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Computer Programs in Europe: A Comparative Analysis of the 1991 EC Software Directive

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INTRODUCTION

Long awaited—if not feared—in the computer industry, where its elaboration had evoked heated debate, the European Council Directive of May 14, 1991 on the Legal Protection of Computer Programs (the "Directive" or "Software Directive")[1] has imposed

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1. Council Directive 91/250 1991 O.J. (L 122) 42 [hereinafter Directive]. On the different versions of the Directive, see Thomas Dreier, *The Council Directive of May 14, 1991, on the Legal Protection of Computer Programs*, [1991] 9 EUR. INTELL. PROP. REV. 319. The first important stage of the Directive was the Commission's initial text of January 5, 1989. Commission Proposal for a Council Directive on the Legal Protection of Computer Programs, 1989 O.J. (C 91) 13 [hereinafter Directive Draft I]. The Commission published an Explanatory Memorandum to Directive Draft I. 1989 O.J. (C 91) 4 [hereinafter Explanatory Memorandum]. The intermediate stage was the Commission's modified proposal of October 18, 1990. Commission Amended Proposal for a Council Directive on the Legal Protection of Computer Programs, 1990 O.J. (C 320) 22 [hereinafter Directive Draft II]. On December 13, 1990 the Council adopted this intermediate version without many changes. This version of the text became the final version of the Directive of May 14, 1991.

On the legislative history of the Directive, see, e.g., Alan K. Palmer & Thomas C. Vinje, *The EC Directive on the Legal Protection of Computer Software: New Law Governing Software Development*, 2 DUKE J. COMP. & INT'L L. 65, 67-78 (1992); Mindy J. Weichselbaum, Note, *The EEC Directive on the Legal Protection of Computer Programs and U.S. Copyright Law: Should Copyright Law Permit Reverse Engineering of Computer Programs?*, 14 FORDHAM INT'L L.J. 1027, 1043-50 (1991); André Lucas, *Copyright in the European Community: The Green Paper and the Proposal for a Directive Concerning Legal Protection of Computer Programs*, 29 COLUM. J. TRANSNAT'L L. 145 (1991); Anthony R.G.

common principles of copyright protection on the twelve Member States of the European Community (the "EC", the "Community"). As it declares in its preamble, the Directive responds to the need to ensure the proper functioning of a single market[2] and, to that end, to

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Nolan, *Brave New World? Copyright Protection of Computer Programs in Germany and France in Light of the European Community Software Directive*, 39 J. COPYRIGHT SOC'Y U.S.A. 121 (1991); Linda G. Morrison, Note, *The EC Directive on the Legal Protection of Computer Programs: Does It Leave Room for Reverse Engineering Beyond the Need for Interoperability?* 25 VAND. J. TRANSNAT'L L. 293 (1992); Joseph W. Haaf, Note, *The EC Directive on the Legal Protection of Computer Programs: Decompilation and Security for Confidential Programming Techniques*, 30 COLUM. J. TRANSNAT'L L. 401 (1992).

For additional commentary about the Directive and its legislative history see, e.g., BRIDGET CZARNOTA & ROBERT J. HART, LEGAL PROTECTION OF COMPUTER PROGRAMS IN EUROPE: A GUIDE TO THE EC DIRECTIVE (1991); Daniel J. Connors, Jr. & Antje Westphal, *The European Community Directive on the Legal Protection of Computer Programs: A Comparison Between European and U.S. Copyright Law*, COMM. & L. Mar. 1992, at 25; Jean-François Verstrynge, *Protecting Intellectual Property Rights within the New Pan-European Framework: The Case of Computer Software*, 92/2 REVUE DE DROIT DE L'INFORMATIQUE ET DES TÉLÉCOMS [D.I.T.] 6 (1992) (The author is particularly well informed about the Community text, having worked extensively on its final revision. While the author comments on the Directive as it existed at the time of the adoption of the common position by the Counsel in December 1991, there have not been any significant changes since.); Dreier, *supra*; Thomas Dreier & Mickael Lehmann, *The Legal Protection of Computer Programs: Certain Aspects of the Proposal for an (EC) Council Directive*, COMPUTER L. & PRAC., Jan.-Feb. 1990, at 92; Chris Reed, *Reverse Engineering Computer Programs Without Infringing Copyright*, [1991] 2 EUR. INTELL. PROP. REV. 47; Guy P.V. Vandenberghe, *Copyright Protection of Computer Programs: An Unsatisfactory Proposal for a Directive*, [1989] 11 EUR. INTELL. PROP. REV. 409; Michel Vivant, *Le programme d'ordinateur au Pays des Muses, Observations sur la directive du 14 mai 1991*, 1990 La Semaine Juridique (Juris-Classeur Périodique) édition Entreprise, *Chronique* 94; CLAUDE COLOMBET, PROPRIÉTÉ LITTÉRAIRE ET ARTISTIQUE No. 94 (6th ed. 1992).

2. This is the classic justification for harmonization measures adopted within the EC, formerly on the basis of Article 100 of the original Treaty of Rome, and now on the basis of Article 100a of the amended Treaty of Rome. TREATY ESTABLISHING THE EUROPEAN ECONOMIC COMMUNITY [EEC TREATY] arts. 100-100a (as amended 1987). Article 100a sets forth the principle of harmonizing the Member States' laws to the full extent required to achieve the "internal" market.

Adopted after the Single European Act of 1986, the Directive was based upon Article 100a, which only requires a "qualified majority" to propose a directive. This, however, did not hamper the Council from reaching unanimity in voting on this text. For the basis of the justification that the Directive is necessary to assure the proper functioning of the common market, see the Directive's preamble: "certain differences in the legal protection of computer programs offered by the laws of the Member States have direct and negative effects on the functioning of the common market . . . ." Directive, *supra* note 1, pmbl., para. 4. The same justification was advanced in connection with the Council Directive of July 25, 1985 on the Approximation of the Laws, Regulations and Administrative Provisions of the Member States Concerning Liability for Defective Products: "existing divergences may distort competition and affect the movement of goods within the common market . . . ." Council Directive 85/374, 1985 O.J. (L 210) 29. This directive was adopted on the basis of Article 100, which requires the Council to act "unanimously." EEC TREATY, art. 100 (as in effect in 1985).

eliminate many of the current differences among the Member States' legal systems.[3]

In the domain of European copyright law, the Software Directive is a trend-setting text. This, the Community's first directive concerning copyright law,[4] was enacted more than thirty years following the adoption of the Treaty of Rome.[5] The treaty mentions copyright only in Article 36, which simply affirms that the free circulation of goods in the Community must respect intellectual property rights.[6] The Directive was elaborated in the wake of the White Paper of 1985 on the internal market,[7] which in turn presaged the adoption of the Single European Act of 1986,[8] and followed the Green Paper of 1988 on "Copyright and the Challenge of Technology."[9] The White Paper mentioned intellectual property rights as objects of harmonization,

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3. Regarding these differences, see Verstrynge, *supra* note 1, at 7:

> [S]ome Community Countries [lacked] any specific reference to computer programs as protected works under national copyright law . . . .
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> Furthermore, even where Member States had express copyright legislation protecting computer programs, that protection was not the same in scope from one state to the next. The term of protection varied between 25 and 70 years [and] the level of originality required to attract protection at all to a computer program varied dramatically between Member States.

4. However, this is the second directive concerning intellectual property in general; the first was the Council Directive 87/54 of 16 December 1986 on the Legal Protection of Topographies of Semiconductor Products, 1987 O.J. (L 24) 36.

5. *See supra* note 2.

6. In the 1970s there was some concern that the Community might play too great a role in the cultural domain (and thereby exceed its primarily economic role) if it were to become involved in the area of copyright. *See* André Françon, *Copyright and the Treaty of Rome Instituting the European Community*, 100 REVUE INTERNATIONALE DU DROIT D'AUTEUR [R.I.D.A.] 128, 140 (1979); Commission Communication to the Council, Sent on 22 November 1977, on Community Action in the Cultural Sector, *in* BULLETIN OF THE EUROPEAN COMMUNITIES 12-17 (Supp. 6/77 1977); ADOLF DIETZ, COMMISSION OF THE EUROPEAN COMMUNITIES, COPYRIGHT LAW IN THE EUROPEAN COMMUNITY Nos. 650-68 (1978) (envisioning harmonization of legislation); COLOMBET, *supra* note 1, No. 494. During the same period, the European Court of Justice clarified that "industrial and commercial property," within the meaning of Article 36 of the EEC TREATY, includes literary and artistic property. *See, e.g.*, Case 62/79, Coditel v. Ciné Vog Films, 1980 E.C.R. 881, 894, [1979-1981 Transfer Binder] Common Mkt. Rep. (CCH) ¶ 8662 (1980). *See* COLOMBET, *supra* note 1, No. 495.

7. Completing the Internal Market: White Paper from the Commission to the European Council, COM(85)310 final [hereinafter White Paper].

8. Single European Act, Feb. 28, 1986, 1987 O.J. (L 169) 1.

9. Communication from the Commission, Green Paper on Copyright and the Challenge of Technology—Copyright Issues Requiring Immediate Action, COM(88)172 final [hereinafter Green Paper]. Concerning this document, see André Françon, *Thoughts on the Green Paper*, 139 R.I.D.A. 128 (1989); Jérôme Huet, *Le livre vert sur le droit d'auteur*, 88/3 D.I.T. 74 (1988).

especially with respect to new technologies,[10] and the Green Paper constituted the first true program for Community action in the area of intellectual property. The historical contrast between the EC's approach to copyright and that of the United States is striking. In the United States, the Constitution declared from the beginning federal competence over copyright law (and patent law), a competence which led to uniformity of law among the fifty States. The current EC effort shows that, starting from a diametrically opposed position, convergence can nonetheless occur. Henceforth, in Europe, Community institutions will take charge of at least some intellectual property issues, preempting or overriding Member State regulation in the field.

There is another convergence occurring, this one in the broader international arena. The World Intellectual Property Organization (WIPO) has formed a Committee of Experts on a Possible Protocol to the Berne Convention that would include, among other subjects, protection of computer software.[11] The Berne Convention[12] is the oldest multilateral copyright treaty; ninety countries are signatories to it.[13] The Berne treaty imposes certain supranational norms of protection, including specification of the kinds of works and rights that signatory states must protect. The terms by which the proposed Protocol would govern computer programs are in fact very close to those of the EC Directive.[14]

The motivation for the Directive is not limited to the goal of achieving European, or even international, harmonization. It is apparent that concerns about Community-wide economic competi-

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10. White Paper, *supra* note 7, no. 149.

11. The Committee's First Session was held in Geneva, November 4-8, 1991. A Memorandum summarizing the First Session was prepared by the International Bureau of WIPO and reprinted in *Normative Activities of WIPO in the Field of Copyright*, COPYRIGHT, Feb. 1992, at 30 [hereinafter 1 WIPO Proposed Protocol to Berne]. A memorandum summarizing the Committee's Second Session, held in Geneva, February 10-17, 1992, was prepared by the International Bureau of WIPO and reprinted in *Normative Activities of WIPO in the Field of Copyright*, COPYRIGHT, Mar. 1992, at 66 [hereinafter 2 WIPO Proposed Protocol to Berne]. The Report adopted by the Committee was reprinted in *Normative Activities of WIPO in the Field of Copyright*, COPYRIGHT, Apr. 1992, at 93 [hereinafter 3 WIPO Proposed Protocol to Berne].

12. Berne Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, S. TREATY DOC. NO. 27, 99th Cong., 2d Sess. (1986), 828 U.N.T.S. 221 (as amended in 1979) [hereinafter Berne Convention].

13. *See Berne Convention for the Protection of Literary and Artistic Works*, COPYRIGHT, Jan. 1992, at 6-8 (number of Berne Convention adherents as of January 1, 1992).

14. *See, e.g.*, 1 WIPO Proposed Protocol to Berne, *supra* note 11, at 32-35 (Computer programs should be included under the Berne Convention definition of "literary work"; reproduction of computer programs should be allowed in certain circumstances where the copying becomes "indispensable for using the computer program.").

tiveness underlie the text as well.[15] EC authorities consider the adoption of the Directive a means of stimulating creation of computer programs, especially by smaller and mid-sized enterprises, through ensuring an adequate level of protection.[16] One of the Directive's guiding aims is to afford protection that is at once uniform and sufficient.

But protection should not be excessive. There is another ideal implicit in the Directive: preservation of the best conditions for competition in the domain of information and communication technologies. Unlimited protection for copyright owners risks undermining this goal. The extreme protection that some interests[17] had sought would have gone so far as to allow the creator of a computer program to forbid third parties access to the basic ideas and information contained within the program. The desire to avoid this result is evident in the Directive's sections permitting certain acts of decompilation—the translation of a program's object code into an intelligible version, called source code, that the user may examine in detail.[18] One sees this concern in the final statements of the

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15. *See* Directive, *supra* note 1, pmbl., para. 3 ("[C]omputer programs are playing an increasingly important role in a broad range of industries and computer program technology can accordingly be considered as being of fundamental importance for the Community's industrial development . . . .").

16. On the one hand, the object is to ensure "an adequate level of protection . . . in the laws of all Member States" and, on the other hand, to eliminate "any difference [in protection] which could affect the functioning of the common market . . . ." Explanatory Memorandum, *supra* note 1, pt. 1, No. 1.4. The Commission emphasized that such a legal environment "is essential . . . if research and investment in computer technology are to continue at a sufficient level to allow the Community to keep pace with other industrialized countries. In particular, as regards small and medium sized enterprises it is important that their ability to create and market innovative software is not significantly reduced by unauthorized reproductions of their products." *Id.*, pt. 1, No. 1.3.

