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The Current State of Computer Software Protection: A Survey and Bibliography of Copyright, TradeSecret and Patent Alternatives

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Abstract

Our society is becoming more “computer-conscious” by the minute. Whereas only a short time ago the computer was a monstrous, expensive curiosity used behind the closed doors of major corporations, today it is not uncommon for a family to own one or more.

KEYWORDS: trade, protection, computer

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I. Introduction

Our society is becoming more "computer-conscious" by the minute. Whereas only a short time ago the computer was a monstrous, expensive curiosity used behind the closed doors of major corporations, today it is not uncommon for a family to own one or more. Computers are no longer only for experienced professionals, as even children are learning to manipulate them as tools for learning and playing. Microcomputer sales will reach an estimated \$15 billion by 1987, with software sales increasing tenfold to \$4.8 billion.¹ In light of the awesome changes experienced by the computer industry in recent years, it is not surprising that the legal aspects of computer trade are undergoing an evolution of their own.

Behind every computer there is a "brain." This brain, or computer program, is defined by the Copyright Act as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result."² In the same way that human language is capable of numerous combinations to express the same idea, the instructions given to a computer to bring about the desired result can vary. In this sense, the embodiment of the idea in the form of a program is creative expression. By the volume of programs on the market today for home use alone, we see that the fruits of that creativity are in demand. The ease with which programs can be copied has sparked an

1. *Getting Tough on Software Theft*, Bus. Wk., May 31, 1982, at 28, 29. Some terms with which the reader may not be familiar will be defined throughout this note. Software is "[a] set of programs, procedures, rules and possibly associated documentation concerned with the operation of a data processing system." Data Processing is "the execution of a systematic sequence of operations performed upon data." R. DORF, *COMPUTERS AND MAN* 482, 471 (1977).

2. Copyright Act of 1976, 17 U.S.C. § 101 (Supp. V 1981) (*as amended by Act of Dec. 12, 1980, Pub. L. No. 96-517, § 10(a), 94 Stat. 3028*). For a discussion of the treatment of software under federal copyright law, see generally text accompanying notes 11-87.

active interest in the search for adequate insulation from piracy. Computer clubs allegedly make hundreds of copies of programs for use by their members.³ Persons claiming to be authors have sold infringed copies of programs to unsuspecting software distributors who in turn manufacture them for widespread sale. This illegal copying is costly for original producers, some of whom estimate a loss of half their sales to piracy.⁴ Accordingly, these computer programs, known as software, constitute proprietary information that requires legal protection.

Legal protection for computer software is most visible in the form of copyrights, trade secrets, and patents. The world is witnessing the historical development of this area of intellectual property protection, while a legal system that cautiously expands its limits grapples with an exploding technology bound only by creative genius. Considering that setting, this note will present the latest developments in the areas of copyrights, trade secrets and patents as they relate to software protection.

In particular, it will be shown how the latest court decisions have construed recent legislation to conclude that a computer program's machine-readable object code⁵ is protectable by copyright law. In addition, the Copyright Office is seriously considering a change in deposit requirements which would allow a computer program to be copyrighted while remaining a trade secret.⁶ Regarding the application of patent law to computer programs, the distinction drawn by the United States Supreme Court between patentable processes and mathematical algorithms is being questioned.⁷ It is intriguing that these various forms of protection are each applicable, under certain circumstances, to computer software. Article I, section 8 of the United States Constitution empowers 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."⁸ As a result, exclusive rights were granted to authors for their writings through the enactment of the Copyright Act,⁹ and to inventors for their discov-

3. Morgan, *How Can We Stop Software Piracy?*, BYTE, May 1981, at 6, 10.

4. *Getting Tough on Software Theft*, *supra* note 1, at 28.

5. *See infra* note 24.

6. *See infra* text accompanying note 114.

7. *See generally* text accompanying notes 135-56.

8. U.S. CONST. art. I, § 8, cl. 8.

9. 17 U.S.C. §§ 101-810 (Supp. V 1981). *See infra* note 12 for the statutory period of the exclusive right granted to authors.

eries by the creation of the Patent Act.¹⁰ The unique character of a computer program allows it to be considered as the written expression of a programmer/author, or under the right circumstances as a new, non-obvious invented process. Consequently, the software developer needs guidance as to the best available protection for his work. This note outlines the requirements for software protection under the laws of copyrights, trade secrets and patents. In addition, it discusses how the courts view computer programs as fitting into the scheme of intellectual property protection.

II. Copyright Protection

A. Statutory Construction

In 1964, the Copyright Office announced its position that copyright registration for computer programs was permissible under the Copyright Act.¹¹ In order to meet the requirements for registration, the program had to be the "writing of an author," the reproduction of which had to be a "copy" acceptable for registration. Acknowledging the inconclusiveness of these criteria, while upholding its policy of resolving doubtful issues in favor of registration, the Copyright Office presented the following guidelines which would place computer programs in a class with books:

- (1) The elements of assembling, selecting, arranging, editing, and literary expression that went into the compilation of the program . . . [must be] sufficient to constitute original authorship.
- (2) The program . . . [must have] been published, with the required copyright notice; that is, 'copies' (i.e., reproductions of the program in a form perceptible or capable of being made perceptible to the human eye) bearing the notice [must] have been distributed or made available to the public.
- (3) The copies deposited for registration [must] consist of or include reproductions in a language intelligible to human beings. If

10. 35 U.S.C. §§ 1-376 (Supp. V 1981). An inventor is granted an exclusive right over the use, manufacture, and sale of his invention for a period of 17 years. 35 U.S.C. § 154 (Supp. V 1981).

11. *Copyright Registration for Computer Programs—Announcement from the Copyright Office*, 11 COPYRIGHT SOCIETY OF THE U.S.A. - BULLETIN 361 (1964). The law in effect in 1964 was the original Copyright Act of 1909, 17 U.S.C. §§ 1-32 (1964).

the only publication was in a form that cannot be perceived visually or read, something more (e.g., a print-out of the entire program) would also have to be deposited.¹²

The final words of the Copyright Office announcement indicated that the procedure regarding computer programs would necessarily evolve "over a period of time, on the basis of experience."¹³

In 1976, a major revision of the Copyright Act was enacted with an effective date of January 1, 1978.¹⁴ The new act eliminated common-law copyright, simplified procedure, and facilitated the curing of "mistakes" in publications without a copyright notice. Under the new law, statutory copyright takes effect as soon as the writing is complete, rather than when publication with notice occurs, as with the 1909 Act.¹⁵

Where a "copy" for registration purposes used to be "a written or printed record of . . . [the work of authorship] in intelligible notation,"¹⁶ the 1976 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*. The term 'copies' includes the material object, other than a phonorecord, in which the work is first fixed.¹⁷

12. *Copyright Registration for Computer Programs*, *supra* note 11, at 361. The benefit received from securing registration is that a limited monopoly, through a grant of exclusive rights, is obtained for a statutory period. (That statutory period is, in general: life of the author plus 50 years; for joint works: life of the last surviving author plus 50 years; anonymous/ pseudonymous/works for hire: 75 years from date of first publication or 100 years from creation, whichever expires first. 17 U.S.C. § 302 (1976). For works created but not published or copyrighted before January 1, 1978 see 17 U.S.C. § 303.) The rationale behind the grant of an exclusive right is that the rents obtained from it reward innovation and encourage innovators to create and market new products. Stern, *Present Copyright Law—Little Protection Against Unlicensed Use of Proprietary Compilers*, IEEE MICRO, Feb. 1983, at 67.

13. *Copyright Registration for Computer Programs*, *supra* note 11, at 361.

14. 17 U.S.C. §§ 101 (1976). Sections 118, 304(b) and Chapter 8 took effect Oct. 19, 1976.

15. P. HOFFMAN, *THE SOFTWARE LEGAL BOOK II-B-1* (1982).

16. This definition was used by the Supreme Court in *White-Smith Music Publishing Co. v. Apollo Co.*, 209 U.S. 1, 17 (1908) and adopted by the 1909 Copyright Act.

17. 17 U.S.C. § 101 (Supp. V 1981) (emphasis added). Under section 101, "[a]

This terminology also appears in section 102(a) of the Copyright Act,¹⁸ which defines what works are subject to copyright protection.

