COMMENTS

A PROPOSAL FOR THE INTERNATIONAL INTELLECTUAL PROPERTY PROTECTION OF COMPUTER SOFTWARE

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1. INTRODUCTION

With services becoming a more significant part of the U.S. economy, the importance of obtaining adequate intellectual property protection for computer software becomes increasingly critical. The U.S. computer software industry estimates that its annual losses from piracy are between ten and twelve billion dollars.[1] It is thus not surprising that U.S. software companies are increasingly concerned with the pirating of their products overseas and are taking action to protect their intellectual property.[2]

The problems of providing adequate protection of computer software are complex. Computer software, which has creative and functional characteristics, does not fit easily into the

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[1] *See Computer Industry Recommends Tax Changes, Says Clinton Plan Would Hurt R&D, Exprorts*, 10 Int'l Trade Rep. (BNA) 507 (Mar. 24, 1993) (estimate of the Business Software Alliance); *see also* Michael J. Miller, *Bought any Software Recently?*, PC MAG., Mar. 16, 1993, at 81, 82 (the Software Publishers Association estimates that piracy in the United States cost software companies $1.2 billion in 1991, down from $2 billion in 1990).

[2] Among other actions, U.S. software companies have initiated raids of companies where they suspect pirated software is being used. *See, e.g.*, James Cox, *Bootlegging Billions; U.S. Loses Ground in Crackdown*, USA TODAY, Mar. 9, 1993, at 1B; Rami Grunbaum, *Software Firms Draw Bead on Corporate Pirates*, J. BUS. SPOKANE, Aug. 15, 1991, at 17; *Computer Alliance Raids Software Pirates*, UPI, May 22, 1991, *available in* LEXIS, Nexis Library, UPI File; *Microsoft, Autodesk Spur Raids Against Pirates in Brazil*, UPI, May 6, 1991, *available in* LEXIS, Nexis Library, UPI File; Terence Finan, *Corporate Hunt on for Software Copyright Violators*, UPI, May 1, 1991, *available in* LEXIS, Nexis Library, UPI File.

existing intellectual property framework. Most nations, including the United States, protect software under copyright law. The international copyright law framework consists of two international agreements, the Berne Convention for the Protection of Literary and Artistic Works[3] (the "Berne Convention") and the Universal Copyright Convention[4] (the "Universal Convention"). The protection of computer software is problematic under these conventions because of several shortcomings of copyright law and the specific provisions of these conventions.

This Comment argues that a new approach is necessary to achieve the appropriate international level of protection for computer software. A workable approach could be developed through software-specific modifications to U.S. copyright law, but this solution would create problems on the international level. A better approach would include computer software in the current round of negotiations under the General Agreement on Tariffs and Trade ("GATT").[5] Such approach would achieve uniform protection and would balance the interests of the developed countries and those of the developing countries.

Section 2 examines U.S. copyright law and analyzes its shortcomings as it has been applied to the protection of computer software. Section 3 discusses the existing international framework for the protection of computer software by examining the Berne Convention and the Universal Convention and the ongoing negotiations on intellectual property in the current round of the GATT. Section 4 proposes *sui generis*[6] computer software protection law, negotiated and

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[3] Berne Convention for the Protection of Literary and Artistic Works of Sept. 9, 1886, completed at Paris on May 4, 1896, revised at Berlin on Nov. 13, 1908, completed at Berne on Mar. 20, 1914, revised at Rome on June 2, 1928, revised at Brussels on June 26, 1948, revised at Stockholm on July 14, 1967, and revised at Paris on July 24, 1971, 828 U.N.T.S. 221 [hereinafter Berne Convention].

[4] Universal Copyright Convention, revised on July 24, 1971, 25 U.S.T. 1341, 943 U.N.T.S. 178 [hereinafter Universal Convention]. The original draft was signed in Geneva on Sept. 6, 1952, 6 U.S.T. 2731, 216 U.N.T.S. 132.

[5] General Agreement on Tariffs and Trade, *opened for signature* Oct. 30, 1947, 61 Stat. A3, 55 U.N.T.S. 187 [hereinafter GATT].

[6] *Sui generis* is defined as "[o]f its own kind or class." BLACK'S LAW DICTIONARY 1434 (6th ed. 1990). When utilized in a discussion of intellectual property, it refers to an approach designed to apply to a specific

implemented in the GATT, which addresses the shortcomings of copyright law and of the existing international framework.

2. PROTECTION OF COMPUTER SOFTWARE UNDER U.S. COPYRIGHT LAW

In the United States, computer software is primarily protected by copyright law.[7] The protection is in the form of a legal right that allows the developer to prevent the unauthorized copying of the protected computer software. Intellectual property law is an attempt to balance the incentives necessary to encourage creative activity with the desire to allow the public to benefit from creative activity. To encourage an optimal level of software development, the law must assure developers that they will be compensated for their efforts.

2.1. Copyright Law and Computer Software

In 1975, the U.S. Congress authorized the formation of the Commission on New Technological Uses of Copyrighted Works ("CONTU").[8] CONTU's mandate was to study the intellectual property issues raised by computer software and other new technologies and to propose changes to the intellectual property laws.[9] CONTU submitted its final report to the U.S. Congress in 1978.[10] CONTU recommended several changes to the 1976 Copyright Act, including the recognition of computer software as subject matter eligible for protection.[11]

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technology.

[7] This Comment focuses on copyright law because it is the dominant form of protection for computer software. Other laws may be used to protect computer software. *See* Donald S. Chisum, *The Patentability of Algorithms*, 47 U. PITT. L. REV. 959 (1986) (patent law); David Bender, *Protection of Computer Software: The Copyright/Trade Secret Interface*, 47 U. PITT. L. REV. 907, 915 (1986) (trade secret law); *see also* Jonathan M. Moses, *When Copyright Law Disappoints, Software Firms Find Alternatives*, WALL ST. J., May 4, 1993, at B6 (contract, trade secret and patent law).

[8] *See* Pub. L. No. 93-573, § 201, 88 Stat. 1873 (1975).

[9] *Id.*

[10] *See* NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS, FINAL REPORT OF THE NATIONAL COMMISSION ON NEW TECHNOLOGICAL USES OF COPYRIGHTED WORKS (July 31, 1978).

[11] CONTU recommended that:

> The new copyright law should be amended 1) to make it explicit that computer programs, to the extent that they embody an author's

In 1980, the U.S. Congress amended the Copyright Act to include computer software as protectable subject matter.[12]

2.1.1. Protectable Subject Matter

A copyright exists in original works of authorship and attaches when the work is fixed in a tangible medium of expression.[13] Works of authorship include literary works.[14] Because they are "expressed in words, numbers or other verbal or numerical symbols or indicia," computer programs qualify as literary works and thus qualify as works of authorship.[15]

A copyright protects the expression of an idea but does not protect the idea itself.[16] The subject matter of copyright

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original creation, are proper subject matter of copyright; 2) to apply to all computer uses of copyrighted programs by the deletion of present Section 117; and 3) to assure that the rightful possessors of copies of computer programs can use or adapt these copies for their use.