17. *See* Verstrynge, *supra* note 1, at 7 (discussing the pressure applied on Parliament by the software industry about protection of interfaces); Dreier, *supra* note 1, at 319 n. 4 (recalling that the industry was divided into two groups: on the side urging the highest level of copyright protection was Software Action Group for Europe (SAGE), a group that included Apple, Digital, IBM, Philips, and Siemens; on the other side was the European Committee for Interoperable Systems (ECIS), a group that included Amstrad, Bull, Fujitsu, Olivetti, and NCR); Palmer & Vinje, *supra* note 1, at 70-78; Weichselbaum, *supra* note 1, at 1045-50.

18. *See* COMMISSION OF THE EUROPEAN COMMUNITIES, XXTH REPORT ON COMPETITION POLICY pt. 2, ch. I, § 4(g) (1991) (seeking a balance, in considering the question of software decompilation, between protection for the software's creator, on the one hand, and "safeguarding . . . an economic environment that could encourage competition and innovation," on the other). *See also* discussion *infra* part II.B.2; Weichselbaum, *supra* note 1, at 1037.

The term "decompilation" (in both the French and English versions) is the one chosen by the Directive, where it is presented as the act of bringing about a "translation of

preamble as well; they declare that, with respect to the interoperability of computer programs, the Directive's provisions are "without prejudice to the application of the competition rules under Articles 85 and 86" of the Treaty of Rome, and that protection must not be contrary to the "specific requirements of Community law already enacted with respect to the publication of interfaces in the telecommunications sector or Council decisions relating to standardization in the field of information technology and telecommunication."[19] These considerations are fundamental in today's world of data processing technology, which is of necessity intercommunicative, yet which continues to evolve largely outside any official set of standards.

In this respect, however, it is not clear that EC authorities have succeeded—following the extraordinary industry pressure brought to bear on the drafting of the Directive—in arriving at an entirely satisfactory result. One criticism to which the Directive is vulnerable is that it has created a hybrid form of protection, half copyright and half trade secret. Commercialized software is fully protected against infringement, like any other work of authorship. Yet, at the same time, it retains some aspects of non-divulged know-how. The Directive does not permit all forms of analysis, study, or reverse engineering of the program. Rather, the Directive includes a variety of restrictions on decompiling computer programs. These restrictions result to some extent in protecting software like a trade secret against third party investigation.

This Article will address the Directive's articulation of the rights of both software copyright holders and of software users. In Part I we review the Directive's prerequisites to copyright in computer programs, its designation of copyright owners, and the rights it confers. In Part II we consider the rights of software users. We address user rights from which the software copyright owner may derogate by contract, as well as mandatory user rights, in particular the right to decompile a protected program for the purpose of creating a program that may operate in tandem with or in lieu of the protected program. Throughout this Article, we compare software copyright protection under the Directive with copyright protection for computer programs as it has evolved in the United States.

[the] form" of the program's code. Directive, *supra* note 1, art. 6.1. This term is narrower than that of "reverse engineering," which refers more generally to many types of operations analyzing software carried out by working back from the program's object code but without necessarily doing a translation into source code. *See also* discussion *infra* part II.B.2.

19. Directive, *supra* note 1, pmbl., paras. 27, 28.

I. COPYRIGHT PROTECTION FOR COMPUTER PROGRAMS

The 1991 EC Directive confirms that the protection of computer programs will be guaranteed principally by the rules of copyright law, even though Article 9.1 indicates that other laws, such as those in the areas of patent, trade secrets or contracts, may furnish complementary protection.[20] The Member States, who must implement the Directive's rules by January 1, 1993, are obliged under Article 7 to undertake "special measures of protection" against the commercialization of infringing programs, for example, affording copyright owners the remedy of seizure. Article 8.1 of the Directive incorporates the classic copyright rule of duration of protection—the life of the author plus fifty years,[21] or fifty years after commercial distribution of the program to the public in the case of a juridical person.[22] Article 9.2 provides that these rules apply even to programs created before January 1, 1993. (However, no claim for infringement may be brought against acts occurring before the implementation of the Directive by national laws.[23]) Thus, the author or copyright owner of a program—the latter often in practice a corporation, be it a hardware manufacturer or an software service provider—fully enjoys well-established intellectual property rights.

It is not necessary to reflect at length either on the principle of applying copyright law to the protection of computer programs, or on the Directive's express classification of computer programs as

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20. Directive, *supra* note 1, art. 9.1. The text also mentions unfair competition and trademarks; while the former is justified, the latter is less so, for such distinctive symbols protect an activity and not a creation in and of itself. As for the idea of trade secrets, it is similar to the idea of know-how, which is protected in EC countries under such tort-law doctrines as fraudulent conversion and liability for breach of confidence. *See* PINNER'S WORLD UNFAIR COMPETITION LAW: AN ENCYCLOPEDIA No. 74 (Heinz L. David ed., 1979).

21. Article 8.2 allows those States that already do apply a longer period of duration to continue to do so up until Community harmonization of the duration period for protection of works. A harmonization of copyright terms to life-plus-70 may be on the horizon. See Thomas Dreier & Silke von Lewinski, *The European Commission's Activities in the Field of Copyright*, 39 J. COPYRIGHT SOC'Y U.S.A. 96, 115-16 (1991).

22. This provision should be interpreted in two different manners depending on whether it concerns mass-produced application programs or custom-made programs. For the former, the program has been made publicly available when it is commercially distributed to the public (comparable to publication of a literary work). For the latter, the "making available" should be deemed to occur on the date of delivery of the completed program, for these programs are generally not made public in the strict sense of the term but are instead delivered by the producer-supplier according to the contract commissioning the creation of the program.

23. Moreover, the text does not affect contracts concluded and rights acquired before January 1, 1993. Directive, *supra* note 1, art. 9.2.

"literary works within the meaning of the Berne Convention."[24] The resort to copyright law is a strategy that the Directive holds in common with many domestic copyright laws, notably those of France and the United States.[25] Unanimity in positive law (if not in academic commentary)[26] already exists as to the above issues. The legislative history of the Directive nonetheless demonstrates a concern to eliminate all ambiguity and to protect software programs as literary works, and not as merely analogous to literary works. The drafters emphasize that software programs, like other literary works, express ideas in determinate language.[27] More fundamentally, the Commission determined for two reasons that copyright was well-adapted to software: first, software programs are exploited by means of copies, and the right of reproduction is an essential right under copyright; and second, copyright protects expression without also privatizing the underlying ideas and concepts expressed. Thus, the Commission concluded:

> Copyright offers a balanced solution between inadequate and excessive protection. Its flexibility is sufficient to permit a compromise between the divergent interests of producers and distributors on the one hand, and computer program users on the other. This form of intellectual property protection has the principal advantage of covering only the individual expression of the work, and thus leaving the latitude desired by other authors to create

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24. Directive, *supra* note 1, art. 1.1.

25. *See, e.g.*, Law of July 3, 1985, Title V ("On Software"), recodified July 1, 1992 in the new CODE DE LA PROPRIÉTÉ INTELLECTUELLE [C. PROP. INTELL.] arts. 111-5, 113-9, 121-7, 122-6, 123-5, 131-4, 332-4; 17 U.S.C. § 101 (1988) (definition of "computer program"); 17 U.S.C. § 117 (1988) (limitations on exclusive rights in a computer program). Germany, Spain and the United Kingdom have also applied copyright law to the protection of computer programs. *See* 1985 Bundesgesetzblatt [BGBl] I 1273, art. 2(1) (F.R.G.) (programs for data processing); Boletin Oficial del Estado (Official Gazette) [B.O.E.], No. 27, Nov. 17, 1987, art. 10(1) (Spain) (intellectual property includes computer programs); Copyright, Designs and Patents Act of 1988, ch. 48, No. 3(1) (U.K.) ("literary work" includes computer programs).

26. For criticism of copyright protection of computer programs, see, e.g., Pamela Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 DUKE L.J. 663; Bernard Edelman, *Commentaire de la loi no. 85-660 du 3 juillet 1985 relative aux droits d'auteur et aux droits voisine (suite)*, 1987 ACTUALITÉ LÉGISLATIVE DALLOZ 1 (objecting to 1985 French law including software in copyright).

27. *See* Explanatory Memorandum, *supra* note 1, pt. 2, art. 1.2; Verstrynge, *supra* note 1, at 7-8; *Cf.* Jérôme Huet & Hubert Maisl, *Droit de l'informatique*, 1985 Recueil Dalloz-Sirey, *Informations Rapides* 39 (noting that a computer program, like a musical composition, is no less a work of language simply because reading that language requires technical or specialized knowledge).

> similar programs . . . , so long as they refrain from copying.[28]

As for the reference to the Berne Convention, the Directive may be attempting to force the treaty interpreter's hand, since the Convention's text does not in fact include computer programs within its extensive illustrative list of literary works.[29] On the other hand, it is generally admitted that new kinds of works may be included within the scope of the definition.[30] In any event, by adopting the double characterization of copyright and literary works, the Directive achieves two results whose import transcends the boundaries of the Community: first, it places software within the rules set forth in the Berne Convention concerning the copyright protection of literary works; and second, with respect to international relations, it requires application of the rule of national treatment to works of foreign Berne Union programmers.[31] One might recall as well that, by application of the rules of the Berne Convention, copyright protection of computer programs in the EC may not be subject to any formalities, such as the requirement of affixation of notice of copyright—a formality in force in the U.S. before its adherence to the Berne Convention.[32] EC copyright protection of computer programs thus appears well-delineated and easy to obtain. We will now examine the conditions under which copyright protection will in fact be recognized, and will specify more precisely who are the copyright owners, and what are their rights.

A. *Subject Matter of Protection: The Computer Program (Articles 1.1, 1.2)*

The Directive covers all modes of computer programs: operations software (such as DOS), addressed to the functioning of the

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28. Explanatory Memorandum, *supra* note 1, pt. 1, Nos. 3-7. On the other hand, protection by patent is of greater scope, for it covers everything up to certain principal ideas that are behind the invention, whence the complementary character of this legal regime as applied to software. Moreover, the Directive expressly reserves the possibility of recourse to patent protection. Directive, *supra* note 1, art. 9.1.

29. *See* Berne Convention, *supra* note 12, art. 2.1.

30. Explanatory Memorandum, *supra* note 1, pt. 1, No. 4.

31. The Berne Convention guarantees Berne member authors "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. . . ." Berne Convention, *supra* note 12, art. 5.1.

32. *See* Berne Convention, *supra* note 12, art. 5.2. *See generally* Jane C. Ginsburg & John M. Kernochan, *One Hundred and Two Years Later: The U.S. Joins the Berne Convention*, 13 COLUM.-VLA J.L.& ARTS 1, 9-12 (1988).

machine; applications programs (such as the word processing program WordPerfect), designed to accomplish a given task; mass-produced programs; and custom-made programs.[33] However, as Article 1.2 of the Directive reminds us, protection extends only to the form of expression of the program, whether it be in binary object code or in higher-level language source code. As a result, the functionality of the program is not in itself the object of protection.[34] As if that were not sufficiently clear, the Directive adds that the ideas and principles underlying the program are not protectable.[35] These rules reiterate principles classic to copyright law in EC Member States, as well as in the U.S.[36] Finally, whatever the requirements of interoperability, it is clear that computer program interfaces[37] are potentially protectable as elements of a program, just like any other original portion of a program.[38]

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33. However, the Directive does not include a definition of "computer program"; this may be justified by the difficulties of such an undertaking and by the absence of significant practical disagreement on this point. Moreover, most commentators agree with the WIPO Model Provisions on the Protection of Computer Software definition of a computer program as "a set of instructions expressed in words, codes, schemes or in any other form, which is capable, when incorporated in a machine-readable medium, of causing a 'computer'—an electronic or similar device having information processing capabilities—to perform or achieve a particular task or result." 1 WIPO Proposed Protocol to Berne, *supra* note 11, at 32. *See also* 17 U.S.C. § 101 (1988) (defining a computer program as "a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result").

34. The principle is familiar in U.S. copyright law as well. *See, e.g.*, Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222, 1236-37 (3d Cir. 1986), *cert. denied*, 479 U.S. 1031 (1987); Lotus Dev. Corp. v. Paperback Software Int'l, 740 F. Supp. 37, 53-54 (D. Mass. 1990) (holding that the function of a computer program is an "idea" and is not protectable under copyright).

35. Directive, *supra* note 1, art. 1.2.

36. *Cf.* 17 U.S.C. § 102(b) (1988) (excluding ideas, methods and processes from the coverage of copyright under U.S. law).

37. Paragraph 11 of the Directive's preamble defines interfaces as "the parts of the program which provide for . . . interconnection and interaction between elements of software and hardware . . . ."

