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Trade Secret and Copyright Protection of Computer Software, 4 Computer L.J. 669 (1984)

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TRADE SECRET AND COPYRIGHT PROTECTION OF COMPUTER SOFTWARE†

by RAY A. MANTLE*

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I. INTRODUCTION

The software industry has become a major commercial and technological contributor to the success of United States businesses; the creators of U.S. software have an undisputed worldwide lead. With the mounting demand for pre-packaged software, the widespread retail marketing of off-the-shelf software (particularly for microcomputers), and the shortage of programmers, software/firmware has become increasingly valuable.¹ The legal system

† © Ray A. Mantle 1983. All rights reserved. Adapted from a speech delivered by Mr. Mantle on May 12, 1983, at the Fourth Annual University of Southern California Computer Law Institute.

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1. "Firmware" is a term of art in the computer industry and refers to micro-instructions permanently embodied in hardware elements. Generally, the term "software" will be used to mean both computer programs and data bases, with specific reference where necessary to draw a distinction. For the purposes of this Article, firmware will be separately identified where it is pertinent to the context, but it generally will be included in discussion of software, albeit embodied in a different medium.

in the U.S., however, is ill-prepared to extend to software/firmware the degree of protection extended to other industrial property through patents, copyrights, and trade secrets.

This Article will examine how the software/firmware industry can legally protect itself against misappropriation and misuse. While a variety of civil, criminal, and administrative laws afford a menu of choices, including injunctive relief for unfair competition,² seizure and forfeiture or destruction,³ and award of damages equal to the infringer's profits,⁴ the focus will be primarily on trade secret and copyright protection of proprietary software/firmware.

The primary source of proprietary protection is the United States Constitution, which grants Congress the power to "promote the Progress of Science and useful Arts, by securing for limited Time to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."⁵ Pursuant to this constitutional mandate, Congress has enacted both the Patent Act,⁶ which grants limited monopolies to inventors for their discoveries, and the Copyright Act of 1976,⁷ which grants protection to authors of their original writings.

II. PATENT PROTECTION

Under the Patent Act, creators of inventions are given a seven-year period of exclusive use, which protects against independent creation, use, or sale of the invention or process by all others in the United States without an express licensing agreement from the patent holder.⁸ Section 101 of the Patent Act describes the subject matter protected by the Act:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.⁹

A patent represents an absolute property right;¹⁰ intentional or innocent infringement of patent rights is actionable under the Pat-

2. *See, e.g.*, 15 U.S.C. § 45 (1982).

3. 17 U.S.C. §§ 506, 509 (1982).

4. *Id.* § 504.

5. U.S. CONST. art. I, § 8, cl. 8.

6. 35 U.S.C. §§ 1-376 (1982).

7. 17 U.S.C. §§ 101-810 (1982).

8. 35 U.S.C. § 154 (1982).

9. *Id.* § 101.

10. *Id.* § 261.

ent Act.¹¹ In order to obtain this limited monopoly, the invention must meet three requirements: the invention must fit into one of the statutory subject matter classifications, i.e., the invention must comprise statutory subject matter;¹² it must be novel;¹³ and, it must be non-obvious to one skilled in the art.¹⁴ The protection is territorially limited to the United States.¹⁵

Although the patent laws seem to afford a broad scope of legal protection for a variety of types of industrial property, Patent Office practices and court decisions have left uncertain how computer software/firmware fits within the patent system. Under current patent law an invention, the embodiment of ideas and principles, is patentable; however, ideas, mathematics, abstract principles, and laws of nature are not.¹⁶ The distinction between ideas and the embodiments of ideas is not always clear,¹⁷ and it is particularly nebulous when applied to computer programs. Confusion over how computer software/firmware fits within the statutory subject matter groups renders patent protection an uncertain method of protecting computer programs against misappropriation and misuse.

The question whether or not inventions realized or implemented by software/firmware comprise statutory subject matter accorded patent protection was addressed and somewhat resolved by the United States Supreme Court in *Diamond v. Diehr*.¹⁸ In *Diehr*, a process for curing synthetic rubber using a computer program and a mathematical equation was found patentable. While the patentability of mathematical equations had been denied in the past,¹⁹ the

11. *Id.* § 271. See, e.g., *Schnadig Corp. v. Gaines Mfg. Co.*, 620 F.2d 1166 (6th Cir. 1980).

12. 35 U.S.C. § 101 (1982).

13. *Id.* § 102.

14. *Id.* § 103.

15. See 17 U.S.C. § 271 (1982).

16. See, e.g., *Parker v. Flook*, 437 U.S. 584 (1978) (method for updating alarm limits during catalytic conversion processes in which the only novel feature was a mathematical formula held not patentable); *Funk Bros. Seed Co. v. Kalo Inoculant Co.*, 333 U.S. 127 (1948) (discovery of particular law of nature not patentable).

17. See, e.g., *Mackay Radio & Tel. Co. v. Radio Corp. of Am.*, 306 U.S. 86 (1939), *modified and reh'g denied*, 306 U.S. 618 (1939). The Court attempted to clarify this distinction stating: "While a scientific truth, or the mathematical expression of it, is not patentable invention, a novel and useful structure created with the aid of knowledge of scientific truth may be." *Id.* at 94.

18. 450 U.S. 175 (1981) (5-4 decision).

19. See *Gottschalk v. Benson*, 409 U.S. 63 (1972). There the Court held that the discovery of a novel and useful mathematical formula was not patentable. The subject matter in *Benson* was an algorithm that described a method for converting binary-coded decimal numbers into pure binary numerals. The Court held that this method was not a "process" within the meaning of the Patent Act. *Id.* at 71.

Court granted a patent in *Diehr* by viewing the claim not "as an attempt to patent a mathematical formula, but rather to [patent] an industrial *process* for the molding of rubber products."²⁰ The Court determined that the process claimed by Diehr was eligible for patent protection since it fit into the statutory classifications. The Court held that its conclusion was "not altered by the fact that in several steps of the process a mathematical equation and a programmed digital computer are used."²¹ In other words, the fact that a programmed computer was utilized in realizing an invention was of no significance for the purpose of statutory classification under the Patent Act.

In another case dealing with whether or not patent protection was applicable to the software/firmware field, *In re Application of Bradley*,²² an invention that combined tangible firmware elements²³ was held patentable despite the fact that certain calculations were made during the operation of the system.²⁴ In granting the patent, the court noted the distinction between what a computer does and how it does it, and explained that the owners of the invention were claiming a patent for the *combination* of hardware elements, not for the information embodied in the firmware or software itself.²⁵ The court concluded that the presence of calculations would not "transform the invention as a whole into a method of calculation."²⁶

Although the *Diehr* and *Bradley* cases clarified somewhat how courts will classify computer programs for purposes of patent protection, the courts' reasoning and the distinctions drawn are still too unclear to afford an inventor any degree of certainty in obtaining patent protection for software/firmware.²⁷ Beyond the certainty problems, there are other drawbacks and limitations to patent protection of computer software/firmware. It may take up to three years to obtain patent approval from the Patent and Trademark Office; by this time the software may be less marketable due to look-

20. *Diehr*, 450 U.S. at 192-93 (emphasis added).

21. *Id.* at 185.

22. 600 F.2d 807 (C.C.P.A. 1979), *aff'd by an equally divided court sub nom. Diamond v. Bradley*, 450 U.S. 381 (1981).

23. The invention sought to be patented in *Bradley* was a "Switch System Base Mechanism" that altered or repositioned information in the computer's system base. 600 F.2d at 808. This was accomplished by use of a "firmware" component. *Id.* at 809.

24. *Id.* at 813.

25. *Id.* at 811-12.

