir. 1982); *Micro-Sparc, Inc. v. Amtype Corp.*, 592 F. Supp. 33, 34-35 (D. Mass. 1984); *Franklin Computer*, 714 F.2d at 1249.) The court noted that "defendant's concession of liability makes it unnecessary for me to decide this issue." *Id.* It must be noted that two of the cited cases, *Williams* and *Franklin Computer*, are about ROM, not RAM. Furthermore, *Bly* concerns damages, and it appears that defendant conceded liability only because it believed damages were minimal. *Id.* at 984.

46. 765 F. Supp. 1310 (N.D. Ill. 1990). In particular, *Altech* notes:

Altech's possession of ISC software not only constitutes "contributory infringement," its subsequent use of that software . . . comprises additional acts of direct infringement by Altech. This is because in order to use an ISC software program, the program must be "loaded" into a computer memory. Loading a computer's memory requires "copying" of the program from a disk into memory, and that copy is a direct infringement of the copyright. *Nimmer on Copyright*, § 8.08 (1989).

765 F. Supp. at 1332 (original emphasis omitted). The court goes on to say: "Therefore, whenever Altech uses ISC's copyrighted software, it necessarily makes an unauthorized copy of that software, and necessarily infringes ISC's copyright." *Id.* (citing *Bly v. Banbury Books, Inc.*, 638 F. Supp. 983, 985 (E.D. Pa. 1986) and *Micro-Sparc, Inc. v. Amtype Corp.*, 592 F. Supp. 33, 35 (D. Mass. 1984)). As the preceding footnote points out, *Bly* does not stand for this proposition; rather, plaintiff made this argument, which was conceded in order to get to the issue of damages (which were thought to be minimal). The court's reference to "memory" is somewhat ambiguous, and could mean storage or memory. At any rate, the *Altech* court treated the issue in conclusory fashion.

47. 594 F. Supp. 617 (C.D. Cal. 1984). What little *Franklin Computer* had to say about RAM was quoted in *MAI* and will be set forth below in the discussion of *MAI*. See *infra* notes 59 to 91 and accompanying text.

48. 592 F. Supp. 33 (D. Mass. 1984).

49. *Id.* at 34.

50. *Id.*

51. *Id.*

52. *Id.* (quoting 17 U.S.C. § 117(1)).

53. The opinion stated:

In our opinion, it refers to the placement of a program into a computer - or, in the jargon of the trade, the "inputting" of it. Inputting a computer program entails the preparation of a copy. 2 *Nimmer on Copyright* ¶ 8.08. Because one must input a program in order to use it, each use constitutes a potential copyright violation. The legislative history of § 117 indicates to us that subsection (1) was enacted simply to permit the rightful possessor of a program to input and use it:

[T]he placement of a work into a computer is the preparation of a copy. . . One who rightfully possesses a copy of a program, therefore, should be provided with a legal right to copy it *to that extent which will permit its use* by that possessor. This would include the right to load it into the computer.

Final Report of the National Commission on New Technological Uses of Copyrighted Works at 31 (emphasis added). For example, subsection (1) permits an owner of Nibble programs, whether in the magazine or on disks, to input and use them, by either manually typing in the programs from the magazine or electronically transferring them in from the disks.

592 F. Supp. at 34-35 (footnotes omitted).

54. The court observed:

[S]uppose a Nibble program is either typed in manually from the magazine or transferred in electronically from a disk. After the input is complete, the user has two copies of the program. One is contained in either the magazine or the disk; the other is contained in the computer's memory. This second copy can be displayed on the computer's screen, printed on its typewriter, or transferred onto a blank disk.

Id. at 35 n.6.

55. *Id.* at 35.

56. *Id.* (emphasis omitted).

57. 17 U.S.C. § 101 ("Literary works' are works . . . expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, . . . tapes [or] disks . . . in which they are embodied.").

58. For example, it could, and did, include a disk with the magazine along with the printed code. *Micro-Sparc*, 592 F. Supp. at 34.

59. FREEDMAN, *supra* note 13, at 636-37.

60. *See, e.g.*, *Triad Sys. Corp. v. Southeastern Express Co.*, 31 U.S.P.Q.2d 1239, 1240 (BNA) (N.D. Cal. 1994); *Advanced Computer Servs. v. MAI Sys. Corp.*, 845 F. Supp. 356, 358 (E.D. Va. 1994).