To appreciate the potential effect of this language, it is important to understand the phases that comprise a computer program.¹⁹ When a problem is presented for a computer to solve, a flow chart,²⁰ or schematic diagram, is made, which indicates the logical steps involved in solving the problem. This chart aids in the development of a source program,²¹ written in one of the many source, or high-level languages²² in which the programmer gives the computer instructions. These source programs are readable by humans. They follow a specific syntax which can be interpreted by a compiler,²³ which in turn translates the instructions into machine-readable code, otherwise known as the object pro-

work is 'fixed' . . . when its embodiment in a copy . . . is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration." *Id.* Thus, only the written or "fixed" *expression of an idea* can be copyrighted, and not an idea itself.

18. 17 U.S.C. § 102(a) (Supp. V 1981).

19. A computer program is "[a] detailed set of instructions telling the computer what types of input data it will receive, exactly what operations to perform on it and in what order, and what type of output to produce." M. HARRIS, *INTRODUCTION TO DATA PROCESSING: A SELF-TEACHING GUIDE* 300 (1979).

20. A flow chart is "[a] graphic representation of the definition, analysis, or solution of a problem, in which symbols are used to represent [such things as] operations, data, flow, [and] equipment. . ." Dorf, *supra* note 1, at 473. In essence it is "a 'picture' of a computer program and how it is intended to operate." Harris, *supra* note 19, at 298.

21. A source program is "[a] computer program written in a symbolic language." Harris, *supra* note 19, at 300.

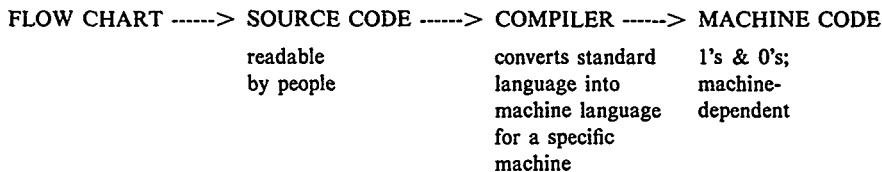
22. Examples of high-level languages are ALGOL (Algorithmic-Oriented Language), APL (A Programming Language), BASIC (Beginner's All-purpose Symbolic Interchange Code), COBOL (Common Business-Oriented Language), FORTRAN (FORMula TRANslating System), PL/1 (Programming Language One), and RPG (Report Program Generator). *See generally* Dorf, *supra* note 1, and Harris, *supra* note 19. There are a variety of types of languages in existence, such as algebraic manipulation languages, associative languages, authoring languages, command and job control languages, formal languages, list processing languages, macrolanguages, metalanguages, nonprocedural languages, problem-oriented languages, procedure-oriented languages, and string processing languages. For an explanation as to the function of each, see A. RALSTON, *ENCYCLOPEDIA OF COMPUTER SCIENCE* (1976).

23. A compiler is [a] program that "prepare[s] a machine language program from a . . . [source] program by making use of the overall logic structure of the program, [and/]or [by] generating more than one machine instruction for each symbolic statement." Dorf, *supra* note 1, at 469.

gram.²⁴ Originally, communications with a computer were done by manually entering the binary machine language.²⁵ Today, through the use of high-level languages, the process of translating to object code occurs within the machine by way of the operating system²⁶ in a compiler program. As a result, there is no longer a reason to program at the machine-language level.²⁷ Object code has thus been considered by some courts to be unintelligible to—or not directed toward—humans, and therefore cannot be protected by copyright under the 1909 Act.²⁸

The words “with the aid of a machine or device” appear, at first blush, to correct any deficiency in the 1909 Act with regard to object code. The House Report²⁹ addressing this language expressed the intention that this language be read broadly, so as to “avoid the artificial and largely unjustifiable distinctions, derived from cases such as *White-Smith Publishing Co. v. Apollo Co.*³⁰ . . . under which statutory copyrightability in certain cases has been made to depend upon the form or medium in which the work is fixed.”³¹

24. An object program is “[a] program in absolute machine language,” which is “the language that is understood by a computer; each statement has two parts: a storage address and operation code.” Harris, *supra* note 19, at 297 and 299. A simplified diagram of the process described is as follows:



While the advent of source programming is a tremendous advancement for computer science, the qualities which make these programs adaptable to more than one computer arguably facilitate software theft.

25. Binary code is “[a] code that makes use of exactly two distinct characters, usually 0 and 1.” Dorf, *supra* note 1, at 467. Machine language, or code, is “the language understood by a computer.” Harris, *supra* note 19, at 297.

26. An operating system is “[s]oftware which controls the execution of computer programs and which may provide scheduling, debugging, input/output control, accounting, compilation, storage assignment, data management and related services.” *Id.* at 478.

27. See *supra* note 24 and 25.

28. See *infra* text accompanying notes 43 and 57.

29. H.R. REP. NO. 1476, 94th Cong., 2d Sess., reprinted in 1976 U.S. CODE CONG. & AD. NEWS 5659.

30. 209 U.S. 1 (1908).

31. H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, reprinted in 1976 U.S. CODE CONG. & AD. NEWS 5659, 5665.

There was a problem, however, in applying the language of the revised statute to object code. At the time of the Copyright Act revision in 1976, the legislature was not ready to make a definitive statement regarding computer programs. As a result, section 117³² was added to the Act, which required that no greater or lesser rights be afforded to owners of copyrights on computer programs than existed on December 31, 1977.³³ This allowed the revision to pass "without committing Congress to a position on the computer-related issue until more study could be undertaken."³⁴ Not affording owners of copyrights on computer programs more rights was interpreted to mean that the 1909 definition of a "copy"³⁵ had to be applied. Since this required that the "copy" be in a form intelligible to humans, machine-readable object code was not a "copy" within the meaning of the Act.

Section 117 of the Copyright Act was completely altered in 1980 to allow for back-up copying for one's own software.³⁶ However, if the

32. 17 U.S.C. § 117 (1976), *amended by* 17 U.S.C. § 117 (Supp. V 1981). The section, as it existed from 1978 until 1980, was entitled "Scope of exclusive rights: Use in conjunction with computers and similar information systems." The text was as follows:

[T]his title does not afford to the owner of copyright in a work any greater or lesser rights with respect to the use of the work in conjunction with automatic systems capable of storing, processing, retrieving, or transferring information, or in conjunction with any similar device, machine, or process, than those afforded to works under the law, whether title 17 or the common law or statutes of a State, in effect on December 31, 1977, as held applicable and construed by a court in an action brought under this title.

Id.

33. *Id.*

34. FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS 39, n.163 (1979) (the Commission is commonly referred to as CONTU).

35. *See supra* text accompanying note 16.

36. 17 U.S.C. § 117 (Supp. V 1981). The title of this amended section is "Limitations on exclusive rights: Computer programs," and the text reads:

Notwithstanding the provisions of § 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.

alleged infringement occurred prior to January 1, 1978—the date the 1976 Act took effect—the courts applied the 1909 Act.

B. Judicial Application

While the statute raised many questions, most courts were willing to find support for the copyrightability of software. One concern that surfaced was whether input formats³⁷ in computers were equivalent to forms which communicate information, and which therefore could be the subject of copyright. In *Synercom Tech. v. University Computing Co.*,³⁸ a federal district court decided that input formats are copyrightable. The formats were distinguished from blank forms which do not express ideas and are not a proper subject of copyright.³⁹ It was noted that code books have been viewed as expressing ideas, thus receiving the benefit of copyright protection.⁴⁰ The court reasoned that the same rationale could be applied to the input format. “The litmus seems to be whether the material proffered for copyright undertakes to express. At first glance these input formats are simply devices for the assistance of the user to facilitate his task—forms. On reflection, however, one must conclude that they indeed express ideas.”⁴¹

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.

Id. Section 101 was also amended in 1980 by adding the definition of a “computer program” as “a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.” 17 U.S.C. § 101 (Supp. V 1981).

