THE COPYRIGHTABILITY OF COMPUTER PROGRAMS†

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INTRODUCTION

If the period of the last 20 years, with its rapid technological growth, could be characterized in a phrase, it would probably be termed the computer era.[1] Computers, with their complexity and technical capabilities, fascinate and amaze the nontechnical person. Nonetheless, each of us is benefited, almost every day, by their usefulness. For instance, we may make an airline reservation which is checked and confirmed by a data processing system; our water bill may be computed and sent to us electronically; or the checks we write may be processed according to the strange symbols appearing on the bottom. Nor is the usefulness of these machines limited to the commercial and engineering fields, since legal research and even the prognosis of psychiatric illnesses may be facilitated by computer systems.[2] One thing is certain, computers are now a part of our life, and, aside from the obvious technical problems, new legal problems are resulting.[3]

In order to investigate the copyright problems surrounding a computer program, it is, of course, first necessary to understand some fundamentals about digital computer operation and programming.[4] Basically, a digital computer consists of input and output sections, a storage section, and a central processing section. Source data, such as engineering, statistical, or commercial, is fed into the input section of the machine in a form which the computer can "read," which may be punched cards or tapes, or magnetized tape. The result of a com-

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[1] The background and growth of computers are discussed in BERKELEY, THE COMPUTER REVOLUTION (1962).

[2] LAW AND RICHMAN, *Processing Psychiatric Research Data*, DATA PROCESSING MAGAZINE, (January/February 1964).

[3] The legal problems are by no means limited to the area of copyright. For instance, the Nebraska Supreme Court was recently faced with the admissibility of taped records stored by electronic computer to establish book accounts, Transport Indemnity Co. v. Seib, 178 Neb. 253, 132 N.W.2d 871 (1965).

[4] See generally, INTERNATIONAL BUSINESS MACHINES CORPORATION, *General Information Manual, Introduction to IBM Data Processing Systems* (1960); BERNSTEIN, THE ANALYTICAL ENGINE: COMPUTERS—PAST, PRESENT, AND FUTURE (1963); LEEDS & WIENBERG, COMPUTER PROGRAMMING FUNDAMENTALS (1961).

puter processing operation is furnished by the output section, usually in a way that can be read, such as ordinary printed sheets. The storage unit is an electronic filing cabinet where data fed into the machine is kept for reference. Instructions or programs which direct the internal functions of the computer can also be stored in this section of the computer. The remaining basic part of a computer is the controlling center of the system, the central processing unit. This unit comprises the arithmetic-logical unit and the control console. The former does the actual mathematical operation, while the latter can be used to direct the entire computer system manually. The central processing unit performs such operations as addition, subtraction, and comparison and directs the computer system to operate as a single machine.

Since the computer is really only a high speed calculator, contrary to many science fiction stories, it is necessary to direct its actions. This requires a computer program. A program specifies what actions a computer takes, and may be defined as a plan or routine for solving a problem on a computer, comprising both instructions and source data.

In writing a program it is usually necessary to first make a flow chart or a block diagram. These are pictorial representations of the "flow" of the mathematical and logical steps necessary to solve a problem. These diagrams symbolically illustrate the logical and arithmetic operations in the program. From this logical statement of the problem, the program is then reduced to a code. Cards or punched tape are prepared from the code sheet and fed into the machine. For simplification and ease, programs are generally not written in a language directly readable by the machine, but rather in one of a number of symbolic languages or mnemonics which are easier to understand than the machine language. These languages also have the advantage that they can be similar for different machines. The programs are then translated by the machine into machine language. The program languages have odd, colorful names, usually abbreviated, such as FORTRAN and COBOL.[5] Thus, the computer program may take a number of forms, but it basically represents symbolically a programmer's solution to a particular problem, a work product of an obvious proprietary nature. It has been estimated that two billion dollars is spent annually in developing programs, indicating that programming is "big business" and deserving of some sort of protection. What then can be done to protect this work product?

The best type of protection and most obvious would, of course, be under the patent laws.[6] A patent gives the inventor, his heirs or assigns,

[5] FORTRAN (Formula Translation) is a problem-oriented language which is expressed mathematically. COBOL (Common Business Oriented Language) utilizes business English to express statements to the machine.