26. *Id.* at 813. The Court also determined that the invention did not recite a mathematical algorithm that would render the invention "non-statutory" under the Patent Act. *Id.*

27. In addition, the precedential value of *In re Application of Bradley* is questionable given the 4-4 split among the Justices of the Supreme Court.

alike competitors or it even may be superseded. In addition, during the period between application for and issuance of the patent the owner has no enforceable rights under the patent laws, thus rendering software protection meaningless during the time when it may be most valuable.²⁸ Finally, there is also a requirement of disclosure in obtaining a patent that may bar simultaneous trade secret protection.²⁹

Due to the shortcomings and uncertainties of the application of patent protection to software/firmware, except in those rare instances under *Diehr* and *Bradley* where patent protection is available and where it is more important than marketing and other considerations, patent protection is not advisable as the primary source of legal protection. The shortcomings inherent in patent protection may be avoided by using copyright and trade secret protection, which are better suited to meet the needs of the software industry, and are a preferable means of protection for most software. The remainder of this Article will focus on trade secret and copyright protection of software.

III. TRADE SECRET PROTECTION

Trade secret protection is a product of the common law and arises in the contexts of property rights,³⁰ contract rights,³¹ and protected or confidential relationships.³² It is not constitutionally based and, for the most part, is not even statutory,³³ unlike copyright and patent protection. Trade secret protection is available both domestically and internationally,³⁴ thus avoiding the territorial limitation of patent, and to some extent copyright, protection.

A commonly cited definition of a trade secret is provided in the Restatement of Torts:

28. See 35 U.S.C. § 151 (1982) (a patent is issued approximately six months after written notice to the applicant of allowance of the patent application by the Patent Office). Procedures for applying for a patent and Patent Office review are set forth in 35 U.S.C. §§ 111-146 (1982).

29. 35 U.S.C. § 112 (1982). *But see* *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 491 (1974) (holding that the extension of trade secret protection to clearly patentable inventions does not conflict with the patent policy of disclosure). See *infra* notes 141-165 and accompanying text for a discussion of *Kewanee*.

30. See generally R. MILGRIM, *TRADE SECRETS* § 1.01 (1983).

31. See generally *id.* § 3.01.

32. See generally *id.* § 5.01.

33. The UNIF. TRADE SECRETS ACT (1980), reprinted in R. MILGRIM, *supra* note 30, app. A, has been adopted by Arkansas, Delaware, Kansas, Louisiana, Minnesota, North Carolina, Utah, and Washington. M. JAGER, *TRADE SECRETS LAW HANDBOOK* § 3.04 (1982).

34. See R. MILGRIM, *supra* note 30, § 7.08[2].

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. It may be a formula for a chemical compound, a process of manufacture, treating or preserving materials, a pattern for a machine or other device, or a list of customs. It differs from other secret information in the business in that it is not simply information as to a single or ephemeral events in the conduct of the business . . . [but] is a process or device for continuous use in the operation of the business. Generally, it relates to the production of goods It may, however, relate to the sale of goods or to other operations in the business³⁵

Under this definition a trade secret must satisfy three requirements. It must be: (1) maintained in confidence;³⁶ (2) used in a trade or business;³⁷ and (3) afford the proprietor a competitive advantage.³⁸ Trade secrets are not protected against independent discovery. Products publicly distributed through sale, lease, or license may contain protectible trade secrets so long as the marketing terms preserve confidentiality.³⁹ Confidentiality is important at all levels and at all times. Protection requires relative secrecy; i.e., that the trade secret is not generally known in the trade.⁴⁰

The law of trade secrets will protect an original combination of known matter and techniques where the combination has a value.⁴¹ A trade secret need not achieve the level of advancement required to obtain a patent. It need only represent a valuable combination of features.⁴² Thus, although applications programs that perform the same function on the same make and model of computers employing the same operating system software necessarily will have cer-

35. RESTATEMENT (FIRST) OF TORTS § 757(B) comments (1939).

36. R. MILGRIM, *supra* note 30, § 2.03.

37. *Id.* § 2.02. Courts do not strictly apply this requirement. For example, a non-profit organization can protect a trade secret even though it is not technically "in business." *Id.*

38. *Id.* § 2.08.

39. *See*, *Warrington Assocs. v. Real-Time Eng'g Sys.*, 522 F. Supp. 367 (N.D. Ill. 1981); *Technicon Medical Information Sys. Corp. v. Green Bay Packaging*, 211 U.S.P.Q. (BNA) 343 (E.D. Wis. 1980); *Management Science Am., Inc. v. Cyborg Sys.*, 6 Comp. L. Serv. Rep. (Callaghan) 921 (N.D. Ill. 1978); *M. Bryce & Assocs. v. Gladstone*, 107 Wis. 2d 241, 319 N.W.2d 907 (Ct. App. 1982); *Data Gen. Corp. v. Digital Computer Controls, Inc.*, 297 A.2d 436 (Del. Ch. 1975).

40. *See Cataphote Corp. v. Hudson*, 422 F.2d 1290 (5th Cir. 1970). *See generally* R. MILGRIM, *supra* note 30, § 2.07[2].

41. *See Com-share, Inc. v. Computer Complex, Inc.*, 338 F. Supp. 1229, 1234 (E.D. Mich. 1971); *Cybertek Computer Prods., Inc. v. Whitfield*, 203 U.S.P.Q. (BNA) 1020 (Cal. Super. Ct. 1977).

42. *See Telex Corp. v. IBM Corp.*, 367 F. Supp. 258, 323 (N.D. Okla. 1973); *Ungar Elec. Tools, Inc. v. Sid Ungar Co.*, 192 Cal. App. 2d 398, 13 Cal. Rptr. 268 (1961).

tain common characteristics, the law of trade secrets will protect each independently created version despite the similarities.

The existence of a trade secret is ultimately a question of fact to be determined by a jury.⁴³ In an action for misappropriation of a trade secret, the trade secret owner has the burden of proving the existence of a protectible trade secret and the ownership of that trade secret.⁴⁴

The amount of use in a trade or business that is required to sustain trade secret protection is generally not difficult to prove. There is, however, a distinction between a trade secret used in business and a submission of industrial or business ideas.⁴⁵

A trade secret user's competitive advantage must be active in nature.⁴⁶ However, in *Kewanee Oil Co. v. Bicron Corp.*,⁴⁷ the Supreme Court stated that research and development was eligible for trade secret protection, even though the research and development results in that case were not directly used or useable in the business activities of the trade secret proprietor. Thus, the head-start value of a new combination of known principles is a good example of a trade secret.⁴⁸

Computer programs and software are protectible subject matter under trade secret law.⁴⁹ Trade secrets can protect the idea, the information, the invention, the design, and the expression of the idea.

43. See *Lear Siegler, Inc. v. Ark-Ell Springs, Inc.*, 569 F.2d 286 (5th Cir. 1978). There the court stated that

[t]he term "trade secret" is one of the most elusive and difficult concepts in the law to define. The question of whether an item taken from an employer constitutes a "trade secret," is of the type normally resolved by a fact finder after full presentation of evidence from each side.

Id. at 288-89. See also *Kodekey Elecs. v. Mechanex Corp.*, 486 F.2d 449 (10th Cir. 1966); *Hulsenbusch v. Davidson Rubber Co.*, 344 F.2d 730 (8th Cir. 1965), *cert. denied*, 382 U.S. 977 (1966); *Sundstrand Corp. v. Hydro-Tech Corp.*, 202 U.S.P.Q. (BNA) 263 (D. Colo. 1978), *aff'd*, 673 F.2d 1171 (10th Cir. 1982).

44. See *Nickelson v. General Motors Corp.*, 361 F.2d 196 (7th Cir. 1966); *Keystone Plastics, Inc. v. C & P Plastics, Inc.*, 340 F. Supp. 55 (S.D. Fla. 1972), *aff'd*, 506 F.2d 960 (5th Cir. 1975); *Bickley v. Frutchey Bean Co.*, 173 F. Supp. 516 (E.D. Mich. 1959), *aff'd*, 279 F.2d 685 (6th Cir. 1960); *Wexler v. Greenburg*, 399 Pa. 569, 160 A.2d 430 (1960).

45. See R. MILGRIM, *supra* note 30, § 8.03.

46. See *id.* § 2.02.

47. 416 U.S. 470 (1974) (secret protection granted for processes, procedures, and techniques developed to grow synthetic crystals useful in detecting ionizing radiation).