Id. at 2.

[12] Pub. L. No. 96-517, § 10, 94 Stat. 3015, 3028 (1980) (codified at 17 U.S.C. §§ 101, 117 (1988)). Copyright protection extends to software where the program is written in source code, readable by humans, machine-readable object code, or etched into a semiconductor chip. *See* Midway Mfg. Co. v. Strohon, 564 F. Supp. 741, 749 (N.D. Ill. 1983).

[13] The statute provides: "Copyright protection subsists . . . in original works of authorship fixed in any tangible medium or 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." 17 U.S.C. § 102(a) (Supp. III 1991). A work is fixed "in a tangible medium of expression when its embodiment in a copy . . . by or under authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration." 17 U.S.C. § 101 (1988).

[14] 17 U.S.C. § 102(a)(1) (Supp. III 1991). The statute provides: " 'Literary works' are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects . . . in which they are embodied." 17 U.S.C. § 101 (1988). Audiovisual works are "works that consist of a series of related images which are intrinsically intended to be shown by the use of machines or devices . . . together with accompanying sounds, if any, regardless of the nature of the material objects . . . in which the works are embodied." *Id.*

[15] The statute provides: "A 'computer program' is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result." 17 U.S.C. § 101 (1988).

[16] The statute provides: "In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form

extends to derivative works.[17] Copyright protection does not extend to scenes a faire.[18]

2.1.2. Rights Granted to the Developer and Infringement

The statute grants the copyright owner the exclusive right (1) to reproduce the copyrighted work in copies, (2) to prepare derivative works based on the copyrighted work, (3) to distribute copies of the copyrighted work to the public, (4) to perform the copyrighted work publicly, and (5) to display the copyrighted work publicly.[19] The rights to reproduce, to prepare derivative works, and to distribute copies are the most important rights to developers of computer software because they allow the commercial exploitation of the software.

For a copyright owner to prove that the copyrighted work was infringed, the copyright owner must show that the alleged infringer violated one of the exclusive rights granted by the statute.[20] The doctrine of substantial similarity enables a copyright owner to prove infringement by establishing that the allegedly infringing work is substantially similar to the copyrighted work; proof of direct copying is not required.[21]

Two statutory limitations are applicable to copyrights in

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in which it is described, explained, illustrated or embodied in such work." *Id.* 102(b). *See* Baker v. Selden, 101 U.S. 99, 104 (1879) (distinguishing the unprotected art from the protected expression).

[17] *See* 17 U.S.C. § 103 (1988). The statute provides:

> A "derivative work" is a work based upon one or more preexisting works, such as a translation, musical arrangement, dramatization, fictionalization, motion picture version, sound recording, art reproduction, abridgment, condensation, or any other form in which a work may be recast, transformed, or adapted. A work consisting of editorial revisions, annotations, elaborations, or other modifications, which, as a whole, represent an original work of authorship, is a "derivative work."

Id. § 101.

[18] *See* Alexander v. Haley, 460 F. Supp. 40, 45 (S.D.N.Y. 1978). Scenes a faire are "incidents, characters or settings which are as a practical matter indispensable, or at least standard, in the treatment of a given topic." *Id.*

[19] 17 U.S.C. § 106 (Supp. III 1991).

[20] *Id.* § 501(a).

[21] *See* E.F. Johnson Co. v. Uniden Corp. of America, 623 F. Supp. 1485, 1492 (D. Minn. 1985) ("Because direct evidence of copying is often unavailable, copying may be inferred where two elements are proven: (1) that defendant had access to the copyrighted work, and (2) that the accused work is substantially similar to the copyrighted work.").

computer software. The fair use of a copyrighted work is a defense to a claim of copyright infringement.[22] The statute also allows the owner of a copy of a computer program to make another copy provided that the copy is created as an essential step in the utilization of the computer program or that the copy is for archival purposes only.[23]

2.1.3. Duration of Protection

The duration of a copyright depends on the type of the work. In general, the duration of a copyright is the life of the author and fifty years after the death of the author.[24] If the

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[22] The statute provides:

> Notwithstanding the provisions of section 106 and 106A, the fair use of a copyrighted work, including such use by reproduction in copies . . . or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use, the factors to be considered shall include—
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> (1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;
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> (2) the nature of the copyrighted work;
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> (3) the amount and substantiality of the portion used in relation to the copyrighted work as a whole; and
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> (4) the effect of the use upon the potential market for or value of the copyrighted work.
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> The fact that a work is unpublished shall not itself bar a finding of fair use if such finding is made upon consideration of all the above factors.

17 U.S.C.A. § 107 (West Supp. 1993).

[23] The statute provides:

> Notwithstanding the provisions of section 106, it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
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> (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
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> (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.

17 U.S.C. § 117 (1988).

[24] *Id.* § 302(a). The duration of a copyright in a joint work is the life of

work is a work made for hire, then the duration of the copyright is seventy-five years from the year of the first publication of the work or one hundred years from the year of the creation of the work, whichever expires first.[25]

2.1.4. Formalities

Copyright formalities include notice, registration and deposit requirements.

Because copyright subsists in original works of authorship fixed in a tangible medium of expression, the copyright owner of works first published on or after March 1, 1989 does not need to include a copyright notice.[26] Inclusion of a copyright notice will defeat a defense of innocent infringement, however.[27]

A copyright owner may register the copyright in a work

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the last surviving author and fifty years after the death of such last surviving author. *Id.* § 302(b). A joint work is "a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole." *Id.* § 101.

[25] *Id.* § 302(c). The statute provides:

> A "work made for hire" is—
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> (1) a work prepared by an employee within the scope of his or her employment; or
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> (2) a work specially ordered or commissioned for use as a contribution to a collective work, as part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test, or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire.

Id. § 101.

[26] *Id.* § 401(a).

[27] *Id.* § 401(d). The form of the notice consists of (1) the symbol ©, or the word "Copyright" or the abbreviation "Copr.", (2) the year of the first publication of the work, and (3) the name of the copyright owner. *See id.* § 401(b). The notice shall be affixed to the copies in such manner and location as to give reasonable notice of the claim of copyright. *See id.* § 401(c). For works reproduced in machine-readable copies, like computer programs, the notice may be (1) embedded in the copies in machine-readable form in such a manner that on visually perceptible printouts, it appears either with or near the title or at the end of the work, (2) displayed at the user's terminal at sign on, (3) continuously on terminal display, or (4) legibly reproduced durably, so as to withstand normal use, on a label securely affixed to the copies or to the container used as a permanent receptacle for the copies. *See* 37 C.F.R. § 201.20(g) (1992).

with the Copyright Office, but is not required to do so.[28] There are three incentives for registration, however. First, registration will ensure prima facie validity of the copyright.[29] Second, registration is a prerequisite to an action for infringement of works of U.S. origin.[30] Third, statutory damages and attorney's fees may be awarded only if registration is made prior to the commencement of the infringement.[31]

The copyright owner is required to deposit two complete copies of the best edition of the work published in the United

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[28] *See* 17 U.S.C. § 408(a) (1988). The deposit requirements for registering a computer program depend on whether or not the computer program contains trade secrets.

