Apple Computer, Inc. v. Franklin Computer Corporation

U.S. Court of Appeals Third Circuit
August 30, 1983
714 F.2d 1240, 219 USPQ 113

[Editor's note: This case is discussed in *Legal Protection of Digital Information* in: Chapter 2, Section II.B.2. (Apple v. Franklin).]

Sloviter, Circuit Judge.

I. Introduction

Apple Computer, Inc. appeals from the district court's denial of a motion to preliminarily enjoin Franklin Computer Corp. from infringing the copyrights Apple holds on fourteen computer programs.

The decision to grant or refuse to grant a preliminary injunction is within the discretion of the district court. See A.O. Smith Corp. v. FTC, 530 F.2d 515, 525 (3d Cir. 1976). Although the scope of our review of the action of the district court in ruling on a motion for preliminary injunction is narrow, reversal is warranted if the trial court has abused its discretion or committed error in applying the law. Kennecott Corp. v. Smith, 637 F.2d 181, 187 (3d Cir. 1980). As the Second Circuit has stated recently, "Despite oft repeated statements that the issuance of a preliminary injunction rests in the discretion of the trial judge whose decisions will be reversed only for 'abuse', a court of appeals must reverse if the district court has proceeded on the basis of an erroneous view of the applicable law." Donovan v. Bierwirth, 680 F.2d 263, 269 (2d Cir.), cert. denied, 103 S.Ct. 488 (1982).

In this case the district court denied the preliminary injunction, inter alia, because it had "some doubt as to the copyrightability of the programs." Apple Computer, Inc. v. Franklin Computer Corp., 545 F. Supp. 812, 215 USPQ 935 (E.D. Pa. 1982). This legal ruling is fundamental to all future proceedings in this action and, as the parties and amici curiae seem to agree, has considerable significance to the computer services industry.[1] Because we conclude that the district court proceeded under an erroneous view of the applicable law, we reverse the denial of the preliminary injunction and remand.

II. Facts and Procedural History

Apple, one of the computer industry leaders, manufactures and markets personal computers (micro-computers), related peripheral equipment such as disk drives (peripherals), and computer programs (software). It presently manufactures Apple II computers and distributes over 150 programs. Apple has sold over 400,000 Apple II computers, employs approximately 3,000 people, and had annual sales of $335,000,000 for fiscal year 1981. One of the byproducts of Apple's success is the independent development by third parties of numerous computer programs which are designed to run on the Apple II computer.

<714 F.2d 1243> Franklin, the defendant below, manufactures and sells the ACE 100 personal computer and at the time of the hearing employed about 75 people and had sold fewer than 1,000 computers. The ACE 100 was designed to be "Apple compatible," so that peripheral equipment and software developed for use with the Apple II computer could be used in conjunction with the ACE 100. Franklin's copying of Apple's operating system computer programs in an effort to achieve such compatibility precipitated this suit.

Like all computers both the Apple II and ACE 100 have a central processing unit (CPU) which is the integrated circuit that executes programs. In lay terms, the CPU does the work it is instructed to do. Those instructions are contained on computer programs.

There are three levels of computer language in which computer programs may be written.[2] High level language, such as the commonly used BASIC or FORTRAN, uses English words and symbols, and is relatively easy to learn and understand (e.g., "GO TO 40" tells the computer to skip intervening

steps and go to the step at line 40). A somewhat lower level language is assembly language, which consists of alphanumeric labels (e.g., "ADC" means "add with carry"). Statements in high level language, and apparently <219 USPQ 116> also statements in assembly language, are referred to as written in "source code." The third, or lowest level computer language, is machine language, a binary language using two symbols, 0 and 1, to indicate an open or closed switch (e.g., "01101001" means, to the Apple, add two numbers and save the result). Statements in machine language are referred to as written in "object code."

The CPU can only follow instructions written in object code. However, programs are usually written in source code which is more intelligible to humans. Programs written in source code can be converted or translated by a "compiler" program into object code for use by the computer. Programs are generally distributed only in their object code version stored on a memory device.

A computer program can be stored or fixed on a variety of memory devices, two of which are of particular relevance for this case. The ROM (Read Only Memory) is an internal permanent memory device consisting of a semi-conductor "chip" which is incorporated into the circuitry of the computer. A program in object code is embedded on a ROM before it is incorporated in the computer. Information stored on a ROM can only be read, not erased or rewritten.[3] The ACE 100 apparently contains EPROMS (Erasable Programmable Read Only Memory) on which the stored information can be erased and the chip reprogrammed, but the district court found that for purposes of this proceeding, the difference between ROMs and EPROMs is inconsequential. 545 F. Supp. at 813 n.3, 215 USPQ 935, 938 n.3. The other device used for storing the programs at issue is a diskette or "floppy disk", an auxiliary memory device consisting of a flexible magnetic disk resembling a phonograph record, which can be inserted into the computer and from which data or instructions can be read.

Computer programs can be categorized by function as either application programs or operating system programs. Application programs usually perform a specific task for the computer user, such as word processing, checkbook balancing, or playing a game. In contrast, operating system programs generally manage the internal functions of the computer or facilitate use of application programs. The parties agree that the fourteen computer programs at <714 F.2d 1244> issue in this suit are operating system programs.[4]

Apple filed suit in the United States District Court for the Eastern District of Pennsylvania <219 USPQ 117> pursuant to 28 U.S.C. §1338 on May 12, 1982, alleging that Franklin was liable for copyright infringement of the fourteen computer programs, patent infringement, unfair competition, and misappropriation. Franklin's answer in respect to the copyright counts included the affirmative defense that the programs contained no copyrightable subject matter. Franklin counterclaimed for declaratory judgment that the copyright registrations were invalid and unenforceable, and sought affirmative relief on the basis of Apple's alleged misuse. Franklin also moved to dismiss eleven of the fourteen copyright infringement counts on the ground that Apple failed to comply with the procedural requirements for suit under 17 U.S.C. §§410, 411.