61. *See, e.g.*, *Triad Sys. Corp.*, 31 U.S.P.Q.2d at 1241; *Advanced Computer Servs.*, 845 F. Supp. at 360.

62. The nature of the market for service and maintenance for larger business computers is quite different from that of personal computers, with which most lawyers are familiar.

A personal computer is an electronic gizmo that is built in a factory and then sold by a dealer to an individual or a business. If everything goes as planned, the customer will be happy with the purchase, and the company that makes the personal computer, say Apple or Compaq, won't hear from that customer again until he or she buys another computer. Contrast that with the mainframe computer business, where big computers are built in a factory, sold directly to a business or government, installed by the computer maker, serviced by the computer maker (for a monthly fee), financed by the computer maker, and often running software written by the computer maker (and licensed, not sold, for another monthly fee). The big computer company makes as much money from servicing, financing, and programming the computer as it does from selling it. It not only wants to continue to know the customer, it wants to be in the customer's dreams.

ROBERT X. CRINGELY, *ACCIDENTAL EMPIRES* 35-36 (1992).

63. *See, e.g.*, *Triad Sys. Corp.*, 31 U.S.P.Q.2d at 1241 n.2; *Advanced Computer Services*, 845 F. Supp. at 361 n.6, 367.

64. ISOs are often composed of, or started by, former employees of one of these particular computer manufacturers. *See, e.g.*, *MAI Sys. Corp. v. Peak Computer, Inc.*, 991 F.2d 511, 513 (9th Cir. 1993).

65. MAI had ceased to manufacture computers by the time of the appeal of dispute. *See id.* at 513. The maintenance market for MAI computers therefore probably had assumed a greater importance than before MAI stopped manufacturing.

66. *Id.* at 517. The opinion quoted the following portions of a representative MAI software license:

4. Software License.

(a) License. . . Customer may use the Software (one version with a maximum of two copies permitted - a working and a backup copy) . . . solely to fulfill Customer's own internal information processing needs on the particular items of Equipment . . . for which the Software is configured and furnished by [MAI]. The provisions of this License . . . shall apply to all versions and copies of the Software furnished to Customer pursuant to this Agreement. The term "Software" includes, without limitation, all basic operating system software. . . .

(b) Customer Prohibited Acts. . . . Any possession or use of the Software . . . is prohibited, including without limitation, examination, disclosure, copying, modification, reconfiguration, augmentation, adaptation, emulation, visual display or reduction to visually perceptible form or tampering. . . .

(c) Customer Obligations. Customer acknowledges that the Software is [MAI]'s valuable and exclusive property, trade secret and copyrighted material. Accordingly, Customer shall . . . (i) use the Software . . . strictly as prescribed under this License, (ii) keep the Software . . . confidential and not make [it] available to others.

The diagnostics software was covered by a separate agreement. A representative such agreement provided in part:

6. Access/Non-Disclosure.

Licensee shall not give access nor shall it disclose the Diagnostics (in any form) . . . to any person . . . without the written permission of [MAI]. Licensee may authorize not more than three (3) of its bona fide employees to utilize the Diagnostics . . . if, and only if, they agree to be bound by the terms hereof.

Id. at 517 n.3.

67. Servicing MAI computers comprised between 50 and 70 percent of Peak's business. *Id.* at 513.

68. The preliminary injunction read in part that defendants were enjoined from "infringing MAI's copyrights in any manner and from using, publishing, copying, selling, distributing or otherwise disposing of any copies or portions of copies" of certain specified MAI software. *Id.* at 513. "Use" was defined as "including, without limitation, the acts of running, loading, or causing to be run or loaded, any MAI software from any magnetic storage or read-only-memory [ROM] device into the computer memory of the central processing unit of the computer system." *Id.* at 513-14.

69. *Id.* at 517.

70. *Id.* at 518.

71. *Id.*

72. *See supra* notes 27-28 and accompanying text.

73. 991 F.2d at 518.

74. *Id.*

75. *Id.* (quoting Fed. R. Civ. P. 56(e); also citing *Anderson v. Liberty Lobby, Inc.*, 477 U.S. 242, 248 (1986); *Harper v. Wallingford*, 877 F.2d 728 (9th Cir. 1989)).

76. 594 F. Supp. 617 (C.D. Cal. 1984).

77. *See supra* note 47 and accompanying text.