38. *See* Mickael Lehmann, *Software Protection Under the 1991 European Directive*, 91/4 D.I.T. 7, 10-11 (1991); Verstrynge, *supra* note 1, at 8; Jérôme Huet, *Le* reverse engineering, *ou ingénierie inverse, et l'accès aux interfaces dans la protection des logiciels en Europe: questions de droit d'auteur et de droit de la concurrence*, 1990 D.S. Chron. 99, 102. It is only necessary to add in this regard that as a practical matter information relating to interfaces will frequently have a purely obvious or inevitable character, and therefore will not enjoy protection. *See id.*

B. *The Condition of Protection: Originality (Article 1.3)*

The Directive states explicitly in Article 1.3 that software must satisfy the condition of originality in order to be protected. Originality is a general principle of copyright law applicable to all works throughout the Community and in the U.S. But, in order to prevent the kinds of erroneous departures from this principle that had occurred in certain EC countries where the technical character of computer programs had led domestic courts to deny copyright protection on the ground that software was devoid of aesthetic value,[39] Article 1.3 of the Directive further provides that "no other criteria shall be applied . . . ." Similarly, the preamble states that "no tests as to the qualitative or aesthetic merits of the program should be applied."[40]

The problem underlying these dispositions concerned the criteria for evaluating originality, for France and Germany had already developed different approaches to this issue. The French High Court had identified the criterion of originality as synonymous with the "mark of an intellectual contribution,"[41] while the German Federal Supreme Court had required a "clearly higher than average degree of creativity."[42] In specifying that, to be considered original, a computer program must be "the author's own intellectual creation,"[43] the drafters of the EC text have demonstrated that they do not intend to impose a high level of creativity; the standard appears to refer to

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39. This phenomenon occurred, prior to the 1985 law, in the Judgment of June 4, 1984 (Valadon v. Atari Ireland, Ltd.), Cour d'appel de Paris [Court of Appeal of Paris], 123 R.I.D.A. 178, 180-81 (1985); *see also* Huet & Maisl, *supra* note 27, at 40.

40. Directive, *supra* note 1, pmbl., para. 8.

41. *See* Judgment of Mar. 7, 1986, Cass. ass. plén., 1986 Receuil Dalloz-Sirey, *Jurisprudence* 405 conclusion J. Cabannes, note B. Edelman (Fr.); Judgment of Mar. 7, 1986, Cass. ass. plén., 1986 La Semaine Juridique (Juris-Classeur Périodique) II No. 20631 note J.-M. Mousseron, B. Teyssié, and M. Vivant (Fr.); Judgment of Mar. 7, 1986, Cass. ass. plén., 129 R.I.D.A. 134, 137 (1986), note A. Lucas (Fr.); Judgment of March 7, 1986, Cass. ass. plén., 3 REVUE DU DROIT DE LA PROPRIÉTE INDUSTRIELLE 203, 269 (1986) (Fr.); André Françon, *Chronique de législation et de jurisprudence Français*, 39 REVUE TRIMESTRIELLE DE DROIT COMMERCIAL ET DE DROIT ECONOMIQUE 397, 400 (1986); *cf.* COLOMBET, *supra* note 1, No. 108.

42. *See* Judgment of May 9, 1985 (Inkasso-Programm), BGH, 94 Entscheidungen des Bundesgerichtshofes in Zivilsachen [BGHZ] 276, 290 (F.R.G.). As to the differences between Member States, see generally Nolan, *supra* note 1, at 132-49 (reviewing German and French high court decisions).

43. Directive, *supra* note 1, art. 1.3.

an average level,[44] an intellectual contribution such as the French High Court formulated in 1986.[45] Those who had advocated a generous interpretation of the originality requirement, so as to permit coverage of a wide range of computer programs by copyright,[46] will be pleased with the Directive's solution.

More importantly, it is clear that the term "originality" in the Directive is meant to have a uniform, supranational definition; it is not intended to be a broad, umbrella-like term sheltering a variety of potentially divergent Member State interpretations. The Directive does not intend to refer back to Member State law to define or supplement the definition of originality; the text's effort to explicate the originality criterion reveals a deliberate effort to render uniform the conditions of software protection in Europe. This means that, as regards the interpretation of the notion of originality, the European Court of Justice will be called upon to play a uniformizing role as the jurisdiction of ultimate resort for the courts of the twelve Member States. In case of doubt, one must look to the European Court of Justice to articulate the meaning to be given to the expression "the author's own intellectual creation."[47]

As the Directive's legislative history emphasizes, and as the text of the Directive itself makes clear, the basic criterion of originality is that the program must not have been copied; it must be the creation of the person who claims to be its author.[48] In this respect, the Directive appears to adopt the traditional Anglo-American concept of "originality" as primarily meaning "not copied."[49] However, as interpreted in the United States, even this broad concept excludes

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44. *See* Dreier, *supra* note 1, at 320 ("In view of the legislative history [of the Directive], however, it should be clear that the [D]irective leaves no further room for an exceedingly high originality standard such as the German one.").

45. Vivant, *supra* note 1, No. 8 (correctly observing that because the Community text does not use the French term *apport* (contribution), there is less movement toward the patent law concept of novelty).

46. *See, e.g.*, Jérôme Huet, *Les logiciels sont protégés par le droit d'auteur*, 1985 D.S. Chron. 261, No. 10.

47. *See* Verstrynge, *supra* note 1, at 8.

48. *See* Explanatory Memorandum, pt. 2, art. 1.3 ("[T]he only criterion which should be applied to determine the eligibility for protection is that of originality, that is, that the work has not been copied."); Huet, *supra* note 46, No. 10 (equating a work's "originality" with "authorship").

49. *See, e.g.*, Alfred Bell & Co. v. Catalda Fine Arts, Inc., 191 F.2d 99, 103 (2d Cir. 1951) ("Originality in this context 'means little more than a prohibition on actual copying.'") (citation omitted); Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49, 54 (2d Cir. 1936) ("[I]f by some magic a man who had never known it were to compose anew Keats's *Ode on a Grecian Urn*" he could claim a copyright in his composition.).

trivial or banal combinations of instructions.[50] There is a public domain of expression from which the program must distinguish itself to be deemed original. Just as in literary works, a dramatist's reliance on stock scenes and characters may lack originality[51]—or in musical works, the composer's resort to familiar patterns of notes does not in itself qualify as original[52]—so in the context of computer programs, certain instructions or sequences of instructions may be entirely commonplace to the genre of program at issue.[53]

Any determination of what is trivial or banal must be made with reference to the general state of knowledge in the computer programming field. This reliance on the backdrop of programming elements generally known in the software writing community, however, does not imply a patent-like "nonobviousness" standard. Although both the copyright and the patent standards refer to the knowledge of one ordinarily skilled in the art, the patent standard requires that the claimed invention exceed the creativity normally expected of such a patent applicant, while the copyright standard simply requires that the program not be a cliché. Just as stock devices abound in conventional literature, so too must there be correspondingly tried-and-true (or tired) formulae in computer programming. The difference between computer programs and more conventional literary works today is primarily one of recognition. A judge would consider such elements as the timely fall of the curtain upon the embrace of a play's male and female protagonists a typical (if today perhaps quaint) suggestion of the characters' subsequent actions,[54] as well as a means of moving the plot to a new stage in the characters' relationship; the judge would therefore be unlikely to entertain a claim of original authorship in that expression of an ellipsis. Today's often computer-

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50. *See, e.g.*, Computer Assocs. Int'l, Inc. v. Altai, Inc., 23 U.S.P.Q.2d 1241, 1255 (2d Cir. June 22, 1992) (holding that standard programming techniques dictated by external computing environment, like "stock" literary devices, are not protectable). *Cf.* Feist Pubs. Inc. v. Rural Telephone Serv. Co., 111 S. Ct. 1282, 1297 (1991) (holding telephone directory white pages too "typical," "garden-variety," "obvious," and "basic" to be original).

51. *See, e.g.*, Nichols v. Universal Pictures Corp., 45 F.2d 119, 120-122 (2d Cir. 1930) (holding character and plot elements common to the plays of both plaintiff and defendant too ill-developed and commonplace to support a copyright).

52. *Cf.* Bright Tunes Music Corp. v. Harrisongs Music, Ltd., 420 F. Supp. 177, 177 (S.D.N.Y. 1976), *order aff'd sub nom.*, ABKO Music, Inc. v. Harrisongs Music, Ltd., 722 F.2d 988 (2d Cir. 1983) (finding that two copied motifs in plaintiff's song were trite, but their combination and number of repetitions was "highly unique").

53. *See, e.g.*, *Altai*, 23 U.S.P.Q.2d at 1255 (in ascertaining whether a computer program is protectable, a court must filter out standard programming routines).

54. *See, e.g.*, Sheldon v. Metro-Goldwyn Pictures Corp., 81 F.2d 49, 50 (2d Cir. 1936) ("He finds her facile and the curtain falls in season.").

illiterate judge might not recognize the software equivalent of the seasonable curtain, but that does not mean that similar plot-forwarding devices do not exist.[55] Indeed, as computer science evolves, and as standardization in the field progresses, the backdrop of public domain elements (and the ability of judges to perceive them) will inevitably increase.

There is an important additional limitation on software copyright in the EC. If the form of a program (or of part of it) is dictated by its function, then the program (or the relevant portion) should be excluded from protection. This principle is recognized in the U.S. as a corollary of the so-called idea/expression dichotomy, under which ideas, methods and processes contained within a work are not themselves the subject matter of copyright.[56] In Europe, the doctrine may not be as explicit (or the label may be lacking), but the Directive's legislative history reveals that the drafters were well aware of the problem of functionality—particularly regarding interfaces—and intended to limit protection to those elements not necessary to the function of the program.[57]

C. *Owners of Rights; Beneficiaries of Protection (Articles 2 and 3)*

The Directive offers few surprises regarding the determination of owners of rights in computer programs. Indeed, in most cases the Directive refers back to the Member States' domestic laws for the application of the Directive's specific provisions. Article 2.1 provides that the "author of a computer program shall be the natural person or group of persons who has created the program or, where the legislation of the Member State permits, the legal person designated as the rightholder by that legislation." The final version of the

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55. *See, e.g., Altai*, 23 U.S.P.Q.2d at 1255 (examples of subroutines found to be "scènes à faire"—banal to the genre).

56. *See* 17 U.S.C. § 102(b) (1988); *cf.* decisions cited *supra* note 34 (functionality of program not protectable).

57. *See* Explanatory Memorandum, *supra* note 1, pt. 1, No. 3.13:

> If similarities in the code which implements the ideas, rules or principles occur as between inter-operative programs, due to the inevitability of certain forms of expression, where the constraints of the interface are such that in the circumstances no different implementation is possible, then no copyright infringement will normally occur, because in these circumstances it is generally said that idea and expression have merged.

Directive abandons all reference to commissioned software.[58] Commissioned programs therefore remain the property of the person(s) who created them, albeit at the behest of a third party. In principle, the creator of commissioned software transfers only the right to use the program, not the copyright in the work, unless the contract provides for a transfer of copyright as well.

Article 2.2 provides for joint ownership of programs written jointly by a group of natural persons. This solution is standard, and should apply also to software jointly created by juridical persons, such as by a joint venture of corporations. Co-ownership of software copyright may not be easy to administer, however, particularly in those Member States in which exploitation of rights under copyright requires the unanimous consent of the co-owners.[59]

The Directive's most important disposition of ownership rights is contained in Article 2.3, which provides:

> Where a computer program is created by an employee in the execution of his duties or following the instructions given by his employer, the employer exclusively shall be entitled to exercise all economic rights in the program so created, unless otherwise provided by contract.

A program "created by an employee in the execution of [her] duties" would include those created by employees working in a company's computer programming department. A program created "following the instructions given by [her] employer" would include one prepared by an employee who was not hired as a systems analyst or computer programmer, but who participated in the creation of a work-related program—for example, an employee in the accounting department who contributed to the elaboration or modification of a spreadsheet

58. The first draft of the Directive had provided: "Where a computer program is created under a contract, the natural or legal person who commissioned the program shall be entitled to exercise all rights in respect of the program, unless otherwise provided by contract." Directive Draft I, *supra* note 1, art. 2.3; see Lucas, *supra* note 1, at 158.

59. *See, e.g.*, C. PROP. INTELL. arts. 113-3(2), 113-3(3) (Fr.) (Co-authors of a collaborative work "must exercise their rights by common accord." "In case of disagreement, the courts must rule [on the exploitation]."). In the United States, joint owners may separately license rights in the work, subject to a duty to account for profits to their co-owners. *See, e.g.*, Oddo v. Ries, 743 F.2d 630, 633 (9th Cir. 1984). On the other hand, a joint owner may not "assign the work or grant an exclusive license in it without the written consent of the other co-owners." MARSHALL A. LEAFFER, UNDERSTANDING COPYRIGHT LAW § 5.4[C] (1989).

program for the firm.[60] The economic context in which software is written—creation often occurs within large client corporations, hardware manufacturers, or service organizations—justifies employer ownership. It is nonetheless worth noting that the Directive's approach is extremely favorable to the employer, for it very broadly covers the employee's activities. Moreover, the Directive's designation of employers as initial copyright owners derogates from the general copyright rule of several Member States that the creator's employment status does not prejudice her initial copyright ownership.[61] On the other hand, the EC text limits the employer's rights to economic rights;[62] by implication, the employee retains moral rights. In practice the most relevant moral right is likely to be the right of attribution, i.e., the employee's right to receive authorship credit for having created the work. The right of integrity, invoked against alterations or modifications of the program deleterious to the creator's reputation,[63] may be of uncertain application in this context. Nonetheless, an argument can be made that the Directive preserves the possibility of such a claim on the employee's part.[64]

The Directive's ownership rules resemble U.S. copyright's works made for hire regime,[65] at least in part. Under U.S. law, copyright vests in the work's "author," but the "author" is not always the work's creator. Under the work for hire doctrine, the employer is denominated the "author" when the work is created by an employee pursuant to her employment.[66] In this respect, the EC and U.S. rules

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60. The continental European countries in principle grant copyright rights even to an author who is an employee, although the employer may acquire such rights by agreement. In Anglo-American law countries, the employer is considered the author and first owner of the copyright by virtue of the work for hire theory. EUGEN ULMER, COMMISSION OF THE EUROPEAN COMMUNITIES, INTELLECTUAL PROPERTY RIGHTS AND THE CONFLICTS OF LAWS Nos. 56, 57 (1978).