[6] Title 35, United States Code.

the exclusive right to make, use and sell the subject of his invention throughout the United States for a term of 17 years.[7] Such protection, although desirable, is currently not available to the developer of a program.[8] The United States Patent Office is presently taking the position that a computer program is not within the statutory classes[9] and therefore does not define patentable subject matter. Additionally, the Patent Office is taking the position that a program consists of mathematics or an "idea," or is "in the area of thought" and as such is not eligible for patent.[10] There are compelling arguments that can be made that a program is a "process," since a process under 35 U.S.C. § 100(b) includes a new use of a known machine. A few cases[11] and writers[12] support patentability on one theory or another, but the present position of the Patent Office is against it. Therefore, until legislation or a court decision settles the matter by reversing the present position of the Patent Office, the programmer is still in a dilemma.

The next logical solution, outside of attempting to keep developments a trade secret,[13] is to look to the copyright law. Does a computer program meet the requisites of the copyright law? To determine this, it is first necessary to see if a program is a "writing" of an author and whether it comes within the terms of the statutory grant by the Government for a period of time.

The Copyright Office in regard to this question states in a recent publication[14] that registrability is a doubtful question, but in accordance with the policy of resolving doubtful issues in favor of the applicant, a program will be considered for registration. Apparently the Copyright Office is leaving the ultimate determination of the question of copyrightability for the courts.

SUBJECT MATTER OF A COPYRIGHT

Generally

There has been a gradual increase in the types of creative works

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[7] 35 U.S.C. § 154 (1952).

[8] See JACOBS, *Patent Protection of Computer Programs*, 47 J. PAT. OFF. SOC'Y. 6 (1965).

[9] 35 U.S.C. § 101 defines patentable inventions as ". . . any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof. . . ."

[10] See Vol. 141, No. 6, PATENT TRADEMARK AND COPYRIGHT WEEKLY REPORTS, at III (1964).

[11] *Ex parte* Squires, 133 USPQ 598 (Pat. Off. Bd. App. 1961); *Ex parte* Egan, 129 USPQ 23 (Pat. Off. Bd. App. 1960).

[12] JACOBS, *supra* note 8 and 9.

[13] For a discussion of the problem within the common law relating to unfair competition, see WESSEL, *Legal Protection of Computer Programs*, HARV. BUS. REV. (March/April 1965).

[14] Copyright Office, Cir. 31D (Jan. 1965).

which are copyrightable, from the first U. S. Copyright Statute of 1790[15] to the present statute,[16] which proclaims in Section 4 that "The works for which a copyright may be secured in this title shall include all the writings of an author." "Writing," however, is not restricted to the literal sense of the word but "can be defined as an original creative work of the intellect expressed in tangible form."[17] As was stated by the Supreme Court, writings include "all forms of writing, painting, engraving, etching, etc., by which the *ideas* in the mind of the author are given *visible expression*. . . ."[18] It would seem that under this broad concept a computer program would qualify as a form of writing, as the test is apparently not so much the form as whether the subject is a creation of the intellectual power of the author, expressed in tangible form.

There are several kinds of works which do not qualify for a copyright and which could be made the basis for objecting to a copyright on a computer program. Broadly, these are "Tools, Implements, Devices and Similar Articles of Functional Utility"[19] which normally are outside the scope of copyright protection. The denial of copyright protection to these materials is based upon a leading case,[20] and rests upon the proposition that they are "works designed for recording information which themselves do not teach or convey information." In *Taylor Instrument Co. v. Frawley-Brost Co.*,[21] plaintiff's charts for use in conjunction with a recording thermometer were denied copyrightability in Class "(i) Drawings or plastic works of a scientific or technical character."[22] The court said such a chart was clearly within the realm of patent protection and that the chart had no copyright status as it was a mechanical part of the recording device. The chart neither explained nor conveyed any information. A later case[23] approved the *Taylor* case and said that the real information given by such charts would be placed on the charts by the stylus of the recorder's pen after the machine was put in operation and that the chart itself conveyed no information.