78. 594 F. Supp. at 621-22. The pertinent part of Section 117 reads as follows:

[I]t is not an infringement for the owner of a copy of a computer program to make . . . another copy . . . of that computer program provided:

(1) that such a new copy . . . is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner

17 U.S.C. § 117 (Supp. 1995).

79. 594 F. Supp. at 622.

80. *Id.*

81. 991 F.2d at 519 (quoting *Apple Computer*, 594 F. Supp. at 622).

82. *Id.*

83. *Id.*

84. *See supra* note 44 and accompanying text.

85. *See supra* note 46 and accompanying text.

86. This is the quote that refers to storage, not RAM. *See supra* notes 41-43 and accompanying text. *MAI's* reading of the Copyright Act has some basis in *CONTU*. But while *CONTU* concluded that a copy in RAM is potentially infringing, it recognized the need to excuse copying by the rightful possessor.

Because the placement of a work into a computer is the preparation of a copy, the law should provide that persons in rightful possession of copies of programs be able to use them freely without fear of exposure to copyright liability. Obviously, creators, lessors, licensors, and vendors of copies of programs intend that they be used by their customers, so that rightful users would but rarely need a legal shield against potential copyright problems. It is easy to imagine, however, a situation in which the copyright owner might desire, for good reason or none at all, to force a lawful owner or possessor of a copyright to stop using a particular program. One who rightfully possesses a copy of a program, therefore, should be provided with a legal right to copy it to that extent which will permit its use by that possessor. This would include the right to load it into a computer.

CONTU Report, *supra* note 40, at 13. *CONTU* thus intended that rightful possessors be able to make copies of their programs. The right to copy under *CONTU's* reasoning should extend to the lawful agents of the rightful possessor as well. Unfortunately, Congress changed "rightful possessors" to "owners" without any explanation. *Supra* note 40.

87. 991 F.2d at 519. The court's conclusions regarding RAM were specifically regarding *MAI* operating system software. But the court made clear that it would have applied its findings to other *MAI* software if it had been so inclined. *MAI's* claims were not only concerning its operating system, but its diagnostic software that resided in customers' computers. Peak's field service manager admitted that if Peak loaded *MAI* diagnostic software into a computer's RAM, such loading would produce the same copyright violation as loading the operating system software. *Id.* at 518 n.4.

88. *Id.* at 519. The court also discussed use of unlicensed software at its own offices (not just in customers' computers located at customers' offices), loaning of *MAI* computers and software, and trade secret claims. *Id.* at 519-24. These issues are beyond the scope of this article.

89. Trinnie Arriola, *Software Copyright Infringement Claims After MAI Systems v. Peak Computer*, 69 WASH. L. REV. 405, 421-22 (1994); Katrine Levin, Note, *MAI v. Peak: Should Loading Operating System Software Into RAM Constitute Copyright Infringement?*, 24 GOLDEN GATE U. L. REV. 649, 677-80 (1994); *see* 17 U.S.C. § 107. Fair use requires consideration of several nonexclusive statutory factors in deciding whether to allow a plenary defense to copyright infringement. The factors are (1) the purpose and character of use; (2) the nature of the copyrighted work; (3) the amount and substantiality of the portion used in relation to the whole; and (4) the effect of the use upon the potential market for or value of the copyrighted work. 17 U.S.C. §107. The final, economic factor is the most important. *See Stewart v. Abend*, 495 U.S. 207, 238 (1990); *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 566-67 (1985). In defense of the *MAI* court, it does not appear that the issue was raised.

Courts are often inconsistent and uncertain in applying the fair use doctrine. An author pointed out in 1990 that five of the then-recent leading fair use cases were reversed at every stage of review, and in the Supreme Court's first two encounters with fair use, it split 4-4 each time and failed to resolve anything. Pierre N. Leval, *Toward A Fair Use Standard*, 103 HARV. L. REV. 1105, 1106 n.9 & 1107 n.10 (1990). The trend continues. *See Acuff-Rose Music, Inc. v. Campbell*, 754 F. Supp. 1150 (M.D. Tenn. 1991), *rev'd*, 972 F.2d 1429 (6th Cir. 1992), *rev'd*, 114 S. Ct. 1164 (1994). As Leval notes,

The opinions reflect widely differing notions of the meaning of fair use. Decisions are not governed by consistent principles, but seem rather to result from intuitive reactions to individual fact patterns. Justification is sought in notions of fairness, often more responsive to the concerns of private property than to the objectives of copyright.