61. *See, e.g.*, C. PROP. INTELL., art. 111-1 (Fr.) (general copyright ownership rule conferring intellectual property rights on the creator). *But see* C. PROP. INTELL., art 113-9 (Fr.) ("[A]ll rights recognized to authors . . . devolve upon" the employer of the creator of a computer program.).

62. Directive, *supra* note 1, art. 2.3.

63. *See, e.g.*, Berne Convention, *supra* note 12, art. 6bis(1).

64. There is a tension between an employee's moral rights implicitly recognized in Article 2.3 and the employer's exclusive right to authorize adaptations without prejudice under Article 4(b). Some Member States' domestic copyright provisions may bring this latent conflict into relief. For example, in France, the creator is expressly provided "inalienable" moral rights. C. PROP. INTELL. art. 121-1. Yet an author may not object to the modification of a computer program in which he has granted adaptation rights. C. PROP. INTELL. art. 121-7.

65. *See* 17 U.S.C. § 101 (1988) (definition of "work made for hire").

66. 17 U.S.C. § 201(b) (1988).

appear to be coextensive, although it remains to be seen whether courts on either side of the Atlantic apply similar interpretations of the key terms "pursuant to employment" and "exercise of his functions." However, under U.S. law, the party commissioning the creation of a work may also be the "author" if the work is of a kind specified in the copyright statute and if, in addition, there is a contract between the creator and the commissioning party declaring the work to be "for hire."[67] To determine if there is a disparity between EC rules and U.S. rules concerning initial ownership of copyright in commissioned computer programs, it is necessary to determine if specially ordered software would be considered a work for hire under U.S. law. If so, the copyright would vest in the commissioning party, whereas under EC rules, the copyright would remain with the creator.

The U.S. statute's list of qualifying commissioned works generally addresses classes of works other than computer programs: audiovisual works, periodicals, anthologies, and educational texts and materials. However, the list also includes "a compilation." The statute defines a compilation as "a work formed by the collection and assembling of preexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship."[68] Arguably, a computer program—which the statute defines as "a set of statements or instructions to be used directly or indirectly in a computer to bring about a certain result"[69]—could be considered a compilation of instructions.[70] Were that the case, then the copyright in commissioned computer programs could vest in the commissioning party, and there would be a disparity between EC and U.S. copyright ownership rules.[71] However, the argument that computer programs are "compi-

67. 17 U.S.C. § 101.

68. *Id.*

69. *Id.*

70. The statutory list of commissioned works capable of being works made for hire also includes "an instructional text." *Id.* Arguably, the definition of a computer program as a "set of statements or instructions" would make it an "instructional text." However, it is clear from the context of the statute's list of works for hire that the latter refers to pedagogical materials. *Id.*

71. The disparity would carry significant consequences if an EC country declined to recognize the ownership status of a U.S. commissioning party on the ground that, under EC law, the software creator, and not the commissioner, has standing to sue. *Cf.* Jane C. Ginsburg & Pierre Sirinelli, *Authors and Exploitations in International Private Law: the French Supreme Court and the Huston Film Colorization Controversy*, 15 COLUM.-VLA J.L. & ARTS 135 (1991) (reviewing consequences of international conflicts of authorship status regarding exploitation of U.S. works made for hire in France). However, an EC Member

lations" seems to us strained; indeed, the reasoning supporting the "compilation" characterization would also lead to denominating literary works in general as "compilations," for any conventional literary work is also "a work formed by the collection and assembling of preexisting materials or of data [in this case, words] that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship."[72] If our conclusion is correct, then computer programs are generally not the kinds of works envisioned by the statute as commissioned works for hire, and there is no significant disjunction between the EC and the U.S. approaches to initial copyright ownership.

D. The Content of Protection: The Rights of Reproduction, Adaptation, and Distribution (Article 4)

1. Specification of Rights (Article 4(a)-(c))

The Directive concerns only economic rights in software. It enunciates no substantive rules concerning moral rights, which are left to the competence of the Member States' internal law. However, domestic regulation is itself constrained by the Berne Convention, which requires protection of signatories' rights of attribution and of integrity.[73]

With respect to economic rights, the Directive enumerates three kinds of "exclusive rights." Under the rather clumsy rubric "Restricted Acts," Article 4 makes subject to the copyright owner's authorization:

State court might avoid the conflict by deeming the commissioner-creator work-for-hire contract as a transfer of copyright ownership, rather than as a designation of authorship status.

Article 3 of the Directive states: "Protection shall be granted to all natural or legal persons eligible under national copyright legislation as applied to literary works." Combined with the concept of copyright ownership, this text concerning beneficiaries of protection is intended to take into account domestic and international rules concerning recognition of authorship status. Beneficiaries of protection are not only the EC forum country's nationals, but also foreigners whose authorship status local legislation acknowledges.

72. Moreover, this expansive and inventive interpretation of "compilation" would be inconsistent with the Supreme Court's narrow and common-law-based interpretation of "work made for hire" in Community for Creative Non-Violence v. Reid, 490 U.S. 730 (1989) (narrowly construing the definition of "work made for hire" in 17 U.S.C. § 101 not to include certain kinds of commissioned works failing the common law of agency definition of employment).

73. Berne Convention, *supra* note 12, art. 6bis. *See* COLOMBET, *supra* note 1, No. 466; André Françon, *Propriété littéraire et artistique, conventions internationales, in* Juris-Classeur de Droit International, Fascicule 563-B, No. 34 (1977).

(a) the "permanent or temporary reproduction" of the program "by any means and in any form, in part or in whole,"[74]

(b) the adaptation of the program, or, more precisely, "the translation, adaptation, arrangement and any other alteration of a computer program," and

(c) "any form of distribution to the public," including by means of rental, but—except as to rental—subject to the exhaustion of rights upon the first sale.

This enumeration of rights, which corresponds closely to exclusive rights in the United States under copyright of reproduction, preparation of derivative works and public distribution,[75] warrants several observations.

First, although the Directive's concept of reproduction is broadly understood, and even covers "temporary" as well as "permanent" reproductions, the Directive makes no provision for the copyright owner's right to perform publicly or authorize the public performance of software. At first blush, this absence would seem of no practical import, for software is marketed by sales of copies. This is true even when access to programs is by means of on-line services, for the use of the accessed program on the user's computer constitutes the making of a copy under the Directive's definition. Nonetheless, it seems premature to say that the concept of public performance will play no role in the exploitation of computer programs. Given on the one hand the wide variety of works expressed in digital form, extending from scientific works to computer games, and on the other hand the development of the "look and feel" concept, which addresses visual and other user-perceptible aspects of the program,[76] explicit

74. This is a classic statement of the reproduction right, but the text also makes clear that it extends to such operations as the loading or storage of the program. This is true in the United States as well. *See* COMMISSION ON NEW TECHNOLOGICAL USES (CONTU), FINAL REPORT (1978), *quoted in* ALAN LATMAN, ROBERT A. GORMAN & JANE C. GINSBURG, COPYRIGHT FOR THE NINETIES 166-68 (3d ed. 1989) (Commission appointed by Congress in 1976 to study and make recommendations regarding computer software copyright in the US also concluded that these acts constituted reproductions).

75. *See* 17 U.S.C. § 106(1) to (3) (1988) (addressing reproduction, derivative works, and distribution).

76. Regarding "look and feel," see, e.g., Morrison, *supra* note 1, at 326-30; Richard H. Stern, *Legal Protection of Screen Displays and Other User Interfaces for Computers: A Problem in Balancing Incentives for Creation Against a Need for Free Access to the Utilitarian*, 14 COLUM.-VLA J.L. & ARTS 283 (1990); Jeffrey R. Benson, Note, *Copyright Protection for Computer Screen Displays*, 72 MINN. L. REV. 1123 (1988).

inclusion of a public performance right might have aided application of the Directive to future, perhaps currently unforeseen, problems of software exploitation. However, the Directive does include "displaying" among the "restricted acts"; the combination of the copyright owner's exclusive rights of display and of transmission may reach these future problems.

Second, Article 4(b)'s broadly phrased adaptation right appears to reserve to software copyright holders a wide array of exclusive "translation" rights, encompassing not only the revision of a program from one source code language to another (e.g., from Fortran to Basic), but also the exclusive right to adapt the program to a variety of computers (e.g., to convert a program designed for a minicomputer to one that will function with a PC micro-computer). Similar results have been achieved in the U.S., albeit not always explicitly under the rubric of the derivative works right.[77]

A different provision of the Directive addresses a problem that has, in the United States, so far eluded the grasp of the derivative works right. The problem concerns computer programs designed to neutralize copy-protection codes included on commercialized software. While a U.S. software producer contended that a program of this kind—which had been created by reverse engineering plaintiff's program—was itself a derivative work, or in any event created a derivative work when combined with a program that included the copy-protection codes, a U.S. appellate court has rejected these assertions.[78] The Directive does not endeavor to bring this kind of activity within the scope of the adaptation right. Rather, it includes a specific provision, in an article devoted to "special measures of protection," obliging member nations to provide remedies against "any act of putting into circulation, or the possession for commercial purposes of, any means the sole intended purpose of which is to facilitate the unauthorized removal or circumvention of any technical device which may have been applied to protect a computer program."[79]

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77. In the United States, Whelan Assocs., Inc. v. Jaslow Dental Lab. Inc., 797 F.2d 1222 (3d Cir. 1986), *cert. denied*, 497 U.S. 1031 (1987) recognized the software copyright owner's exclusive rights over the transportability of programs from one hardware system to another (in that instance, from a minicomputer to a microcomputer), although the court phrased its decision in terms of the exclusive right to reproduce the structure, sequence and organization of plaintiff's program.

78. Vault Corp. v. Quaid Software, Ltd., 847 F.2d 255, 267-68 (5th Cir. 1988).

79. Directive, *supra* note 1, art. 7.1(c).

Third, as in the United States, the Directive's distribution right primarily concerns the initial public distribution of copies. Under the Directive, the copyright owner has the exclusive right to determine whether, when, and how to release copies to the public. Once a copy has been sold, however, the distribution right is deemed "exhausted." The copyright owner therefore has no further right to limit the disposition of copies once they have been sold.[80] Thus, for example, the copyright owner may not prevent the resale of used copies of computer programs. Nonetheless, as is also the case in the United States after the Computer Software Rental Amendments Act of 1990,[81] the exhaustion principle does not extend to rental of copies of computer programs. As a result, even after a copy has been sold, the copyright owner may prevent the owner of a particular copy from renting out that copy.

The exemption of the rental of copies of computer programs from the general rule of exhaustion might also be considered in light of a proposed EC directive on the rental of copyrighted works generally.[82] In fact, compared with video rentals, the software rental market is probably economically insignificant. The market for rental of videocassettes for private home viewing is a major one; some EC countries already recognize that the commercial value of the work is substantially realized through rentals, and local law accordingly entitles authors to a share of the rental fees.[83] By contrast, it appears that software is rented not for its temporary enjoyment, but in order to make unauthorized copies of the rented program.[84] The software rental right might best be understood, on both sides of the Atlantic, not as the exclusive right to develop a new market for the exploitation of copyrighted programs, but as a means to prevent rentals altogether. However, given the goal of the Directive's rental right to prevent clandestine copying, the text should probably have extended also to gratuitous borrowing of copies of programs.

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80. On exhaustion of rights, see *infra*, part I.D.2. The U.S. version of the exhaustion rule, known here as the "first sale doctrine," is codified at 17 U.S.C. § 109(a) (1988).

81. Pub. L. No. 101-650, Title VIII, §§ 802, 803, 104 Stat. 5135, 5143 (codified as amended at 17 U.S.C. § 109(b) (Supp. II 1990)).

82. Proposal for a Council Directive on Rental Rights, Lending Rights, and on Certain Rights Related to Copyright, COM(90)586 final.

83. *See, e.g.*, 1972 Bundesgesetzblatt, Teil I [BGBl. I] 1281 art. 27 (F.R.G.); Bolétin Oficial del Estado (Official Gazette) [B.O.E.], No. 27, Nov. 17, 1987, art. 25 (Spain).

84. *See, e.g.*, 136 CONG. REC. S17,577 (1990) (daily ed. Oct. 27, 1990) (statement of Senator Hatch) (supporting passage of Computer Software Rental Amendments on the ground that rental is disguised copying).

2. Exhaustion of Rights (Article 4(c))

The Directive makes explicit reference to the principle known as "exhaustion of rights," developed primarily in the patent domain. Its purpose is to avoid the fragmentation of the Common Market that would otherwise result from enforcement of national or territorial intellectual property.[85] Under the rule of exhaustion, once goods have been put into circulation in one EC nation, their importation into another EC nation may not be forbidden. This principle applies to copyrighted works with respect to the right of reproduction.[86] As a result, in the absence of an exemption from the rule of exhaustion (such as that set forth regarding software rental), the marketing of copies of goods covered by copyright may not be constrained once the copies have been put into circulation and lawfully obtained. Thus, for example, if copies of a French computer program have been lawfully made and sold in France, their subsequent purchase for resale in Germany affords the German licensee of the reproduction right no basis for complaint even though the seller of second-hand copies imported into Germany is competing with the licensee—and thereby compromising the "exclusivity" of his reproduction right. (Of course, the German licensee would have grounds for action if the competitor were importing *pirated* copies.)