If the computer program does not contain trade secrets, then the registrant must send one copy of identifying portions of the source code (first and last 25 pages) reproduced in a form visually perceptible without the aid of a machine or device together with the page containing the copyright notice, if any. If the program is a revised version and the revisions are not contained in the first and last 25 pages, then the registrant must send 50 pages representative of the revised material in the new program and the page containing the copyright notice for the revised version, if any. If the program is less than 50 pages long, then the registrant must send the entire source code. If the registrant is unwilling or unable to deposit source code, then the registrant must state in writing that the work as deposited in object code contains copyrightable authorship. *See* 37 C.F.R. § 202.20(vii)(A)(1) (1992).

If the computer program contains trade secrets, then the registrant must include a cover letter stating that the computer program contains trade secrets and the page containing the copyright notice, if any. If the computer program is entirely new or is a revised version with the revisions present in the first and last 25 pages, then the registrant must include either (1) the first and last 25 pages of source code with portions containing trade secrets blocked out, (2) the first and last 10 pages of source code alone, with no blocked out portions, (3) the first and last 25 pages of object code plus any 10 or more consecutive pages of source code, with no blocked-out portions, or (4) for programs 50 pages or less in length, the entire source code with portions containing trade secrets blocked out. If the computer program is a revised version and if the revisions are not present in the first and last 25 pages, then the registrant must include either 20 pages of source code containing the revisions with no blocked out portions or any 50 pages of source code containing the revisions with some portions blocked out. The blocked out portions must be proportionately less than the material remaining and the visible portion must represent an appreciable amount of original computer code. *See id.* § 202.20(vii)(A)(2).

[29] 17 U.S.C. § 410(c) (1988).

[30] 17 U.S.C. § 411(a) (Supp. III 1991).

[31] *Id.* § 412.

States within three months of the date of publication.[32] Copies deposited with the Library of Congress in fulfillment of the mandatory deposit requirement may be used to satisfy the registration requirements.[33]

2.1.5. Remedies for Infringement

A copyright owner may seek temporary and permanent injunctions.[34] The copyright owner may request that the court impound the allegedly infringing copies and the equipment used to make them pending resolution of the litigation.[35] As part of its final judgment or decree, the court may order that the copies and equipment be destroyed.[36]

An infringer may also be held liable for either actual damages and additional profits or statutory damages.[37] If the copyright owner elects actual damages, then the copyright owner is entitled to recover the actual damages caused by the infringement and any profits of the infringer that are attributable to the infringement and that are not taken into account in computing the actual damages.[38] If the copyright owner elects statutory damages, then the infringer is liable for a sum of not less than $500 or more than $20,000 per work.[39] If the infringement was willful, then the court may increase the award to not more than $100,000.[40] If the infringement was innocent, then the court may decrease the award to not less than $200.[41]

In a civil action, the court may allow the recovery of full costs by or against any party other than the United States or an officer thereof and may award a reasonable attorney's fee to the prevailing party as part of the costs.[42]

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[32] 17 U.S.C. § 407(a) (1988).
[33] *Id.* § 408(b).
[34] *Id.* § 502.
[35] *Id.* § 503(a).
[36] *Id.* § 503(b).
[37] *Id.* § 504(a).
[38] *Id.* § 504(b).
[39] *Id.* § 504(c)(1).
[40] *Id.* § 504(c)(2).
[41] *Id.*
[42] *Id.* § 505.

Willful infringement of a copyright for commercial advantage or private financial gain subjects the infringer to fines and imprisonment.[43] In the case of criminal infringement, the court must order the forfeiture and destruction of all infringing copies and all equipment used in their manufacture.[44]

2.2. Objections to Using Copyright Law to Protect Computer Software

Several commentators have criticized the use of copyright law to protect computer software.[45] Other commentators have argued that copyright law is an appropriate way to protect computer software.[46] Those opposed to the use of copyright law to protect computer software have raised five objections.

2.2.1. Disclosure Objection

The premise of the disclosure objection to using copyright law to protect computer software is that the registration of computer software in machine-readable object code does not

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[43] *Id.* § 506(a); 18 U.S.C.A. § 2319 (West Supp. 1993).

[44] 17 U.S.C. § 506(b) (1988).

[45] *See, e.g.*, Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663 [hereinafter Samuelson, *CONTU Revisited*]; Pamela Samuelson, *Creating a New Kind of Intellectual Property: Applying the Lessons of the Chip Law to Computer Programs*, 70 MINN. L. REV. 471 (1985) [hereinafter Samuelson, *Creating a New Kind of Intellectual Property*]; Max W. Laun, Comment, *Improving the International Framework for the Protection of Computer Software*, 48 U. PITT. L. REV. 1151 (1987); Howard K. Szabo, Comment, *International Protection of Computer Software: The Need for Sui Generis Legislation*, 8 LOY. L.A. INT'L & COMP. L.J. 511 (1986).

[46] *See, e.g.*, Leo J. Raskind, *The Uncertain Case for Special Legislation Protecting Computer Software*, 47 U. PITT. L. REV. 1131, 1134 (1986) ("It is the thesis of this Article that the criticisms of the existing scheme of copyright protection, while valid in many respects, have not shown persuasively that copyright protection of software should be abandoned."); Duncan M. Davidson, *Common Law, Uncommon Software*, 47 U. PITT. L. REV. 1037, 1071-80 (1986); Marla R. Bloch, Note, *The Expansion of the Berne Convention and the Universal Copyright Convention to Protect Computer Software and Future Intellectual Property*, 11 BROOK. J. INT'L L. 283 (1985) (the existing international copyright conventions are adequate to protect computer software).

result in meaningful disclosure.[47] The Copyright Office allows the deposit of machine-readable computer programs in object code.[48] Object code is the computer language that communicates with the hardware; it appears as a series of ones and zeros. Because object code is not intelligible to humans, it does not disclose the ideas expressed by the computer software.

The U.S. Constitution grants Congress the power to "promote the Progress of Science and the useful Arts, by securing for limited Times, to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."[49] The promotion of progress is best served by disclosure of an author's ideas and expression. If protection were granted without sufficient disclosure of an author's ideas and expression, then the author would receive protection but the public would not benefit from the promotion of progress through disclosure. U.S. courts, however, have held that computer software registered in machine-readable form is copyrightable because communication with a human audience is not required by the statute.[50]

2.2.2. Utilitarian Objection

The utilitarian objection to using copyright law to protect computer software is based upon the policy of denying copyright protection to utilitarian works.[51] Computer software is inherently functional because it allows the user to achieves some task and thus does more than convey information.

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[47] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 705-25; Laun, *supra* note 45, at 1164-65. *But see* Raskind, *supra* note 46, at 1139-43 (disclosure is not an integral part of the policy of copyright protection).