Leval, *supra*, at 1107. The courts have failed to give the doctrine the predictability that the public needs and of which the doctrine is capable. *See generally* Michael G. Anderson & Paul F. Brown, *The Economics Behind Copyright Fair Use: A Principled and Predictable Body of Law*, 24 LOY. U. CHI. L.J. 152 (1993). A fair use analysis of the facts of *MAI*, however, is beyond that scope of this article.

90. Arriola, *supra* note 89, at 425. Copyright misuse involves extending the rights granted under the copyright, usually through contract, so that the use of the copyright becomes anticompetitive in nature. The leading case allowing the copyright misuse defense is *Lasercomb America, Inc. v. Reynolds*, 911 F.2d 970 (4th Cir. 1990), in which a manufacturer attempt to extend copyright protection for its product to 99 years. *Id.* at 978-79. Copyright misuse has failed to become commonplace in judicial opinions, although it is often raised by parties in copyright litigation. *See* Ramsey Hanna, Note, *Misusing Antitrust: The Search For Functional Copyright Misuse Standards*, 46 STAN. L. REV. 401, 445 (1994). Again, in defense of the *MAI* court, the issue apparently was not raised. The subject of copyright misuse is beyond the scope of this article.

91. Arriola, *supra* note 89, at 419-20; Levin, *supra* note 89, at 669-77; MELVILLE B. NIMMER, ET AL., NIMMER ON COPYRIGHT, § 8.08[B] at 8-109 (1994). The author believes that Section 117 is not applicable to the facts in *MAI* because of Congress's clear but unexplained change in CONTU's recommendations, altering "rightful possessors" to "owners." It would appear that Peak's customers were not owners of the copies of the software, although they were rightful possessors.

92. *Advanced Computer Servs. v. MAI Sys. Corp.*, 845 F. Supp. 356 (E.D. Va. 1994). The author participated in the briefing of this case as an attorney for the ISOs.

93. *Id.* at 359-60.

94. *Id.*

95. *Id.* at 362-64.

96. *Id.* at 363 (quoting 17 U.S.C. § 102(a)) (emphasis omitted).

97. *See supra* notes 10-21 and accompanying text.

98. 845 F. Supp. at 363.

99. *Id.* (paraphrasing 17 U.S.C. § 101 (definition of fixation)).

100. *Id.*

101. In particular, the court stated:

[I]f a computer is turned off within seconds or fractions of a second of the loading, the resulting RAM representation of the program arguably would be too ephemeral to be considered "fixed" or a "copy" under the Act. It is unnecessary here to decide precisely where along the time continuum the line should be drawn between RAM representations of a program that are of a sufficient duration to be "fixed" and those that are not. *MAI's* copyright infringement claim is not aimed at situations where the power to the computer is turned off and the RAM erased within a second of the completion of loading. Instead, *MAI's* attack focuses on those situations where the computer is left on for a time measured in minutes, if not longer. . . . In sum, where, as here, a copyrighted program is loaded into RAM and maintained there for minutes or longer, the RAM representation of the program is sufficiently "fixed" to constitute a "copy" under the Act.

Id.

102. *See supra* notes 59-91 and accompanying text.

103. *See supra* note 46 and accompanying text.

104. *See supra* notes 48-58 and accompanying text.

105. 562 F. Supp. 775 (C.D. Cal. 1983), *aff'd* 725 F.2d 521 (9th Cir. 1984). This opinion in the dispute between Apple Computer and Formula is not the one cited in *MAI* (*see supra* notes 59-91 and accompanying text), and does not discuss RAM but ROM. *Id.* at 777.

106. 845 F. Supp. at 364. The ISOs had pointed out that MAI's own licensing agreements prohibited licensees from "copying" MAI licensed software. *Id.*, *see supra* note 66. This meant that, under *MAI Sys. Corp. v. Peak Computer*, MAI's licensees violate their license with MAI every time they load their software into RAM. 845 F. Supp. at 364.

107. *Triad Sys. Corp. v. Southeastern Express Co.*, 31 U.S.P.Q.2d 1239 (BNA) (N.D. Cal. 1994). The author also participated in the briefing of this case as one of the attorneys for Southeastern Express.

108. *Id.* at 1243 (quoting *MAI*, 991 F.2d at 519).

109. *Id.* (citing CONTU Report at 22-23).