48. See R. MILGRIM, *supra* note 30, § 2.02[1] n.16.

49. See *University Computing Co. v. Likes-Youngston Corp.*, 504 F.2d 518 (5th Cir. 1974); *Hancock v. Decker*, 379 F.2d 552 (5th Cir. 1967); *Warrington Assocs. v. Real-Time Eng'g Sys.*, 522 F. Supp. 367 (N.D. Ill. 1981); *Management Science Am., Inc. v. Cyborg Sys.*, 6 Comp. L. Serv. Rep. (Callaghan) 921 (N.D. Ill. 1978); *Telex Corp. v. IBM Corp.*, 367 F. Supp. 258 (N.D. Okla. 1973); *Com-Share Inc. v. Computer Complex*,

Thus, trade secret protection extends to elements not covered by copyright law, which only protects the expression of the idea.⁵⁰ Although any duplication of copyright protection is precluded in the United States due to the preemption of other laws that afford rights equivalent to the exclusive rights granted under the Copyright Act of 1976,⁵¹ duplication may be significant in those jurisdictions that do not afford copyright protection to software. Therefore, trade secret protection of software is particularly important for software that is marketed outside of the United States; international copyright protection of software is highly uncertain, whereas trade secret protection is available internationally. Although some jurisdictions have legislation regulating the transfer of technology that supersedes or limits the availability of trade secret protection,⁵² other statutory protection is usually substituted to some extent to protect the trade secret proprietor, albeit on less advantageous grounds to implement the public policy reflected in the local law.

Certain precautions can and should be taken in order to secure the maximum degree of trade secret protection. Some practical trade secret measures include: (1) limiting access to programs and computer areas on a need-to-know basis; (2) monitoring all software and document copying; (3) entering into restrictive covenants with key employees to prevent disclosure and to limit post-employment competition;⁵³ (4) requiring all third-parties having access to computer programs, and their employees, subcontractors, and other related parties having access, to sign a restrictive non-disclosure agreement; (5) using software with a built-in "lock-out," "time bomb" or self-destruct feature activated upon copying; (6) using firmware as opposed to software where feasible to make copying more difficult;⁵⁴ (7) licensing a machine-readable object code only

Inc., 338 F. Supp. 1229 (E.D. Mich. 1971); *Cybertek Computer Prods., Inc. v. Whitfield*, 203 U.S.P.Q. (BNA) 1020 (Cal. Super. Ct. 1977).

50. See *infra* notes 55-139 and accompanying text (discussion of copyright protection of computer software/firmware).

51. 17 U.S.C. § 301 (1982); See *infra* notes 141-69 and accompanying text (discussion of pre-emption under the 1976 Act).

52. For example, Mexico and Brazil have such statutes. Many other South American countries have nationalistic laws limiting the importation and protection of foreign technology.

53. But note that non-competition agreements may not be enforceable in some states. See, e.g., CAL. BUS. & PROF. CODE §§ 16600-16602 (West 1964); R. MILGRIM, *supra* note 30, § 3.05[1][d].

54. See *supra* notes 22-26 and accompanying text (discussion of the affirmation of the patentability of subject matter relying in part on hardware elements and firmware). Consider the Texas Instruments "GROM" approach. Wall St. J., Mar. 4, 1983, at 25, col. 1.

and prohibiting reverse assembly, engineering, and compilation; (8) destroying all obsolete, excess, and preliminary copies of proprietary materials to prevent their use or reproduction; (9) adopting appropriate physical security measures, including the use of employee badges, restricted areas, audit trails of all users accessing material, and secure storage; and (10) encrypting high value material. Most importantly, one must know who will have access to information and avoid high-risk situations (e.g., allowing alcoholic or narcotic addicted persons, or those who have personal financial troubles or a past history of abuse of confidences to access computers) where financial or personal considerations may induce the loss of proprietary rights.

IV. COPYRIGHT PROTECTION

The same portion of the United States Constitution that authorizes Congress to grant inventors limited monopolies in the form of patent protection also confers authority on Congress to protect the property rights of authors in their works through the enactment of copyright laws.⁵⁵ There was great uncertainty under the Copyright Act of 1909 (1909 Act)⁵⁶ as to whether or not statutory copyright protection extended to software. The Copyright Office registered claims to "published" computer programs as books, but copyrights in "unpublished" works were only protected under a state's common law.⁵⁷ Since trade secret law was more fully developed and state law remedies were sufficiently similar to the relief available under the 1909 Act, software proprietors tended not to rely on copyright protection for unpublished software.⁵⁸ In addition, the publication of a computer program forced the owner to elect copyright protection at the expense of trade secret protection.⁵⁹ Although the registration of a copyright in a "published" computer program was permitted, and it afforded certain *prima facie* rights to the software proprietor, the Copyright Office practice was not contested and the legality of the registration was unclear.⁶⁰ In those cases where com-

55. U.S. CONST. art. I, § 8, cl. 8; See *Mazer v. Stein*, 347 U.S. 201, *reh'g denied*, 347 U.S. 949 (1954); *White v. Kimmell*, 94 F. Supp. 502 (S.D. Cal. 1950), *rev'd on other grounds*, 193 F.2d 744 (9th Cir. 1952), *cert. denied*, 343 U.S. 957 (1952).

56. Act of March 4, 1909, ch. 320, 35 Stat. 1075.

57. See generally, M. NIMMER, NIMMER ON COPYRIGHT § 2.04[c] (1983).

58. *But cf.* *Data Gen. Corp. v. Digital Computer Controls, Inc.*, 357 A.2d 105 (Del. Ch. 1975) (computer software protected under both trade secrets law and common law copyright).

59. See *infra* notes 136-39 and accompanying text.

60. See generally 4 COPYRIGHT, CONGRESS AND TECHNOLOGY: THE PUB. RECORD (N. Henry ed. 1980). Computer programs were classified as "books" and were af-

mon law copyright protection of software was sought, trade secret relief was also claimed.⁶¹

The Copyright Act of 1976 (1976 Act)⁶² extended the privilege of copyright to computer programs and data bases, in both unpublished and published form. Under the 1976 Act, common law copyright protection for unpublished works was superseded and a single statutory scheme was applied to both published and unpublished works.⁶³ Although the 1976 Act did not expressly enumerate computer programs as copyrightable subject matter, definitional references and the legislative history indicate that Congress considered computer programs subject to protection as "literary works."⁶⁴

The Computer Software Copyright Act of 1980 (the CONTU Amendment)⁶⁵ did not specify computer programs as copyrightable works within section 102 of the Copyright Act; it did add, however, a definition of "computer program" to section 101,⁶⁶ and amended section 117 to delete language originally intended to preserve the status quo until the CONTU Report was acted upon by Congress to provide in place of the deletion certain limitations on exclusive rights in computer programs.⁶⁷ The new section 117 text added by the CONTU Amendment provides that it would not constitute copyright 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 new a [sic] copy or adaptation is created as an es-

forded the degree of protection offered by the copyright laws to literary works. *Id.* at 357.

61. *See, e.g.,* Data Gen. Corp. v. Digital Computer Controls, Inc., 357 A.2d 105 (Del. Ch. 1975); Data Gen. Corp. v. Digital Computer Controls, Inc., 297 A.2d 433 (Del. Ch. 1971), *aff'd*, 297 A.2d 437 (Del. 1972).

62. Pub. L. No. 95-553, 90 Stat. 2541 (1976).

63. *See* H.R. REP. NO. 1476, 94th Cong., 2d Sess. 129-33, *reprinted in* 1976 U.S. CODE CONG. & AD. NEWS 5659, 5744-49.

64. *See id.* at 51, 54, 56-57, 151-52; 1976 U.S. CODE CONG. & AD. NEWS at 5659, 5667, 5669-70, 5767-68; S. REP. NO. 473, 94th Cong., 1st Sess. 50, 52, 54, 134 (1975). *See also* FINAL REP. OF THE NAT'L COMM'N ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS 16 (1978) ("It was clearly the intent of Congress to include computer programs within the scope of copyrightable subject matter in the Act of 1976.") [hereinafter cited as CONTU REP.]; Tandy Corp. v. Personal Micro Computers, Inc., 524 F. Supp. 171 (N.D. Cal. 1981).