A computer program would seem to fall outside the prohibition of these cases, since they were based upon the principle that the works conveyed no information but rather only received information as part of a mechanical operation. This is not true of a computer

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[15] Act of May 31, 1790, ch. 15, 1 Stat. 124.
[16] Title 17, United States Code.
[17] RINGER AND GITLIN, COPYRIGHTS (Practicing Law Institute) at 7 (1965).
[18] Burrow-Giles Lithographic Co. v. Sarony, 111 U.S. 53, 58 (1884).
[19] HOWELL, THE COPYRIGHT LAW (Second Edition 1948). This is one of six broad categories the author considers non-copyrightable.
[20] Baker v. Selden, 101 U.S. 99 (1879).
[21] 139 F.2d 98 (7th Cir. 1943).
[22] 17 U.S.C. § 5(i) (1947).
[23] Brown Instruments Co. v. Warner, 161 F.2d 910 (D.C. Cir. 1947).

program. It contains and imparts information to the machine; it tells the machine what to do by designating an operation and a corresponding operand; and it provides reference information to be used by the computer in the solution of problems.

Form of program

As has been discussed, writing a computer program requires a number of steps, and depending on the stage of preparation, a program may take the form of a deck of punched cards, magnetic or punched tape, or may be formulated as a block diagram, flow sheet, or code. The form of the program may be highly significant in determining the copyrightability of a particular program. A program which is fed into a machine as cards may be printed out by a high speed printer in a visible form, including numerals, symbols, and special characters. This printed version would seem easily copyrightable, as there is no difficulty in considering it a "writing" within the copyright law.

Similarly, there is little problem in finding a block diagram or a flow sheet as the proper subject of a copyright as they are merely schematic in form and represent a pictorial statement of the process. Flow diagrams are common to the scientific and engineering fields, and are often used by chemical and civil engineers. Clearly under Section 5 of the Copyright Law[24] such technical drawings are copyrightable. The Regulations of the Copyright Office clearly support this view,[25] as does the case law.[26]

The other physical forms that a computer program may assume present a more difficult problem. On the basis of existing procedure, a punched deck of cards or tape, a roll of magnetic tape, or similar representations, would probably be denied copyright protection. In and of themselves such forms of information are meaningless to the average reader. Even giving a most sweeping interpretation to *Burrow-Giles Lithographic Co. v. Sarony*,[27] which rejected a literal interpretation of the term "writing" in the "copyright clause" of the United States Constitution,[28] one would not likely consider a pile of perforated cards, a few yards of sievelike paper tape, or a magnetized tape to be a "writing" of an author.[29]

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[24] 17 U.S.C. § 5(i) (1947).

[25] 37 C.F.R. § 202.12 (a) states "Works registrable (this class) include diagrams or models illustrating scientific or technical works . . . such as; for example: A mechanical drawing . . . an architect's blueprint . . . or an engineering diagram."

[26] Burndy Engineering Co. v. Penn-Union Elec. Corp., 25 F. Supp. 507 (W.D. Pa. 1938).

[27] 111 U.S. 53 (1884).

[28] U.S. CONST.; art. I, § 8.

[29] For a discussion of the definition of "writings" see *The Meaning of "Writings" in the Copyright Clause of the Constitution*, (Copyright Law Revision Study No. 3, Comm. Print 1960).

The courts or the Register of Copyrights could dispose of the contention that punched tapes or decks are the proper subject of a copyright by reference to several early cases dealing with music and piano rolls. In *White-Smith Music Publishing Co. v. Appollo Co.*,[30] the Supreme Court held that perforated player piano rolls did not infringe the plaintiff's musical copyright, saying that piano rolls are not intended to be read as ordinary pieces of sheet music. In *Kennedy v. McTammary*,[31] the court refused to enjoin defendant's manufacture and sale of perforated music rolls. The court said that perforated strips were "not made to be addressed to the eye as sheet music, but form part of the machine."[32] In *Aeolian Co. v. Royal Music Roll Co.*,[33] the court stated flatly that music rolls "are not strictly matters of copyright."[34] Thus it would appear at first glance that the card and tape forms of a program do not fit the statutory classes of copyright.

There are, however, persuasive arguments that the early cases relating to piano rolls are not applicable to the present case, at least as to punched cards and tape. First, proponents of copyrightability could urge a broad definition of section 8 of the Constitution, arguing that it should be interpreted broadly in light of new arts, and that a narrow interpretation would frustrate the constitutional intent. Second, a clear distinction could be pointed out between piano rolls and computer programs, in that the result of running a piano roll through its machine is a sound, while the result of the running of a program of punched cards or tape may be a physical, concrete result, e.g., a printed-out sheet with the operational results thereon.