37. *Id.* An input-output routine is a “program which tells the computer how to take the information which is put into the computer by an operator in one computer language and translate that information into a more simplified “machine” language which the computer can understand.” *Tandy Corp. v. Personal Micro Computers, Inc.*, 524 F. Supp. 171, 173 (N.D. Cal. 1981). Most digital computers have five functional components: 1) input; 2) storage of the input by memory; 3) a control unit which receives data from the memory and gives instructions for the arithmetic; 4) an arithmetic which carries out the control’s commands; 5) output capability. *Synercom Tech. v. University Computing Co.*, 462 F. Supp. 1003, 1005 (N.D. Tex. 1978).

38. 462 F. Supp. 1003 (N.D. Tex. 1978).

39. *Id.*, at 1011 (*citing Baker v. Selden*, 101 U.S. 99 (1879)).

40. *Synercom*, 462 F. Supp. at 1011 (*citing Reiss v. Nat’l Quotation Bureau, Inc.*, 276 F. 717, 719 (S.D.N.Y. 1921)).

41. *Synercom*, 462 F. Supp. at 1011.

A 1979 case subscribing to the "human intelligibility"⁴² requirement is *Data Cash Systems, Inc. v. JS&A Group, Inc.*⁴³ The court in *Data Cash* ruled that the read-only memory (ROM)⁴⁴ object code of the plaintiff's program was not protected by copyright, even though the source program was marked correctly. Copying the ROM was held not to be actionable, since Judge Flaum determined that a program in ROM does not constitute a true copy within the 1909 Copyright Act. He determined that "[o]bject programs, which enter into the mechanical process itself, cannot be read without the aid of special equipment and cannot be understood by even the most highly trained programmers."⁴⁵

Judge Flaum's determination was not entirely accurate. He was compelled, by the existence of the original 17 U.S.C. § 117,⁴⁶ to apply the standards of the 1909 Copyright Act requiring human intelligibility. But according to a group of technical experts, object code can be read by man:

Object code in binary form is often intelligible to skilled assembly- or machine-language programmers. This is certainly true on an instruction-by-instruction basis. We feel that object code is no more obscure in the U.S. than languages such as Arabic or Sanskrit. A sequence of several thousand bytes of 8080 code, for example, could be converted byte by byte to an assembly-language source listing that could be protected by U.S. copyright laws. . . .

Object code does communicate in fixed messages to humans. Duplicated object code will always be understood in the same way as the original code by an individual who knows the machine code and the computer instruction set to which it belongs.⁴⁷

42. See *supra* text accompanying note 16.

43. 480 F. Supp. 1063 (N.D. Ill. 1979).

44. Read-only memory is "a photochemically imprinted silicon chip which stores information in the form of minute 'bits.' Bits are simply on-and-off switches. The pattern, sequence and frequency with which these switches are activated gives (sic) instructions to the machine and causes (sic) it to function in its various modes." *Apple Computer, Inc. v. Formula Int'l, Inc.*, 562 F. Supp. 775, 778 (C.D. Cal. 1983). The memory is permanently stored on the silicon chip and is, for all practical purposes, immutable.

45. *Data Cash*, 480 F. Supp. at 1065.

46. See *supra* note 32.

47. Stern and Squires, *Can We Stop Software Theft?* IEEE, MICRO, Feb. 1982, at 13, noting comments on memo submitted in response to the International Trade

On appeal,⁴⁸ the trial court's decision was affirmed on different grounds. Because of this, and perhaps due to the difficulty in reconciling the notion of "human intelligibility" with the 1976 Copyright Act, *Data Cash* has not received much of a following in the courts. However, it is an oft-cited case, mostly by alleged copyright infringers in search of relief.

In *Tandy Corp. v. Personal Micro Computers, Inc.*⁴⁹ the requirement of human readability was rejected by a California district court. The court, following the 1976 Copyright Act, found a computer program to be the required "work of authorship," while the silicon chip served as the "tangible medium of expression."⁵⁰ The court seized the opportunity to apply the language of 17 U.S.C. § 102(a) regarding the fixing of words in media "from which they can be perceived . . . either directly or with the aid of a machine or device."⁵¹ In support of the court's application of this statutory language to the object code controversy, legislative history was cited to clarify "the all-inclusive nature of the definition of 'fixed' form:"

Under 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 other stable form, and whether it is capable of perception directly or by means of any machine or device 'now known or later developed.'⁵²

The question of object code copyrightability was still not fully resolved. The defendant, charged with copying a ROM chip, asserted that section 117 required the court to determine whether it was a copy within the meaning of the copyright laws by applying the law as it existed before January 1, 1978. The court made it clear that to do so would be

Commission's request for public comment (46 Fed. Reg. 26,589 (1981)).

48. 628 F.2d 1038 (7th Cir. 1980). The judge hearing the case of *Apple Computer, Inc. v. Franklin Computer Corp.* acknowledged that the district court's holding in *Data Cash* was weakened (since it was affirmed on different grounds), and suggested that the circuit court's affirmance may have revealed its belief that ROMs may be copyright protected as long as copyright formalities have been satisfied.

49. 524 F. Supp. 171 (N.D. Cal. 1981).

50. *Id.* at 173.

51. See *supra* text accompanying note 17.

52. *Tandy*, 524 F. Supp. at 173 (quoting H.R. REP. NO. 1476, 94th Cong., 2d Sess. 52, reprinted in, 1976 U.S. CODE CONG. & AD. NEWS 5659, 5665.)

an incorrect application of the law:

It was not intended to provide a loophole by which someone could duplicate a computer program fixed on a silicon chip. It did not refer to the unauthorized duplication of a silicon chip upon which a properly copyrighted computer program is imprinted. Such a *duplication* of a chip is not the use of a copyrighted program 'in conjunction with' a computer; it is simply the copying of a chip. Moreover, any other interpretation would render the theoretical ability to copyright computer programs virtually meaningless.⁵³

Less than one year after the *Tandy* decision, the United States District Court for the Northern District of Illinois specifically stated that the ROM⁵⁴ of plaintiff's videogame was protected by copyright. In *Midway Mfg. Co. v. Artic Intern, Inc.*,⁵⁵ the plaintiff's motion for a preliminary injunction was granted. This prohibited Artic from distributing its videogame, the architecture for which had been structured around an infringed copy of Midway's ROM chip. Initially, the decision would seem to overrule *Data Cash*, which was argued in the same court. But where the rationale in *Data Cash* was based on application of the 1909 Copyright Act, the *Midway* decision clearly centered on the language found in the revised Copyright Act in conjunction with the 1980 amendment. To further support the decision, district court Judge Decker stated that "a work is no less a motion picture (or other audio-visual work) because the images are embodied in a video tape, video disc, or any other tangible form."⁵⁶

In July 1982, four months after the *Midway* decision, the United States District Court for the Eastern District of Pennsylvania decided the case of *Apple Computer, Inc. v. Franklin Computer Corp.*⁵⁷ Judge Newcomer refused to issue a preliminary injunction sought by Apple to restrain Franklin "from using, copying, selling, or infringing in any other way Apple's registered copyrights on fourteen computer programs that are contained in or sold with the Apple II personal com-

53. 524 F. Supp. at 175 (emphasis in original).

54. See *supra* note 44.

55. 547 F. Supp. 999 (N.D. Ill. 1982).

56. *Id.* at 1013 (quoting NIMMER ON COPYRIGHT § 2.09[D], in quote of Memorandum from the General Counsel of the Int'l Trade Comm'n to The Commission 7 (June 8, 1981).