110. *Id.*

111. *Compare* House Report, *supra* note 29, at 53 (U.S.C.C.A.N. at 5666) ("[T]he definition of 'fixation' would exclude from the concept purely evanescent or transient reproductions such as those projected briefly on a screen, shown electronically on a television or other cathode ray tube, or captured momentarily in the 'memory' of a computer.") *with* ROSCH, *supra* note 14, and accompanying text (electrical impulses in RAM memory are "evanescent" but can be made permanent when converted into magnetic storage.)

112. *See supra* notes 10-21 and accompanying text.

113. *See supra* notes 27-28 and accompanying text.

114. *See supra* note 30 and accompanying text.

115. *See Triad Sys. Corp. v. Southeastern Express Co.*, 31 U.S.P.Q.2d 1239, 1243 (BNA) (N.D. Cal. 1994).

116. *See, e.g.*, MINN. STAT. ANN. § 325C.01(3) (West 1981 & Supp. 1995) (Minnesota's adoption of the UNIF. TRADE SECRETS ACT, 14 U.L.A. 438 (1985)). Misappropriation of a trade secret is defined as "disclosure or use of a trade secret of another without express or implied consent by a person" who either improperly acquired the secret or had reason to know that it was a trade secret. *Id.* Trade secret status requires that the information derive independent economic value from not being generally known and not readily ascertainable, as well as being the subject of reasonable efforts to maintain its secrecy. MINN. STAT. ANN. § 325C.01(5) (West Supp. 1995). The classic definition is that a "trade secret may consist of any formula, pattern, device or compilation of information which is used in one's business, and which gives him an opportunity to obtain an advantage over competitors who do not know or use it." RESTATEMENT OF TORTS § 757 cmt. b (1939). The trade secret doctrine is used in computer industry to restrict access and disclosure of software. *See, e.g.* WILLIAM S. STRONG, *THE COPYRIGHT BOOK: A PRACTICAL GUIDE* 24 (1990); *see generally* David Bender, *Protection of Computer Programs: The Copyright/Trade Secret Interface*, 47 U. PITT. L. REV. 905, 921 (1986).

117. This is not to suggest that trade secret protection cannot apply to copyrighted computer software programs, but only that copyright and trade secret misappropriation are two distinct and separate forms of intellectual property protection. *See Computer Assoc. Int'l, Inc. v. Altai, Inc.*, 982 F.2d 693, 721 (2d Cir. 1992) ("so long as trade secret law is employed in a manner that does not encroach upon the exclusive domain of the Copyright Act, it is an appropriate means by which to secure compensation for software espionage"). One author thinks that legal theorists have underestimated the important role of trade secret laws in mediating between formal intellectual property regimes and free competition. *See Jerome H. Reichman, Legal Hybrids Between the Patent and Copyright Paradigms*, 94 COLUM. L. REV. 2432, 2438 (1994).

118. Trade secret protection is provided exclusively under state law, while copyright is predominantly a matter of federal law. *See, e.g.*, 17 U.S.C. § 301 (1977 & Supp. 1994); CONTU Report at 17; Reichman, *supra* note 117, at 2438 n.13.

119. *See infra* note 146 and accompanying text.

120. *See supra* notes 22-26 and accompanying text.

121. CONTU Report, *supra* note 40, at 11.

122. *Campbell v. Acuff-Rose Music, Inc.*, 114 S. Ct. 1164, 1175 (1994) (creative expression for public dissemination falls within the core of the copyright's protective purposes); *Gilliam v. Am. Broadcasting Cos., Inc.*, 538 F.2d 14, 23 (2d Cir. 1976) ("copyright law should be used to recognize . . . the need to encourage production and dissemination of artistic works"); *Harry Fox Agency, Inc. v. Mills Music, Inc.*, 543 F. Supp. 844, 862 (S.D.N.Y. 1982), *aff'd per curiam*, 779 F.2d 35 (2d Cir. 1985) ("As reflected in the Constitution, the fundamental purpose of the copyright laws is to encourage the production and dissemination of artistic works for the general public good."); *see United States v. Paramount Pictures, Inc.*, 334 U.S. 131, 158 (1948) (public interest lies in the general benefits derived by the public from the labors of others); *MCA, Inc. v. Wilson*, 677 F.2d 180, 183 (2d Cir. 1981) (aim of copyright is to stimulate artistic creativity for public benefit); *United States v. LaMacchia*, 871 F. Supp. 535, 537 (D. Mass. 1994) ("The limited nature of the property interest conferred by copyright stems from an overriding First Amendment concern for the free dissemination of ideas."). *See generally* L. Ray Patterson, *Free Speech, Copyright, and Fair Use*, 40 VAND. L. REV. 1 (1987).