65. Pub. L. No. 96-517, 94 Stat. 3015 (1980). The abbreviation stands for the National Commission on New Technological Uses of Copyrighted Works.

66. 17 U.S.C. § 101 (1982). A computer program is defined as a "set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." *Id.*

67. *Id.* § 117.

sential 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.⁶⁸

The amended section 117 raises numerous questions, including whether or not a "licensee" has the rights of an "owner". Section 117 also provides that copies of a computer program may be "leased, sold, or otherwise transferred . . . only as part of the lease, sale, or other transfer of all rights in the program."⁶⁹ These definitional and limiting provisions evidence an understanding that computer programs are within the protection of section 102.⁷⁰ The inclusion has its limits, however. The portion of the House Report dealing with section 102(b) provides in pertinent part:

Some concern has been expressed lest copyright in computer programs should extend protection to the methodology or the processes adopted by the programmer, rather than merely to the writing expressing his ideas. Section 102(b) is intended, among other things, to make clear that the expression adopted by the programmer is a copyrightable element in the computer program and that the actual processes or methods embodied in the program are not within the scope of the copyright law. This proposition restates that the basic dichotomy between expression of the idea and the idea remains unchanged.⁷¹

It has been urged that the 1976 Act be further amended to provide for more explicit treatment of computer programs. The ADAPSO Bill introduced during 1982⁷² would further amend the 1976 Act to include "computer software" in the listing of copyrightable works under section 102(a), and include programs, descriptions, and supporting material as a designated type of "literary work."⁷³ The ADAPSO Bill would also change the definition of "computer program," to include "program descriptions," and "supporting materials," such as instructions, manuals, and

68. *Id.*

69. *Id.*

70. *See Williams Elects., Inc., v. Artic Int'l, Inc.*, 685 F.2d 870 (3rd Cir. 1982) (copyrightability of computer programs is firmly established under the 1980 Amendment to the Copyright Act).

71. H.R. REP. NO. 1476, *supra* note 63, at 56-57; 1976 U.S. CODE CONG. & AD. NEWS at 5669-70.

72. H.R. 6983, 97th Cong., 2d Sess. (1982). The Association of Data Processing Service Organization (ADAPSO), a trade group whose membership consists of software houses and service groups, proposed this Bill.

73. *Id.* at 2.

documentation.⁷⁴

Although copyrights can be more easily and inexpensively obtained, the 1976 Act does not offer as complete a protection as the Patent Act does. A basic principle of copyright law is that a copyright only protects the expression of the author's idea, not the ideas, concepts, principles, systems, or inventions themselves.⁷⁵ Although this copyright principle was equally true under the 1909 Act and its predecessors, it was not until the introduction of computers that technological advances pressed this rubric to its limit. The distinction between "idea" and "expression" was initially drawn under the 1909 Act, albeit with some difficulty,⁷⁶ but its application to the nature and use of computer programs, combined with the requirement of its compatibility with operating system hardware or software, magnifies the effect of classification as one or the other. The distinction between particular software applications becomes vital in determining the value of a software copyright.⁷⁷

Consider, for example, the steps followed to obtain a ROM⁷⁸ with an embedded program. The analogy of a "writing" protected by copyright law is easy at the flowchart stage, where high level language is used by programmers to create a computer program. Even the object code resulting from the assembly or compilation of the source code into a machine-executable binary form can be analogized to a recording of a phonograph record or a tape in a form that the machine can recognize and play back; both items covered under copyright law. The transposition, however, of that binary code into a circuit design that replicates the on-off switching of the binary form object code using sophisticated optical, electrical, photographic, and other processes raises serious questions of copyright protectability. Where is the authorship in this work? How can it be a protected

74. *Id.* at 2-3. A revised version of the ADAPSO Bill is expected to be filed during the 98th Session of Congress.

75. 17 U.S.C. § 102(b) (1982); H.R. REP. NO. 1476, *supra* note 63, at 56-57; 1976 U.S. CODE CONG. & AD NEWS at 5669-70; S. REP. NO. 473, *supra* note 64, at 54.

76. *See Nichols v. Universal Pictures Corp.*, 45 F.2d 119 (2d Cir. 1930), *cert. denied*, 282 U.S. 902 (1931).

77. *Compare Atari, Inc. v. Williams*, 1981-1983 COPYRIGHT L. REP. (CCH) ¶ 25,412 (E.D. Cal. 1981) (audio-visual display presented no similarity of expression between Pac Man and Jaw Breaker game displays) *with Atari, Inc. v. North Am. Phillips Consumer Elecs. Corp.*, 672 F.2d 607 (7th Cir. 1982) (audio-visual display with substantial similarity of expression between Pac Man and K.C. Munchkin game displays); *see also Synercom Technology, Inc. v. University Computing Co.*, 462 F. Supp. 1003 (N.D. Tex. 1979). *See generally* M. NIMMER, *supra* note 57, §§ 2.18(H)(3)(B), 2.18(J), 8.08.

78. ROM stands for a "read only memory" computer chip; it may be used to store a computer's operating system software or dedicated applications program that are sold as part of a computer system.

“writing”? After all, is it not, in microchip form, a part of a machine, a device, a utilitarian object—valuable yes, but protected under copyright? The function of the operating system software in a computer makes this analysis even more troublesome, because the computer cannot operate without it—it may be supplied by the hardware manufacturer as part of a system.⁷⁹

Confronting some of these problems, the Third Circuit Court of Appeals decision in *Apple Computer, Inc. v. Franklin Computer Corp.*,⁸⁰ decided August 30, 1983, held that 1976 Act protection extends to operating system software in a ROM. Although this decision was reached on an interlocutory appeal, the reasoning and holding is likely to be widely cited by other courts dealing with similar difficult issues.

The idea-expression dichotomy has led to suggestions that other forms of existing and proposed protection are better suited to software than to copyrights.⁸¹ Since copyright law only protects against the copying of an expression and not an idea, and does not protect against independent creation of an identical work,⁸² combining copyright with other forms of protection is desirable to the extent possible. Although this may be true at the present time, there have been efforts made to adapt copyright law to the changes in technology over the years and current copyright law may be extendable to protect object codes, firmware (e.g., ROMs), and their progeny. For example, Congress clearly intended to overrule *White-Smith Music Co. v. Apollo Co.*,⁸³ where the Supreme Court had held that a player piano roll was not a “copy” within the meaning of the copyright laws because it was embodied in a machine or device, even though it could reproduce copyrighted music when it was played on an appropriate instrument,⁸⁴ when it passed the 1976 Copyright Act.⁸⁵ Another example is the definition of “literary

79. See *Data Gen. Corp. v. Digital Computer Controls, Inc.*, 357 A.2d 105 (Del. Ch. 1975); *Data Gen. Corp. v. Digital Computer Controls, Inc.*, 297 A.2d 436 (Del. Ch. 1971), *aff'd*, 297 A.2d 437 (Del. 1972).

80. 714 F.2d 1240 (3d Cir. 1983). This case was settled on January 4, 1984 without further judicial review. The settlement provided for entry of a \$2.5 million judgment against Franklin and Franklin's agreement not to infringe Apple's copyrights in the future, subject to Franklin's right to dispose of its inventory. Wall St. J., Jan. 5, 1984, at 10, col. 1.

81. See CONTU REP., *supra* note 64, at 27 (Commissioner Hersey dissenting).

82. See, e.g., *Fred Fisher Music Co. v. Dillingham*, 298 F. 145 (S.D.N.Y. 1924).

83. 209 U.S. 1 (1908).

84. *Id.* at 18.