Another, and perhaps more compelling argument, would be that the tests of the *Apollo* and *Burrow-Giles* cases are intelligibility and readability. The argument would go further; if punched cards and tapes can be "read," they are the proper subject of a copyright. A skilled programmer can decipher punched cards and relate the holes to a symbol; hence the cards and tapes are readable. This is not true with music rolls. Such an interpretation, the author submits, is an expansion, if not a distortion, of the constitutional term "writings," and such subtle differences would probably not be recognized and appreciated by the average nontechnically oriented court.

The reason for refusing registration would probably be that, however original and intellectual the program, it is not something ascertainable or intelligible by the eye of the average reader, and that, in view of *Burrow-Giles* and *National Tel. News Co. v. Western Union*,[35]

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[30] 209 U.S. 1 (1907).
[31] 33 Fed. 584 (C.C.D. Mass. 1888).
[32] *Ibid.*
[33] 196 Fed. 926 (W.D.N.Y. 1912).
[34] *Id.* at 927.
[35] 119 Fed. 294 (7th Cir. 1902).

Congress intended to exclude copyright protection to forms not of a literary or quasi-literary nature.

The Copyright Office is not considering such forms of a program as a writing. The office publication, Cir. 31D on Comuter Programs, states that a requirement for registration of a program is that "copies" in a form perceptible to the human eye have been made available to the public. This view is sound and supportable under the existing law.

Esoteric form

As has been mentioned, there is a "language barrier"[36] between the programmer and the machine. The programmer must translate the English language into terms understood by the machine. He may accomplish this by expressing his program in "machine language," or he may use a "program language." Machine language, such as binary coded decimal (BCD),[37] is arbitrary, and has no meaning except to the machine, while program language has meaning to the machine and the programmer.[38] The question then becomes whether the program is copyrightable when in one of these forms, which is visible and readable, but which makes no sense to the ordinary viewer.

This should not preclude registrability under the statute. Nothing in the statute limits copyrightable works to a particular language or form, and both the machine and program language forms would seem to meet the requirements that there must be a "writing" in tangible form and the work must be a product of creative authorship. Such a program is a writing, is creative, and conveys information, although the information is in a non-English form. In a similar situation a list of telegraphic code words to be used for a private cable code was the proper subject of a copyright.[39] Clearly then the esoteric form should be no bar to the copyrightability.

Thought

It has recently been reported[40] that the German Patent Office has ruled that a computer program is a "law of thought." Such a holding, if followed by the U. S. Patent Office, would definitely preclude patentability,[41] and similarly, such a holding by the Copyright Office

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[36] LEEDS, *supra* note 4 at 42.

[37] For example, the IBM 7040, 7090, and 7094 used this code. This method of programming is impractical and has given way to the easier procedural or machine languages.

[38] See text accompanying note 5 *supra*.

[39] American Code Co., Inc. v. Bensinger, 282 Fed. 829 (2d Cir. 1922).

[40] 141 PATENT TRADEMARK AND COPYRIGHT WEEKLY REPORTS, *op.cit. supra* note 10.

[41] "It is hornbook patent law that a patentee cannot claim a general idea . . . his invention, if invention it be, consists in the means he discloses and embodies in his claim. . . ." Dyer v. Sound Studios of New York, Inc., 85 F.2d 431, 432 (3rd. Cir. 1936).

would probably prevent copyrightability. In *Baker v. Selden*,[42] the Supreme Court held that the blank accounting forms in plaintiff's copyrighted book on accounting were not protected against unauthorized use. Similarly, shorthand writing systems[43] and rules to card games[44] have been denied copyright protection, the apparent rationale being that a copyright protects the expression of the idea and, although these various ideas and schems may be the result of much time, intellect, and money, the copyright statute is violated only when the mode of expression and not the essence is "copied."

It is submitted by the writer that a computer program is not a law of thought, and that this position is inaccurate and will not be followed by the Copyright Office. Obviously, a program involves mental concepts and is a scheme of thought to the extent that a program does the "thinking" for a computer; it gives the machine a series of instructions necessary to perform a given task and, additionally, supplies reference information. Nevertheless, there is authorship in the program as we have seen; a progarm is a tangible thing reduced to a visible form and is not merely an idea or thought in the sense of a purely abstract mental process.[45]

FORMALITIES

Publication

One requirement for the acquisition of a statutory copyright is that the work be published. What constitutes publication is the subject of numerous decisions and articles. Suffice it to say that publication is generally the offering of copies for public sale, with the authority of the author of the work.[46] This publication is the line of demarcation between common law rights and the statutory copyright.