123. *See, e.g.*, *Atari Games Corp. v. Nintendo of Am., Inc.*, 975 F.2d 832, 842-43 (Fed. Cir. 1992); *see also* Dennis S. Karjala, *Copyright, Computer Software, and the New Protectionism*, 28 JURIMETRICS J. 33, 56-57 (1987).

124. As the United States Supreme Court has observed:

Creative work is to be encouraged and rewarded, but private motivation must ultimately serve the cause of promoting broad public availability of literature, music, and the other arts. The immediate effect of our copyright law is to secure a fair return for an "author's" creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good. "The sole interest of the United States and the primary object in conferring the monopoly," this Court has said, "lie in the general benefits derived by the public from the labors of authors." When technological change has rendered its literal terms ambiguous, the Copyright Act must be construed in light of this basic purpose.

Twentieth Century Music Corp. v. Aiken, 422 U.S. 151, 156 (1972) (citations and footnotes omitted).

125. *See Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1526 (9th Cir. 1992); *Atari Games*, 975 F.2d at 842-43.

126. *See, e.g.*, CONTU Report, *supra* note 40, at 20; Karjala, *supra* note 123.

127. *Cf. Sega Enters.*, *supra* note 125, at 1514 (In discussing a trademark image that would appear as a result of gaining access to a computer program, the court noted that "when there is no other method of access to the computer that is known or readily available to rival cartridge manufacturers, the use of the initialization code by a rival does not violate the [Lanham] Act even though that use triggers a misleading trademark display.").

128. The anticompetitive effects in *MAI* stemmed in part from *MAI*'s leasing rather than selling of the computer program. Leasing combined with maintenance can be very lucrative for the copyright owner which sells hardware, leases software, and charges a monthly fee for service. *See supra* notes 60-64. A number of cases have noted the anticompetitive effect of leasing. *See, e.g.*, *Hanover Shoe, Inc. v. United Shoe Mach. Corp.*, 392 U.S. 481, 483-87 (1968); *United States v. United Shoe Mach. Corp.*, 110 F. Supp. 295, 343 (D. Mass. 1953), *aff'd per curiam*, 347 U.S. 521 (1954). Indeed, when the limited copyright monopoly is used to gain control of a market other than one for the copyrighted product, such facts may suggest that some form of monopoly leveraging and copyright misuse may be taking place. For the problems created by extending copyright protection through use of licensing agreements, see David A. Rice, *Licensing the Use of Computer Program Copies and the Copyright Act First Sale Doctrine*, 30 JURIMETRICS J. 157 (1990); Thomas Lee Hazen, *Contract Principles as a Guide for Protecting Intellectual Property Rights in Computer Software: The Limits of Copyright Protection, The Evolving Concept of Derivative Works, and the Proper Limits of Licensing Arrangements*, 20 U. C. DAVIS L. REV. 105, 142-57 (1986). Professor Rice questions whether breach of a clause in a licensing agreement should be treated as copyright infringement; such terms are usually a means of circumventing the terms of the Copyright Act, including, of course, the first sale doctrine, 17 U.S.C. § 109(a), which limits the seller's ability to impose restrictions. *See* David A. Rice, *Public Goods, Private Contract and Public Policy: Federal Preemption of Software License Prohibitions Against Reverse Engineering*, 53 U. PITT. L. REV. 543, 559-60 & n.56 (1992).

129. It should be noted that the rule in *MAI* prevents third parties from assisting rightful possessors of computer software. Such third parties might include not only the ISOs in *MAI*, but also consultants to the business of the rightful possessor of a licensed software

program, including accountants, bookkeepers, temporary secretaries, or word processors.

130. CONTU recognized that trade secret protection can be more anticompetitive than copyright. The CONTU report analyzed the differing scopes of intellectual property protection, and concluded that copyright is the least anticompetitive:

Patents are designed to give inventors a short-term, powerful monopoly in devices, processes, compositions of matter, and designs which embody their ideas. The doctrine of trade secrecy is intended to protect proprietors who use a "formula, pattern, device or compilation of information" in their business "which gives [them] an opportunity to obtain an advantage over competitors who do not know or use it." . . . Each of these forms of protection may inhibit the dissemination of information and restrict competition to a greater extent than copyright.