85. See H.R. REP. NO. 1476, *supra* note 63, at 52; 1976 U.S. CODE CONG. & AD. NEWS at 5659, which states that the broad language of § 201 of the Copyright Act is intended to avoid the artificial and largely unjustifiable distinctions, de-

works" as "works . . . expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects . . . in which they are embodied."⁸⁶

In addition, the object code or firmware versions of computer programs are really derivative works of protectible writings, i.e., the source codes.⁸⁷ Congress even left room for the protection of technology under the copyright laws by not defining "original works of authorship."⁸⁸

Thus, in applying the terms "expressions," "writing," and "authorship" to a software program, one must look back to the origination of the software to see if it meets the above requirements and if subsequent transformations by compilers, assemblers, ROM designers, and others limit the availability of copyright protection. If the object code is the binary encryption of the copyrighted source code, the two should be treated as one work; i.e., copyright of the source code should protect the object code as well.⁸⁹ Most courts that have dealt with this issue support this analysis;⁹⁰ others still need enlightenment.⁹¹

What if the idea inherent in the expression cannot be used in

rived from cases such as *White-Smith* . . . under which statutory copyrightability in certain cases has been made to depend upon the form or medium in which the work is fixed . . . [I]t 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, and whether it is capable of perception directly or by means of any machine device "now known or later developed."

Id.

86. 17 U.S.C. § 101 (1982).

87. See *GCA Corp. v. Chance*, 217 U.S.P.Q. (BNA) 718 (N.D. Cal. 1982).

88. 17 U.S.C. § 102(b) (1982).

89. See *GCA Corp. v. Chance*, 217 U.S.P.Q. (BNA) 718 (N.D. Cal. 1982); *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171 (N.D. Cal. 1981) (ROM chip duplication as infringing copy under definitional provisions).

90. See, e.g., *Williams Elecs., Inc. v. Artic Int'l, Inc.*, 685 F.2d 870, 877 (3rd Cir. 1982) (rejecting the "suggestion that would afford an unlimited loophole by which infringement of a computer program is limited to copying of the program text but not to duplication of a computer program fixed on a silicon chip."); *GCA Corp. v. Chance*, 217 U.S.P.Q. (BNA) 718 (N.D. Cal. 1982) ("Because the object code is the description of the copyrighted source code, the two are to be treated as one work; therefore, copyright of the source code protects the object code as well."); *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171 (N.D. Cal. 1981) (ROM chip duplication as infringing copy under definitional provisions).

91. See, e.g., *Synercom Technology, Inc. v. University Computing Co.*, 462 F. Supp. 1003 (N.D. Tex. 1979) (while instruction manual was protectible by copyright, arrangement of data in the input formats was not).

any other form?⁹² The *Data General* cases shed some light on this problem.⁹³ These cases involved restraint of trade dealing with a computer operating system that the owner, Data General, would not license to a computer manufacturer that emulated the Data General system. From a copyright perspective, the competitors wanted the right to use Data General's operating system software with the competitors' hardware, in order for their computer to be compatible with the Data General users' applications programs. Another operating system would necessarily have most, if not all, of the same characteristics in order to be compatible; however, it probably would be identical only if it was a direct copy. The question was whether or not the Data General operating system design/idea was protectible as an "expression" under copyright law.⁹⁴ The district court found that it was, noting that there were available competitive operating systems for Data General computers.⁹⁵

The 1976 Act affords copyright protection to subject matter created after January 1, 1978.⁹⁶ A work is considered to be created when it is fixed in a tangible medium of expression sufficient 'to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration.'⁹⁷ Generally, copyright protection endures for the life of the author and fifty years after the author's death.⁹⁸

The notice provision of the 1976 Act requires that whenever a copyrighted work is published⁹⁹ in the United States, or elsewhere,

92. *Baker v. Selden*, 101 U.S. 99 (1879) (bookkeeping system forms not protected). In *Baker* the Court stated: "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 one is explanation; the object of the other use. The former is secured by copyright." *Id.* at 105. See also *Taylor Instrument Cos. v. Fawley-Brost Co.*, 139 F.2d 98 (7th Cir. 1943) (charts to record temperatures not protected under copyright), *cert. denied*, 332 U.S. 801 (1947). In *Taylor* the Court stated: "The chart is . . . indispensable to the operation of a recording thermometer. . . . [T]he chart neither teaches nor explains the use of the art. It is an essential element of the machine; it is the art itself." *Id.* at 100.

93. *In re Data General Corp.*, 1980-1 Trade Cas. (CCH) ¶ 63,219 (N.D. 1980); 529 F. Supp. 801, 1982-1 Trade Cas. (CCH) ¶ 64,487 (N.D. Cal. 1980).

94. 529 F. Supp. at 801.

95. *Id.*

96. 17 U.S.C. § 302(a) (1982).

97. *Id.* § 101; See H.R. REP. NO. 1476, *supra* note 63, at 52-53 (exclusion of "purely evanescent or transient reproductions such as those . . . captured momentarily in the 'memory' of a computer"); 1976 U.S. CODE CONG. & AD. NEWS at 5665-66.

98. 17 U.S.C. § 302(a) (1982).

99. Publication is defined as "the distribution of copies . . . of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending [and] [t]he offering to distribute copies . . . to a group of persons for purposes of further distribution, public performance, or public display. . . ." *Id.* § 101. A public display of a work

a copyright notice must be placed on "all publicly distributed copies from which the work can be visually perceived, either directly or with the aid of a machine or device."¹⁰⁰ For copies distributed on or after January 1, 1978, the notice must be affixed "in such a manner and location as to give reasonable notice" of the claimed copyright.¹⁰¹ The Copyright Office has prescribed the specific manner of affixation and position of notices that will satisfy the notice requirement,¹⁰² but a copyright owner may show that a noncomplying notice is reasonable under the circumstances and therefore valid under the 1976 Act.¹⁰³ The Copyright Office regulations provide that where works will be reproduced in machine-readable form, it would be reasonable for the copyright notice to be displayed at the user's terminal at sign-on, or continuously on terminal display, or on a permanent label securely affixed to the copies or permanent receptacle of the copy, or embodied in such fashion that it appears at or with the title or at the end of the work on printout.¹⁰⁴ Although these locations are proposed in the alternative, multiple notices are frequently used.¹⁰⁵

The alternative forms of copyright notice are the symbol ©, the word "copyright" or the abbreviation "copr," and the year of the first publication of the work and the name, recognizable abbreviation, or alternative designation of the copyright owner.¹⁰⁶ Computer printers and CRT screens generally are unable to reproduce the copyright symbol ©, and therefore the practice has developed to use "(c)". Under the 1909 Act, the Copyright Office accepted such notices on deposit, without expressly passing on their validity. Current practice apparently follows this view. When the Copyright Office was asked to clarify this use by regulation and recognize the

does not, of itself, constitute publication. *Id.* See also H.R. REP. NO. 1476, *supra* note 63, at 143; 1976 U.S. CODE CONG. & AD. NEWS at 5759; S. REP. NO. 473, *supra* note 64, at 126 (no publication upon mere display "through computer transmission"). In the area of computer programs, it is unclear where the courts will draw the line as to what constitutes "published" or "unpublished" programs.

100. 17 U.S.C. § 401(a) (1982).

101. 37 C.F.R. § 201.20(a)(1) (1983).

102. *Id.* § 201.20. This section provides that an "acceptable" notice must be "permanently legible to the ordinary user of the work under normal conditions of use, and affixed to the copies in such a manner and position that, when affixed, it is not concealed from view upon reasonable examination." *Id.* § 201.20(c)(1).

103. 17 U.S.C. § 401(c) (1982).

104. 37 C.F.R. § 201.20(g) (1983).

105. See, e.g., *Midway Mfg. Co. v. Artic Int'l, Inc.*, 211 U.S.P.Q. (BNA) 1152 (N.D. Ill. 1981) (the court found that a copyright notice affixed to the cabinet near the display screen and displayed on the screen prior to and at the commencement of display was adequate).

106. 17 U.S.C. § 401(b) (1982).

validity of the "(c)" form, however, it declined.¹⁰⁷

Under the Universal Copyright Convention,¹⁰⁸ only the symbol © is authorized.¹⁰⁹ Compliance with the Universal Copyright Convention requirement is important for copyright protection outside of the United States, unless the copyright proprietor intends to rely solely on other conventions.¹¹⁰ The acceptability of "(c)" notices for this purpose is generally left to determination by the forum country.