57. 545 F. Supp. 812 (E.D. Pa. 1982).

puter.”⁵⁸ Although no conclusion was reached on the copyrightability question, Judge Newcomer’s opinion on the preliminary injunction issue expressed doubt as to the extent of protection afforded by the copyrights. In his opinion, Apple failed to show a reasonable probability of success on the merits, or that it would suffer irreparable harm. On the contrary, Judge Newcomer indicated that Apple’s economic superiority in the marketplace made it better suited to withstand the burden of litigation. If Franklin were precluded from selling its major product pending litigation, the consequences would be devastating.⁵⁹

Judge Newcomer presented some interesting arguments for both camps. In support of Apple’s position, he noted that

[o]bject code may be said to be the language used by a programmer in the same way Hemingway may be said to have used English to write *For Whom the Bell Tolls*. A ROM may be considered a ‘*tangible medium of expression*,’ fixing an original work much as a book, record or motion picture film fix a literary work, a musical work or a motion picture.⁶⁰

In addition to the “tangible medium of expression,” an “original work of authorship” is needed to satisfy the requirements of copyright registration. But in the transition from flow chart to source program to object code, major transformations take place in the structure of the program. Judge Newcomer opined that it was not clear at which stage the program author’s design was in its original form, therefore qualifying as a work of authorship.⁶¹ As noted earlier, programmers can communicate with a computer in object code. However, they no longer need to do so since the computer is capable of making its own “translation” from the source program. Apple thus argued that the “automatic translation of source to object code established a predictable one-to-one relationship between the two codes that preserved the programmer’s original force of authorship.”⁶²

The court introduced one issue discussed by the Commission on New Technological Uses of Copyrighted Works (CONTU), the body created by Congress to aid in the Copyright Act revision of 1976.⁶³ The

58. *Id.* at 812.

59. *Id.* at 825.

60. *Id.* at 819-20 (emphasis added).

61. *Id.* at 820.

62. *Id.* at 822.

63. *See generally* CONTU’s final report, *supra* note 34.

contention was that object code embodied in a ROM is a mechanical device and is therefore not copyrightable. This was not to suggest, however, that no protection should be available. Rather, a ROM may be characterized as firmware, or a combination of software and hardware⁶⁴ that operate together to control a computer, which may, if other aspects satisfy statutory criteria, be protectable under patent law.⁶⁵

Judge Newcomer agreed that it is not illogical to treat object code as an expression, but he added that “[i]f the concept of ‘language’ means anything, it means an ability to create human interaction.” He submitted that a limit must be set in place. Otherwise, the court would ultimately be providing “copyright protection to the programs created by a computer to run other computers. With that, we step into the world of Gulliver where horses are ‘human’ because they speak a language that sounds remarkably like the ones humans use. It is an intriguing analogy but false.”⁶⁶ Judge Newcomer’s analysis is interesting, but the code at issue is still the result of a human’s creativity.

A mere three days after *Franklin* was decided, the United States Court of Appeals for the Third Circuit ruled on *Williams Electronics, Inc. v. Artic Int’l, Inc.*⁶⁷ The Third Circuit, which is the same court that would soon hear the *Franklin* appeal, upheld a permanent injunction enjoining Artic (the same Artic that was sued by Midway), from infringing Williams Electronics’ copyrighted program. Artic, relying on *Data Cash*, unsuccessfully argued that ROM was not intelligible to humans, and therefore not a proper subject for copyright. The Third Circuit, however, relied on section 101 of the Copyright Act for their decision:

By this broad language, Congress opted for an expansive interpretation of the terms ‘fixation’ and ‘copy’ which encompass technological advances such as those represented by the electronic device in this case. We reject any contention that this broad language should nonetheless be interpreted in a manner which would severely limit the copyrightability of computer programs which Congress clearly intended to protect. We cannot accept defendant’s suggestion that would afford an unlimited loophole by which in-

64. Hardware is “[p]hysical equipment, as opposed to the program or method of use; for example, mechanical, magnetic, electrical, or electronic devices.” Dorf, *supra* note 1, at 474.

65. *Id.* at 824. See generally text accompanying notes 135-56.

66. *Id.* at 825.

67. 685 F.2d 870 (3d Cir. 1982).

fringement of a computer program is limited to copying of the computer program text but not to duplication of a computer program fixed on a silicon chip.⁶⁸

In the year following the *Franklin* and *Williams* decisions, commentators have attempted to find some justification for the divergent opinions. But in August 1983, the Third Circuit reversed the *Franklin* district judge's refusal to grant a preliminary injunction to Apple. The court of appeals declared that Apple's copyrights are indeed valid, despite Franklin's argument that a "process," "system" or "method of operation" cannot be copyrighted. The court predictably relied upon its decision in *Williams*, thereby continuing the trend toward accepting the copyrightability of operating systems and programs embodied in ROM.⁶⁹

In February 1983, another district court was faced with the issue of object code copyrightability. The court in *Hubco Data Products Corp. v. Management Assistance, Inc.*⁷⁰ determined that the certificate of registration on copyrighted levels of the program served as *prima facie* evidence of the validity of the copyright. However, a question still remained as to the uncopyrighted levels. The court declared that Management Assistance had the burden of showing that their object code was an "original work of authorship" under the Act, for which copyright registration is not required in order to benefit from protection.⁷¹ In response to defendant's argument that the code is used commonly throughout the industry, it was determined that the originality required here meant "independent creation," and not "novelty." In other words, "a work is original and may command copyright protection even if it is completely identical with a prior work provided it was not copied from such prior work but is rather a product of the independent efforts of its author."⁷²

An argument similar to Franklin's⁷³ was asserted in a California district court by Formula International in *Apple Computer, Inc. v.*

68. *Id.* at 877.

69. *Apple Computer, Inc. v. Franklin Computer Corp.*, 714 F.2d 1240 (3d Cir. 1983). See also Freiberger, *Apple Has Ace in the Hole with ROM*, INFO WORLD, Sept. 26, 1983, at 1; Gillen, *Ruling Seen Definitive: Court Upholds Apple's ROM Copyright Suit*, COMPUTER WORLD, Sept. 12, 1983, at 5.

70. COPYRIGHT LAW DECISIONS (CCH) 18,100 (D. Idaho Feb. 3, 1983).

71. *Id.* at 18,104 (citing 17 U.S.C. § 408(a) (1976)).

72. *Hubco* at 18,104.

73. See *supra* text accompanying note 57.

*Formula Int'l, Inc.*⁷⁴ Formula took the position that programs which were integral to the operation of the machine, and which did not directly produce visual communication, were not copyrightable. Judge Hill disposed of that argument by suggesting that there was no statutory authority to sustain different treatments for functionally different computer programs.⁷⁵ The opinion included an analysis of *Franklin*, where Judge Hill submitted that Judge Newcomer misunderstood CONTU's position. Judge Newcomer had cited CONTU's report on the 1976 Copyright Act revision to support his determination that object code is not copyrightable. In support of his conclusion, Judge Hill stated that the *Franklin* decision was undermined by the *Williams* case, since the Third Circuit, in *Williams*, took a point of view opposite from that of the district court, in *Franklin*, only a few days later.⁷⁶ Additionally, Judge Hill noted that *Franklin* did not present a clear holding on the object-code question, and was decided under different state injunction standards.⁷⁷

Formula asserted that the grant of a preliminary injunction would constitute an impediment to free competition. The court disagreed, claiming that it would in fact be to Apple's advantage to have more software available for owners of its computer. The defendant would still be free to create compatible programs, but a byte by byte copy would not be tolerated. The court stated:

Apple seeks here not to protect *ideas* (i.e., making the machine perform particular functions) but rather to protect their particular *expressions* of those ideas in the form of specific programs. And Formula wants the privilege of using and marketing those expressions without having to invest the millions of dollars and thousands of manpower hours necessary to develop them. Simple economics suggests that Formula's strategy would hinder, not promote, competition and innovation in the computer market. Few companies are going to invest the time and resources to develop new programs if their products can be freely duplicated by anyone. Such 'competitors,' who could undersell the originator simply because they don't have its development costs, would destroy the market which any innovator needs to recoup his investment.⁷⁸

74. 562 F. Supp. 775 (C.D. Cal. 1983).

75. *Id.* at 780.

76. See *supra* text accompanying note 67.

77. *Formula*, 562 F. Supp. at 785.

78. *Id.* at 783.