The application of the exhaustion principle to software entitles the acquirer of a copy, be she a merchant or a consumer, to dispose of the copy as she would any other kind of goods. The object of the rule, here as elsewhere, is to forbid restrictions on commercialization of copies that the original distributor might seek to impose on buyers, because these restrictions threaten to segment the Common Market. But, in the software context, the rule should also cut short restrictions to which users are sometimes subjected, such as requirements that the program be used on a particular type of machine or at a particular site, because these limitations also tend to undermine the free

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85. *See* DIETZ, *supra* note 6, Nos. 225-249 (surveying the different Member States' laws on exhaustion of the distribution right and arguing that harmonization of these laws is particularly urgent.); Jean-Jacques Burst & Robert Kovar, *Savoir-faire et libre circulation des marchandises en droit communautaire*, 1986 Juris-Classeur Commercial Annexes, Brevets, Fascicule 540, No. 28. On the application of the principle of free circulation of goods in the context of copyright, see COLOMBET, *supra* note 1, No. 496; Françon, *supra* note 6, at 164. No paragraph in the Directive's preamble adequately clarifies the application of the rule to this area.

86. The right of public performance does not seem to be subject to the rule of exhaustion. *See* Case 62/79, Coditel v. Ciné Vog Films, 1980 E.C.R. 881, 894, [1979-1981 Transfer Binder] Common Mkt. Rep. (CCH); COLOMBET, *supra* note 1, No. 515.

circulation of these goods.[87] In any event, the idea of exhaustion should be interpreted as rendering illicit any license or sales clauses that forbid alienation of the copy. The object of such clauses is to oblige the purchaser to deal with the supplier for any resale of the copy; they therefore curb the development of a true Community-wide software market by hindering the development of security interests in copies of programs.[88]

As formulated in Article 4(c), the exhaustion rule appears to apply most readily to mass-produced software; the Directive's reference to the "sale of a copy of the program" treats the medium of fixation and the intellectual work as a single entity.[89] But the scope of the exhaustion rule is wider still. Thus, while two kinds of situations may be distinguished from sales, in one of these cases, the principle nonetheless continues to apply.

The first situation that initially appears different from a sale triggering the exhaustion rule is the creation of custom-made software. In at least some EC countries, the contract with the software writer may be characterized as a hiring of services, rather than as a sale. The exhaustion rule nonetheless should apply. This is because the client receives not only the benefit of the programmer's services, but also acquires a copy of the program. It is appropriate that the client be able to resell that copy, just as she could resell a mass-produced program.

By contrast, in the second case, a sale should be distinguished from a rental or a license of temporary user rights in the program. Even though the rental contract may give rise to the first dissemination of the product, it is nonetheless clear that the supplier of the program has not divested himself of the personal property right in the copy of the program. The client must return the copy once the

87. By contrast, a software copyright owner may permissibly restrict the *number* of machines on which the program may be used, because use of the program on more than one machine entails the making of further copies—a right protected by copyright, and not subject to exhaustion. *See infra* note 95 and accompanying text.

88. *Cf.* Dreier, *supra* note 1, at 322 (emphasizing that the clause limiting the use of a program to only one machine would be contrary to the principle of exhaustion of rights). Regarding inalienability clauses, see Jérôme Huet, *Application du droit des sûretés au financement des logiciels*, in LE FINANCEMENT DES LOGICIELS 19, 27-28 (1988).

89. The Directive does not refer to the sale of the medium of fixation alone, which would clearly be of no interest to the buyer: software is purchased, as is a machine or a book, along with the intellectual content which constitutes its utility. A contract for a "right-to-use license" to software, provided the license is transferred in definitive manner and in return for consideration, constitutes in reality the sale of a copy of the software. *See* Huet & Maisl, *supra* note 27, at 45-46. *Contra* Vivant, *supra* note 1, No. 16.2.

contract has terminated. The supplier therefore conserves all rights in the copy and indeed may withdraw it from circulation thereafter. However, to ensure that the exhaustion rule is not eluded by means of pseudo rentals, one should be careful to verify the presence of an indicia of a true rental, for example, that the contract conveys the user rights for a limited time, in return for corresponding payments.[90]

Although the Directive's provisions governing "restricted acts" broadly define the software copyright holder's exclusive rights of reproduction and adaptation, the Directive also establishes an elaborate array of exceptions to these rights, for the benefit of the software user. Some of these exceptions are necessary consequences of the broad definitions of reproduction and adaptation; the software user in fact could not use the program were the copyright owner's rights not modified on the user's behalf. Other exceptions, however, go beyond modifications necessary to the user's quiet enjoyment of the program, to afford users additional affirmative rights to copy and modify the work. We therefore will now shift this Article's focus from the rights of the copyright owner to those of the users of computer programs.

II. THE RIGHTS OF SOFTWARE USERS (ARTICLES 5 AND 6)

Article 5 of the Directive sets forth "exceptions to the restricted acts" and specifies that the "lawful acquirer" of a computer program need not obtain the copyright owner's permission:

> 1) to use the program "in accordance with its intended purpose," which includes reproducing the program in conjunction with running the program on the machine and correcting any errors in the program;
>
> 2) to make a back-up copy; and
>
> 3) to "observe, study or test the functioning of the program in order to determine the ideas and principles which underlie any element of the program if he does so while

90. *See* Dreier, *supra* note 1, at 322 ("Exhaustion only takes place if a copy of a program has been 'sold,' but not if a program has been merely licensed."). The criterion of sale chosen by Dreier is whether the right to use the program is free of any temporal limit. Dreier also adds, quite rightly, that only the right of distribution is subject to exhaustion and that the prerogatives attached to the reproduction right remain with the copyright owner of the program; notably that of controlling the conditions of reverse engineering as provided by Articles 5 and 6 of the Directive. *Id.*

> performing any of the acts of loading, displaying, running, transmitting or storing the program which he is entitled to do."[91]

Article 6 sets forth the specific conditions under which the user may decompile (reverse engineer) the program, that is, to transcribe the program's object code into source code, thereby permitting the user to read the instructions comprising the program.

It is also important to take into account Article 9 of the Directive, which declares that "any contractual provisions contrary to" the user's rights to make a back-up copy, to study the program, and to decompile the program (within the limits set forth in Article 6) "shall be null and void."[92] As a result, software copyright owners and users may derogate contractually only from the user's right to use the program. Moreover, although the Directive leaves room for contractual freedom regarding the right to use the program, one nonetheless may doubt the validity of contract language restricting user rights such as that contained in "shrink wrap licenses"—adhesion contracts that purport to take effect once the consumer opens the packaging of the program.[93]

We will divide the ensuing discussion of user rights according to rights subject to contractual derogation on the one hand, and mandatory user rights on the other.

A. *User Rights Subject to Waiver or Modification by Contract (Article 5.1)*

1. Right of Reproduction

Article 5.1 places in the forefront of rights accorded the "lawful acquirer" the right to copy the program in the course of its use. This provision is structured as a derogation from Article 4(a)'s exclusive right of reproduction. Despite the copyright owner's exclusive rights, the user need not obtain her authorization to engage in this kind of copying. This result is a natural consequence of the scope of the

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91. Directive, *supra* note 1, arts. 5.1 to 5.3.

92. *Id.*, art. 9.1. In fact, there are provisions in the Directive other than those mentioned in Article 9 that are mandatory; for example, the principle of exhaustion of rights in Article 4(c) as discussed *supra* part I.D.2.

93. *Cf.* Joanna Schmidt-Szalewski, *Conditions générales des contrats et contrats-types*, 1990 Juris-Classeur éditions Techniques, Contrats et distribution, Fascicule 60, Nos. 23-24 (under French contract law, actual consent to each condition of a contract is required; consent to some clauses of a contract does not necessarily imply consent to others).

reproduction right: software cannot be used without being loaded into the computer's temporary memory. Because the Directive defines the reproduction right to cover these acts, the user inevitably creates reproductions in the course of using the program. The exception is necessary therefore to permit the user to use the software.[94]

The term "acquirer" should be broadly understood to cover any person contracting with the computer program producer to obtain the right to use the computer program, regardless of whether the acquisition occurs as a sale or a rental of the program. However, the term does not encompass all persons in a contractual relationship with the acquirer (as opposed to the producer). For example, it should also be understood that the lawful acquisition of one copy of a program does not imply a right to transmit or distribute further copies to multiple users by means of a network, even if these persons are all contractually bound to the acquirer, for example, by a contract of employment. Thus, an office that acquires one copy of WordPerfect may not avail itself of Article 5.1 of the Directive in order to arrange free access to the program from all employee work stations connected to the office's local area network. A software copyright owner may, consistently with the Directive, restrict use of a copy of the program to a single machine at a time.[95] On the other hand, the term "lawful acquirer" should be construed to include those persons who obtain ownership of the program through a contract of sale with the first acquirer, provided, of course, that the seller relinquishes all copies of the program to the buyer.[96] Finally, the requirement that there be a "lawful acquirer" should disqualify user rights claims by any person possessing an unauthorized copy of the program.

The Directive also authorizes the lawful acquirer to make a back-up copy, and further provides that the copyright owner may not

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94. Although Article 5.1 allows for "specific contractual provisions" requiring the copyright holder's authorization to reproduce or adapt the program, even when such acts are necessary to the use of the computer program, it seems unlikely that a lawful acquirer of the program would contract to deprive himself of the right to reproduce the program within the machine, or more generally, of the right to accomplish those acts "necessary for the use of the computer program." *But see* discussion *infra* part II.A.2 (contracts to limit the user's right to adapt the program).

95. *See* Dreier, *supra* note 1, at 322.

96. *Cf.* 17 U.S.C. § 117 (1988) ("Any exact copies prepared in accordance with the provisions of this section [recognizing certain rights in owners of copies of computer programs] may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program.").

derogate from this right by contract. However, the Directive qualifies this right by providing that it applies only where the user "ha[s] a right to use" the program, and where making a back-up is "necessary for that use."[97] This suggests that if the software distributer includes a back-up disk together with the initial copy of the program, the user would not have the right to make additional back-ups.[98]

Many of these features parallel U.S. copyright law. The U.S. statute permits the owner of a copy of a computer program to "make or authorize the making of another copy . . . 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."[99] Congress included the provision at the urging of the Commission on New Technological Uses (CONTU), a body Congress had appointed upon passage of the 1976 Copyright Act to study and make recommendations regarding statutory coverage of computer programs. CONTU, like the EC Commission, determined that acts of reproduction, in principle subject to the copyright owner's control, occurred not only at the "output" stage of computer use, but at the "input" stage as well. Hence, loading a program into the machine's temporary memory constitutes making a copy of the program. Hence arises the need to provide for certain user rights.[100] In contrast to the Directive, the U.S. computer program user's rights benefit not a broad class of "lawful acquirers" but simply the "owner" of the copy of the program. As a result, under U.S. law, absent an agreement with the copyright owner, a person merely in lawful *possession* of a program, for example a lessee or a person who had borrowed the copy of the program from its owner, would not be entitled to use the program.

U.S. law also contains a user exception for back-up copies. The statute permits the owner of a copy of a computer program to make a new copy "for archival purposes only and [provided] that all

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97. Directive, *supra* note 1, art. 5.2.

98. This situation might arise when the software in question is protected by copy-protection codes, which the user might otherwise seek to remove in order to make a back-up copy. The user would not be able to take advantage of a right to do so if the back-up were already furnished him. Hence, the prohibition on marketing programs to neutralize copy-protection codes, as provided by Article 7.1(c) of the Directive, reinforces the conclusion that a software producer may override the user's right to make a backup copy if the producer furnishes the back-up himself.

99. 17 U.S.C. § 117.

100. CONTU stated: "Because the placement of a work into a computer is the preparation of a copy, the law should provide that persons in rightful possession of copies of programs be able to use them freely without fear of exposure to copyright liability." CONTU, FINAL REPORT, *quoted in* LATMAN, GORMAN & GINSBURG, *supra* note 74, at 169.

archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful."[101] U.S. courts have held that the right to create an "archival copy" applies only to programs in media subject to destruction or degeneration in the course of normal use, i.e., to programs on disks. Thus, programs expressed on paper or permanently embedded on a chip, because they do not present the same risks of volatility, have been excluded from the exemption.[102] Would the same result apply to the EC Directive? The Directive protects "the expression in any form of a computer program."[103] Thus, the term "program" probably should be read throughout the Directive to include all media in which the instructions may be expressed.[104] In that case, is the medium of the program to which the right to make a back-up copy attaches similarly indifferent? At least arguably, the term "back-up" copy in the Directive should be interpreted, like the term "archival" copy in U.S. law, to reach only those media requiring "back-ups" because there is a danger that the initial copy will self-destruct.[105]

2. Right of Adaptation

Article 5.1 of the EC Directive goes further than permitting the lawful user to copy the program; it also derogates from the copyright owner's right of adaptation, by specifying that "the acts referred to in Article 4(a) and (b) shall not require authorization by the rightholder when they are necessary for the use of the computer program by the lawful acquirer in accordance with its intended purpose, including for error correction." One may infer from this language that the lawful acquirer benefits from a right to adapt the program to his personal

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101. 17 U.S.C. § 117.