CONTU Report, *supra* note 40, at 16 (footnote omitted).

131. *See Sega Enters.*, *supra* note 125.

132. For an overview of this subject, see Betsy E. Bayha, *Reverse Engineering of Computer Software in the United States, The European Union and Japan*, Address before ALI-ABA Conf. on Intellectual Property Claims in High Technology Markets (January 26-27, 1985), and Andrew Johnson-Laird, *Software Reverse Engineering in the Real World*, 19 U. DAYTON L. REV. 843 (1994).

133. *See Sega Enters.*, *supra* note 125, at 1518-19.

134. *See, e.g.*, Arthur R. Miller, *Copyright Protection for Computer Programs, Databases and Computer-Generated Works: Is Anything New Since CONTU?*, 106 HARV. L. REV. 978, 1014-17 (1993); Allen R. Grogan, *Decompilation and Disassembly: Undoing Software Protection*, 1 COMPUTER LAW. 1, at 9 (Feb. 1984).

135. Pamela Samuelson, *Fair Use for Computer Programs and Other Copyrightable Works in Digital Form: The Implications of Sony, Galoob and Sega*, 1 J. INTELL. PROP. L. 49, 96 n. 196 (1993) [hereinafter Samuelson, *Fair Use for Computer Programs*]; *see generally* Brief Amicus Curiae of Eleven Copyright Law Professors, *Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510 (9th Cir. 1992) (No. 92-15655), reprinted in 33 JURIMETRICS J. 147 (1992).

136. Pamela Samuelson, et al., *A Manifesto Concerning the Legal Protection of Computer Programs*, 94 COLUM. L. REV. 2308, 2390 n.328 (1994). Professor Samuelson observes:

The real concern of those who oppose decompilation of computer programs . . . is that much of the value in a computer program lies in the applied know-how embodied in it. Much of this know-how cannot be discerned by watching the executable version of the program in operation. 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 access to the know-how through decompilation, the know-how can no longer be a secret (at least as to that person). Nor can it be regarded as expression for copyright purposes nor as an invention under patent law. 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.

Samuelson, *Fair Use for Computer Programs*, *supra* note 135, at 96-97.

137. *See Sega Enters. Ltd. v. Accolade, Inc.*, 977 F.2d 1510, 1527 (9th Cir. 1992) ("We conclude that where disassembly is the only way to gain access to the ideas and functional elements embodied in a copyrighted computer program and where there is a legitimate reason for seeking such access, disassembly is a fair use of the copyrighted work, as a matter of law."); *Atari Games Corp. v. Nintendo of Am., Inc.*, 975 F.2d 932, 942-43 (Fed. Cir. 1992) ("Reverse engineering object code to discern the unprotectable ideas in a computer program is a fair use.").

138. Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection For Computer Programs In Machine-Readable Form*, 1984 DUKE L.J. 663, 718 (setting forth the list that follows) [hereinafter Samuelson, *CONTU Revisited*].

139. 28 U.S.C. § 1338(a).

140. 17 U.S.C. § 502.

141. 17 U.S.C. § 503.

142. 17 U.S.C. § 504(a) & (b).

143. 17 U.S.C. § 504(c).

144. 17 U.S.C. § 505; *cf.* MINN. STAT. ANN. § 325C.04 (West 1981 & Supp. 1995) (finding of bad faith required for award of attorney's fees under trade secret statute).

145. 17 U.S.C. § 506.

146. *See, e.g.*, MINN. STAT. ANN. § 325C.01(5) (West 1981 & Supp. 1995) (failure to maintain reasonable efforts to ensure secrecy is a defense to a trade secret misappropriation claim).

147. Compare the elements of copyright infringement in *MAI*, 991 F.2d at 511 (ownership of the copyright and copying beyond the scope of a license) with, *e.g.*, MINN. STAT. ANN. § 325C.01 (West 1981 & Supp. 1995) (manifold elements of trade secret misappropriation under the Uniform Trade Secrets Act).

148. *See* 17 U.S.C. § 302.

149. *See* Samuelson, *CONTU Revisited*, *supra* note 138, at 719.

150. *See supra* notes 122-124 and accompanying text.