The court did not see this, however, as the final word in software protection. In fact, Judge Hill submitted that copyright may not even be the best form of protection for computer programs. He noted that perhaps a hybrid or an entirely new form of protection would need to be devised, but that the legislature, not the court, would be the proper forum for such a determination. "To the extent [the court] is free to express public policy, its choice is to place computer programs into an existing category of legal protection as against affording them no protection at all."⁷⁹

C. Current Methodology and Considerations for the Future

The language in *Formula* adds credence to the indications that there are strong policy justifications for protecting computer programs. Apparently, there are a number of persons who agree, for efforts are being made to enact a more comprehensive amendment to the Copyright Act as it relates to computer programs. "A Bill to Improve the Protection Afforded to Computer Software" was introduced in August 1982 at the request of the Association of Data Processing Service Organizations (ADAPSO).⁸⁰ The 1980 definition of "computer program" would be revised, and definitions would be provided for "program description," "supporting material," and "computer software." Section 102(a) of the Copyright Act, which gives a non-comprehensive list of copyrightable subject matter, would be appended with "computer software." Sections 401(b)(1) and 408(b), concerning the copyright symbol (©) and registration, would be amended to accommodate programs. Section 301, on preemption with respect to other laws, would resolve any conflicts which can arise through the combined use of copyrights and trade secrets.⁸¹

79. *Id.*

80. Stern, *Protecting Computer Software - The ADAPSO Bill*, IEEE MICRO, April 1983, at 58. The amended sections would be §§ 101, 102(a), 301, 401(b) and 408(b).

81. 'A computer program' means a set of instructions capable, when incorporated in a machine-readable medium, of causing a machine having information processing capabilities to indicate, perform, or achieve a particular function, task, or result. . . . A 'program description' means a complete procedural representation in verbal, schematic, or other form, in sufficient detail to determine a set of instructions constituting a corresponding computer program. . . . 'Supporting material' means any material, other than a computer program or a program description, created for

An alternative has been suggested that would require compulsory licensing for those distributing programs to the public for private use, and stiffer penalties for known infringers.⁸² Another recommendation calls for an alternative form of protection altogether, that being a regulatory statute under the Commerce Clause which would render copying of object code unfair as offending public policy.⁸³ On the other hand, it is arguable that the available laws already provide adequate protection.

Considering the present state of copyright law, simple measures can be taken to assure the best available protection. Each physical embodiment of the software should be stamped with the copyright symbol followed by the year the program was first distributed to the public. Although copyright takes effect when the writing is completed, early registration can make a difference in the amount of damages available to a prevailing plaintiff in the event of a suit. Programmers can further safeguard their work by imbedding "dummy" data into their programs to aid in detecting an infringement;⁸⁴ likewise, encrypting the code may serve to deter a would-be infringer.

Copyrights are now the most common form of protection available for software today, due to the ease with which registration can be secured, as well as the reasonable \$10.00 filing fee. Circular "R61," entitled "Copyright Registration for Computer Programs," is readily available from the Copyright Office.⁸⁵ The applicant is advised that "[c]opyright protection extends to the literary or textual expression contained in the opinion. Copyright protection is not available for ideas, program logic, algorithms, systems, methods, concepts, or lay-

aiding the understanding or application of a computer program, for example, problem descriptions and use instructions. 'Computer software' means any or several of the literary works referred to in the definitions of computer program, program description, and supporting material. Stern, *supra* note 80, at 59.

82. Note, *Software Piracy and the Personal Computer: Is the 1980 Software Copyright Act Effective?* 4 *COMPUTER/LAW J.* 171 (1983).

83. Stern, *Can We Stop Software Theft?*, *supra* note 13.

84. Brown, *Software Protection Battle Rages On*, *ELECTRONICS*, Nov. 17, 1982, at 24. Dummy data is information imbedded into a program which is not essential to the program's successful performance. Its appearance in a suspect program aids in proving the likelihood of an infringement.

85. U.S. Government Printing Office: 1983-381-279:572. Forms can be obtained by writing to Information and Publications Section, LM-455, Copyright Office, Library of Congress, Washington, D.C. 20559, or by calling the Forms Hotline on (202)287-9100.

outs.”⁸⁶ It also includes the definition of a computer program, deposit requirements and instructions on placing the copyright notice, both for visually perceptible copies and works reproduced in machine-readable copies. While source programs are recommended for deposit, it is noted that “registration will proceed under our RULE OF DOUBT policy upon receipt of written assurance from the applicant that the work as deposited in object code contains copyrightable authorship.”⁸⁷

Since the 1964 announcement by the Copyright Office, copyright registration for computer software has metamorphosed from a mere position taken on validity to a relatively well-defined procedure backed by legislation and case law. While more changes will surely be seen in the near future, copyrighting can be expected to remain an important force to be considered when evaluating the alternatives in legal protection for software.

III. Trade Secret Protection

A. The Basis for Trade Secret Protection

There are programs that do not meet the statutory requirements for patents, or whose authors wish to protect their idea so as to market it while a patent application is pending. There are others who desire to protect their very ideas, and not only the embodiment of those ideas, rendering copyright protection insufficient. For these purposes, trade secret protection serves a useful function. Unlike patents and copyrights, trade secrecy is a state doctrine. In many states it exists only through common law,⁸⁸ and arises from taking precautions to keep one's idea or methodology a secret. It is commonly secured through contractual arrangements, with the owner putting the user on notice that the information being transferred is not to be disclosed, except as may be authorized. Trade secrecy offers a broad scope of protection which covers the concept and the expression, it protects against disclosure, and continues in effect until the idea enters the public domain.⁸⁹

86. *Id.*

87. Form TX, for published and unpublished nondramatic literary works, is the correct form to be filed for the registration of computer programs. U.S. Government Printing Office: 1983:381-278/101.

88. *See infra* text accompanying note 94.

89. The information need not be “generally known to the public for trade secret rights to be lost,” but may be known within the industry, or available to the public in print. UNIFORM TRADE SECRETS ACT § 1 comment 5, 14 U.L.A. 537, 541 (1980).

“Trade secret” is characterized by the Restatement of Torts:

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 manufacturing, treating or preserving materials, a pattern for a machine or other device, or a list of customers.⁹⁰

This definition has been employed by courts in their discussion of trade secret protection for software,⁹¹ as well as by the United States Supreme Court in cases regarding the validity of a proclaimed trade secret.⁹² The official comment to the Restatement of Torts acknowledges that there exists no exact definition of “trade secret,” but provides factors which help determine whether a trade secret has been established by the product owner. Those factors are:

(1) the extent to which the information is known outside of his business; (2) the extent to which it is known by employees and others involved in his business; (3) the extent of measures taken by him to guard the secrecy of the information; (4) the value of the information to him and to his competitors; (5) the amount of effort or money expended by him in developing the information; (6) the ease or difficulty with which the information could be properly ac-

90. RESTATEMENT OF TORTS § 757 comment b (1939). The text of section 757 reads:

One who discloses or uses another's trade secret, without a privilege to do so, is liable to the other if

- (a) he discovered the secret by improper means, or
- (b) his disclosure or use constitutes a breach of confidence reposed in him by the other in disclosing the secret to him, or
- (c) he learned the secret from a third person with notice of the facts that it was a secret and that the third person discovered it by improper means or that the third person's disclosure of it was otherwise a breach of his duty to the other, or
- (d) he learned the secret with notice of the facts that it was a secret and that its disclosure was made to him by mistake.

RESTATEMENT OF TORTS § 757 (1939).

91. *See, e.g.,* Videotronics, Inc. v. Bend Electronics, 564 F. Supp. 1471 (D. Nev. 1983) (*see infra* text accompanying note 128), and J & K Computer Systems, Inc. v. Parrish, 642 P.2d 732, 735 (Utah 1982) (*see infra* text accompanying note 98).

92. Aronson v. Quick Point Pencil Co., 440 U.S. 257 (1979); Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470 (1974).

quired or duplicated by others.⁹³

The Uniform Trade Secrets Act was approved in 1979 by the National Conference of Commissioners on Uniform State Laws,⁹⁴ but as of 1983 it had only been adopted in Indiana, Kansas, Louisiana, Minnesota and Washington.⁹⁵ The act more broadly defines trade secrets as

information, including a formula, pattern, compilation, program, device, method, technique, or process, that:

- (i) derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable by proper means by, other persons who can obtain economic value from its disclosure or use, and (ii) is the subject of the efforts that are reasonable under the circumstances to maintain its secrecy.⁹⁶

Applying either definition, it is clear that computer programs do constitute trade secret subject matter.⁹⁷ Recent case law confirms this, while attempting to identify the extent of protection offered to trade secret owners.