102. *See, e.g.*, Micro-SPARC, Inc. v. Amtype Corp., 592 F. Supp. 33, 35-36 (D. Mass. 1984) (program published in a magazine); Atari, Inc. v. JS & A Group, Inc., 597 F. Supp. 5, 8-10 (N.D. Ill. 1983) (program on a Read-Only-Memory (ROM) disk). *But see* Vault Corp. v. Quaid Software, Ltd., 847 F.2d 255, 264-67 (5th Cir. 1988) (declining to limit the right to make archival copies to cases where the original program is threatened by mechanical or electrical failure).

103. Directive, *supra* note 1, art. 1.2.

104. *See also* Directive, *supra* note 1, art. 1.1 ("the term 'computer programs' shall include their preparatory design material").

105. By referring to archival copies, in the plural, the U.S. law does not restrict the user to making one back-up. By contrast, the Directive's text refers to "a" back-up copy. Directive, *supra* note 1, art. 5.2. Arguably, the Directive would not authorize the making of more than one back-up. In that case, backing up a program onto a hard disk would be permissible, as would copying it to another floppy disk, but the Directive would not permit the user to copy both to a hard disk and to a floppy disk without the copyright owner's authorization.

needs. This person also would seem entitled to perform maintenance on the program. The latter proposition, however, stirred a surprising amount of controversy in the course of the drafting and revision of the Directive. The European Parliament had suggested that the user's need to maintain the program justified reverse engineering the program, and in fact analysis of the program is often necessary to the program's upkeep.[106] One should keep in mind that upkeep includes not only correction of errors but also improvements that might be made, as well as updates. Of all these user functions, the final text of Article 5.1 explicitly retains only the user's right to correct programming errors—the minimum upkeep operation. However, Article 5.1's text does not foreclose the user from improving the program; the text prefaces "error corrections" with the non-limitative designation "including." Presumably, other kinds of adaptations (Article 4(b) "acts") are also consistent with using the program "in accordance with its intended purpose." Moreover, the analysis of the program necessary to upkeep may be undertaken pursuant to Article 5.3, which grants the user the right to "observe, study or test" the program's functioning.[107]

The Directive allows the computer program copyright owner and the lawful acquirer to contract to limit or deny the user's adaptation privilege. While the user has an obvious interest in being able to adapt the program to personal needs, one can also envision that the copyright owner would reasonably wish to reserve the exclusive right to modify the software, particularly when the copyright owner not only sells copies of programs, but also offers software upkeep or updating services for those programs. The Directive's provision for alienability of the user's adaptation privilege makes it possible for software producers to retain control over adaptations. This control might be exercised in two ways. First, mass-marketed software might be accompanied by a "shrink-wrap license" under which the user purports to agree to forego the adaptation privilege. This device would be effective only to the extent EC member countries enforce this type of adhesion contract.[108] Second, and perhaps more realis-

106. *See* Verstrynge, *supra* note 1, at 10 (noting that the European Parliament had proposed an amendment to authorize decompilation for maintenance purposes, which the Commission rejected on the ground that the term "maintenance" was too broad and too indeterminate).

107. *See* Dreier, *supra* note 1, at 324 (recognizing, however, that maintenance was not used as an "independent reason" to justify decompilation) and at 323 (stating that the acts of reverse engineering authorized by Article 5.3 are not subject to the restrictions in Article 6). Regarding Article 5.3, see *infra* part II.B.1.

108. *See supra* note 93 and accompanying text.

tically, the producer of custom-made software could make renunciation of the user's adaptation privilege a term of the (negotiated) contract for the creation and servicing of the software. Thus, despite its frequent solicitude for user interests, on this issue, the Directive ultimately favors the software producers, although it also places on them the burden to contract out of the user's prerogatives.

The Directive could have reconciled the copyright owner's Article 4(b) adaptation right with the user's Article 5.1 adaptation privilege differently. Another approach would have distinguished two kinds of user-generated adaptations. On the one hand are those that give rise to a derivative work and that are intended to be marketed as such. This kind of adaptation is an act that falls squarely within the traditional scope of protection recognized by every copyright regime. On the other hand are adaptations made in order to permit the user to modify the program to her own needs, with no intention of exploiting the results through marketing the altered program. Arguably, if no commercialization would be made of the adaptation, the author's rights remain secure. Under this view, it would have been reasonable to extend to the user a nonwaivable right to personalize her copy of the software.[109] Making the right inalienable need not prejudice the interests of software producers who also service the programs they sell. In these instances, the producer is often servicing programs exploited by multiple users, for example, over an office network. Just as our prior analysis indicated that the "lawful acquirer's" right to "use" the program by reproducing it in a machine's internal memory should be limited to an individual acquirer's use of an individual program on an individual machine at any one time,[110] so should the user's privilege to adapt the program be understood to be equally spatially and temporally constrained.

Finally, whether the user is engaged in reproducing or in adapting the program, the Directive restricts these acts to those "in accordance with [the program's] intended purpose." By contrast, while the U.S. Copyright Act permits certain users to copy and to adapt, this particular limitation on the user's rights is not specified in the U.S. statute. Moreover, one U.S. federal appeals court has declined to interpret the statute as imposing such a restriction. In *Vault Corp. v. Quaid Software, Ltd.*,[111] the court rejected the

109. *Cf.* 17 U.S.C. § 117 (adaptations of the program made by owners of copies of the program may not be transferred without the authorization of the copyright owner).

110. *See supra* note 95 and accompanying text.

111. 847 F.2d 255 (5th Cir. 1988).

contention that defendant's copying and adaptation of plaintiff's copy-protection program in order to create a program that would defeat the copy-protection code exceeded the statutory rights of the owner of the copy of a program. The court held: "[the statute] contains no language to suggest that the copy it permits must be employed for a use intended by the copyright owner, and, absent clear congressional guidance to the contrary, we refuse to read such limiting language into this exception."[112] The EC has supplied the clarity lacking in the U.S. legislation.

We turn now to user rights that the Directive has explicitly insulated from contractual waiver or variation.

B. *User Rights Not Subject to Waiver or Modification by Contract: Reverse Engineering and its Limits (Articles 5.3 and 6)*

Two provisions of the Directive address the difficult question of reverse engineering: Article 5.3 rather briefly, and Article 6 in copious detail.

1. The Right to Analyze the Program (Article 5.3)

Introduced by the Commission in a modified version of the proposed Directive, following the European Parliament's review of the prior text,[113] Article 5.3 is difficult to interpret. It entitles "the person having a right to use a copy of a computer program"[114] to "observe, study or test [its] functioning . . . in order to determine the ideas and principles which underlie any element of the program." This text seems to accord the user a full right to analyze the program. This contrasts with Article 6, which also addresses program analysis, but from the angle of decompilation, and which circumscribes the decompilation right within a variety of restrictions.[115] The contrast

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112. *Id.* at 261.

113. "Whereas a person having a right to use a computer program should not be prevented from performing acts necessary to observe, study or test the functioning of the program provided that these acts do not infringe the copyright in the program . . . ." Directive Draft II, *supra* note 1, pmbl., para. 17. This paragraph was retained in the final version. Directive, *supra* note 1, pmbl., para. 19.

114. This terminology is used to designate the beneficiary of the right provided by this clause, but it seems that one can consider the phrase as the equivalent of "lawful acquirer," which has already been given a broad interpretation. *See supra* part II.A.1.

115. Commentators have not greatly illuminated the juxtaposition of the two texts, see, e.g., Verstrynge, *supra* note 1, at 10-12; Vivant, *supra* note 1, No. 17.3. *Compare* Dreier, *supra* note 1, at 323 (reconciling this duality of texts and suggesting that Article 5.3 should justify acts of reverse engineering without Article 6 limitations).

is jarring because one way to "determine the ideas and principles" that underlie the program is to reverse engineer the program; both texts therefore might seem to concern reverse engineering.[116] Moreover, Article 9 of the Directive prohibits contractual derogations from both Article 5.3 and Article 6.

In fact, two guidelines must be taken into account in order to grasp the meaning of Article 5.3. First, it appears that one should interpret Article 5.3 by distinguishing its object from that of Article 6. From that perspective, it seems that the kind of study of the program envisioned in Article 5.3 should not require the initial "translation of [the] form" of the program's code.[117] Otherwise, Article 5.3 would fall squarely within the domain of Article 6, that is, within decompilation as such. Second, according to the terms of Article 5.3, the user may analyze the program only "if he does so while performing any of the acts of loading, displaying, running, transmitting or storing the program which he is entitled to do."[118]

One can conclude that Article 5.3 extends to the user the nonwaivable right to analyze the program to the full extent desired, but that the means by which he may do so are limited; he may not retranscribe the object code of the program into source code permitting an exhaustive analysis of the program. Even this limitation, however, may seem perplexing. After all, both patent and copyright law normally entitle users to analyze another's work.[119] The leeway these laws allow for study of prior works promotes the development of the arts and the progress of science. Once the work is divulged, the owner of a copy should be able to examine it thoroughly to learn the creative steps leading to its production. For example, suppose an artist wished to apply X-ray analysis to a predecessor's painting to discover the composition of brush strokes as well as the artist's

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116. For an argument that Article 5.3 also concerns reverse engineering, see Dreier, *supra* note 1, at 323 ("the reverse engineering acts permitted by Article 5.3 are not subject to the restrictions which Article 6 stipulates for the acts of decompilation.") The two texts' shared history is outlined by Verstrynge, who declares that the decompilation provisions of Article 6 should not apply when the holder of the program can obtain the information about interoperability by using the methods of analysis provided by Article 5.3. Verstrynge, *supra* note 1, at 10-11. Regarding the meaning of the term "decompilation" as distinguished from "reverse engineering," see *infra* part II.B.2.

117. Certainly, Article 6.1 includes "reproduction of the code and the translation of its form" under the term "decompilation." *See infra* part II.B.2. However, here it can only refer to the translation of the code because reproduction is explicitly covered and permitted by Article 5.3 when its purpose is loading or storage. Thus, only translation can be reserved to Article 6 and excluded from Article 5.3.

118. Directive, *supra* note 1, art. 5.3.

119. *See, e.g.*, Huet, *supra* note 38, at 100-01.

second thoughts, or *pentimenti*. Even though the X-ray plate might constitute a "copy" or "adaptation" of the painting, the U.S. copyright law "fair use" doctrine, and its Berne Convention analogue,[120] would most likely tolerate the X-ray analysis, at least so long as no commercial use was made of the plate. The creator of a work of authorship should not be able to use the copyright law to shield himself from inquiries into the creative process—unless he takes refuge in the law of trade secrets and refuses to divulge the work.

To the extent that the Directive truncates the user's right to study the program, it appears inconsistent with the general copyright approach. Nonetheless, despite its reservations, the Article 5.3 right to observe and study the program still expresses a principle favoring users.[121] Granted, it might have been preferable for the Directive, rather than setting forth broad exclusive rights and later qualifying them with a variety of user-friendly exceptions, simply to have provided that the copyright owner's monopoly does not extend to these user activities. In any event, it should not matter that technical reasons, arising from the need to make a copy of the program within the machine in order to use or study the work, led to treating this user rights question as an exception to the author's exclusive right of reproduction. Article 5.3 authorizes studying the program, and Article 9, by prohibiting agreements to the contrary, renders mandatory the right to "observe, study or test." This constitutes a right to learn the "ideas and principles" underlying the program, which not only are excluded as such from protection under Article 1.2, but also—as a result of Article 5.3—are rendered accessible to any lawful possessor of the program.

However, it is also true that while, technically, loading or running a program in the machine may permit the user to study it, these procedures will not yield complete knowledge of the program. That cannot be achieved without decompiling the program.

2. Decompilation (Article 6)

The difficult and highly controversial question of decompilation is governed by Article 6, which sets forth a compromise solution. That text provides in part:

> The authorization of the rightholder shall not be required where reproduction of the code and translation of its form

120. *See* 17 U.S.C. § 107 (Supp. II 1990); Berne Convention, *supra* note 12, art. 9.2.

121. *Contra* Vivant, *supra* note 1, No. 17.3 (stating that the Directive poses the principle of "the illegality of reverse engineering").

> . . . are indispensable to obtain the information necessary to achieve the interoperability of an independently created computer program with other programs. . . .[122]

The first element of the compromise was already expressed in Article 5.3, which sets forth the principle of the lawful acquirer's right to analyze the program. Article 6 concerns only decompilation per se, that is, only one of the means of analysis capable of implementation by reverse engineering. Decompilation may be defined as the rewriting, on the basis of the object code, of a pseudo-source code of the program—a version in humanly intelligible high-level language, such as the original programmer herself might have written to produce the machine-code version accessible to the user.

The second element of the compromise is found in the text of Article 6, which permits reconstitution of the source code, but only for the purpose of achieving interoperability of programs, and only to the extent that reverse engineering enables the user to access information concerning the interfaces of the decompiled program. Article 9 provides that the decompilation right is imperative; the user may not contract this right away.[123]

Article 6 responds to two major problems that reverse engineering attempts to address: communication between systems on open networks (because to connect to the network one must learn the communications protocols of other programmers); and creation of systems that are compatible with the standards imposed by the marketplace (an issue that arises most acutely in the domain of microcomputers). The Directive's preamble repeatedly emphasizes the importance of these issues. Paragraph 9 declares that "the Community is fully committed to the promotion of international standardization" (and thus favors communication on open networks); paragraphs 10 and 11 stress that "the function of a computer program is to communicate and work together with other components of a computer system" and that "the parts of a program which provide for such interconnection and interaction between elements of software and hardware are generally known as 'interfaces,'" while paragraph 12

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122. Directive, *supra* note 1, art. 6.1.