Another subject of controversy is whether or not use of the copyright notice on software or related materials negates trade secret protection. The argument for negation has been expressed in various forms, including estoppel,¹¹¹ and waiver or election.¹¹² To date, the courts have not adopted the view that use of a copyright notice alone forfeits trade secret protection.¹¹³ In adopting regulations on affixation of copyright notices, the Copyright Office explicitly declined to treat the presence of a copyright notice as evidence that the work had been published, thus supporting the view that

107. Copyright Office Circular 61 (1964), 46 Fed. Reg. 58,307 (1981). The Copyright Office stated:

Section 401(b)(1) of the Act specifies that one of the elements contained in the notice shall be the symbol © . . . the Copyright Office has no authority to alter this requirement. . . . Although the print matrices may not presently be equipped to print the symbol ©, they can presumably print either of the alternative indicia. . . .

Id. at 58,310.

108. Much of copyright protection for U.S. citizens under foreign law is obtained by virtue of the Universal Copyright Convention. *See generally* M. NIMMER, *supra* note 57, §§ 5.05(B)(2)(d), 17.04(B).

109. UNIVERSAL COPYRIGHT CONVENTION art. III (1), 25 U.S.T. 1341 (1974).

110. A citizen of the U.S. may still obtain copyright protection even if the nation in which he seeks such protection is not a party to the Universal Copyright Convention. There are several bilateral treaties to which the U.S. is a party that would afford such protection in China (33 Stat. 2208 (1903) & 63 Stat. 1300, 1368-9 (1946)), Hungary (37 Stat. 1631 (1912)), and Thailand (53 Stat. 1731 (1937)). In addition, American copyright owners may obtain copyright protection under the Berne Convention to which the U.S. is not a party and the Buenos Aires Convention, to which the U.S. is a signatory, by following the prescribed requirements. *See* N. NIMMER, *supra* note 57, § 4.01[c] n.35.

111. For example, that the notice is an admission of publication inconsistent with confidentiality.

112. For example, that the claim of federal copyright is inconsistent with the preservation of state trade secret relief.

113. *See* Technicon Medical Information Sys. v. Green Bay Packing, 211 U.S.P.Q. (BNA) 1001 (E.D. Wis. 1980) (the mere act of affixing a copyright notice does not void a claim of secrecy under state trade secrets law); Management Science Am., Inc. v. Cyborg Sys., 6 Computer L. Serv. Rep. (Callaghan) 921 (N.D. Ill. 1978) (affixing a copyright notice does not preclude a claim of secrecy). *See also* M. Bryce & Assocs. v. Gladstone, 107 Wis. 2d 241, 319 N.W.2d 902 (Ct. App. 1982) (owner's use of federal copyright notice did not prevent the state from applying its trade secrets law), *cert. denied*, 103 U.S. 258 (1983).

trade secret protection is not forfeit.¹¹⁴

Use of a form of notice that preserves both trade secret confidentiality and copyright, by establishing the unpublished character of the work while meeting the minimal requirements of section 401,¹¹⁵ is probably the best approach. This would prevent uncertainty as to whether or not use of copyright notice might evidence publication and thus deny trade secret confidentiality, and whether or not widespread commercial exploitation of copyrighted software might be deemed "publication" despite confidentiality restrictions imposed by licensing terms. An example of one form of such a notice is:

Confidential Information—Limited distribution to authorized persons only. This software [data base] is protected as an unpublished work under the U.S. Copyright Act of 1976. Created 19— ©. All rights reserved. [Name of owner.]

Inadvertent omissions of copyright notice for published works after January 1, 1978, will not invalidate copyright if any one of three conditions provided in section 405¹¹⁶ is met: omission may occur by complete absence of a notice for published copies, postdating a notice by more than one year, certain types of so-called disbursed notices,¹¹⁷ and by failing to meet special requirements for work "consisting preponderantly of one or more works of the U.S. Government."¹¹⁸

Notices omitted "from no more than a relatively small number" of publicly distributed copies do not forfeit copyright.¹¹⁹ There is little guidance as to the meaning of the term "relatively small number." Further, if the notice is omitted by a licensee or other authorized user in breach of an "express requirement in writing" that the distributed copies or phono-records bear notice, copyright is still not forfeited.¹²⁰ Software owners should insert appropriately worded clauses in their licensing agreements to gain this savings

114. The Copyright Office declined the proposed wording that "presence of a copyright notice should not be construed as evidence that the work . . . has, in fact, been published or as an admission that notice is required," but stated that "affixation of copyright notice may not necessarily evidence publication." 46 Fed. Reg. 58,307-08 (1981).

115. Section 401(b) requires that the form of copyright notice contain the following: "(1) the symbol © (the letter C in a circle), the word 'Copyright,' or the abbreviation 'Copr.', and (2) the year of first publication of the work; and (3) the name of the owner of copyright in the work" 17 U.S.C. § 401(b) (1982).

116. *Id.* § 405.

117. *See id.* § 406(b), (c).

118. *See id.* §§ 403, 405(a).

119. *Id.* § 405(a)(1).

120. *Id.* § 405(a)(3).

provision. If a notice omission is cured by registering the work within five years after publication without notice, and reasonable effort is made after the omission is discovered to add notice to all copies distributed to the public in the United States, copyright will be preserved.¹²¹ Note that "reasonable effort" is an ambiguous term.

Even if one of these conditions is met, notice omissions may affect the remedies available against innocent infringers who have been misled.¹²² In addition, errors in the name of the copyright owner appearing in the notice will not forfeit copyright, but may provide defenses to innocent infringers who deal with the person named in the notice.¹²³ Omission of any name or date is equivalent to the complete omission of a notice.¹²⁴ The Copyright Office practice has been to examine published works deposited with an application for registration for the presence or absence of copyright notice. Registration will be refused for works published before January 1, 1978, with notice omissions or defects that would have been sufficient to dedicate a work under the 1909 Act. Works published after January 1, 1978, with defective or omitted notices, will be registered with a possible warning letter.¹²⁵

Thus, published software and data bases that lack copyright notice may have registration delayed or issued subject to a warning letter in light of applicable deposit requirements and the Copyright Office registration practice. In addition, there are special notice provisions that may apply to some data bases.¹²⁶

Copyright registration may be made for any eligible copyrightable work, whether published or unpublished.¹²⁷ Works published with notice under the 1909 Act, or eligible unpublished works that were registered before January 1, 1978, must have a timely renewal registration filed to secure extension of United States copyright protection beyond the first term of twenty-eight years.¹²⁸ Registration affords two distinct advantages in the event of an infringement: recovery of attorneys' fees and statutory damages.¹²⁹

121. *Id.* § 405(a)(2).

122. *Id.* § 405(b).

123. *Id.* § 406(a).

124. *Id.* § 406(c).

125. See N. NIMMER, *supra* note 57, § 2.04(c).

126. See 17 U.S.C. § 403 (1982). Special notice requirements apply for works constituting "preponderantly of one or more works of the U.S. Government," i.e., "collective works." *Id.*

127. *Id.* §§ 103, 104.

128. *Id.* § 304(a).

129. *Id.* § 412. No award of statutory damages or attorney's fees may be granted in an action for copyright infringement if the copyright is not registered before the infringement.

There has been, however, some hesitancy on the part of computer program proprietors to register their software under the Copyright Act deposit requirement. A deposit of the work to be registered must accompany an application for copyright registration.¹³⁰ Under the 1976 Act¹³¹ and the Freedom of Information provisions of the Administrative Procedure Act¹³² as adopted by the Copyright Office,¹³³ the deposit becomes part of the Copyright Office's public record, available for public inspection but generally not for copying. Proprietors are concerned that disclosure through deposit might forfeit trade secret status and make available unpublished programs.