B. Case Law

In *J & K Computer Systems, Inc. v. Parrish*,⁹⁸ J & K sued its former employees and their corporation, alleging wrongful appropriation of proprietary information. Parrish had made an electronic copy of a program he developed while an employee of J & K, and continued to use it, in defiance of his employment contract, after he left the com-

93. RESTATEMENT OF TORTS § 757 comment b (1939). These criteria were noted by the court in *M. Bryce & Associates, Inc. v. Gladstone*, 107 Wis. 2d 241, 319 N.W.2d 907 (1982). See *infra* text accompanying note 102. The Restatement Second of Torts (1978) did not incorporate section 757, but the language of the first Restatement is still controlling, as is evident in the cases cited *supra* notes 91 and 93.

94. UNIFORM TRADE SECRETS ACT § 1, 14 U.L.A. 537, 539 (1980). The Act was proposed by a special committee pursuant to recommendations by the Patent Law Section of the American Bar Association. The committee's work was done in conjunction with the Antitrust, Banking and Business, Corporation, and Patent Law sections of the American Bar Association. *Id.* at 538-39.

95. UNIFORM TRADE SECRETS ACT, 14 U.L.A. 206 (Supp. 1983).

96. UNIFORM TRADE SECRETS ACT, 14 U.L.A. 537, 542 (1980).

97. For a discussion of trade secrets and computer programs, see Bender, *Trade Secret Protection of Software*, 38 GEO. WASH. L. REV. 909 (1969).

98. 642 P.2d 732 (Utah 1982).

pany. Parrish asserted that the program was not confidential so as to constitute a trade secret. The Utah Supreme Court, however, disagreed with Parrish's assertion, noting that the program was unique in that it could not be found in any text or source book.⁹⁹ This established the requirement that the information sought to be protected not be known throughout the industry.¹⁰⁰ Parrish further argued that the program had been revealed to certain customers and could not therefore be deemed secret. This argument was rejected by the court, since J & K had taken steps to inform employees and customers of the secret nature of programs they had been authorized to use. In addition, the programs themselves were marked as being proprietary to J & K, and usable by license agreement only. "That a few of the plaintiff's customers had access to the program does not prevent the program from being classified as a trade secret where the plaintiff was attempting to keep the secret and the program is still unavailable to the computer trade as a whole."¹⁰¹

In the 1982 case of *M. Bryce & Associates, Inc. v. Gladstone*,¹⁰² a non-disclosure agreement was signed by persons attending a demonstration of M. Bryce's management information system. Though no sale resulted from the demonstration, the persons to whom the system was shown used the information disclosed to reproduce the system. In the suit that followed, the defendant asserted that there had been no misappropriation since the product he issued was not an exact duplicate of plaintiff's system. The court disagreed, noting the trial court's instruction to the jury, adopted from the Restatement of Torts, as to a "use" of a trade secret:

To subject a person to liability for use of another's trade secret, there is no requirement that he use it exactly in the form that he received it. He may be liable even if [he] uses it with modification—modifications or improvements upon it affected by his own efforts.

Differences in detail do not preclude liability if substantially the process used by the actor is derived from the other's secret in breach of a relationship of trust and confidence.

The liability is avoided only when the contribution by the other's secret is so slight that the actor's process can be said to be

99. *Id.* at 735.

100. *See supra* note 89.

101. *J & K Computer Systems*, 642 P.2d at 735.

102. 107 Wis. 2d 241, 319 N.W.2d 907 (1982).

derived from other sources.¹⁰³

The defendant also argued that since information pertaining to the system had been offered to the public in advertisements, trade-secret status was lost. The court noted, however, that the advertisement showed the reader "what" the product was, and not "how" it was put together.¹⁰⁴

For many companies, policy regarding employee conduct may be the only way to keep information secure. In March 1983, the district court of Hawaii upheld Honeywell Information Systems' firing of two employees who formed a computer company while working for Honeywell.¹⁰⁵ The dismissed employees argued that their business did not compete with Honeywell's market, since Honeywell did not sell a certain type of computer in Hawaii.¹⁰⁶ The court's response was that direct competition was not necessary for a finding of conflict:

Honeywell is undoubtedly in possession of valuable trade secrets, such as software programs, marketing techniques, market studies, and other valuable information developed perhaps at great cost to the company. The employment policy here seems to be a reasonable means to prevent the improper and unauthorized use of such information by persons or businesses which may unjustly benefit themselves with such information.¹⁰⁷

Company policies are frequently embodied in a written contract between the employer and the employee. In this manner, the employee is on notice that information learned as an employee is to be maintained in confidence. International Business Machines Corp., for example, requires newly-hired employees to sign an "Agreement Regarding Confidential Information and Intellectual Property."¹⁰⁸ The agreement forbids disclosure of confidential information *during and after* their employment; the employee assigns to the corporation his

103. *Id.* at 252, 319 N.W. 2d at 912. The trial court's instructions to the jury came from RESTATEMENT OF TORTS § 757 comment c (1939).

104. 107 Wis. 2d at 250, 319 N.W.2d at 911.

105. *Moore v. Honeywell Information Systems, Inc.*, 558 F. Supp. 1229 (D. Hawaii 1983).

106. *Id.* at 1233.

107. *Id.*

108. IBM form, "Agreement Regarding Confidential Information and Intellectual Property" (Rev. 6/80).

entire right, title and interest in any idea, invention, design of a useful article (whether the design is ornamental or otherwise), computer program and related documentation, and other work or authorship . . . conceived . . . or written wholly or in part by . . . [the employee], whether or not such . . . [works] are patentable, copyrightable or susceptible to other forms of protection . . . [which are] created within the scope of . . . [his] employment.¹⁰⁹

Trade secrets have proven effective for a wide variety of products, such as soft drink formulae, and the process of manufacturing orchestral cymbals.¹¹⁰ Once proper precautions have been taken to guard the trade secret, products of this nature are put on the market for widespread distribution. Other manufacturers attempt to imitate successful products. But as long as the producer has taken steps to prevent disclosure, the actual process involved in making the original product will remain a secret. When computer programs are marketed by licensing them to individual users, the contractual agreement protects the owner in case of infringement. However, it is impractical to have that type of arrangement when widespread distribution is desired. The software manufacturer can distribute his system while taking steps to keep his methodology secret, such as limiting knowledge of the process involved to his employees. Unlike many other products, however, computer applications may not receive adequate protection from trade secrecy, due to the scope of protection afforded. Trade secret status guards against discovery by "improper means."¹¹¹ "Improper means" does not include independent development or reverse engineering. Reverse engineering is "a technique by which the product of a secret formula or process is analyzed, first to retrace the steps essential to its creation and then to recreate the formula or process itself."¹¹² In the case of many computer programs, reverse engineering may not be difficult. The result may be a

109. *Id.*

110. One process for manufacturing cymbals has been maintained a family secret for hundreds of years. J. POOLEY, *TRADE SECRETS: HOW TO PROTECT YOUR IDEAS AND ASSETS* 18-19 (1982). Other examples noted are such divergent things as "[a] process for extracting alcohol from empty whiskey barrels, . . . [t]he seminar technique of a group nonsmoking clinic, . . . [d]esigns for automatic toll collection equipment [and] [e]mployee benefit information." *Id.* at 19. In effect, anything maintained secret which can comply with the requirements set forth in the Restatement (*see supra* text accompanying notes 90 and 93), qualifies for trade secret protection.