151. *See, e.g.*, *Sony Corp. of Am. v. Universal City Studios, Inc.*, 464 U.S. 417 (1984) (home video recording of a televised recording does not lessen the commercial value of the work and therefore does not infringe the copyright). Fair use recognizes the significance of the distinction between harmful and harmless copying. *See* 17 U.S.C. § 107(4). Indeed, the most important consideration in a fair use analysis is the effect of the use on the potential market for or value of the copyrighted work. 17 U.S.C. § 107(4); *Stewart v. Abend*, 495 U.S. 207, 238 (1990); *Harper & Row Publishers, Inc. v. Nation Enters.*, 471 U.S. 539, 566-67 (1985).

152. *See supra* note 17 and accompanying text.

153. Loading into RAM also may be of such limited duration, or otherwise of such insignificant actual injury, as to justify holding for the defendant under the principle of *de minimus non curat lex*. *See Sony*, *supra* note 151, at 451 n.34 (1984); *Knickerbocker Toy Co. v. Azrak-Hamway Int'l, Inc.*, 668 F.2d 699, 703 (2d Cir. 1982); 3 MELVILLE B. NIMMER ET AL., NIMMER ON COPYRIGHT § 13.05 [A] at 13-102.49 n.25.3 (1993).

154. The copy is lost unless, of course, it is copied into computer storage, i.e., a floppy disk or a hard drive. An individual could borrow a copy on a floppy disk and load that copy into RAM as an intermediate step in copying that program into that individual's own computer storage. A copy transferred to computer storage can also be sold or given to someone else in violation of the distribution right. *See* 17 U.S.C. § 106. Giving or selling the disk would infringe on the copyright owner's distribution right, as well as, in *MAI's* view, the right to "copy" the work. *See id.*

155. *Cf. Sony*, *supra* note 151 (permitting copying without infringement liability when such copying-videotaping television programs was in the nature of storage rather than memory).

156. This would restore computer copyright owners to the same rights as other copyright owners. The owner of a copyright in a book, for example, receives revenue from the sales of the book. The owner of a copyright in a book does not, *under copyright law*, acquire the right to an additional revenue stream for the privilege of reading the book.

157. *See supra* notes 27-28 and accompanying text.

158. 17 U.S.C. § 102(b) ("In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.").

159. Compare the following remarks:

The very object of publishing a book on science or the 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. . . . [T]he teachings of science and the rules and methods of useful art have their final end in application and use; and this application and use are what the public derive from the publication of a book which teaches them. . . . The description of the art in a book, though entitled to the benefit of copyright, lays no foundation for an exclusive claim to the art itself. The object of the one is explanation; the object of the other is use. The former may be secured by copyright. The latter can only be secured, if it can be secured at all, by letters-patent.

Baker v. Selden, 101 U.S. (11 Otto) 99, 103-05 (1879). In *Baker*, the Supreme Court held that one could not use or discuss the bookkeeping system explained in the plaintiff's book without reproduction of the ruled lines and headings inherent in that system. *Id.* at 104. The charts were absolutely necessary to understanding and using the bookkeeping system, just as loading a software program into RAM is necessary to understanding and use of the program. The charts were simply the method of operation for the bookkeeping system; loading into RAM is the method of operating a software program. For this reason, *MAI* runs afoul of *Baker* and its codification in 17 U.S.C. § 102(b).

160. *See Lotus Dev. Corp. v. Borland Int'l, Inc.*, 49 F.3d 807, 816 (1st Cir. 1995) (if otherwise protectable forms of expression in a computer program, e.g., the use of certain words, "are essential to operating something, then they are part of a 'method of operation' and, as such, are unprotectable.").

161. *See* U.S. CONST. art. I, § 8, cl. 8; 17 U.S.C. § 101 *et seq.*

162. 17 U.S.C. § 101.

163. 17 U.S.C. § 117. Such legislation has been proposed in the House of Representatives by Congressman Joseph Knollenberg of Michigan. *See* H.R. No. 533, 104th Cong., 1st Sess. (1995). Under such revisions, it is possible that contrary licensing provisions based on state law would be considered preempted by contrary federal copyright law. *See* 17 U.S.C. § 301. *See generally* Peter A. Luccarelli, Jr., *The Supremacy of Federal Copyright Law Over State Trade Secret Law For Copyrightable Computer Programs Marked With a Copyright Notice*, 3 COMPUTER/LAW J. 19 (1981).

164. *See, e.g.*, Niva Elkin-Koren, *Copyright Law and Social Dialogue on the Information Superhighway*, 13 CARDOZO ARTS & ENTERTAINMENT L.J. 345, 353-55, 383-86 (1985).