<714 F.2d 1245> After expedited discovery, Apple moved for a preliminary injunction to restrain Franklin from using, copying, selling, or infringing Apple's copyrights. The district court held a three day evidentiary hearing limited to the copyright infringement claims. Apple produced evidence at the hearing in the form of affidavits and testimony that programs sold by Franklin in conjunction with its ACE 100 computer were virtually identical with those covered by the fourteen Apple copyrights. The variations that did exist were minor, consisting merely of such things as deletion of reference to Apple or its copyright notice.[5] James Huston, an Apple systems programmer, concluded that the Franklin programs were "unquestionably copied from Apple and could not have been independently created." He reached this conclusion not only because it is "almost impossible for so many lines of code" to be identically written, but also because his name, which he had embedded in one program (Master Create), and the word "Applesoft", which was embedded in another (DOS 3.3), appeared on the Franklin master disk. Apple estimated the "works in suit" took 46 man-months to produce at a cost of over $740,000, not including the time or cost of creating or acquiring earlier versions of the programs or the expense of marketing the programs.

Franklin did not dispute that it copied the Apple programs. Its witness admitted copying each of the works in suit from the Apple programs. Its factual defense was directed to its contention that it was not feasible for Franklin to write its own operating system programs. David McWherter, now

Franklin's vice-president of engineering, testified he spent 30-40 hours in November 1981 making a study to determine if it was feasible for Franklin to write its own autostart ROM program and concluded it was not because "there were just too many entry points in relationship to the number of instructions in the program." Entry points at specific locations in the program can be used by programmers to mesh their application programs with the operating system program. McWherter concluded that use of the identical signals was necessary in order to ensure 100% compatibility with application programs created to run on the Apple computer. He admitted that he never attempted to rewrite Autostart ROM and conceded that some of the works in suit (i.e., Copy, Copy A, Master Create, and Hello) probably could have been rewritten by Franklin. Franklin made no attempt to rewrite any of the programs prior to the lawsuit except for Copy, although McWherter testified that Franklin was "in the process of redesigning" some of the Apple programs and that "[w]e had a fair degree of certainty that that would probably work." Apple introduced evidence that Franklin could have rewritten programs, including the Autostart ROM program, and that there are in existence operating programs written by third parties which are compatible with Apple II.

Franklin's principal defense at the preliminary injunction hearing and before us is primarily a legal one, directed to its contention that the Apple operating system programs are not capable of copyright protection.

The district court denied the motion for preliminary injunction by order and opinion dated July 30, 1982. Apple moved for reconsideration in light of this court's decision in <219 USPQ 118> Williams Electronics, Inc. v. Artic International, Inc., 685 F.2d 870, 215 USPQ 405 (3d Cir. 1982), which was decided August 2, 1982, three days after the district court decision. The district court denied the motion for reconsideration. We have jurisdiction of Apple's appeal pursuant to 28 U.S.C. §1292(a)(1).

III. The District Court Opinion

In its opinion, the district court referred to the four factors to be considered <714 F.2d 1246> on request for a preliminary injunction: a reasonable probability of success on the merits; irreparable injury; the improbability of harm to other interested persons; and the public interest. 545 F.Supp. at 825, 215 USPQ at 947; see Delaware River Port Authority v. Transamerican Trailer Transport, Inc., 501 F.2d 917, 919-20 (2d Cir. 1974). The court stated it based its denial of the motion on the first two factors. The court held Apple had not made the requisite showing of likelihood of success on the merits because it "concluded that there is some doubt as to the copyrightability of the programs described in this litigation." 545 F. Supp. at 812, 215 USPQ at 935. It also stated that "Apple is better suited to withstand whatever injury it might sustain during litigation than is Franklin to withstand the effects of a preliminary injunction" because an injunction would have a "devastating effect" on Franklin's business, Id. at 825, 215 USPQ at 947, apparently concluding on that basis that Apple had failed to show irreparable harm.

It is difficult to discern precisely why the district court questioned the copyrightability of the programs at issue since there is no finding, statement, or holding on which we can focus which clearly sets forth the district court's view. Throughout the opinion the district court referred to the "complexity of the question presented by the present case", 545 F. Supp. at 824, 215 USPQ at 947, and the "baffling" problem at issue. Id. at 822, 215 USPQ at 945.

The opinion expresses a series of generalized concerns which may have led the court to its ultimate conclusion, and which the parties and amici treat as holdings. The district court referred to the requirement under the Copyright Act of finding "original works of authorship", 17 U.S.C. §102(a), and seems to have found that there was a sufficient "modicum of creativity" to satisfy the statutory requirement of an "original work". 545 F. Supp. at 820-21, 215 USPQ at 943. The court was less clear as to whether the creation of a computer program by a programmer satisfied the requirement of "works of authorship", id., and whether an operating system program in "binary code or one represented either in a ROM or by micro-switches" was an "expression" which could be copyrighted as distinguished from an "idea" which could not be. Id. at 821, 215 USPQ at 944.