Particular regulations pertain to the deposit of unpublished works fixed, or works published, "only in the form of machine-readable copies, such as magnetic tape or disks, punched cards, or the like, from which the work cannot ordinarily be perceived except with the aid of a machine or device."¹³⁴ The deposit of these works is to consist of one copy of identifying portions in visually perceptible form, i.e., printouts.¹³⁵ Deposit of diskettes and chips is excluded because of examination considerations (i.e., the inability to "read" the material) but should not affect copyrightability of computer programs embodied in that media. Deposit of "identifying material" may protect against loss of confidentiality through public access to Copyright Office records to the extent that the material deposited contains none, or only part, of the significant proprietary information.

It is questionable whether or not the public availability of materials deposited with the Copyright Office will destroy trade secret protection for information disclosed by the deposit. In *Warrington Associates, Inc. v. Real-Time Engineering Systems Inc.*,¹³⁶ the court indicated that copyright registration will not destroy the confidentiality requisite for trade secret relief as a matter of law.¹³⁷ The

130. *Id.* § 408; 37 C.F.R. § 202.20 (1983).

131. 17 U.S.C. §§ 701(d), 705(b), 706(b) (1982).

132. 5 U.S.C. § 552 (1982).

133. 37 C.F.R. § 203 (1983).

134. *Id.* § 202.20(c)(vii)(A) (computer programs), (B) (data bases).

135. *Id.* § 202.20(c)(vii)(B) states that:

"[I]dentifying portions" shall mean either the first and last 25 pages or equivalent units of the program if reproduced on paper, or at least the first and last 25 pages or equivalent . . . if reproduced in microform together with the page or equivalent unit containing the copyright notice if any

136. 522 F. Supp. 367 (N.D. Ill. 1981).

137. *Id.* at 368-69. The court held that the 1976 Act did not preempt the owner's claim of trade secret misappropriation. There is a question whether in order to defeat trade secret protection a defendant must show actual loss of confidentiality,

problem of the required deposit was exacerbated because the Copyright Office would not accept deposits of object codes except under a rule of doubt procedure based on its inability to examine the material.¹³⁸ Recently, however, two developments have changed this situation. First, the Copyright Office will accept deposit of object code accompanied by ten pages of source code without issuing a rule of doubt letter. Second, the Copyright Office will act upon requests for confidential treatment of software deposits.¹³⁹

V. DUAL PROTECTION BY COMBINING COPYRIGHT AND TRADE SECRET PROTECTION

Copyright protection of software is effective and should be pursued by any proprietor wishing to protect his interest in software/firmware. Proprietors, however, should understand the limitations of copyright, as well as trade secret, protection and use a combination of both to cover the shortcomings in each. The combination of trade secret protection under state law and copyright protection under the 1976 Act will provide the maximum amount of legal protection for a computer program short of a patent. For example, if one were to create a new VX series for IBM computers, it would be wise to place a limited publication copyright notice on it along the lines set out above,¹⁴⁰ and market it with carefully drawn contractual restrictions to preserve its trade secret status.

The interplay of trade secret and copyright in a dual protection scheme provides ideal synergy. Whereas trade secret protection can be diminished by marketing absent restrictions by contract or confidential relationships, a copyright can provide protection even in the case of unrestricted sales that would forfeit trade secret protection. Conversely, although a copyright is not diminished by marketing, it does not protect the idea, which trade secret protection guards. In addition, whereas a copyright proprietor has the exclusive right to copy, adapt, or create derivative works or other forms of commercial exploitation of the copyrighted work, the trade secret proprietor can also gain a contract/license to improvements, enhancements, modifications, and new works based on the same idea if the proper contractual arrangements are made. If one can study the idea only by making an unauthorized copy of the work, or can reverse engineer only by reproducing a copyrighted ROM, copyright protection alone

rather than mere availability of deposited materials. See *Carson Prods. Co. v. Califano*, 594 F.2d 453 (5th Cir. 1979); *Franke v. Wiltscheck*, 209 F.2d 493 (2d Cir. 1953).

138. See Copyright Office Guide Letter R-70 (July, 1981).

139. See Copyright Office Circular R7c.

140. See *supra* text accompanying note 115.

will suffice; but if the idea is available from the copyrighted work itself, then trade secret protection adds another dimension.

Thus, if marketing is restricted to the licensing of software with express limitations on assignment, resale, adaptation, improvement, enhancement, modification, reverse assembly, and compilation, as well as reservation of all rights afforded by copyright, the dual protection of trade secret law and copyright will cover the weaknesses inherent in copyright protection of software.

VI. COPYRIGHT PREEMPTION OF TRADE SECRETS UNDER SECTION 301 OF THE 1976 COPYRIGHT ACT

Section 301 of the 1976 Act preempts state common law or statutory protection of rights "that are equivalent to any of the exclusive rights within the general scope of copyright . . . [in fixed works that] come within the subject matter of copyright. . . ." ¹⁴¹ Preemption does not prevent dual protection of copyright and trade secret protection, but it does preclude overlapping protection.

In considering section 301 of the Act, Congress clearly set out its objectives for preemption boundaries:

The declaration of this principle [preemption] in section 301 is intended to be stated in the clearest and most unequivocal language possible, so as to foreclose any conceivable misinterpretation of its unqualified intention that Congress shall act preemptively, and to avoid the development of any vague borderline areas between State and Federal protection. ¹⁴²

The language of section 301 requires a three-part test. One must first inquire as to whether or not the subject matter falls within the scope of copyright, specifically with reference to sections 102 and 103; if the answers to the preceding questions are affirmative, one must determine if the rights sought to be protected are "equivalent" to any of the exclusive rights in section 106. ¹⁴³ Underlining this test are the threshold requirements that the work involved be a "work of authorship," and that it be "fixed in a tangible medium of expression." ¹⁴⁴

The legislative history of section 301 indicates that Congress did not intend that the 1976 Act preempt trade secret law. ¹⁴⁵ The courts

141. 17 U.S.C. § 301 (1982).

142. H.R. REP. NO. 1476, *supra* note 63, at 130; 1976 U.S. CODE CONG. & AD. NEWS at 5746.

143. 17 U.S.C. § 301(a) (1982).

144. *Id.*

145. H.R. REP. NO. 1307, 96th Cong., 2d Sess. 23-24 (Report on CONTU Amendments), *reprinted in* 1980 U.S. CODE CONG. & AD. NEWS 6482-83.

The Committee consulted the Copyright Office for its opinion as to whether

that have considered this preemption issue have generally found no preemption; trade secret protection is not an "equivalent right" because trade secret protection extends to ideas, methodology, or "know how" that is not protected by copyright.¹⁴⁶ The United States Supreme Court decisions in *Kewanee Oil Co. v. Bicron Corp.*¹⁴⁷ and *Goldstein v. California*,¹⁴⁸ decided before the 1976 Act was adopted, provided a definitive analysis of the preemption doctrine as it relates to the Patent and Copyright Acts.

In *Goldstein*, a California tape piracy statute that provided copyright protection for records and tapes for an unlimited duration was upheld on constitutional grounds despite arguments that such a statute would be preempted by federal copyright law.¹⁴⁹ The Court specifically held that a federal copyright statute passed in 1971¹⁵⁰ did

Section 301 of the 1976 Copyright Act in any way preempted these and other forms of state law protection for computer software [i.e. trade secret or unfair competition]. On the basis of this advice and advice of its own counsel the Committee concluded that state remedies for protection of computer software are not limited by this bill.

Id. See CONTU REP., *supra* note 64, at 18.

146. See *B.P.I. Sys. v. Leith*, 532 F. Supp. 208 (W.D. Tex. 1981); *Warrington Assocs. v. Real-Time Eng'g Sys.*, 522 F. Supp. 367 (N.D. Ill. 1981); *Walker v. University Books, Inc.*, 382 F. Supp. 126 (N.D. Cal. 1974) (*Kewanee* establishes that claim for misappropriation of trade secrets based on state law may exist independently of copyright protection), *aff'd*, 602 F.2d 859 (9th Cir. 1979); *M. Bryce & Assocs. v. Gladstone*, 107 Wis. 2d 241, 319 N.W.2d 902 (Ct. App. 1982). *Cf.* *Technicon Medical Information Sys. Corp. v. Green Bay Packaging, Inc.*, 211 U.S.P.Q. (BNA) 343 (E.D. Wis. 1980); *Bromhall v. Rorvik*, 478 F. Supp. 361 (E.D. Pa. 1979) ("ideas" not copyrightable, hence misappropriation claim not preempted); *Management Science Am., Inc. v. Cyborg Sys.*, 6 Computer L. Serv. Rep. (Callaghan) 921 (N.D. Ill. 1978).