[48] For the deposit rules for computer programs, see *supra* note 28.

[49] U.S. CONST. art. I, § 8, cl. 8.

[50] *See, e.g.*, Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1247-48 (3d Cir. 1983), *cert. dismissed per stipulation*, 464 U.S. 1033 (1984); Williams Elecs., Inc. v. Artic Int'l, Inc., 685 F.2d 870, 876-77 (3d Cir. 1982).

[51] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 727-49; Laun, *supra* note 45, at 1165-66; *but see* Raskind, *supra* note 46, at 1143-48 (utilitarian character of computer software is not a disabling condition for protection; rather, it is another reason why the protectable elements in software must be identified).

The extension of copyright law to protect utilitarian works blurs the line between copyright and patent systems.[52] The relative advantage of copyright protection over patent protection would be increased.[53]

2.2.3. *Writing Objection*

The writing objection to using copyright law to protect computer software states that computer software does not meet the U.S. Constitution's "writing" requirement.[54] The U.S. Constitution empowers Congress to give "authors" a limited term of protection for their "writings" to promote the progress of science.[55] Computer software functionally replaces hardware.[56] Therefore, computer software does more than convey information and anything that does more than convey information does not qualify as a writing.[57]

2.2.4. *Duration Objection*

The duration objection to the use of copyright law to protect computer software is based on the belief that the term of protection granted by the copyright law is too long for computer software.[58] A long term of protection is acceptable for a work that conveys information but is not acceptable for useful works, such as computer software, because the public has a strong interest in having access to useful works. Additionally, because of the rapid rate of software development, many protected computer programs will have little

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[52] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 735-36; Laun, *supra* note 45, at 1166.

[53] "Copyright is already more advantageous by virtue of its lower standard of originality or creativity than patent, the greater ease and lesser expense and delay involved in getting a copyright registration certificate than in getting a patent, and its longer duration." Samuelson, *CONTU Revisited*, *supra* note 45, at 722 (citations omitted).

[54] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 732-33; Laun, *supra* note 45, at 1167.

[55] See *supra* note 49 and accompanying text.

[56] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 673; Samuelson, *Creating a New Kind of Intellectual Property*, *supra* note 45, at 509-10.

[57] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 733.

[58] *See id.* at 734-35; Laun, *supra* note 45, at 1167-68; *but see* Davidson, *supra* note 46, at 1079 ("The long term of copyright is largely irrelevant to software, rather than an impediment to competition.").

commercial value by the time the copyright term of protection expires.[59] A term of protection that exceeds the commercial life of a product is unnecessary to provide an incentive to develop and therefore the term of protection granted by copyright law is too long for computer software.

2.2.5. Procedural Objection

The procedural objection is based upon a belief that Congress did not understand the specific issues raised by copyright protection of computer software when it passed the 1980 amendments to the Copyright Act of 1976.[60] Congress did not understand these issues because CONTU did not have the expertise to evaluate them.[61]

2.3. Judicial Difficulties in Applying Copyright Law to Computer Software

In addition to the five objections discussed above, courts have had some difficulty in applying the doctrines of copyright law to computer software. Courts have been unable to strike the optimal balance between providing a sufficient incentive to develop software and not providing too much protection. Courts have granted protection to elements of computer software that do not warrant protection. This result arises from an improper application of the idea/expression dichotomy to computer software. The idea/expression dichotomy states that the copyright in a work protects the expression of an idea but does not protect the idea.[62] Courts have had trouble in separating the idea of a computer program from the expression of the idea. This difficulty is reflected in the willingness of some courts to grant software developers too much protection in two particular areas of computer software. The first area is the application of copyright law to the structure of a computer program.[63] The second is the application of copyright law to

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[59] *See* Raskind, *supra* note 46, at 1153 ("Given the rapid rate of innovation in the production of software programs, a shorter term of protection seems warranted.").

[60] *See* Samuelson, *CONTU Revisited*, *supra* note 45, at 699.

[61] *See id.*

[62] *See, e.g.*, Baker v. Selden, 101 U.S. 99 (1879).

[63] *See* Whelan Assoc's., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222

the user interface of a computer program; the user interface is the way in which the user interacts with the computer program.[64]

Congress can balance the interests implicated by the protection of computer software better than the federal courts can. A *sui generis* law passed by Congress would reflect this ability to balance interests.

3. THE EXISTING INTERNATIONAL FRAMEWORK FOR THE PROTECTION OF COMPUTER SOFTWARE

The international framework addresses intellectual property in several ways.[65] The Berne Convention and the Universal Convention are international agreements on copyright law. Because intellectual property is an increasingly important component of international trade, it is a topic in the Uruguay Round of the GATT, the current round of negotia-

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(3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987). (holding that the structure, sequence and organization of a program is copyrightable expression); *see also* Suzanne R. Jones, Note, Whelan Associates v. Jaslow Dental Laboratory: *Copyright Protection for the Structure and Sequence of Computer Programs*, 21 LOY. L.A. L. REV. 255 (1987) (proposing the addition of a scenes a faire requirement to the *Whelan* idea/expression test); *but see* Computer Assoc's. Int'l, Inc. v. Altai, Inc., 982 F.2d 693 (2d Cir. 1992) (applying a abstraction-filtration-comparison test); Thomas J. Smedinghoff, *Developments in Software Copyright Law*, 3 SOFTWARE L.J. 637 (1990) (noting that *Whelan* ignores that the structure, sequence and organization of a computer program may be dictated by external constraints).

[64] *See* Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37 (D. Mass. 1990) (granting copyright protection to the user interface of Lotus 1-2-3); *see also* Gerard J. Lewis, Jr., Comment, Lotus Development Corp. v. Paperback Software International: *Broad Copyright Protection for User Interfaces Ignores the Software Industry's Trend Toward Standardization*, 52 U. PITT. L. REV. 689 (1991) (standardization is consistent with the public interest goal of the Copyright Act and with the goal of private rewards for product developers); Craig A. Laidig, Note, Lotus *Leaves Software Copyright in a Dream State: Defining Protection of the User Interface Following* Lotus Development Corp. v. Paperback Software International, 24 LOY. L.A. L. REV. 1301 (1991) (offering a modified analysis to more clearly define the scope of protection for software); *but see* Ashton-Tate Corp. v. Ross, 728 F. Supp. 597 (N.D. Cal. 1989), *aff'd*, 916 F.2d 516 (9th Cir. 1990) (holding that user interface commands are uncopyrightable ideas).

[65] *See generally* Werner Meng, *GATT and Intellectual Property Rights - The International Law Framework*, *in* LIBERALIZATION OF SERVICES AND INTELLECTUAL PROPERTY IN THE URUGUAY ROUND OF GATT 57 (Giorgio Sacerdoti ed., 1990).

tions.[66]

3.1. The International Copyright Conventions

The two major international copyright conventions are the Berne Convention[67] and the Universal Convention.[68] The Berne Convention, drafted at the International Convention for the Protection of Literary and Artistic Works in 1886, was formed "for the protection of the rights of authors in their literary and artistic works."[69] The Universal Copyright Convention is the second major multilateral agreement providing for the protection of copyrights.