Again, although we cannot point to a specific holding, running throughout the district court opinion is the suggestion that programs in object code and ROMs may not be copyrightable. Thus, for example, in a series of discursive footnotes, the district court stated that it found "persuasive" a district court opinion "holding that object code in ROM is not copyright protected", 545 F. Supp. at 818 n. 8,

215 USPQ at 941 n.8, (referring to Data Cash Systems, Inc. v. JS&A Group, Inc., 480 F. Supp. 1063, 203 USPQ 735 (N.D. Ill. 1979), aff'd on other grounds, 628 F.2d 1038, 208 USPQ 197 (7th Cir. 1980)); described an opinion reaching a contrary conclusion as containing "rather terse analysis [which] provides little guidance", 545 F. Supp. at 818 n.8, 215 USPQ at 941 n.8 (referring to GCA Corp. v. Chance, 217 USPQ 718 (N.D. Cal. 1982), which followed the reasoning of Tandy Corp. v. Personal Micro Computers, Inc., 524 F. Supp. 171, 214 USPQ 178 (N.D. Cal. 1981)); and stated that "Congressional intent regarding the copyrightability of object codes and ROMs is not clear", 545 F. Supp. at 819 n.9, 215 USPQ at 942 n.9, and that even among members of the industry it was not clear that the copyright law protects works "like those in suit that are ROM-based," id. at 819 n.10, 215 USPQ at 942 n.10.

We read the district court opinion as presenting the following legal issues: (1) whether copyright can exist in a computer program expressed in object code, (2) whether copyright can exist in a computer program embedded on a ROM, (3) whether copyright can exist in an operating system program, and (4) whether independent irreparable harm must be shown for a preliminary injunction in copyright infringement actions.

IV. Discussion

A. Copyrightability of a Computer Program Expressed in Object Code

Certain statements by the district court suggest that programs expressed in object <219 USPQ 119><714 F.2d 1247> code, as distinguished from source code, may not be the proper subject of copyright. We find no basis in the statute for any such concern. Furthermore, our decision in Williams Electronics, Inc. v. Artic International, Inc., supra, laid to rest many of the doubts expressed by the district court.

In 1976, after considerable study, Congress enacted a new copyright law to replace that which had governed since 1909. Act of October 19, 1976, Pub. L. No. 94-553, 90 Stat. 2541 (codified at 17 U.S.C. §§101 et seq.). Under the law, two primary requirements must be satisfied in order for a work to constitute copyrightable subject matter – it must be an "original wor[k] of authorship" and must be "fixed in [a] tangible medium of expression." 17 U.S.C. §102(a). The statute provides:

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

Id. The statute enumerates seven categories under "works of authorship" including "literary works", defined as follows:

> "Literary works" are works, other than audiovisual works, expressed in words, numbers, or other verbal or numerical symbols or indicia, regardless of the nature of the material objects, such as books, periodicals, manuscripts, phonorecords, film, tapes, disks, or cards, in which they are embodied.

17 U.S.C. §101. A work is "fixed" in a tangible medium of expression when:

> its embodiment in a copy or phonorecord, by or under the authority of the author, is sufficiently permanent or stable to permit it to be perceived, reproduced, or otherwise communicated for a period of more than transitory duration. A work consisting of sounds, images, or both, that are being transmitted, is "fixed" for purposes of this title if a fixation of the work is being made simultaneously with its transmission.

Id.

Although section 102(a) does not expressly list computer programs as works of authorship, the legislative history suggests that programs were considered copyrightable as literary works. See H.R. Rep. No. 1476, 94th Cong., 2d Sess. 54, reprinted in 1976 U.S. Code Cong. & Ad. News 5659, 5667 ("literary works' * * * includes * * * computer programs"). Because a Commission on New Technological Uses ("CONTU") had been created by Congress to study, inter alia, computer uses of copyrighted works, Pub. L. No. 93-573, §201, 88 Stat. 1873 (1974), Congress enacted a status quo provision, section 117, in the 1976 Act concerning such computer uses pending the CONTU report and

recommendations.[6]

The CONTU Final Report recommended that the copyright law be amended, inter alia, "to make it explicit that computer programs, to the extent that they embody an author's original creation, are proper subject matter of copyright." National Commission on New Technological Uses of Copyrighted Works, Final Report 1 (1979) [hereinafter CONTU Report]. CONTU recommended two changes relevant here: that section 117, the status quo provision, be repealed and replaced with a section limiting exclusive rights in computer programs so as "to ensure that rightful possessors of copies of computer programs may use or adapt these copies for their use," id.; and that a definition of computer program be added to section 101. Id. at 12. Congress adopted both changes. Act of Dec. 12, 1980, Pub. L. No. 96-517, §10, 94 Stat. 3015, 3028. The revisions embodied CONTU's recommendations to clarify the law of copyright of computer software. H.R. Rep. No. 1307, 96th Cong., 2d Sess. 23, reprinted in 1980 U.S. Code Cong. & Ad. News 6460, 6482.

The 1980 amendments added a definition of a computer program: <714 F.2d 1248>

> A "computer program" is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.

17 U.S.C. §101. The amendments also substituted a new section 117 which provides that "it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program" when necessary to "the utilization of the computer program" or "for archival purposes only." 17 U.S.C. §117. The parties agree that this section is not implicated in the instant law <219 USPQ 120> suit. The language of the provision, however, by carving out an exception to the normal proscriptions against copying, clearly indicates that programs are copyrightable and are otherwise afforded copyright protection.

We considered the issue of copyright protection for a computer program in Williams Electronics, Inc. v. Artic International, Inc., and concluded that "the copyrightability of computer programs is firmly established after the 1980 amendment to the Copyright Act." 685 F.2d at 875, 215 USPQ at 409. At issue in Williams were not only two audiovisual copyrights to the "attract" and "play" modes of a video game, but also the computer program which was expressed in object code embodied in ROM and which controlled the sights and sounds of the game. Defendant there had argued "that when the issue is the copyright on a computer program, a distinction must be drawn between the 'source code' version of a computer program, which * * * can be afforded copyright protection, and the 'object code' stage, which * * * cannot be so protected," an argument we rejected. Id. at 876, 215 USPQ at 409.