Questions have been raised about the strength of trade secret protection. See, e.g., *Avco Corp. v. Precision Air Parts, Inc.*, 210 U.S.P.Q. (BNA) 894 (M.D. Ala. 1980) (trial court held trade secrets claim equivalent to copyright under certain circumstances and preempted; appellate court affirmed on statute of limitations grounds), *aff'd on other grounds*, 676 F.2d 494 (11th Cir. 1982), *cert. denied*, 51 U.S.L.W. 3419 (1983); *Harper & Row Publishers, Inc. v. Nation Enters., Inc.*, 501 F. Supp. 848 (S.D.N.Y. 1980) (preemption of conversion claim); *Mitchell v. Penton Indus. Publishing Co.*, 486 F. Supp. 22 (N.D. Ohio 1979) (broad misappropriation claim of plaintiff preempted even though certain types of misappropriation not preempted). *Compare* *Bromhall v. Rorvik*, 478 F. Supp. 361 (E.D. Pa. 1979) (no preemption of "idea" protection) *with* *Hoehling v. Universal City Studios, Inc.*, 618 F.2d 972 (2d Cir. 1980) (preemption of "fact" protection). See also *J & K Computer Sys. v. Parrish*, 642 P.2d 732 (Utah 1982) (preemption defense to trade secret claim could not be raised on appeal for first time).

147. 416 U.S. 470 (1974). See *supra* note 47 and accompanying text.

148. 412 U.S. 546 (1973).

149. *Id.* at 550-51.

150. Pub. L. 92-140, 85 Stat. 391 (codified at 17 U.S.C. §§ 1(f), 5(n), 19, 20, 26, 101(e) (1982)).

not preempt the California law¹⁵¹ despite the Court's previous decisions in *Sears, Roebuck & Co. v. Stiffel Co.*,¹⁵² and *Compco Corp. v. Day-Brite Lighting*,¹⁵³ that recognized a congressional policy of establishing uniform laws throughout the United States in order to protect original writings.¹⁵⁴ The Court distinguished the *Sears/Compco* cases on the grounds that they dealt with high standards of patentability for mechanical designs and arose in an unfair competition context.¹⁵⁵ The *Goldstein* Court reasoned that the area of sound recordings had been left "unattended" by Congress and therefore was open to state regulation, so long as the regulation did not interfere with the operation of the copyright laws.¹⁵⁶ *Goldstein* specifically held that the copyright clause of the United States Constitution did not vest exclusive power in Congress over "writings."¹⁵⁷

In *Kewanee Oil Co. v. Bicron Corp.*,¹⁵⁸ the Supreme Court similarly held that the patent clause of the Constitution did not vest exclusive power in Congress over "discoveries"¹⁵⁹ and that Ohio trade secret law was not preempted by federal patent law.¹⁶⁰ Moreover, the Court held that this holding was not contrary to the *Sears/Compco* cases, thereby allowing the *Sears/Compco* holdings to stand.¹⁶¹ What is particularly interesting about both the *Goldstein* and *Kewanee* decisions is precisely how they distinguished the *Sears/Compco* cases without overruling them. Both *Goldstein* and *Kewanee* discuss the similarity of goals between the patent, copyright, and trade secret laws, and the state regulation concerning the wrongs sought to be redressed in each case; economic issues and the public interest are also discussed. *Goldstein* was less straightforward, in that the Court created a concept of national ver-

151. *Goldstein*, 412 U.S. at 558.

152. 376 U.S. 225 (1964).

153. 376 U.S. 234 (1964).

154. *Id.* at 237-38; *Sears*, 376 U.S. at 231-32. In *Goldstein*, petitioners claimed "that Congress intended to allow individuals to copy any work which was not protected by federal copyright." 412 U.S. at 551.

155. 412 U.S. at 569. Specifically, the Court stated that the "question [in *Sears* and *Compco*] was whether a State could, under principles of state unfair competition law, preclude the copying of mechanical configurations which did not possess the qualities required for the granting of a federal design or mechanical patent." *Id.* (emphasis added).

156. *Id.* at 570. "[Congress] has left the area unattended, and no reason exists why the State should not be free to act." *Id.*

157. *Id.* at 560, 571.

158. 416 U.S. 470 (1974).

159. *Id.* at 479. The Court stated: "Just as the States may exercise regulatory power over writings so may the States regulate with respect to discoveries." *Id.*

160. *Id.* at 491-93.

161. *Id.* at 481-83.

sus local interest to justify the California regulation.¹⁶² California is one of the major centers in the world recording industry, and apparently the Court recognized the lack of a sufficient remedy under the copyright laws for piracy of recordings. The main thrust of the decision, however, was that Congress did not express an intent to carve out this particular copyright area for regulation; power was therefore retained by the states under the Supremacy Clause of the Constitution.¹⁶³ *Kewanee* also focused on the economic interest and the public benefit, but in a more pragmatic manner. The *Kewanee* Court approached the issue by discussing the debilitating effect on research and development if discoveries could not be safeguarded by trade secret protection before patentability, and the ultimate loss to the public.¹⁶⁴ The Court also engaged in an extensive analysis of relative degrees of patentability vis-a-vis trade secret law,¹⁶⁵ holding that trade secret law was not preempted even when the subject matter was clearly patentable because it would require the state courts to make decisions concerning patentability.¹⁶⁶ In the view of the *Kewanee* Court, this would effectively "overburden" the state courts.¹⁶⁷ Citing *Goldstein* with approval,¹⁶⁸ the *Kewanee* Court also reasoned that the same policies underlying the patent and copyright clause of the Constitution, and that have encouraged invention, justified state trade secret regulations; states can regulate as long as the regulation is not in conflict with the operation of federal patent and copyright laws.¹⁶⁹

This line of cases brings us back to the meaning of "equivalent

162. 412 U.S. at 552-60.

163. *Id.* at 561-70.

164. The Court noted that trade secret law protects materials that would not be proper subjects for patent protection. 416 U.S. at 482.

Since no patent is available for a discovery, however useful, novel, and non-obvious, unless it falls within one of the express categories of patentable subject matter . . . , the holder of such a discovery would have no reason to apply for a patent whether trade secret protection existed or not. Abolition of trade secret protection would, therefore, not result in increased disclosure to the public of discoveries in the area of nonpatentable subject matter.

Id. at 483.

165. *Id.* at 485.

Trade secret law will encourage invention in areas where patent law does not reach, and will prompt the independent innovator to proceed with the discovery and exploitation of his invention. Competition is fostered and the public is not deprived of the use of valuable, if not quite patentable, invention.

Id. (citation omitted).

166. Clearly unpatentable situations (*Id.* at 484-87); doubtfully patentable (*Id.* at 487-89); or clearly patentable (*Id.* at 489-91).

167. *Id.* at 492.

168. *Id.* at 491-92.

169. *Id.* at 483.

rights" under the 1976 Act and the CONTU Amendment. It appears that Congress seriously considered the limiting effect of *Goldstein* and *Kewanee* on the *Sears/Compco* cases as section 301 evolved. This line of cases, read in conjunction with the 1976 Copyright Act, indicates that an expansive reading should not be given to the *Sears/Compco* doctrine; had Congress intended to preempt trade secret law, it would have explicitly done so.

VII. CONCLUSION

If possible, dual protection under both copyright and trade secrets law should be utilized to protect software. If trade secret protection is unavailable due to marketing or other considerations, then software should be protected by copyright means alone. In either event, the copyright should be registered with the Copyright Office as an unpublished work and a notice similar to the one set out above¹⁷⁰ should be included to protect against inadvertent publication of the unpublished software.

170. See *supra* note 115 and accompanying text.