The current international framework of protecting computer software through international copyright conventions is subject to three criticisms. First, the copyright conventions do not explicitly address computer software. Second, the copyright conventions provide for national treatment, which is particularly problematic if a nation grants authors moral rights in their works. Third, the copyright conventions grant terms of protection that are too long for computer software.

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[66] The Ministers of the GATT contracting parties established a negotiating group on Trade Related Aspects of Intellectual Property ("TRIPS"). The Ministers charged the negotiating group with the following mandate:

> In order to reduce the distortions and impediments to international trade, and taking into account the need to promote effective and adequate protection of intellectual property rights, and to ensure that measures and procedures to enforce intellectual property rights do not themselves become barriers to legitimate trade, the negotiations shall aim to clarify GATT provisions and elaborate as appropriate new rules and disciplines.
>
> Negotiations shall aim to develop a multilateral framework of principles, rules and disciplines dealing with international trade in counterfeit goods, taking into account work already undertaken in GATT.

Marshall A. Leaffer, *Protecting United States Intellectual Property Abroad: Toward a New Multilateralism*, 76 IOWA L. REV. 273, 277 (1991) (citing Punta del Este Ministerial Declaration, *reprinted in* A. Jane Bradley, *Intellectual Property Rights, Investment, and Trade in Services in the Uruguay Round: Laying the Foundation*, 23 STAN. J. INT'L L. 57, 59 (1987)).

[67] Berne Convention, *supra* note 3.

[68] Universal Convention, *supra* note 4.

[69] Berne Convention, *supra* note 3, art. 1.

3.1.1. Is Computer Software Protectable?

Although computer software appears to be protectable under both the Berne Convention and the Universal Convention, the protection is not explicit.[70] Because the protection is not explicit, computer software developers cannot be sure that computer programs will be protected. Even if it is conclusively determined that the copyright conventions protect computer software, their substantive terms are subject to criticism.

3.1.2. National Treatment

Both the Berne Convention and the Universal Convention provide for national treatment.[71] National treatment means

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[70] Article 2 of the Berne Convention states that "The expression 'literary and artistic works' shall include every production in the literary, scientific and artistic domain, whatever may be the mode or form of its expression." *Id.* art. 2. Article 2 then lists examples of 'literary and artistic works' without mentioning computer software. Thus, the "absence of limits on expression may be taken as an explicit confirmation of the fact that the machine-readable computer program is a work protected under the Convention." Manfred Kindermann, *Computer Software and Copyright Conventions*, 3 EUR. INTELL. PROP. REV. 6, 8 (1981); *see also* Laun, *supra* note 45, at 1155; Szabo, *supra* note 45, at 521-22.

Article I of the Universal Convention states that "Each Contracting State undertakes to provide for the adequate and effective protection of the rights of authors and other copyright proprietors in literary, scientific and artistic works, including writings . . . ." Universal Convention, *supra* note 4, art. I. Computer software can reasonably be considered a scientific writing and thus subject to protection under the Universal Convention. *See* Marie Francoise Gilbert, Comment, *International Copyright Law Applied to Computer Programs in the United States and France*, 14 LOY. U. CHI. L.J. 105, 109-10 (1982); *see also* Laun, *supra* note 45, at 1157; *but see* Szabo, *supra* note 45, at 524 (concluding that computer software is not protectable under the Universal Convention).

[71] Article 3(1)(a) of the Berne Convention provides that "The protection of this Convention shall apply to: (a) authors who are nationals of one of the countries of the Union, for their works, whether published or not . . . ." Berne Convention, *supra* note 3, art. 3(1)(a). Article 5 further provides that "[a]uthors shall enjoy, in respect of works for which they are protected under this Convention, in countries of the Union other than the country of origin, the rights which their respective laws do now or may hereafter grant to their nationals . . . ." *Id.* art. 5(1).

Article II of the Universal Convention provides that "Published works of nationals of any Contracting State and works first published in that State shall enjoy in each other Contracting State the same protection as that other State accords to works of its nationals first published in its own territory . . . ." Universal Convention, *supra* note 4, art. II.

that member nations must treat non-nationals the same as they treat nationals.

National treatment creates uncertainty as to the extent of protection granted to computer software by a given country.[72] For computer software to be protected, two conditions must be satisfied. First, the country where the computer software was developed and the country where enforcement is being sought must be parties to one of the international copyright conventions.[73] Second, the law of the country where enforcement is sought must protect computer software.[74] The country where enforcement is sought, although a member of one or both international copyright conventions, may not protect computer software. A computer software developer would receive no protection in such a country. Alternatively, the extent of the protection granted by the country where enforcement is sought may not be clear.

Even if both of the conditions are satisfied and the country where enforcement is sought clearly grants protection to computer software, national treatment is problematic because it results in inconsistent results. The rights of the computer software developer will depend on the country in which enforcement is sought.

The principle of national treatment is particularly problematic if a member nation grants authors moral rights in their works.[75] Moral rights are incompatible with works that are predominantly utilitarian, such as computer software. They grant the author the power to control the use of the author's work, which limits the value of the work to owners of copies, particularly if the work is utilitarian. The right of an author

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[72] *See* Laun, *supra* note 45, at 1176.

[73] *See id.* at 1151-52.

[74] *See id.* at 1152.

[75] *See id.* at 1152, 1177-78. Moral rights include the rights of an author:

> [t]o be known as the author of his work; to prevent others from being named as the author of his work; to prevent others from falsely attributing to him the authorship of work which he has not in fact written; to prevent others from making deforming changes in his work; to withdraw a published work from distribution if it no longer represents the view of the author; and to prevent others from using the work or the author's name in such a way as to reflect on his professional standing.

2 MELVILLE B. NIMMER, NIMMER ON COPYRIGHT § 8.21[A] (1992).

to withdraw a work is particularly troubling because "[a]llowing a programmer to withdraw his software could be devastating to those who have used, and become dependent on the program."[76]

National treatment is problematic because it results in uncertain and inconsistent protection of computer software, particularly with respect to nations that grant authors moral rights in their works.

3.1.3. Term of Protection

The Berne Convention provides for a term of protection equal to the life of the author plus fifty years.[77] The Universal Convention provides that the term of protection shall not be less than the life of the author plus twenty-five years.[78] These terms of protection are too long for computer software.[79] Computer software is utilitarian and thus does more than convey information. The rapid rate of development in the industry results in computer software becoming obsolete quickly and therefore a long term of protection does not provide an additional incentive to developers.[80]

3.2. The General Agreement on Tariffs and Trade

The GATT is the most important international agreement regulating international trade.[81] The GATT is based on five fundamental principles:

> (1) the most favored nation principle (contracting parties must give unconditional most favored nation treatment to the products of other contracting parties);
>
> (2) the national treatment principle (contracting

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[76] Laun, *supra* note 45, at 1178.