The district court here questioned whether copyright was to be limited to works "designed to be 'read' by a human reader [as distinguished from] read by an expert with a microscope and patience", 545 F. Supp. at 821, 215 USPQ at 944. The suggestion that copyrightability depends on a communicative function to individuals stems from the early decision of White-Smith Music Publishing Co. v. Apollo Co., 209 U.S. 1 (1908), which held a piano roll was not a copy of the musical composition because it was not in a form others, except perhaps for a very expert few, could perceive. See 1 Nimmer on Copyright §2.03[B][1] (1983). However, it is clear from the language of the 1976 Act and its legislative history that it was intended to obliterate distinctions engendered by White-Smith. H.R. Rep. No. 1476, supra, at 52, reprinted in 1976 U.S. Code Cong. & Ad. News at 5665.

Under the statute, copyright extends to works in any tangible means of expression " *from which they can be perceived,* reproduced, or otherwise communicated, either directly or *with the aid of a machine or device.*'" 17 U.S.C. §102(a) (emphasis added). Further, the definition of "computer program" adopted by Congress in the 1980 amendments is "sets of statements or instructions to be used *directly or indirectly* in a computer in order to bring about a certain result." 17 U.S.C. §101 (emphasis added). As source code instructions must be translated into object code before the computer can act upon them, only instructions expressed in object code can be used "directly" by the computer. See Midway Manufacturing Co. v. Strohon, No. 82 C 1305, slip op. at 25-26, 219 USPQ 42, 50 (N.D. Ill. June 1, 1983). This definition was adopted following the CONTU Report in which the majority clearly took the position that object codes are proper subjects of copyright. See CONTU Report at 21. The majority's conclusion was reached although confronted by a dissent based upon the theory that the "machine-control phase" of a program is not directed at a human audience. See CONTU Report at 28-30 (dissent of Commissioner Hersey).

The defendant in Williams had also argued that a copyrightable work "must be intelligible to

human beings and must be intended as a medium of communication to human beings," id. at 876-77, 215 USPQ at 409. We reiterate the statement we made in Williams when we rejected that argument: "[t]he answer to defendant's contention is in the words of the statute itself." 685 F.2d at 877, 215 USPQ at 410.

<714 F.2d 1249> The district court also expressed uncertainty as to whether a computer program in object code could be classified as a "literary work."[7] However, the category of "literary works", one of the seven copyrightable categories, is not confined to literature in the nature of Hemingway's For Whom the Bell Tolls. The definition of "literary works" in section 101 includes expression not only in words but also "numbers, or other * * * numerical symbols or indicia", thereby expanding the common usage of "literary works." Cf. Harcourt, Brace & World, Inc. v. Graphic Controls Corp., 329 F. Supp. 517, 523-24, 171 USPQ 219, 223-224 (S.D.N.Y. 1971) (the symbols designating questions or response spaces on exam answer sheets held to be copyrightable "writings" under 1909 Act); Reiss v. National Quotation Bureau, Inc., 276 F. 717 (S.D.N.Y. 1921) (code book of coined words designed for cable use copyrightable). <219 USPQ 121> Thus a computer program, whether in object code or source code, is a "literary work" and is protected from unauthorized copying, whether from its object or source code version. Accord Midway Mfg. Co. v. Strohon, slip op. at 25-27, 219 USPQ at 50; see also GCA Corp. v. Chance, 217 USPQ at 719.

B. Copyrightability of a Computer Program Embedded on a ROM

Just as the district court's suggestion of a distinction between source code and object code was rejected by our opinion in Williams issued three days after the district court opinion, so also was its suggestion that embodiment of a computer program on a ROM, as distinguished from in a traditional writing, detracts from its copyrightability. In Williams we rejected the argument that "a computer program is not infringed when the program is loaded into electronic memory devices (ROMs) and used to control the activity of machines." 685 F.2d at 876, 215 USPQ at 409. Defendant there had argued that there can be no copyright protection for the ROMs because they are utilitarian objects or machine parts. We held that the statutory requirement of "fixation", the manner in which the issue arises, is satisfied through the embodiment of the expression in the ROM devices. Id. at 874, 876, 215 USPQ at 408; See also Midway Mfg. Co. v. Strohon, slip op. at 27-30, 219 USPQ at 51; Tandy Corp. v. Personal Micro Computers, Inc., 524 F. Supp. at 173, 214 USPQ at 179; cf. Stern Electronics, Inc. v. Kaufman, 669 F.2d 852, 855-56, 213 USPQ 443, 445-446 (2d Cir. 1982) (audiovisual display of video game "fixed" in ROM). Therefore we reaffirm that a computer program in object code embedded in a ROM chip is an appropriate subject of copyright. See also Note, Copyright Protection of Computer Program Object Code, 96 Harv. L. Rev. 1723 (1983); Note, Copyright Protection for Computer Programs in Read Only Memory Chips, 11 Hofstra L. Rev. 329 (1982).

C. Copyrightability of Computer Operating System Programs

We turn to the heart of Franklin's position on appeal which is that computer operating system programs, as distinguished from application programs, are not the proper subject of copyright "regardless of the language or medium in which they are fixed." Brief of Appellee at 15 (emphasis deleted). Apple suggests that this issue too is foreclosed by our *Williams* decision because some portion of the program at issue there was in effect an operating system program. Franklin is correct that this was not an issue raised by the parties in *Williams* and it was not considered by the <714 F.2d 1250> court. Thus we consider it as a matter of first impression.

Franklin contends that operating system programs are per se excluded from copyright protection under the express terms of section 102(b) of the Copyright Act, and under the precedent and underlying principles of Baker v. Selden, 101 U.S. 99 (1879). These separate grounds have substantial analytic overlap.