The first "copy" of the program publicly disseminated must bear the notice.[47] This requirement is a prerequisite for consideration by the Copyright Office. Several interesting problems arise with respect to this requirement. What if the first public distribution of the program was in a form not readable by the average person and without the proper notice, and a subsequent form is made which is readable, such as a print-out, and which carries the proper notice? Is the prior distribution an abandonment of the common law rights? Reference

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[42] 101 U.S. 99 (1879).
[43] Brief English Systems, Inc. v. Owen, 48 F.2d 555 (2d Cir. 1931).
[44] Whist Club v. Foster, 42 F.2d 782 (S.D.N.Y .1929).
[45] Bristol v. Equitable Life Assurance Society of the United States, 132 N.Y. 264 (1892).
[46] 17 U.S.C. § 26 (1947).
[47] 17 U.S.C. § 10 (1947); White v. Kimmel, 94 F. Supp. 502 (S.D. Cal. 1950), *rev'd* 193 F.2d 744 (9th Cir. 1952).

for the answer to this question is again made to the celebrated case of *White-Smith v. Apollo.*[48] The Supreme Court, speaking through Mr. Justice Day, said that a "copy" was a "written or printed record — in *intelligible* notation." (Emphasis added.)[49] The view therein expressed is still apparently the majority view[50] but the holding has been attacked.[51] It would seem that the unintelligible form of a program is not a "copy," but the dilemma is not solved, as publication without the notice in an unreabable form might nevertheless destroy the common law rights.[52]

The only conclusion that can be drawn is that a perforated tape or punched cards published with the notice will probably not be sufficient to acquire the protection of the statutory copyright, while publication of this form without the notice may constitute an abandonment of the common law rights. The practical solution for the programmer-author to this vexing, unanswered problem would be to make certain all forms of the program carry an adequate copyright notice.

A related question is: what common law protection is afforded to the computer program prior to publication? This is an important consideration because many computer programs will never be published; thus, if there is to be any protection, the common law principles must be adhered to. The common law right has been expressly preserved by the copyright statute[53] and, in the absence of publication, is not limited in duration. This right includes "a property right in the products of man's creative mind, regardless of the form in which they took expression."[54] This broad language would seem to encompass the computer program. Nevertheless, the statutory right has distinct advantages over the common law right when an infringer is being sued.[55]

Copyright notice

Since the statutory copyright is a legislative creature, strict compliance with the statute is required. Failure to comply with the notice

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[48] *Supra,* note 30.

[49] *Id.* at 17.

[50] See Capitol Records, Inc. v. Mercury Records Corp., 221 F.2d 657 (2d Cir. 1955); Yacoubian v. Carrol, 74 U.S.P.Q. 257 (S.D. Cal. 1947); Miller v. Goody, 139 F. Supp. 176 (S.D.N.Y. 1956).

[51] See McIntyre v. Double-A Music Corp., 166 F. Supp. 681 (S.D. Cal. 1958); Mills Music v. Cromwell Music, 126 F. Supp. 54 (S.D.N.Y. 1954); Shapiro, Bernstein & Co. v. Miracle Record Co., 91 F. Supp. 473 (N.D. Ill. 1950).

[52] For a discussion of the problem see STRAUSS, *Protection of Unpublished Works* (Copyright Law Revision Study No. 29, Comm. Print 1960).

[53] 17 U.S.C. § 2 (1947).

[54] White v. Kimmel, 94 F. Supp. 502, 504 (S.D. Cal. 1950).