[77] Berne Convention, *supra* note 3, art. 7(1). The Berne Convention allows the member countries to grant a term of protection longer than the life of the author plus fifty year's after the author's death. *Id.* art. 7(6).

[78] Universal Convention, *supra* note 4, art. IV(2)(a). The Universal Convention also provides for a 25 year term of protection measured from the date of first publication in certain circumstances. *Id.* art. IV(2)(a) and (b).

[79] *See* Laun, *supra* note 45, at 1178-79.

[80] *See supra* section 2.2.4; *infra* section 4.1.3.

[81] Leaffer, *supra* note 66, at 298 (ninety countries, accounting for over eighty percent of world trade, subscribe to the GATT).

> parties may not impose more onerous internal taxes or regulations on imported products than [they do] on similar domestic products);
>
> (3) the tariff concession principle (contracting parties must maintain customs duties on imported products at levels not more than those specified in the latest applicable schedules that the party has filed);
>
> (4) the principle against nontariff barriers (contracting parties should not use quantitative and other nontariff barriers to restrict trade);
>
> (5) the fair trade principle (contracting parties should not promote exports through subsidies or dumping and may defend domestic industries from such unfair practices only through the use of reasonable, proportionate tariff measures).[82]

The GATT does not contain any substantive law dealing with intellectual property.[83]

Because the GATT is a contract among member nations, it can be amended. Amendments of Articles I, II and XXIX require unanimous acceptance while amendments of other provisions require a two-thirds majority of all contracting parties.[84] Amendments bind only those contracting parties which accept them.[85] These requirements will allow developing countries to defeat any efforts to include a standard approach to the protection of computer software. There are, however, other instances in which GATT provisions have been

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[82] *Id.* at 299.

[83] *See* Jean M. Dettmann, Comment, *GATT: An Opportunity for an Intellectual Property Rights Solution*, 4 TRANSNAT'L LAW. 347, 361 (1991). Two provisions of the GATT address intellectual property. Article IX states that marks of origin should not be used to hamper international trade. *See* GATT, *supra* note 5, art. IX. Article XX(d) states that member countries can adopt and enforce measures necessary to secure compliance with laws which are not inconsistent with the GATT, including the protection of patents, trademarks, and copyrights, and the prevention of deceptive trade practices. *See id.* art. XX(d).

[84] *Id.* art. XXX.

[85] *Id.* One observer has noted that this is "a potentially untidy arrangement." Friedl Weiss, *TRIPS in Search of an Itinerary: Trade Related Intellectual Property Rights and the Uruguay Round Negotiations*, *in* LIBERALIZATION OF SERVICES AND INTELLECTUAL PROPERTY IN THE URUGUAY ROUND OF GATT 87, 110 (Giorgio Sacerdoti ed., 1990).

interpreted in a variety of ways.[86] A contracting party could argue that another contracting party's laws protecting intellectual property upsets its "reasonable expectations as to the balance of rights and obligations and commercial opportunities between them . . . ."[87] Additionally, under Article XXV, contracting parties can take joint action with respect to facilitating the operation and furthering the objectives of the GATT.[88]

4. A Proposal for the Negotiation and Implementation of an International *Sui Generis* Computer Software Protection Law in the GATT

Because of the shortcomings of copyright law and the Berne Convention and the Universal Convention, a *sui generis* law protecting computer software should be negotiated and implemented in the GATT.

4.1. Substantive Provisions of a Sui Generis Law

The substantive provisions of the law will have to address the following issues: the subject matter warranting protection, the rights of the developer, the term of protection, and the remedies for infringement.

4.1.1. Protectable Subject Matter

The law should protect the expression of the idea throughout the development process, from design papers through source code to the object code. Microcode, which is a last level of instructions to the hardware, should also be protected from copying. The standard for protection should be that of originality as opposed to novelty.[89] This aspect of the *sui generis* law is similar to that of copyright law. If the allegedly infringing program is substantially similar to the protected program, then the owner of the protected program has been harmed.

Developers should not be able to protect the structure of a

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[86] *Id.*

[87] *Id.*

[88] GATT, *supra* note 5, art. XXV.

[89] Laun, *supra* note 45, at 1182.

computer program because of the way in which computer software is developed. Computer software is developed in a modular object-oriented approach which means that the structure of the program is often dictated by the purpose of the program.

The *sui generis* law should not protect user interfaces. Because there appears to be a standardization on a window-based system, which is currently the most efficient system for users to interact with their computers, developers should not be able to protect user interfaces. Although the lack of protection for user interfaces would appear to discourage the development of user interfaces, the market alone provides a sufficient incentive. A developer that reaches the market with a significantly superior user interface would be rewarded quickly because users consider how easy it is to use a piece of computer software to be a significant factor in choosing software.

The law should protect application programs, which are computer programs that perform a particular function.[90] Examples of application programs include wordprocessing, spreadsheet, database, graphics programs, and games. These should be protected to provide incentives to develop new applications as well as to protect incremental improvements in current applications.

The law should protect operating systems, which are programs that act as the interface between the application program and the hardware.[91] Operating systems require a significant investment. Currently, there is also a move towards a standardization of operating systems, so that the incentive to develop new operating systems is reduced.

The computer software should receive protection regardless of the form of storage. It should not matter that the computer program is stored on magnetic or optical media or in ROM.[92]

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[90] *See generally* Samuelson, *CONTU Revisited*, *supra* note 45, at 679-82.

[91] *See generally id.* at 678-79.

[92] ROM is an acronym for Read Only Memory; information (the computer program) stored in ROM will not be lost when the power is turned off. Information stored in RAM, an acronym for Random Access Memory, is lost when the power source is turned off. U.S. courts have interpreted U.S. copyright law to protect computer software encoded on a ROM chip. *See, e.g.*, Apple Computer, Inc. v. Franklin Computer Corp., 714 F.2d 1240, 1249 (3d Cir. 1983), *cert. dismissed per stipulation*, 464 U.S. 1033 (1984).

4.1.2. Rights Granted to the Developer and Infringement

The *sui generis* law should only grant economic rights to the developer. The law should grant the computer software developer the right to prevent unauthorized copying of the software. Additionally, the computer software developer should have the right to prevent the marketing of programs that are substantially similar to the one protected. The law should not grant moral rights to the developer.[93]

Users of legitimately acquired software should be able to make one copy for archival purposes and should be able to modify the software for their own needs. These rights limit the value of the protection to the software developer but not to such an extent as to discourage software development.

The law should specifically allow reverse engineering.[94] Reverse engineering is the process by which the source code of a piece of software is discovered by working backward from the object code. Permitting reverse engineering will allow other software developers to understand the ideas of a program and develop their own programs. As long as these programs are not substantially similar, then they are not infringing the reverse-engineered product.