In Baker v. Selden, plaintiff's testator held a copyright on a book explaining a bookkeeping system which included blank forms with ruled lines and headings designed for use with that system. Plaintiff sued for copyright infringement on the basis of defendant's publication of a book containing a different arrangement of the columns and different headings, but which used a similar plan so far as

results were concerned. The Court, in reversing the decree for the plaintiff, concluded that blank account-books were not the subject of copyright and that "the mere copyright of Selden's book did not confer upon him the exclusive right to make and use account-books, ruled and arranged as designated by him and described and illustrated in said book." Id. at 107. The Court stated that copyright of the books did not give the plaintiff the exclusive right to use the system explained in the books, noting, for example, that "copyright of a work on mathematical science cannot give to the author an exclusive right to the methods of operation which he propounds." Id. at 103.

Franklin reads Baker v. Selden as "stand[ing] for several fundamental principles, each presenting * * * an insuperable obstacle to the copyrightability of Apple's operating systems." It states:

> *First,* Baker teaches that use of a system itself does not infringe a copyright on the description of the system. *Second,* Baker enunciates the rule that copyright does not extend to purely utilitarian works. *Finally,* Baker emphasizes that the copyright laws may not be used to obtain and hold a monopoly over an idea. In so doing, Baker highlights the principal difference between the copyright and patent laws – a difference that is highly pertinent in this case.

Brief of Appellee at 22.

Section 102(b) of the Copyright Act, the other ground on which Franklin relies, <219 USPQ 122> appeared first in the 1976 version, long after the decision in Baker v. Selden. It provides:

> In no case does copyright protection for an original work of authorship extend to any idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

It is apparent that section 102(b) codifies a substantial part of the holding and dictum of Baker v. Selden. See 1 Nimmer on Copyright §2.18[D], at 2-207.

We turn to consider the two principal points of Franklin's argument.

1. "Process", "System" or "Method of Operation"

Franklin argues that an operating system program is either a "process", "system", or "method of operation" and hence uncopyrightable.[8] Franklin correctly notes that underlying section 102(b) and many of the statements for which Baker v. Selden is cited is the distinction which must be made between property subject to the patent law, which protects discoveries, and that subject to copyright law, which protects the writings describing such discoveries. However, <714 F.2d 1251> Franklin's argument misapplies that distinction in this case. Apple does not seek to copyright the method which instructs the computer to perform its operating functions but only the instructions themselves. The method would be protected, if at all, by the patent law, an issue as yet unresolved. See Diamond v. Diehr, 450 U.S. 175 (1981).

Franklin's attack on operating system programs as "methods" or "processes" seems inconsistent with its concession that application programs are an appropriate subject of copyright. Both types of programs instruct the computer to do something. Therefore, it should make no difference for purposes of section 102(b) whether these instructions tell the computer to help prepare an income tax return (the task of an application program) or to translate a high level language program from source code into its binary language object code form (the task of an operating system program such as "Applesoft", see note 4 supra). Since it is only the instructions which are protected, a "process" is no more involved because the instructions in an operating system program may be used to activate the operation of the computer than it would be if instructions were written in ordinary English in a manual which described the necessary steps to activate an intricate complicated machine. There is, therefore, no reason to afford any less copyright protection to the instructions in an operating system program than to the instructions in an application program.

Franklin's argument, receptively treated by the district court, that an operating system program is part of a machine mistakenly focuses on the physical characteristics of the instructions. But the medium is not the message. We have already considered and rejected aspects of this contention in the discussion of object code and ROM. The mere fact that the operating system program may be etched on a ROM does not make the program either a machine, part of a machine or its equivalent. Furthermore, as one of

Franklin's witnesses testified, an operating system does not have to be permanently in the machine in ROM, but it may be on some other medium, such as a diskette or magnetic tape, where it could be readily transferred into the temporary memory space of the computer. In fact, some of the operating systems at issue were on diskette. As the CONTU majority stated.

> Programs should no more be considered machine parts than videotapes should be considered parts of projectors or phonorecords parts of sound reproduction equipment.* * *That the words of a program are used ultimately in the implementation of a process should in no way affect their copyrightability.

CONTU Report at 21.

Franklin also argues that the operating systems cannot be copyrighted because they are "purely utilitarian works" and that Apple is seeking to block the use of the art embodied in its operating systems. This argument stems from the following dictum in Baker v. Selden:

> The very object of publishing a book on science or the useful arts is to communicate to the world the useful knowledge which it contains. But this object would be frustrated <219 USPQ 123> if the knowledge could not be used without incurring the guilt of piracy of the book. And where the art it teaches cannot be used without employing the methods and diagrams used to illustrate the book, or such as are similar to them, such methods and diagrams are to be considered as necessary incidents to the art, and given therewith to the public; not given for the purpose of publication in other works explanatory of the art, but for the purpose of practical application.

101 U.S. at 103. We cannot accept the expansive reading given to this language by some courts, see, e.g., Taylor Instrument Companies v. Fawley-Brost Co., 139 F.2d 989, 59 USPQ 384 (7th Cir. 1943), cert. denied, 321 U.S. 785, 60 USPQ 579 (1944). In this respect we agree with the views expressed by Professor Nimmer in his treatise. See 1 Nimmer on Copyright §2.18[C].

<714 F.2d 1252> Although a literal construction of this language could support Franklin's reading that precludes copyrightability if the copyright work is put to a utilitarian use, that interpretation has been rejected by a later Supreme Court decision. In Mazer v. Stein, 347 U.S. 201, 218, 100 USPQ 325 (1954), the Court stated: "We find nothing in the copyright statute to support the argument that the intended use or use in industry of an article eligible for copyright bars or invalidates its registration. We do not read such a limitation into the copyright law." Id. at 218, 100 USPQ at 333. The CONTU majority also rejected the expansive view some courts have given Baker v. Selden, and stated, "That the words of program are used ultimately in the implementation of a process should in no way affect their copyrightability." Id. at 21. It referred to "copyright practice past and present, which recognizes copyright protection for a work of authorship regardless of the uses to which it may be put." Id. The Commission continued: "The copyright status of the written rules for a game *or a system for the operation of a machine* is unaffected by the fact that those rules direct the actions of those who play the game or *carry out the process*.'" Id. (emphasis added). As we previously noted, we can consider the CONTU Report as accepted by Congress since Congress wrote into the law the majority's recommendations almost verbatim. See 18 Cong. Rec. H10767 (daily ed. Nov. 17, 1980) (Rep. Kastenmeier: Bill "eliminates confusion about the legal status of computer software by enacting the recommendations of [CONTU] clarifying the law of copyright of computer software"); 18 Cong. Rec. S14766 (daily ed. Nov. 20, 1980) (Sen. Bayh: "[t]his language reflects that proposed by [CONTU"]).