111. RESTATEMENT OF TORTS § 757 (1939).

112. P. GOLDSTEIN, *COPYRIGHT, PATENT, TRADEMARK AND RELATED STATE DOCTRINES* 157 (1981).

loss of one's proprietary information:

This freedom to create or recreate independently means that any number of unrelated firms within a particular industry may eventually come to possess a single trade secret. Once this possession becomes general, and the information becomes widely known in the industry, the secrecy requisite is no longer met and, under the rule usually followed, even those to whom the secret was imparted in confidence may use the information freely.¹¹³

C. Current Problems: Trade Secrets on Copyrighted Computer Programs

The issue today is not whether computer programs can receive trade secret protection, but rather whether trade secret protection can be used in conjunction with federal grants of exclusive rights on intellectual property. There is a problem inherent in copyrighting a program while maintaining that it constitutes a trade secret. Though the Copyright Act no longer requires immediate registration, once a copy of the program is furnished to the Copyright Office it is a matter of public record. This is obviously inconsistent with the basic requirement of secrecy with trade secrets. Yet, many program owners are treating programs as trade secrets while affixing the copyright symbol to their work. It is an attempt to secure protection for both the expression and the idea, and to have copyright protection available as a backup should secrecy be lost.¹¹⁴

Court decisions reflect the confusion that exists with the attempt to combine trade secrets with copyrights. In 1974, the Supreme Court determined that patentable inventions could be protected by state trade secret doctrines, since federal intellectual property law does not preempt state trade secret protection.¹¹⁵ "The only limitation on the States is that in regulating the area of patents and copyrights they do not

113. *Id.* at 157-158. There may be a problem of proof involved in determining whether a program has been independently created, analyzed and recreated, or simply unfairly acquired. For a discussion on how to recognize a copy, see Dakin and Higgins, *Fingerprinting a Program*, DATAMATION, April 1982, at 133.

114. See generally Lucarelli, 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).

115. *Kewanee*, 416 U.S. at 470.

conflict with the operation of the laws in this area passed by Congress. . . ."¹¹⁶

Courts have seized on this language to hold both ways. In *Synercom Technology, Inc. v. University Computing Co.*,¹¹⁷ the federal district court refused to grant relief on a state theory of unfair competition for the use of computer input formats and instruction manuals. Since relief had already been granted for copyright infringement, the court expressed its belief that enforcement of the state doctrine would significantly interfere with federal policy. The court thus declared the state misappropriation doctrine preempted by federal patent and copyright laws.¹¹⁸ Two years later, a district court in Texas took the opposite view in deciding *Warrington Assoc. v. Real-Time Eng. Systems*.¹¹⁹ The court found that Warrington Associates' common-law trade secret claim was not preempted by the federal Copyright Act, and thus denied Real-Time's motion for summary judgment. While noting that copyright disclosure could "strip the underlying idea of its confidentiality, and thus its status as a trade secret,"¹²⁰ the court acknowledged that the two could be interactive. In addition, "the trade secrets tort is premised on concepts of breach of trust and confidentiality, and not copying,"¹²¹ therefore not compelling preemption.

In *Technicon Med. Info. v. Green Bay Packaging*,¹²² the Seventh Circuit likewise refused to find a conflict between the federal and state laws. In a user's manual for Technicon's computer software, a legend was included, noting that the disclosed information was proprietary "and shall not be duplicated, used or disclosed, in whole or in part, except with the expressed permission of the owner."¹²³ In addition, a copyright symbol was affixed. The defendant argued that the symbol represented publication, which negated the existence of a trade secret. Technicon's claim was that there was no publication,¹²⁴ and that the

116. *Id.* at 479.

117. 474 F. Supp. 37 (N.D. Tex. 1979).

118. *Id.* at 44.

119. 522 F. Supp. 367 (N.D. Ill. 1981).

120. *Id.* at 368.

121. *Id.* at 369.

122. 687 F.2d 1032 (7th Cir. 1982) (cert. denied) ____ U.S. ____, 103 S. Ct. 732 (1983).

123. *Id.* at 1033 n.1.

124. The court quoted 1 NIMMER ON COPYRIGHT § 4.04 (1981) to note the difference between the two types of publication:

A general publication 'occurs when by consent of the copyright owner the

symbol was “included for protection in the event that an inadvertent publication occurred.”¹²⁵ The court agreed with Technicon’s argument, and declared that affixing the copyright notice as a deterrent constituted correct usage of the symbol. It was further noted that advancing alternative theories—i.e., copyright or trade secret—was permissible under the Federal Rules of Civil Procedure.¹²⁶ Enforcement of both, however, could present a conflict.¹²⁷

That the law in this area is far from settled is further evidenced in an opinion issued by the United States District Court for the District of Nevada.¹²⁸ In what seems to be a reversal of the trend away from preemption since *Synercom*,¹²⁹ the court found that federal copyright law preempted the application of the state common-law doctrines of misappropriation and trade secrecy. The court acknowledged that evidence clearly established that the defendant copied the plaintiff’s video game,¹³⁰ which included software. Despite this, the plaintiff could not avail itself of state doctrines since the programs involved were eligible for copyright protection.

Apparently, the desire to take advantage of both trade secret and copyright protection on computer programs is widespread. Many copyright owners, especially authors of computer programs, have requested that the Copyright Office consider special deposit provisions for works containing trade secrets.¹³¹ The Copyright Office normally requires that

original or tangible copies of a work are sold, leased, loaned, given away or otherwise made available to the general public, or when an authorized offer is made to dispose of the work in any such manner if a sale or other such disposition does not, in fact, occur.’

Id. at 1035. This was contrasted with the definition of a limited publication, found in *White v. Kimmel*, 193 F.2d 744 (9th Cir.) cert. denied 343 U.S. 957 (1952). “‘A limited publication [is one] which communicates the contents of a manuscript to a definitely selected group and for a limited purpose, and without the right of diffusion, reproduction, distribution or sale. . . .’” *Technicon*, 687 F.2d at 1035 (quoting *Data Cash*, 628 F.2d at 1042).

125. *Technicon*, 687 F.2d at 1034.

126. FED. R. CIV. P. 8(e)(2).

127. *Technicon*, 687 F.2d at 1038.

128. *Videotronics, Inc. v. Bend Electronics*, 564 F. Supp. 1471 (D. Nev. 1983).

129. See *supra* text accompanying note 114.

130. *Videotronics*, 564 F. Supp. at 1473.

131. Notice of Inquiry Deposit of Computer Programs and Other Works Containing Trade Secrets, 48 Fed. Reg. 22,951 (1983), reprinted in *New Developments: Comments Requested on Deposits Containing Trade Secrets*, 11 COPYRIGHT LAW REPORTS (CCH) 20,229 (1983).

two copies of the work be submitted for registration. The deposit then becomes a matter of public record, which would destroy any trade secret that might be included. In response to the concerns expressed, the Copyright Office published a request for comments in May 1983.¹³² The request notes in its section on policy considerations that many applicants have requested the same treatment that secure tests¹³³ receive. In such instances, one complete copy is received as a deposit instead of two. After examination the copy is returned to the applicant, the Copyright Office retaining some portion or description to serve as a record of deposit.¹³⁴ In this manner trade secret status would not be nullified by virtue of a copy being made available for public viewing through deposit with the Copyright Office. Alternative deposit suggestions for computer programs containing trade secrets have been solicited, and in particular, answers have been requested to twelve detailed questions. The notice makes it clear that the policy decisions the Office intends to formulate, with the aid of responses received, will shape the future of copyright registration.

IV. Patent Protection

Patent protection offers the software producer a combination of the most attractive features of copyright and trade secret security. In addition to being protected against copying and disclosure, the patent holder is shielded from independent creation and reverse engineering.¹³⁵

The federal government's power to grant a patent is derived from article I of the United States Constitution.¹³⁶ The benefit conferred upon the patent owner is the legal right "to exclude others from making, using, and selling an invention" for a period of 17 years.¹³⁷ This

132. *Id.* See generally 37 C.F.R. § 202.20 (1982) for deposit requirements.

133. A secure test is a "nonmarketed test administered under supervision and specified centers on specific dates, all copies of which are accounted for and either destroyed or returned to restricted locked storage following each administration." 37 C.F.R. § 202.20(b)(4) (1982)).

134. 48 Fed. Reg. 22,951, 22,952 (citing 37 C.F.R. § 202.20(c)(vi) (1982)).

135. See *supra* text accompanying note 112.

136. "The Congress shall have Power . . . 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. As explained in the text accompanying note 8, *supra*, the power to grant copyrights is also derived from this clause.