The law should allow the limited use of protected computer software for research and teaching.[95]

4.1.3. Duration of Protection

Because of the characteristics of computer software, a shorter term of protection than that granted by the U.S. copyright law[96] and the international copyright conventions[97] is warranted. Two features of computer software development justify a shorter term of protection for computer

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[93] *See supra* notes 75-76 and accompanying text.

[94] The U.S. Court of Appeals for the Ninth Circuit has held that reverse engineering may be protected by the fair use defense of copyright law. *See* Sega Enterprises Ltd. v. Accolade, Inc., 977 F.2d 1510 (9th Cir. 1992); Atari Games Corp. v. Nintendo of America, Inc., 975 F.2d 832 (9th Cir. 1992). *see also* Gary R. Ignatin, Comment, *Let the Hackers Hack: Allowing the Reverse Engineering of Copyrighted Computer Programs to Achieve Compatibility*, 140 U. PA. L. REV. 1999 (1992).

[95] *See* Laun, *supra* note 45, at 1183.

[96] *See supra* notes 24-25 & 58-59 and accompanying text.

[97] *See supra* notes 76-80 and accompanying text.

software. First, the development of computer software occurs at a high rate. Second, the development of computer software occurs incrementally. Thus, a given version of a product will become obsolete in a relatively short period of time and no longer warrant protection. Users not needing the state of the art will then be able to utilize an obsolete version of a product without fear of sanction. Other developers will be able to examine the original developer's ideas and possibly improve upon the product without having to develop many of the features on his or her own.

The Semiconductor Chip Protection Act[98] ("SCPA") provides a basis for comparison. Because the development of computer software usually parallels the development of new microprocessors, which are covered by the SCPA, the term of protection for computer software should be no longer than that granted to semiconductor mask works, which is ten years under the SCPA.[99] Because their products will likely become obsolete within ten years, software developers should not object to the shortening of the term of protection. A ten-year term of protection should be sufficient to balance the interests of developers and the public, both in developed and in developing countries.[100]

A shorter term of protection should be more acceptable to developing countries. A shorter term of protection will allow developing countries and their citizens to purchase state-of-the-art software and then distribute it widely when its protection expires. This will generate revenue for software developers while lessening the costs to developing countries of utilizing computer software to further their economic development. By the time the term of protection has expired, the software will no longer be state-of-the-art.

4.1.4. Formalities

With respect to formalities, the *sui generis* law should track the current U.S. copyright law. Notice and registration should be permissive and deposit should be mandatory. The deposit requirements should require the deposit of source code to

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[98] 17 U.S.C. §§ 901-914 (1988).

[99] *Id.* § 904.

[100] *See* Laun, *supra* note 45, at 1182.

enhance disclosure.[101] Developers that include a notice and register their computer software should receive similar procedural benefits as provided by the U.S. copyright law.

4.1.5. Remedies for Infringement

The *sui generis* law should provide for the recovery of actual damages, which would be based on the profits generated by sales lost to the infringer's version or copy. The infringer should be required to account for its profits. The new law should also provide for injunctive relief.

In cases of intentional infringement, the infringer should be subject to punitive damages; this is necessary to discourage mass copying, which is a significant problem in many developing countries.

The law should allow the court to grant a prevailing software developer attorney's fees. This enhances the ability of smaller software developers to protect their software more effectively.

4.2. Negotiation and Implementation in the GATT

When dealing with the piracy of computer software developed by U.S. developers, the United States has several choices.[102] First, the United States can take unilateral action and impose trade sanctions on countries that inadequately protect U.S. computer software.[103] Second, the United States can attempt to negotiate bilateral agreements with countries that provide for the protection of U.S. computer software. Third, the United States can attempt to use the international copyright conventions to obtain increasing protection through national treatment.[104] Finally, the United States can also attempt to use the GATT as a forum for the

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[101] *Id.*

[102] *See* Dettmann, *supra* note 83, at 353-59.

[103] One commentator has characterized this approach as the pragmatic or "carrot and stick" approach. Thomas Dreier, *National Treatment, Reciprocity and Retorsion—The Case of Computer Programs and Integrated Circuits, in* GATT OR WIPO? NEW WAYS IN THE INTERNATIONAL PROTECTION OF INTELLECTUAL PROPERTY 63, 73-74 (Friedrich-Karl Beier & Gerhard Schricker eds., 1989).

[104] This has been referred to as the traditional or idealistic approach. *Id.* at 74.

resolution of issues involving the pirating of U.S. computer software.

> Of prime importance for the future stability of international trade in this field would be the ability of signatories to resolve disputes via the existing GATT dispute settlement machinery. This would provide a clear and effective alternative to the pursuit of trade complaints via unilateral and bilateral action with their potential for escalation.[105]

Amending the GATT to provide for the protection of computer software would provide a set of uniform standards and a dispute resolution system.

Developing countries argue that minimum standards ignore the level of technological development of a particular country.[106] Given the importance of the protection of computer software and other intellectual property to the United States, however, developing countries should realize that they may be subject to unilateral action if they do not provide adequate protection of computer software. Additionally, the increased protection of intellectual property in general may:

> (1) create jobs in primary and supporting industries, (2) enhance labor force quality through on-the-job training, (3) encourage multinational corporations to transfer up-to-date technologies to developing countries, (4) shift jobs to higher productivity areas, (5) increase a develop-

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[105] John Slaughter, *TRIPs: The GATT Intellectual Property Negotiations Approach their Conclusion*, 12 EUR. INTELL. PROP. REV. 418, 419 (1990).

[106] One commentator has noted that:

> [t]he balance between the competing interests of assuring wide dissemination of technological advances ... and of promoting temporary monopolies to inventors in order to allow them financial awards ... has always been settled in a given national context, taking into account the level of technological development of a given country. This balance is being turned in favour of a multilateral system involving strong minimum standards of intellectual property protection which evades completely the need of maintaining an equilibrium of rights and obligations of holder of IPRs [Intellectual Property Rights].

Paulo Roberto de Almeida, *The "New" Intellectual Property Regime and its Economic Impact on Developing Countries*, *in* LIBERALIZATION OF SERVICES AND INTELLECTUAL PROPERTY IN THE URUGUAY ROUND OF GATT 74, 84 (Giorgio Sacerdoti ed., 1990).

> ing country's capital stock, (6) enhance the quality of capital through innovation, (7) improve the allocation of the capital stock, (8) expand activities subject to economies of scale, (9) improve local economic efficiency, (10) lower the cost of producing existing products, and (11) spur the production of new products.[107]

A strong case for uniform protection of computer software exists because computer software development is not capital-intensive. Software developers of developing countries can thus enter the international software market easier than many other markets.