Perhaps the most convincing item leading us to reject Franklin's argument is that the statutory definition of a computer program as a set of instructions to be used in a computer in order to bring about a certain result, 17 U.S.C. §101, makes no distinction between application programs and operating programs. Franklin can point to no decision which adopts the distinction it seeks to make. In the one other reported case to have considered it, Apple Computer, Inc. v. Formula International, Inc., 562 F. Supp. 775, 218 USPQ 47 (C.D. Cal. 1983), the court reached the same conclusion which we do, i.e. that an operating system program is not per se precluded from copyright. It stated, "There is nothing in any of the statutory terms which suggest a different result for different types of computer programs based upon the function they serve within the machine." Id. at 780, 218 at 51. Other courts have also upheld the copyrightability of operating programs without discussion of this issue. See Tandy Corp. v. Personal Micro Computers, INc., 524 F. Supp. at 173, 214 USPQ at 179 (input-output routine stored in ROM which translated input into machine language in a similar fashion as Applesoft and Apple Integer

Basic proper subject of copyright); GCA Corp. v. Chance, 217 USPQ at 719 (object code version of registered source code version of operating programs is the same work and protected).

2. Idea/Expression Dichotomy

Franklin's other challenge to copyright of operating system programs relies on the line which is drawn between ideas and their expression. Baker v. Selden remains a benchmark in the law of copyright for the reading given it in Mazer v. Stein, supra, where the Court stated, "Unlike a patent, a copyright gives no exclusive right to the art disclosed; protection is given only to the expression of the idea – not the idea itself." 347 U.S. at 217, 100 USPQ 333 (footnote omitted).

The expression/idea dichotomy is now expressly recognized in section 102(b) which precludes copyright for "any idea." This provision was not intended to enlarge or contract the scope of copyright protection but "to restate * * * that the basic dichotomy between expression and idea remains unchanged." H.R. Rep. No. 1476, supra, at 57, reprinted in 1976 U.S. Code Cong. & Ad. News at 5670. The legislative history indicates that section 102(b) was intended "to make clear that the expression adopted by the programmer is the copyrightable element <714 F.2d 1253> in a computer program, and that the actual processes <219 USPQ 124> or methods embodied in the program are not within the scope of the copyright law." Id.

Many of the courts which have sought to draw the line between an idea and expression have found difficulty in articulating where it falls. See, e.g., Nichols v. Universal Pictures Corp., 45 F.2d 119, 121, 7 USPQ 84, 86 (2d Cir. 1930) (L. Hand, J.); see discussion in 3 Nimmer on Copyright §13.03[A]. We believe that in the context before us, a program for an operating system, the line must be a pragmatic one, which also keeps in consideration "the preservation of the balance between competition and protection reflected in the patent and copyright laws". Herbert Rosenthal Jewelry Corp. v. Kalpakian, 446 F.2d 738, 742, 170 USPQ 557, 559 (9th Cir. 1971). As we stated in Franklin Mint Corp. v. National Wildlife Art Exchange, Inc., 575 F.2d 62, 64, 197 USPQ 721, 723 (3d Cir.), cert. denied, 439 U.S. 880, 199 USPQ 57 (1978), "Unlike a patent, a copyright protects originality rather than novelty or invention." In that opinion, we quoted approvingly the following passage from Dymow v. Bolton, 11 F.2d 690, 691 (2d Cir. 1926).

> Just as a patent affords protection only to the means of reducing an inventive idea to practice, so the copyright law protects the means of expressing an idea; and it is as near the whole truth as generalization can usually reach that, *if the same idea can be expressed in a plurality of totally different manners, a plurality of copyrights may result,* and no infringement will exist.

(emphasis added).

We adopt the suggestion in the above language and thus focus on whether the idea is capable of various modes of expression. If other programs can be written or created which perform the same function as an Apple's operating system program, then that program is an expression of the idea and hence copyrightable. In essence, this inquiry is no different than that made to determine whether the expression and idea have merged, which has been stated to occur where there are no or few other ways of expressing a particular idea. See, e.g., Morrissey v. Procter & Gamble Co., 379 F.2d 675, 678-79, 154 USPQ 193, 194-95 (1st Cir. 1967); Freedman v. Grolier Enterprises, Inc., 179 USPQ 476, 478 (S.D.N.Y. 1973) ("[c]opyright protection will not be given to a form of expression necessarily dictated by the underlying subject matter"); CONTU Report at 20.

The district court made no findings as to whether some or all of Apple's operating programs represent the only means of expression of the idea underlying them. Although there seems to be a concession by Franklin that at least some of the programs can be rewritten, we do not believe that the record on that issue is so clear that it can be decided at the appellate level. Therefore, if the issue is pressed on remand, the necessary finding can be made at that time.

Franklin claims that whether or not the programs can be rewritten, there are a limited "number of ways to arrange operating systems to enable a computer to run the vast body of Apple-compatible software," Brief of Appellee at 20. This claim has no pertinence to either the idea/expression dichotomy or merger. The idea which may merge with the expression, thus making the copyright unavailable, is the idea which is the subject of the expression. The idea of one of the operating system programs is, for example, how to translate source code into object code. If other methods of expressing that idea are not

foreclosed as a practical matter, then there is no merger. Franklin may wish to achieve total compatibility with independently developed application programs written for the Apple II, but that is a commercial and competitive objective which does not enter into the somewhat metaphysical issue of whether particular ideas and expressions have merged.