[55] A Statutory Copyright Confers:
(a) Federal Jurisdiction under 28 U.S.C. §§ 1338 and 1400.
(b) Prescribed remedies under 17 U.S.C. §§ 101 and 116.
(c) Prima facie presumption in favor of the registrant under 17 U.S.C. §§ 209 and 210.

requirement[56] of the present copyright law is fatal. Specifically, the Copyright Office requires that

> (b) The program has 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 have been distributed or made available to the public.[57]

The notice prescribed must contain either the word "copyright" or its abbreviation, or the © symbol, the name of the owner, and the date if a "printed literary, musical, or dramatic work."[58]

The most difficult problem that this notice requirement presents to the programmer is where to place the notice. If the first published copy is in the form of a printed-out sheet, it would be a simple matter to affix the proper notice thereon. However, what if the first "published" form is a machine readable tape, or cards? As has been mentioned, even though card or tape forms of the program may not be copyrightable in themselves, loss of the common law rights might occur if a program were published in card or tape form without compliance with the notice requirement. Therefore, safe practice demands that the notice be affixed. It would be burdensome to require notice on each card, and a roll of tape presents a question similar to the repetitive design problem.

If a deck of cards is looked upon as a book or printed publication, one notice on the first card would be sufficient. Courts have apparently retreated, in the case of repetitive design, from the early case of *DeJong & Co. v. Breuker & Kessler Co.*[59] and recent decisions have indicated a reasonable test under the circumstances.[60] As the court said in *Peter Pan Fabrics, Inc. v. Dixon Textile Corp.*[61]

> (3) The printing of the notice of copyright on the selvage is sufficient in the absence of defendant's showing that notice could have been embodied in the design without impairing the market value . . . .[62]

Thus, the courts could take a liberal view of the requirement and hold that notice printed regularly and repeatedly on a roll of tape would be sufficient, even though the tape was rolled and the notice was obscured. One patent attorney suggests "There is no reason why the provisions of

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[56] 17 U.S.C. §§ 10, 19, 20 (1947).
[57] Copyright Office Cir. 31D (b) (Jan. 1965).
[58] *Ibid.*
[59] 235 U.S. 33 (1914).
[60] See *e.g.*, Peter Pan Fabrics, Inc. v. Dixon Textile Corp., 280 F.2d 800 (2d Cir. 1960), *on remand*, 188 F. Supp. 235 (S.D.N.Y. 1960); Peter Pan Fabrics, Inc. v. Martin Weiner Corp., 274 F.2d 487 (2d Cir. 1960).
[61] 188 F. Supp. 235 (S.D.N.Y. 1960).
[62] *Id* at 238.

the copyright statute concerning notice cannot be amended to cover all types of computer programs."[63] This is probably the only satisfactory solution.

Deposit

As a condition precedent to the bringing of an action for infringement, the copyrighted material must be deposited with Copyright Office. Section 13 of the Act provides in part:

> After copyright has been secured by publication of the work with the notice of copyright as provided in section 10 of this title, there shall be promptly deposited in the Copyright Office . . . two complete copies of the best edition thereof then published . . . . .

Seemingly, the only problem presented with respect to the legal necessity for deposit is the requirement that the deposited copies be the best edition then published. There are only a few cases defining the term "best edition," but it would seem that if the program has been published with the required notice in different forms including a tape or card form, the latter would not be the best edition within the statutory requirement.

The Copyright Office has anticipated this problem and has provided it will only consider registration when:

> (c) The copies deposited for registration consist of or include reproduction in a language intelligible to human beings. If the first publication was in a form [such as machine readable tape] that cannot be perceived visually or read by humans, something more [such as a print-out of the entire program] must be deposited along with two complete copies of the program as first published.[64]

Class of Registration

Finally, the deposited copies must be accompanied by "a claim of copyright." In practice this is done by filing a completed form, along with a statutory fee.[65] This application must specify in which class the copyrighted work belongs.[66] This division into classes "is primarily an administrative procedure to enable the Copyright Office to perform its task in an orderly fashion, including the publication of a Catalogue of Copyright Entries in conformity with the classes mentioned."[67]

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[63] SIEDEL, *Antitrust and Copyright Law Implications of Computer Technology*, 44 J. PAT. OFF. SOC'Y 2 (1962).
[64] Cir. 31D, *op.cit. supra* note 57.
[65] 17 U.S.C. § 215 (1947).
[66] 17 U.S.C. § 5 (1947).
[67] HOWELL, *op.cit. supra* note 18 at 15.

An error by claimant in classification will not invalidate or impair the coyright protection secured under the Act.[68] Although there is great discretion in the Register to refuse a registration certificate when he believes the claim of copyright invalid, he may not refuse registration of the material merely because he disagrees with the author as to how it should be classified.[69] Thus, the validity of the copyright is not affected by registration in the wrong class but nevertheless, to avoid a conflict with the Register, the work should be fitted into one of the thirteen categories best suited to the type of work.