4.2.1. Advantages of the GATT

The *sui generis* law should be negotiated and implemented in the GATT. "The GATT provides a flexible yet weak institutional structure for remedying problems of international trade."[108] There are several issues requiring resolution before the GATT framework can be utilized and computer software can be adequately protected. The GATT will need to be amended to provide for intellectual property protection of computer software.[109] Once the GATT has been amended to provide for protection, it will be necessary to decide who should determine the substantive standards and what those substantive standards should be.[110] The law should take the form articulated above.[111]

Alternatively, an international computer software protection law could be negotiated and implemented through the World Intellectual Property Organization ("WIPO"). WIPO is a special agency of the United Nations that administers the Berne Convention.[112] The GATT provides a forum for negoti-

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[107] Alden F. Abbott, *Developing a Framework for Intellectual Property Protection to Advance Innovation, in* INTELLECTUAL PROPERTY RIGHTS IN SCIENCE, TECHNOLOGY, AND ECONOMIC PERFORMANCE: INTERNATIONAL COMPARISONS 311, 333-34 (Francis W. Rushing & Carole Ganz Brown eds., 1990).

[108] Leaffer, *supra* note 66, at 302.

[109] *See id.* at 303-04.

[110] *See id.* at 304-06.

[111] *See supra* section 3.

[112] *See* Leaffer, *supra* note 66, at 292-93. The United Nations Educational, Scientific and Cultural Organization, from which the United States has

ations and an enforcement mechanism, unlike either of the copyright conventions.[113] WIPO also lacks the power to force a state to exercise its own law.[114] GATT also may provide another advantage over WIPO. GATT's framework of negotiations is greater than that of WIPO. This increases the chances of success because there are more issues on which the parties can compromise.[115] Additionally, with more issues subject to negotiation, the formation of negotiating blocks will be less likely because countries whose interests are concurrent with respect to intellectual property may not have similar interests with respect to other issues.[116]

A *sui generis* law containing provisions reflecting the policies discussed above would address the shortcomings of the international copyright conventions.

4.2.2. Disadvantages of the GATT

a. The Problem of National Treatment

Like the Berne Convention and the Universal Convention, the GATT provides for national treatment.[117] For a *sui generis* law to be an improvement over the current framework, the law must provide for uniform treatment of computer software by members. The *sui generis* computer software protection convention could be negotiated and implemented within the framework of the GATT. By providing uniform treatment of computer software, a *sui generis* law adopted by

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withdrawn, administers the Universal Convention. *Id.* 293 n.95.

WIPO has proposed a draft treaty and a model law for the protection of computer software. *See* Manfred Kindermann, *The International Copyright of Computer Software: History, Status and Developments*, *in* 24 COPYRIGHT 201, 202-04 (Apr. 1988) (noting that the idea of special protection secured by an international treaty failed to win acceptance); *see also* Laun, *supra* note 45, at 1159-62 (observing that the WIPO model law did not suffer from the problem of national treatment but that it did provide for too long a term of protection and did grant rights that were too broad).

[113] *See* Leaffer, *supra* note 66, at 300-01.

[114] Weiss, *supra* note 85, at 112.

[115] Ulrich Joos & Rainer Moufang, *Report on the Second Ringberg Symposium*, *in* GATT OR WIPO? NEW WAYS IN THE INTERNATIONAL PROTECTION OF INTELLECTUAL PROPERTY 1, 35 (Friedrich-Karl Beier & Gerhard Schricker eds., 1989).

[116] *Id.*

[117] *See* GATT, *supra* note 5, art. III.

each of the GATT member nations would provide computer software developers with a guaranteed level of protection, regardless of where the alleged infringement is prosecuted. Because intellectual property protection is already being discussed in the current round of negotiations, this approach would not require any major modifications to the GATT.

b. Other Disadvantages

There may be several disadvantages to including intellectual property in the GATT negotiations instead of leaving it to WIPO. First, the negotiators of GATT do not have the expertise of WIPO negotiators.[118] Second, there is a concern that including intellectual property in the GATT will duplicate the efforts of WIPO.[119] Third, some observers have expressed a concern that WIPO, the Berne Convention, and the Universal Convention would lose their force as the international framework for the protection of intellectual property.[120] Fourth, some observers believe that including intellectual property in GATT would have anti-competitive effects.[121]

These disadvantages do not outweigh the benefits of including the negotiation and implementation of a *sui generis* convention in the GATT.

4.3. Potential Problems with the Negotiation and Implementation of a Computer Software Protection Law in the GATT

There are several potential problems with the negotiation and implementation of a computer software protection law in the GATT.

The U.S. software industry is resisting any change because its members feel that they can successfully lobby the U.S. government to impose trade sanctions on countries where their products are not adequately protected. Independent of whether United States unilateral trade action is consistent with the GATT, this approach is short-sighted and demonstrates a lack of appreciation for the needs of developing

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[118] *See* Joos & Moufang, *supra* note 115, at 32.

[119] *See id.*

[120] *See id.* at 33-34.

[121] *See id.* at 34.

countries. There is a possibility that the U.S. dominance of the software industry will be weakened and that the United States will become a significant importer of computer software.

On the other hand, developing countries believe that they need modern technology to develop their economies but they do not want to pay what they perceive to be extortionate prices. They do not accept the argument of developed countries that the only way to succeed is to attract investment by providing intellectual property protection.[122]

Additionally, some observers believe that the current international system is adequate for the protection of computer software. They believe that the implementation of a *sui generis* computer software protection law would entail too much negotiation over the details and might lead to results contrary to the best interests of some of the parties.[123] Given the incremental nature of computer software development, however, the international copyright conventions, which confer widespread coverage, may deter efforts to reach consensus on the scope and duration of protection for computer software.[124]

5. CONCLUSION

This Comment has attempted to demonstrate the necessity for a *sui generis* law for the protection of computer software, negotiated and implemented in the GATT, because of the inadequacies of copyright law as applied to the protection of computer software and because of the inadequacies of the existing international framework for the protection of computer software. The application of copyright law to computer

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[122] For a significant part of its history, while it was developing into an industrialized nation, the United States ignored intellectual property laws of other countries "on the grounds that it was freely entitled to foreign works to further its social and economic development." Office of Technology Assessment, *Intellectual Property Rights in an Age of Electronics and Information* 228 (1986).

[123] *See* Anne Wells Branscomb, *Computer Software: Protecting the Crown Jewels of the Information Economy*, *in* INTELLECTUAL PROPERTY RIGHTS IN SCIENCE, TECHNOLOGY, AND ECONOMIC PERFORMANCE: INTERNATIONAL COMPARISONS 47, 55 (Francis W. Rushing & Carole Ganz Brown eds., 1990).

[124] *See id.* (citing Dennis S. Karjala, *United States Adherence to the Berne Convention and Copyright Protection of Information-Based Technologies*, 28 JURIMETRICS J. 147 (1988)).

software has significant shortcomings. The Berne Convention and the Universal Convention are inadequate because they look to the copyright laws of member nations, because they provide for national treatment, and because they provide for a term of protection that is too long for computer software. Because the GATT has advantages over the World Intellectual Property Organization, the GATT is a superior framework for the negotiation and implementation of a new computer software protection law. Although the difficulties in establishing an international intellectual property law would be substantial, the importance of computer software to the economic growth of the United States, other developed countries, and developing countries warrants an effort to negotiate and implement a *sui generis* computer software protection law in the GATT.