In summary, Franklin's contentions that operating system programs are per se not copyrightable is unpersuasive. The other courts before whom this issue has been raised have rejected the distinction. Neither the CONTU majority nor Congress made a distinction between operating and application programs. We believe that the <714 F.2d 1254> 1980 amendments reflect Congress' receptivity to new technology and its desire to encourage, through the copyright laws, continued imagination and creativity in computer programming. Since we believe that the district court's decision on the preliminary injunction was, to a large part, influenced by an erroneous view of the availability of copyright for operating system programs and unnecessary concerns about object code and ROMs, we must reverse the denial of the preliminary injunction and remand for reconsideration.

D. Irreparable Harm

The district court, without any extended discussion, found that Apple had not made the requisite showing of irreparable harm, stating "Apple is better suited to withstand whatever injury it might sustain during litigation than is Franklin to withstand the <219 USPQ 125> effects of a preliminary injunction." 545 F. Supp. at 812, 825, 215 USPQ at 937. In so ruling, the district court failed to consider the prevailing view that a showing of a prima facie case of copyright infringement or reasonable likelihood of success on the merits raises a presumption of irreparable harm. See, e.g., Atari, Inc. v. North American Philips Consumer Electronics Corp., 672 F.2d 607, 620 (7th Cir.), cert. denied, 103 S.Ct. 176 (1982); Wainwright Securities Inc. v. Wall Street Transcript Corp., 558 F.2d 91, 94, 194 USPQ 401, 402 (2d Cir. 1977), cert. denied, 434 U.S. 1014, 196 USPQ 864 (1978); Klitzner Industries, Inc. v. H.K. James & Co., 535 F. Supp. 1249, 1259, 216 USPQ 73, 80 (E.D. Pa. 1982); Custom Decor, Inc. v. Nautical Crafts Inc., 502 F. Supp. 154, 157, 213 USPQ 565, 567 (E.D. Pa. 1980). A copyright plaintiff who makes out a prima facie case of infringement is entitled to a preliminary injunction without a detailed showing of irreparable harm. See 3 Nimmer on Copyright §14.06[A], at 14-50, 14-51 & n.16 (collecting authorities).

The CONTU Final Report recognized that "[t]he cost of developing computer programs is far greater than the cost of their duplication." CONTU Report at 11. Apple introduced substantial evidence of the considerable time and money it had invested in the development of the computer programs in suit. Thus even without the presumption of irreparable harm generally applied in copyright infringement cases, the jeopardy to Apple's investment and competitive position caused by Franklin's wholesale copying of many of its key operating programs would satisfy the requirement of irreparable harm needed to support a preliminary injunction. See Atari, Inc. v. North American Philips Consumer Electronics Corp., 672 F.2d at 620; Custom Decor, Inc. v. Nautical Crafts Inc., 502 F. Supp. 154, 157, 213 USPQ 565, 567 (E.D. Pa. 1980); Herbert Rosenthal Jewelry Corp. v. Zale Corp., 323 F. Supp. 1234, 1238, 169 USPQ 393, 395 (S.D. N.Y. 1971).

In Kontes Glass Co. v. Lab Glass, Inc., 373 F.2d 319, 320-21, 152 USPQ 654, 655 (3d Cir. 1967), this court appeared to adopt an inverse relationship approach to the irreparable harm issue, suggesting that the strength of the required showing of irreparable injury varies inversely with the strength of plaintiff's showing of a likelihood of success on the merits. See Midway Mfg. Co. v. Bandai-America, Inc., 546 F.Supp. 125, 141-42, 216 USPQ 812, 829 (D.N.J. 1982). In Kontes, we were not presented with a case in which copyrighted material central to the essence of plaintiff's operations was concededly copied, as we are here. We believe the Kontes approach is best suited to those cases where the injury from copying can be fairly considered minimal, limited or conjectural. In those circumstances it provides flexibility in applying the equitable remedy of preliminary injunctions through evaluation of the irreparable harm factor. Normally, however, the public interest underlying the copyright law requires a presumption of irreparable harm, as long as there is, as here, adequate evidence of the expenditure of significant time, effort and money directed to the production of the copyrighted material. Otherwise, the rationale for protecting copyright, that of encouraging creativity, would be undermined. As Judge Broderick stated in Klitzner Industries, Inc. v. H.K. James & Co., 535 F.Supp. at 1259-60, 216 USPQ 73, 81: <714 F.2d 1255>

> Since Congress has elected to grant certain exclusive rights to the owner of a copyright in a protected work, it is virtually axiomatic that the public interest can only be served by upholding copyright protections and, correspondingly, preventing the misappropriation of the skills, creative energies, and resources which are invested in the protected work.

Nor can we accept the district court's explanation which stressed the "devastating effect" of a preliminary injunction on Franklin's business. If that were the correct standard, then a knowing infringer would be permitted to construct its business around its infringement, a result we cannot condone. See Atari, Inc. v. North American Philips Consumer Electronics Corp., 672 F.2d at 620; cf. Helene Curtis Industries, Inc. v. Church & Dwight Co., 560 F.2d 1325, 1333, 195 USPQ 218, 223 (7th Cir. 1977) (trademark infringement), cert. denied, 434 U.S. 1070, 197 USPQ 592 (1978). The size of the infringer should not be determinative of the copyright holder's ability to get prompt judicial redress.