123. However, the supplier may be able to restrain decompilation by publishing information on interfaces. This is because Article 6.1(a) bars decompilation by the user if information necessary to achieve interoperability has already been made available by the supplier. *See* Dreier, *supra* note 1, at 324. *But see infra* note 131 and accompanying text.

defines "interoperability" as "the ability to exchange information and mutually to use the information which has been exchanged."[124]

This definition is crucial. It should engender a rather broad conception of lawful decompilation and lawful exploitation of the results of decompilation. This is because the Directive's goal is to achieve the exchange of information between programs and the use of one program together with another under the best technical conditions, that is, with full knowledge of the functional aspects of the interfaces of the studied program. This policy invites those who implement the Directive to adopt a flexible interpretation of the provisions on decompilation. Moreover, this impression is reinforced by review of the conditions that Article 6.1 imposes on the exercise of the decompilation right, as well as those imposed by Article 6.2 on the exploitation of the information discovered through decompilation.

a. Conditions Justifying Decompilation

Despite their restrictive appearance, the terms the Directive sets forth for exercise of the decompilation right are in fact rather generous. Article 6.1's long list of conditions establishes rather obvious requirements when it states: (a) that decompilation may be performed only by a person having the right to use the program;[125] and (b) that the information sought has not already been rendered accessible.[126] The requirement in 6.1(c) that the right to decompile is "confined to the parts of the original program which are necessary to achieve interoperability" was already set forth at the outset of Article 6.1, which permits decompilation "indispensable to obtain the

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124. Directive, *supra* note 1, pmbl., paras. 9-12. There are other clauses in the preamble to note: paragraphs 21 and 22 correspond to Article 6; paragraph 27 contemplates the application of the competition rules under Articles 85 and 86 of the EEC TREATY if a supplier refuses to allow third parties access to the information necessary for interoperability; and above all paragraph 28, which states that the Directive does not affect either concluded arrangements concerning publication of interfaces in the telecommunications sector or standardization agreements in the informational technology and telecommunications sectors.

125. However, a person authorized by the lawful acquirer could also perform the decompilation. *Cf.* 17 U.S.C. § 117 (permitting an owner of a computer program to "make or *authorize the making of* another copy or adaptation") (emphasis supplied); Micro-SPARC, Inc. v. Amtype Corp., 592 F. Supp. 33 (D. Mass. 1984) (keying into digital form on clients' computer disks programs originally published in magazines).

In general, the Directive's use of inconsistent terminology in referring to the legitimate user is unfortunate. Article 5.1 discusses the "lawful acquirer"; Article 5.3 concerns the person "having a right to use a copy of [the] program"; and Article 6.1(a) addresses the " . . . acts . . . performed by the licensee or by another person having a right to use a copy of a program, or on their behalf by a person authorized to do so."

126. *See supra* note 123 and accompanying text. *But see infra* note 131 and accompanying text.

information necessary to achieve the interoperability of an independently created program with other programs . . . ." The guiding notion is that decompilation is authorized only for the purpose of, and only to the extent necessary for, the achievement of interoperability.

That said, further examination of two questions will allow us to test how much leeway the Directive in fact allows users. The first question addresses the scope of the interoperability principle. Is the interoperability envisioned by the Directive limited to decompilation in order to create a program that will interact with the decompiled program? The text of Article 6 requires that the "independently created computer program" derived from the information elicited through decompilation be interoperable "with other programs." The text contains no restriction regarding the identity of the program with which the decompiler's program will be interoperative. We therefore conclude that the scope of the decompilation privilege is broad indeed.

The following example may help illustrate the breadth we perceive. The interface software of a microcomputer is known as the "basic input-output system" or "BIOS." Its purpose is to link the operating system software, which governs the internal functioning of the machine, to the applications software. The applications software includes the programs with which the user interacts, for example, the word processing, spreadsheet or graphics programs.[127] The BIOS manages the ensemble of communications between the applications and the operations software. Suppose a hardware manufacturer wished to design a BIOS that would enable his machines to run applications software designed for other microcomputers, such as the IBM PC, and that IBM had not published the specifications of its BIOS interfaces. Is the manufacturer confined to studying or decompiling the interfaces of applications software designed for the IBM PC, or may he decompile the interfaces of IBM's BIOS itself in order to discover the elements of compatibility with IBM-compatible applications software?[128] Put another way, does the Directive

127. Another example in the area of communication systems is that of "network management" software.

128. These facts are similar to those at issue in the United States. In Apple Computer Inc. v. Franklin Computer Corp., 714 F.2d 1240 (3d Cir. 1983), *cert. denied*, 464 U.S. 1033 (1984), defendant Franklin had sought to design an Apple-compatible computer that would run the vast variety of applications software designed for the Apple machine. However, Franklin achieved that compatibility by simply copying the Apple operating system. This would not be permitted under the EC Directive. To achieve Apple-compatibility, Franklin would be permitted to analyze and decompile the interfaces of the Apple BIOS, but Franklin would thereafter be obliged to prepare its own program exploiting that information.

authorize the lawful user to decompile IBM's BIOS program in order to devise a new program that will compete with or substitute for the decompiled program?

The answer, we believe, is that he surely may decompile the BIOS.[129] The Directive authorizes decompilation not only for the purpose of acquiring information about a program in order to design a program to interact with it, but also in order to create any kind of program using the interface information acquired from the decompiled program.[130] This solution is appropriate to the Directive's goal of encouraging interoperability, for it would be technically quite difficult to construct an IBM-compatible BIOS only on the basis of information acquired from the interfaces of IBM-compatible applications programs.

A second question concerns the nature of the interfaces subject to decompilation: are these limited to interfaces expressly included by the creator of the decompiled program, or may the decompiler in effect introduce new interfaces? Because the Directive does not specify only interfaces envisioned by the original programmer, we conclude that the decompiler may seek information concerning any kind of interoperability to which the program may lend itself.[131]

These two conclusions prompt an additional observation regarding the scope of the decompilation right. Although the right is restricted to decompilation necessary to acquire information on interoperability, in practice it seems difficult if not impossible to impose meaningful limits on the extent to which a program may be decompiled. In a computer program, many elements are closely linked to those that directly affect interoperability, so that it is often necessary to understand the functioning of the whole program in

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129. *See* COMMISSION OF THE EUROPEAN COMMUNITIES, XXTH REPORT ON COMPETITION POLICY pt. 2, ch. I, §4(g) (1991); Lehmann, *supra* note 38, at 11; *cf.* Verstrynge, *supra* note 1, at 11 ("[T]he interoperable program which the reverse engineer creates independently of the programs he has analyzed may in fact find itself in competition with those programs.").

130. *See* Verstrynge, *supra* note 1, at 13 ("the text does not impose on [the reverse engineer] that he can only reverse engineer programs he intends to operate with.").

131. This conclusion arguably conflicts with Article 6.1(b) of the Directive, which permits decompilation to acquire interoperability information when the information "has not previously been readily available. . ." This text permits the inference that the copyright owner may forestall decompilation by making interface information available. *See supra* note 123. However, the copyright owner would naturally only disclose information regarding interfaces she had intended to be present in the program. Short of disclosing the entire source code, the copyright owner could not reveal the code corresponding to unintended interfaces. Thus Article 6.1(b) should not deprive the user of the possibility of researching all interfaces by legal methods.

order to create a program that can successfully exploit the decompiled program's interfaces. To attempt to isolate interoperability information from the program as a whole is as artificial, and futile, as endeavoring to confine the knowledge, for example, of a manufacturer of tires for airplanes to the dimensions of the wheels, without revealing anything about the other elements that necessarily influence the tires' construction, such as the weight of the plane or its runway speed.

The apparent limits on the amount of decompilation the user may perform are unrealistic for another reason as well. The decompiler may not know where in the program the elements concerning interfaces are located; she therefore may be obliged to decompile the entire program in order to find the pertinent sections. As a result, it becomes clear that the conditions justifying decompilation are rather open-ended. In fact, it appears that as a practical matter the program in its entirety may be subject to decompilation. The Directive imposes few meaningful restrictions on the threshold matter of whether or not a program may be decompiled. Our inquiry therefore shifts to a subject more susceptible to effective regulation: the delineation of exploitations to which the person effecting the decompilation lawfully may put the resulting information, without the copyright owner's approval.

b. Exploitation of Information Acquired Through Decompilation

The Directive's real restrictions on decompilation pertain to the exploitation of information acquired by means of decompilation. Article 6.2 makes clear that information may be used only to the extent necessary to achieve interoperability, and any program exploiting this information must be "independently created."[132] Thus, one may not decompile a program solely for the purpose of creating a "knock-off" program that is substantially similar in its expression to the initial work.[133] This is a classic principle of copyright law.

The phrase "independently created computer program" suggests that the program created by the person who performed the reverse engineering must itself be this person's own creation. Although this person may well be a potential competitor of the creator of the first program, the new program must not be a literal reproduction of the decompiled program, nor may it be too closely inspired by it.

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132. Directive, *supra* note 1, art. 6.2(a).

133. *Id.*, art. 6.2(c). Article 6.2(b) prohibits the communication to third parties of information acquired by decompilation, except when necessary to interoperability.

However, as noted above, this rule simply recalls fundamental copyright principles. Hence, one may perceive something more in the Directive's phrase. Indeed, a widespread practice in the computer programming profession suggests that one can impose a more stringent standard regarding the manner of exploiting information derived from decompilation. The recommended method follows the so-called "clean-room technique," which involves two successive teams of programmers. The first team decompiles the program and identifies information concerning interoperability. The second, never having encountered the decompiled program, then creates a competing program incorporating the information (in the form of specifications) communicated by the first team. This method helps ensure the independence of the creation of the second program.[134]

However, whatever the method used, the prohibition on creating a program, or part of a program, similar to the decompiled program is not all-encompassing. Copying and exploitation nonetheless may occur when the decompiled program's instructions are banal or standard, or if the form of the program is dictated by the function it performs.[135]

Article 6.3 imposes a final limitation on the decompilation privilege established in the rest of Article 6: that privilege "may not be interpreted in such a way as to allow its application to be used in a manner which unreasonably prejudices the right holder's [sic] legitimate interests or conflicts with a normal exploitation of the computer program."[136] It is difficult to foresee the impact of this provision. The language is taken from a section of the Berne Convention that allows member countries to "permit the reproduction of [literary] works in certain special cases, provided that such reproduction does not conflict with a normal exploitation of the work and does not unreasonably prejudice the legitimate interests of the author."[137] Within the context of the Berne Convention, consistent interpretation of this language has yet to emerge; indeed, the notion

134. The "clean room technique" is consistent with Article 6.2(b)'s conditions on giving decompilation-derived information to others: the information may not be communicated "except when necessary for the interoperability of the independently created computer program." In a recent decision of the U.S. Court of Appeals for the Second Circuit, defendant's recourse to the clean room technique contributed significantly to the court's determination that defendant had not copied protectable expression from plaintiff's program. *See* Computer Assocs. Int'l, Inc. v. Altai, Inc., 23 U.S.P.Q.2d 1241, 1248-49 (2d Cir. June 22, 1992).

135. *See supra* notes 50, 53-57 and accompanying text.

136. Directive, *supra* note 1, art. 6.3.

137. Berne Convention, *supra* note 12, art. 9.2.

of a "normal exploitation" has proven elusive with respect to traditional literary works, and may prove even more so with respect to computer programs.[138] In the context of the Directive, should Article 6.3 require interpretation, one may anticipate that it will fall to the Court of Justice of the European Communities to decide what meaning to give the phrases "normal exploitation" and "unreasonably prejudice legitimate interests" in the particular case of decompilation.[139]

It may be too early to tell whether the decompiler enjoys broader prerogatives under the Directive or under U.S. copyright law. The U.S. approach to decompilation continues to evolve, and is currently in ferment. Since 1991, one federal district court and three federal appellate courts have confronted the problem at the root of decompilation: the establishment of unauthorized copies as an intermediate step in the creation of a potentially competing (albeit not necessarily substantially similar) end-product. One appellate court has condemned the practice as copyright infringement, the other two have tolerated it to varying degrees under the fair use exception to copyright infringement.

In its 1991 decision in *Bellsouth Advertising & Publishing Corp. v. Donnelley Information Publishing Inc.*,[140] the Eleventh Circuit sustained the intermediate copying theory of infringement. The court found the defendant Donnelley infringed plaintiff Bellsouth's yellow pages by loading Bellsouth subscriber information into Donnelley's computer and creating sales lead sheets that permitted Donnelley to solicit additional advertising from Bellsouth's customers. Although the sales sheets were organized differently from the yellow pages, the appellate court upheld the finding of infringement primarily on the ground that defendant had established an intermediate infringing copy by hiring a third party to key Bellsouth's compilation of subscriber information into a data base fixed on a magnetic tape. Donnelley

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138. *See, e.g.*, Françon, *supra* note 72, No. 58; Jane C. Ginsburg, *Reproduction of Protected Works for University Research or Teaching*, 39 J. COPYRIGHT SOC'Y U.S.A. 181, 186-87 (1992).