137. Blumenthal, *Lifeforms, Computer Programs, and the Pursuit of a Patent*,

statutory period of protection encourages inventors of patentable subject matter to disclose their work, since they need not fear infringement.¹³⁸ It would appear, then, that patent protection is the ideal route to computer program protection. However, due to the great degree of protection offered, the requirements for patent eligibility are stringent.¹³⁹ To meet the requirements, it must first be determined whether the program sought to be patented constitutes patentable subject matter. To do so, the item must be a “new and useful process,¹⁴⁰ machine, manufacture, or composition of matter, or any new and useful improvement thereof.”¹⁴¹ Further conditions are that the subject matter, once established as patentable, be novel¹⁴² and non-obvious.¹⁴³

The issue of patentability of computer programs has already reached the United States Supreme Court.¹⁴⁴ The programs in question

86 *TECH. REV.*, Feb./Mar. 1983, at 26, 29.

138. [A] patent system provides an incentive to invent by offering the possibility of reward to the inventor and to those who support him. This prospect encourages the expenditure of time and private risk capital in research and development efforts.

[A] patent system stimulates the investment of additional capital needed for further development and marketing of the invention. In return, the patent owner is given the right, for a limited period, to exclude others from making, using or selling the invented product or process.

[B]y affording protection, a patent system encourages early public disclosures of technological information, some of which might otherwise be kept secret. Early disclosure reduces the likelihood of duplication of effort by others and provides a basis for further advances in the technology involved.

[A] patent system promotes the beneficial exchange of products, services, and technological information across national boundaries by providing protection for industrial property of foreign nationals.

Goldstein, *supra* notes 15-16 (quoting REPORT OF THE PRESIDENT’S COMMISSION ON THE PATENT SYSTEM 1-3 (1966)).

139. These requirements are outlined in the Patent Act, 35 U.S.C. §§ 100-104 (Supp. V 1981).

140. The word “process” is defined as a “process, art or method, and includes a new use of a known process, machine, manufacture, composition of matter, or material.” 35 U.S.C. § 100 (1976).

141. 35 U.S.C. § 101 (Supp. V 1981).

142. 35 U.S.C. § 102 (Supp. V 1981).

143. A patent may not be obtained . . . if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art.

35 U.S.C. § 103 (1976).

144. *Diamond v. Diehr*, 450 U.S. 175 (1981); *Parker v. Flook*, 437 U.S. 584

were part of a "useful process,"¹⁴⁵ as required for subject matter qualification. But if the process contained a program described as consisting of a mathematical formula or algorithm, it was considered a law of nature, and therefore not patentable.¹⁴⁶ "The rule that the discovery of a law of nature cannot be patented rests, not on the notion that natural phenomena are not processes, but rather on the more fundamental understanding that they are not the kind of 'discoveries' that the statute was enacted to protect."¹⁴⁷ However, in the 1981 case of *Diamond v. Diehr*,¹⁴⁸ the Supreme Court saw the program in question as part of an industrial process, and not as an attempt to patent a mathematical formula. As a result, processes will now not automatically be precluded from being considered as patentable subject matter due to the inclusion of an unpatentable algorithm.¹⁴⁹

While one author hailed the decision as "the end of some twelve years of litigation concerning the patentability of computer programs,"¹⁵⁰ there are no clear-cut guidelines on exactly what will pass muster. In fact, the language used in drafting a patent claim may make a difference as to the final determination:

[A]ssuming that the claims do define a mathematical algorithm, if the implementation of the algorithm is couched in terms which either define the structural relationship between physical elements in a claimed apparatus or refine or limit steps in the process for which the patent is being sought, the claim will probably be patentable.¹⁵¹

(1978); *Gottschalk v. Benson*, 409 U.S. 63 (1972).

145. See *supra* text accompanying notes 139 and 140.

146. *Parker*, 437 U.S. at 593.

147. *Id.* "[A] scientific principle, such as that expressed in respondent's algorithm, reveals a relationship that has always existed." *Id.* at 593, n.15. The court notes one author's analogy to the fact that the law of gravity existed even before Newton's formulation of the law. That the law has been recognized affords no rights to exclude others from its use. "Patentable subject matter must be new (novel); not merely heretofore unknown." *Id.*, quoting P. ROSENBERG, *PATENT LAW FUNDAMENTALS* 13 (1975). The courts typically exclude scientific principles, laws of nature, ideas and mental processes. In *Re Meyer*, 688 F.2d 789, 794 (C.C.P.A. 1982).

148. 450 U.S. 175 (1981). For a number of articles discussing this case and those leading up to the decision, see section D of the bibliography accompanying this note.

149. Note, *Algorithm Patentability after Diamond v. Diehr*, 15 *IND. L. REV.* 713, 732 (1982).

150. *Legal Times of Washington*, May 4, 1981, at 27, col. 1, 28, col. 4.

151. Rose, *Protection of Intellectual Property Rights in Computers and Computer Programs: Recent Developments*, 9 *PEPPERDINE L. REV.* 547, 557 (1982). Rose

In a paper presented at the Second Annual Software Protection Conference in 1981, one author suggested that "the distinction the Supreme Court has attempted to draw between patentable processes and mathematical algorithms is confusing and unnecessary,"¹⁵² as well as "illogical and artificial."¹⁵³ The suggestion is that the statutory requirements be applied to algorithms as with any other item sought to be patented.

The discussion on algorithms was continued by the Delaware district court in the 1983 case of *Paine, Webber, Jackson & Curtis, Inc. v. Merrill-Pierce, Fenner & Smith, Inc.*¹⁵⁴ The court began with the premise that computer programs are patentable, but that they must meet the same statutory requirements as do other inventions. A fair portion of the opinion on the issue discussed the confusion caused by the lack of a standard, acceptable definition of the term "algorithm." The court ultimately accepted a narrow definition so as to enable the claim presented to constitute a methodology, and not a restatement of a mathematical formula.¹⁵⁵ While the court determined that the process involved constituted patentable subject matter, it is clear that congressional action is needed for uniformity.

Patent protection is ideal if the program qualifies. One drawback, however, is that the application procedure is lengthy,¹⁵⁶ which can delay the entry of a product into the market. Trade secret protection can be used until a patent application is approved in two or three years, but the extent of protection, as seen, is not as comprehensive as that provided by a patent.

is discussing a two-step test for patentability outlined by the Court of Customs and Patent Appeals (C.C.P.A. 1978) and *In Re Walter*, 618 F.2d 758 (C.C.P.A. 1980). On October 1, 1982, after 53 years of existence, the C.C.P.A. joined with the U.S. Court of Claims to become the U.S. Court of Appeals for the Federal Circuit (C.A.F.C.). Milde, *Life after Diamond v. Diehr: The CCPA Speaks Out on the Patentability of Computer-Related Subject Matter*, 64 J. PAT. OFF. SOC'Y 434, 434 (1982).

152. Gemignani, *Should Algorithms be Patentable?*, 22 JURIMETRICS J. 326, 334 (1982).

153. *Id.* at 335.

154. 564 F. Supp. 1358 (D. Del. 1983).

155. *Id.* at 1368.

156. A patent was issued for a system of computer programs for retrieving data and producing reports on stocks and bonds ten years after the application was made. The delay was due to the confusion on rules governing patent protection for computer programs. N.Y. Times, June 12, 1982, at 44, col. 1. In another case, an issue of statutory qualification was finally decided in favor of the claimant twelve years after his application was filed. *In Re Pardo*, 684 F.2d 912 (1982).

The essential thing to remember, when considering the viability of patenting a computer program, is that the program as a process must be entirely new. The flow chart designed must be entirely novel, and the overall process must be non-obvious.

V. Conclusion

It is clear that computer programs constitute proprietary information deserving of legal protection. Until congressional action is taken, designating an all-encompassing form of protection to adequately safeguard software owners' rights, the public must rely upon the present systems. While the courts and legislature are slowly molding the law to accommodate our rapidly-changing, computer-permeated lifestyle, expertise is needed to determine which avenue best serves a client's needs. While the general legal practitioner should be familiar with the available means of protection for computer software, it is recommended that advice be sought from an experienced patent attorney who has dealt extensively with the subject matter.

New technological developments will undoubtedly uncover issues not conceived of only a short time ago. As a result, some important and exciting changes will be witnessed as software developers seek legal protection for their creativity, which is in ever-increasing demand.

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