There are only two classes in the thirteen listed in Section 5 that could conceivably embrace a computer program: these are class "(a) Books . . ." and class "(i) Drawings or plastic works of a scientific or technical character." Copyright Circular 31D takes the position that a computer program is properly in class (a) and states as a condition that "(d) An application for registration is submitted on Form A as a 'book' . . . ." The fact that there may be a question as to the inclusion of a program is indicated by the use of quotes with the word "book." "Book" in the Act is an all-inclusive term and "is not to be understood in its technical sense of a bound volume, but any species of publication which the author selects to embody his literary product."[70] Accordingly, pamphlets, directories, pictorial matter, and compilations of all sorts are within the purview of the term. Thus, in the broad sense a program, be it in the form of a flow sheet, block diagram, print-out, or written in symbolic form, would be a "book" as it would constitute the intellectual production of a person.

Class (i) might also be applicable. This group extends to such things as engineering and mechanical drawings, graphic charts, and anatomical models. Whether a work is technical apparently is determined by the use to which it is to be put.[71] A computer program for a technical or scientific use might well fit into the category. The only case in point is *Korzybski v. Underwood*[72] in which the court, although refusing a copyright, admitted that this class would be proper for a diagram illustrating thought processes. Surely a computer program of a technical nature, at least in the form of a flow diagram or block diagram, could be construed to be in the group.

At any rate the question is more academic than practical, for, as noted, the classification has no bearing on the validity of the registration.

Protection

Presuming that copyright protection is granted to the systems

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[68] 17 U.S.C. § 5 (1947).
[69] See Bouve v. Twentieth Century-Fox Film Corp., 122 F.2d 51 (D.C. Cir. 1941).
[70] Holmes v. Hurst, 174 U.S. 82, 89 (1899).
[71] Brock v. Nat'l. Electric Supply Co., 186 O.G. 985 (1911).
[72] 36 F.2d 727 (2d Cir. 1929).

analyst and programmer, what is the extent of that protection? The answer to this question will hold little solace "as unlike a patent, a copyright gives no exclusive right to art disclosed; protection is given only to expression of the idea — not the idea itself."[73] This rule is so well established that in *Baker v. Selden*[74] the Supreme Court held that the copyright on a system of bookkeeping did not protect the system itself. A person, therefore, would not infringe the copyright on a computer program by utilizing a similar or even identical program if it was created by independent work.[75] The patent law, on the other hand, contains no such limitation and the innocent as well as the wilful would infringe a patent by making, using, or selling the patented machine, process, or product.[76]

Additionally, protection under the copyright law is limited because there is no exclusive right to practice the arts and methods described in the copyrighted work. This has led one recent writer to state:

> If any approach is available for the protection of the inventive concepts in computer programs, it is that provided by the patent system, which is designed to encourage inventors to make their inventions public in return for exclusive rights to them for a limited time; copyright protection, which is available, is at best limited to "copying" the details, which can assume many forms, and it would not cover the concepts or techniques employed in a program.[77]

The dilemma of an owner of a copyright on a computer program is as a practical matter not quite as bad as the foregoing would seem. If the chief proprietary value of the program is the approach to the problem taken by the programmer, it would be open to reasonably easy duplication without infringement by the second programmer. As long as the second programmer independently devised a program based on the same "approach" but using his own instructions, no infringement would result. The copyright gives no monopoly to the idea behind the program. However, the value of other types of programs resides not so much in the proprietary nature of the approach but rather in the reference information supplied. Here the value of the program is represented by the hours of gathering, compiling, and arranging the data. This would include programs for legal research and for medical diagnostic work, since, although the program itself is relatively simple, the information compiled is momentous. Here again the latecomer is free

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[73] Mazer v. Stein, 347 U.S. 201,217 (1953).
[74] 101 U.S. 99 (1879).
[75] Arnstein v. Edward B. Marks Music Corp., 82 F.2d 275 (2d Cir. 1936); Rochelle Asparagus Co. v. Princeville Canning Co., 170 F. Supp. 809 (S.D. Ill. 1959); Gordon v. Weir, 111 F. Supp. 117 (E.D. Mich. 1953).
[76] Thurber Corp. v. Fairchild Motor Corp., 269 F.2d 841 (5th Cir. 1959).
[77] JACOBS, *supra* note 8.