139. It seems clear, at least, that within the structure of the Directive, the term "normal exploitation" cannot encompass an exclusive right to create and distribute compatible software.

140. 933 F.2d 952 (11th Cir. 1991). [Editor's note: subsequent to submission of this article, by order dated November 4, 1992, the Eleventh Circuit vacated the panel decision in *Bellsouth* and ordered rehearing *en banc*. Bellsouth Advertising & Pub. Corp. v. Donnelley Information Pub., Inc., No.89-5131, 1992 WL 317393 (11th Cir. Nov. 4, 1992).]

created its sales sheets from the data base downloaded from the magnetic tape.[141]

Similarly, a federal district court in California in *Sega Enterprises v. Accolade, Inc.*,[142] awarded a preliminary injunction to a software producer who complained that defendant had reverse engineered subroutines contained in plaintiff's videogame consoles and cartridges, in order to produce unauthorized videogame programs that would be compatible with plaintiff's consoles. Defendant had disassembled the object code of plaintiff's game programs, and had translated the object code into higher level code. Defendant then made copies of the translated program and worked from them in order to devise videogame programs that were not themselves infringingly similar to any of plaintiff's games. The court nonetheless found infringement on the basis of the intermediate copy that defendant had made by translating the source code.

The Ninth Circuit reversed. That court agreed that creation of intermediate copies was prima facie infringing—indeed the Ninth Circuit had itself upheld that basis for liability in a decision involving a work other than a computer program.[143] Nonetheless, the court held that intermediate copying for the purposes of studying a computer program qualified as a fair use. The court stated:

> [W]e conclude based on the policies underlying the Copyright Act that disassembly of copyrighted object code is, as a matter of law, a fair use of the copyrighted work if such disassembly provides the only means of access to those elements of the code that are not protected by copyright and the copier has a legitimate reason for seeking such access.[144]

The court found that defendant's desire to create independent videogames that would be compatible with plaintiff's hardware, but

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141. *Id.* at 958-59. However, basing liability on intermediate copying when the final result that is distributed to the public would not be deemed infringing may be inconsistent with the approach to copyright protection enunciated by the Supreme Court in Feist Pubs. Inc. v. Rural Telephone Serv. Co., 111 S. Ct. 1282 (1991). *See* Jane C. Ginsburg, *No "Sweat"? Copyright and Other Protection of Works of Information after* Feist v. Rural Telephone, 92 COLUM. L. REV. 338, 351-52 (1992) (discussing *Bellsouth*).

142. 785 F. Supp. 1392 (N.D. Cal. 1992), *rev'd*, No. 92-15655, 1992 U.S. App. LEXIS 26645 (9th Cir. Oct. 20, 1992).

143. Walker v. University Books, Inc., 602 F.2d 859 (9th Cir. 1979) (fortune-telling cards).

144. *Sega*, 1992 U.S. App. LEXIS 26645, at *16-17.

that would not be substantially similar to videogames licensed by plaintiff, constituted such a reason.[145]

For the Ninth Circuit, the "hybrid nature of computer programs" justified intermediate copying where no other means of access to a program's ideas and functions exists. A computer program, as an "article[] that accomplish[es] tasks," will be composed of "many logical, structural, and visual display elements that are dictated by the function to be performed, by considerations of efficiency, or by external factors such as compatibility requirements and industry demands."[146] Many, indeed most, of these elements would not be protected by copyright.[147] But disclosure of the program only in object code may render these elements inaccessible. Thus, while they may in theory be freely copied, they are in fact shielded from reproduction, so long as the format in which they are disseminated remains indecipherable. As the Ninth Circuit stressed, "The unprotected aspects of most functional works are readily accessible to the human eye."[148] Where disassembly offers the only means of obtaining access to or understanding unprotected aspects of the program, disassembly must be permitted, lest the copyright owner "gain[] a de facto monopoly over the functional aspects of his work—aspects that were expressly denied protection by Congress."[149]

In a decision rendered shortly before the Ninth Circuit issued its opinion, the Court of Appeals for the Federal Circuit, in *Atari Games Corp. v. Nintendo of America Inc.*,[150] anticipating the jurisprudence of the Ninth Circuit,[151] also held that intermediate copying could be a fair use. The court stated:

> The Copyright Act permits an individual in rightful possession of a copy of a work to undertake necessary efforts to understand the work's ideas, processes, and methods of operation.
>
> . . . .

145. *Id.* at *33-34.

146. *Id.* at *40.

147. See 17 U.S.C. § 102(b) (no protection for ideas, systems, methods, and processes).

148. *Sega*, 1992 U.S. App. LEXIS 26645, at *43.

149. *Id.* at *47.

150. No. 91-1293, 1992 U.S. App. LEXIS 21817 (Fed. Cir. Sept. 10, 1992).

151. When the Federal Circuit rules on legal issues not exclusively assigned to it, such as copyright, it "applies the law which would be applied by the regional circuit." Atari Games Corp. v. Nintendo of America, Inc., 897 F.2d 1572, 1575 (Fed. Cir. 1990).

> The copyright holder has a property interest in preventing others from reaping the fruits of his labor, not in preventing the authors and thinkers of the future from making use of, or building upon, his advances. . . .
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> . . . .
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> . . . When the nature of a work requires intermediate copying to understand the ideas and processes in a copyrighted work, that nature supports a fair use for intermediate copying. Thus, reverse engineering object code to discern the unprotectable ideas in a computer program is a fair use.[152]

But, for the Federal Circuit, reverse engineering ceases to be a fair use if the decompiler goes beyond learning the program's ideas and processes to making a substantial reproduction of the program for commercial purposes.

> Fair use to discern a work's ideas, however, does not justify extensive efforts to profit from replicating protected expression. . . . [F]air use in intermediate copying does not extend to commercial exploitation of protected expression. The fair use reproductions of a computer program must not exceed what is necessary to understand the unprotected elements of the work.[153]

Both the Federal and the Ninth Circuits' treatments of the reverse engineering issue recall the Directive's resolution: one may decompile a predecessor's program to understand its functions, but the knowledge thus acquired must be put to the creation, not of a reprise of the copied work, but of an independently authored, albeit potentially competing, program. Similarly, as both opinions stated, and as the Ninth Circuit particularly emphasized, decompilation will qualify as a fair use only where there is no other means of access to the unprotected programming information. However, the Federal and Ninth Circuits' approaches to decompilation appear more generous than the Directive's, for they are not limited to acquisition and exploitation of information regarding program interfaces. Even though, as we have seen, that limitation in the Directive does not seem to restrict much decompilation, it does confine the use to which the second-comer may put her knowledge of the source code. Under the Directive, the decompiler may not exploit information unrelated

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152. *Atari*, 1992 U.S. App. LEXIS 21817 at * 27-29.

153. *Id.* at *30.

to "interoperability" between programs.[154] By contrast, the Federal Circuit's analysis would permit the reverse engineer to use information pertaining to a variety of program elements that do not necessarily communicate with other programs. The Ninth Circuit, staking a middle ground, did not explicitly limit the scope of its fair use analysis to the context of hardware/software compatibility, but emphasized that "[t]he need to disassemble object code arises, if at all, only in connection with operations systems, system interface procedures, and other programs that are not visible to the user when operating—and then only when no alternative means of gaining an understanding of those ideas and functional concepts exists."[155]

The following example may illustrate the contrast between the EC and the evolving U.S. delineation of permissible decompilation. A word processing program, such as WordPerfect, contains, in addition to the word processing elements with which the user interacts, elements that link the program to programs governing printer functions, and that connect the program to a variety of related programs, such as spell-checkers and thesauruses. Under the Directive, a programmer wishing to create a spell-checker that would work with WordPerfect would be permitted to exploit information derived from decompiling the WordPerfect program, but only insofar as that information relates to the interaction of the word processing and spell-checking programs and is not otherwise available. Under the Federal Circuit's approach, it appears that all information obtained from reverse engineering and making an intermediate high-level language copy of WordPerfect could be exploited to create not only a WordPerfect-compatible spell-checker, but a rival to WordPerfect itself. However, the resulting program could not reproduce the original copyrighted aspects of the decompiled work. Under the Ninth Circuit's approach, disassembly of the code to create a WordPerfect compatible program could be fair use. The fair use claim of the WordPerfect substitute seems more tenuous, because the *Sega* decision itself addressed only a program designed to work together with, rather than to replace outright, the decompiled work.

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154. Although paragraph 12 of the preamble to the Directive offers a very broad definition of interoperability ("whereas such interoperability can be defined as the ability to exchange information and mutually to use the information which has been exchanged"), the interoperability targeted by Article 6 seems limited to exchanges of information between computer programs, rather than between software and users.

155. Sega Enters. v. Accolade, Inc., No. 92-15655, 1992 U.S. App. LEXIS 26645, at *24-25 (9th Cir. Oct. 20, 1992).

Returning to the terms of the Directive, we should make two related points concerning interoperability of software programs within the EC scheme. First, the software producer himself can make available information concerning interfaces, and thereby can curtail the decompilation right. As a practical matter, this is a better solution, for decompilation is a long and costly process. Moreover, if the first producer makes frequent improvements or updates to the program, the decompiler may have to decompile repeatedly, in order to acquire the newer information—hence the desirability of voluntary communication of interface information. The first producer need not make this information unconditionally available to the general public; it can be communicated pursuant to contractual agreements with interested purchasers. Thus furnished, interface information need not be sought by means of decompiling.[156] The Directive anticipates this kind of voluntary communication, for it limits the decompilation right to instances where "the information necessary to achieve interoperability has not previously been readily available . . . ."[157]

The conditions of the Directive are satisfied if the information is "readily available." Of course, the information also must be complete and easy to implement. Moreover, nothing in the Directive prohibits the disclosing producer from demanding a fee for the disclosure, so long as the charge is not so high as to discourage demand. In that case, the user's right to decompile might re-attach. This analysis suggests that contracts can govern the implementation of the interoperability principle.

Second, the EC rules of competition law also may apply to software copyright, as the Preamble reminds us in declaring that the Directive does not exclude "the application of the competition rules under Articles 85 and 86 of the Treaty if a dominant supplier refuses to make information available which is necessary for interoperability as defined in this Directive."[158] One may infer that, even if competition remains possible, there may be cases where competition would be too expensive or too risky, for example, because of the rapid development of computer programs, and that therefore the rapid communication of information concerning interoperability would be the only reasonable solution. If the supplier (copyright owner)

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156. This analysis applies only to interfaces envisioned by the first software producer. When the decompiler is inserting an unforeseen interface, the first producer cannot protect herself against decompilation by divulging interface information.

157. Directive, *supra* note 1, art. 6.1(b). *But see supra* note 131 and accompanying text (difficulty of preempting decompilation when user seeks to explore *unintended* interfaces).

158. Directive, *supra* note 1, pmbl., para. 27.

refused, application of competition law principles might compel him to disclose interface information, just as IBM was constrained in 1984 to disclose the interfaces of its IBM/370 system and its SNA network.[159] Moreover, because the rules of the Directive must be incorporated into Member State legal systems, there is no doubt that the inclusion of these competition law principles in the articulation of informatics policy will occur not only on the Community-wide level, but also within the domestic law of each Member State.

Thus, the Directive opens three routes to access to information concerning interoperability of computer programs: research by means of lawful decompilation; contracts among members of the trade (professional program suppliers and professional users); and regulations imposed by authorities charged with oversight of the competition rules. This last means of access to information should be equally applicable to the other sources of computer program protection, such as patent and trade secret, that Article 9 reminds us are also available to software producers.

CONCLUSION

The EC Software Directive ratifies and reinforces the trend in many Member States toward inclusion of computer programs within the scope of copyright protection. The Directive goes further than some national laws had, by explicitly declaring computer programs to be literary works and thus entitling them, in principle, to full copyright status, both as a matter of domestic law and as a matter of international copyright law under the Berne Convention. Nonetheless, the Directive does not regulate computer programs in a manner completely coextensive with other literary works, for the Directive elaborates substantial user rights that may exceed the privileges traditionally accorded consumers of other literary works. The Directive entitles users to make copies and adaptations of computer programs for their personal use in connection with running the program on the machine. This prerogative might be analogized to the right, found in the copyright laws of many Member States, to engage in private copying. But the Directive also implements a policy favoring standardization and intercommunication in the informatics industry, by permitting users to decompile programs in order to

159. IBM agreed to this disclosure after a hearing in an EC Commission investigation for abuse of dominant market position; the disclosure agreement was renewed in 1988. *See generally* JÉRÔME HUET & HUBERT MAISL, DROIT DE L'INFORMATIQUE ET DES TÉLÉCOMMUNICATIONS No. 749 (1989).

acquire information about the decompiled program's interfaces (or indeed, to insert new interfaces into the original program), which will in turn permit the user to create new programs exploiting those interfaces.

The Directive strives to attain two potentially conflicting objectives. On the one hand, the Directive seeks to encourage the creation and production of software in general, by confirming the place of computer programs in the copyright domain. On the other hand, the Directive endeavors to foster the creativity and the financial viability of smaller producers, by permitting them to uncover the creative process underlying the major market programs, and thereby to design substitutes for these programs. However, if one goal of the Directive was to assist EC Member States' Davids in their competition with (often American) Goliaths in the informatics industry, the Directive's text is neutral as to the commercial size of the user-beneficiary. Hence, the Directive also enables Goliath to decompile and compete with David's innovations. It therefore remains to be seen whether the second goal may be achieved without compromising the first.