to compile the same program but to avoid infringement he must compile the information without appropriating the copyrighted program. In such a case, at least the work product of the programmer has been protected to some extent since the value therein cannot be directly "lifted." The situation is analogous to the case of copyrighted compilations which are entitled to protection. In *Jeweler's Circular Pub. Co. v. Keystone Pub. Co.*[78] the court held, in effect, that a directory was entitled to copyright protection and stated that a compiler produces by his labor a meritorious composition in which he may obtain a copyright, and thus obtain the exclusive right of multiplying copies of his work.

Another particularly interesting question arises in connection with the right "to translate the copyrighted work into other languages or dialects, or make any other version thereof, if it be, a literary work."[79] A literal reading of the foregoing language indicates that the copyright owner has the exclusive right to translate a program written, for example, in FORTRAN to any of the other program languages or forms. Certainly, this would constitute "translation" in its most literal sense, but it was never envisaged by the authors of this section of the law.

Logically, under section 1(a) of the statute, which gives the exclusive right "to print, reprint, publish, copy and vend the copyrighted work," reproduction of a copyrighted program in the form of punched tape or cards would infringe the copyright just as would reproduction of the printed sheet. Under the generally accepted definition of the word "copy" — that which, by ordinary observation, would be readily recognized by every person seeing it as having been copied — this would be true. However, application of the *Apollo* holding that a music roll is not a "copy" of the work itself could bring about a different result.

Obviously, such a result is not desirable, and perhaps a court would look to other sections of the statute upon which to base a finding of infringement. Perhaps section 1(b), in prohibiting the making of another "version" of the copyrighted work, would be broad enough to cover these other forms of the original program. The courts could also, in the case of a reproduction made on magnetic tape, look to section 1(e) of the statute. Here, language giving the copyright owner the exclusive right "to make or procure the making of any transcription or record thereof by or from which, in whole or part, it may in any manner be . . . produced, or reproduced . . . ," might be held to preclude such a reproduction, but again, such an interpretation is certainly not what the framers of this section had in mind.

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[78] 281 Fed. 83 (2d Cir. 1922).
[79] 17 U.S.C. § 1 (b) (1947).

Conclusion

Clearly the programmer is entitled to some form of legal protection for his efforts. Failure to grant him this protection will result in an injustice to him personally and, most important, society will be injured, because the result will be the supression of the free flow of technical information and ideas. The problem concerning what form of protection is available is not easily solved because, as Professor Chafee observed in his often cited article,[80] a dilemma is created when copyright law does not keep pace with the advance of science and industry. Science has created a new tool in the computer, and now the legal field must come to grips with the accompanying legal problems. A computer program is presently a "square peg" which does not fit the "round holes" of existing statutory and case law. It cannot be made to fit the patent notch and thus copyright law is the only remaining statutory protection available for the proprietary rights therein.

The existing statutes and cases make placement difficult under the copyright law, but a computer program, in one of several forms, should by copyrightable. Questions arise as to what constitutes infringement of such a copyrighted program. When faced with a similar situation in regard to music rolls, Congress enacted sections 1(e) and 101(e) to meet the problem. It is submitted that Congress can meet the situation and obey its constitutional mandate "to Promote the Progress of Science and Useful Arts" by legislation. The most expedient thing would be to declare that computer programs in all forms are copyrightable and that all forms constitute "copies" within the meaning of the act.[81] Without such legislation, the courts in coming years will be faced with many problems in interpreting existing copyright statutes and cases with respect to computer programs.

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[80] CHAFEE, *Reflections on the Law of Copyright*, 45 COL. L. REV. 719 (1945).

[81] See H.R. 11947, 88th Congress, 1st session (1964). This Rule included sections which could answer the question of copyrightability of computer programs. Two pertinent sections of the bill are as follows:

§ 1. Subject matter of copyright: in general

Copyright protection subsists, in accordance with this title, in original works of authorship fixed in any tangible medium of expression, now known or later developed, from which they can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device . . . .

§ 54. Definitions

"Copies" are material objects, other than phonorecords, in which a work is fixed or reproduced 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 . . . .