E. Additional Issues

Franklin has raised a number of issues concerning Apple's compliance with various statutory formalities such as registration, notice and deposit. It has challenged, in a pending motion to dismiss, the copyrights of the eleven works in suit which were deposited in object code format, and which were registered under the Copyright Office's "rule of <219 USPQ 126> doubt."[9] Franklin challenges three programs, i.e. Apple Integer Basic, Autostart ROM and DOS 3.3, on the ground that they or their predecessors were published without the requisite notice. We do not reach these issues on appeal nor do we consider Franklin's claim that Apple's misuse of its copyrights bars their enforcement. The district court did not consider these claims in denying the motion for preliminary injunction. There are no factual findings with regard to them. On remand, they can be considered by the district court in the first instance who can also decide the extent to which they are relevant, if at all, to a preliminary injunction.

V.

For the reasons set forth in this opinion, we will reverse the denial of the preliminary injunction and remand to the district court for further proceedings in accordance herewith.

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[1] Four amicus curiae briefs have been submitted; briefs from Digital Research Inc., Microsoft Corp., and Association of Data Processing Service Organizations, Inc. (a trade association for the computer services industry), support the position of Apple, and a brief from Pro-Log Corp. supports at least part of Franklin's position.

[2] Useful nontechnical descriptions of computer operations appear in Note, Copyright Protection for Computer Programs In Read Only Memory Chips, 11 Hofstra L. Rev. 329 (1982), and Note, Copyright Protection of Computers Program Object Code, 96 Harv. L. Rev. 1723 (1983).

[3] Footnote 3. In contrast to the permanent memory devices a RAM (Random Access Memory) is a chip on which volatile internal memory is stored which is erased when the computer's power is turned off.

[4] The fourteen programs at issue, briefly described, are:

(1) *Autostart ROM* is sold as part of the Apple Computer and is embedded on a ROM chip. The program has also been published in source code as part of a copyrighted book, the Apple II manual. When the computer's power is turned on, Autostart ROM performs internal routines that turn on the circuits in the computer and make its physical parts (e.g. input/output devices, screen, and memory) ready for use.

(2) *Applesoft* is Apple's version of the Beginner's All-purpose Symbolic Instruction Code (BASIC) language. The program is stored in ROM and is sold as part of the computer. Applesoft translates instructions written in the higher-level BASIC language into the lower-level machine code that the computer understands.

(3) *Floating-Point* BASIC is the same program as Applesoft but is stored on disks rather than on ROMs. It is used in earlier versions of the Apple II computer that did not have the Applesoft program in ROM.

(4) *Apple Integer* BASIC, another translator program, is stored on the DOS 3.3 Master Disk. This program used Apple's first version of BASIC for the Apple II computer. It implements a simpler version of the Applesoft program.

(5) *DOS 3.3,* the disk operating system program, provides the instructions necessary to control the operation between the disk system (disk drive) and the computer itself. It controls the reading and writing functions of the disks and includes other routines which put all the data transfers in sequence. The DOS 3.3 Master Disk is sold separately from the computer, and includes several of the other operating programs referred to in this note.

(6) *Master Create* is stored on a disk. When a disk is prepared for use the DOS 3.3 program is placed on that disk in a form that is dependent on the amount of Random Access Memory (RAM) available. The Master Create program replaces the DOS 3.3 on the disk with a version that is independent of the amount of RAM available.

(7) *Copy,* which is stored on a disk, enables the user to copy programs written in Apple Integer BASIC from one disk to another.

(8) *Copy A,* also stored on a disk, enables the user to copy programs written in Applesoft from one disk to another.

(9) *Copy OBJO* contains a file of subroutines used by the Copy and Copy A programs.

(10) *Chain,* another disk stored program, allows data to be passed between different parts of a program when only one part of the program is in RAM at a given time. Thus, Chain preserves data already stored in RAM while another part of the program is being loaded into RAM.

(11) *Hello,* also disk stored, is the first program executed after the power is turned on and a disk is ready for use. It determines how much RAM is in the computer and which version of BASIC needs to be loaded into the computer.

(12) *Boot 13* is stored on disk and sold on a Master Disk. It allows the user having a disk controller card that contains the Apple 16-Sector Boot ROM to use older versions of the Apple disk operating system.

(13) *Apple 13-Sector Boot ROM* is stored in a ROM located on the disk controller card plugged into the Mother Board. By turning on numerous circuits on the card and in the Apple II computer, this program causes other parts of the disk operating system used for 13-Sector format disks to load.

(14) *Apple 16-Sector Boot ROM,* stored in a ROM located on the disk controller card, turns on numerous circuits on the card and in the Apple II computer and causes other parts of the disk operating system used for 16-Sector format disks to load. It therefore enables the user to start or permit the running of another program or to prepare the computer to receive a program.

The above descriptions represent an effort to translate the language used by computer experts into language reasonably intelligible to lay persons. They differ in some respects from the descriptions in the district court's opinion, 545 F. Supp. at 815-16, 215 USPQ at 939 which were taken from the complaint.

[5] For example, 8 bytes of memory were altered in the Autostart ROM program so that when the computer is turned on "ACE 100" appears on the screen rather than "Apple II." The Franklin DOS 3.3 program also had 16 bytes (out of 9000) that allowed use of upper and lower case.

[6] Section 117 applied only to the scope of protection to be accorded copyrighted works when used in conjunction with a computer and not to the copyrightability of programs. H.R. Rep. No. 1476, at 116, reprinted in 1976 U.S. Code Cong. & Ad. News at 5731.

[7] The district court stated that a programmer working directly in object code appears to think more as a mathematician or engineer, that the process of constructing a chip is less a work of authorship than the product of engineering knowledge, and that it may be more apt to describe an encoded ROM as a pictorial three-dimensional object than as a literary work. 545 F. Supp. at 821-22, 215 USPQ at 944. The district court's remarks relied in part on a quotation about "microcode", see id. at 821 in 14, 215

USPQ at 944 n. 14; Apple introduced testimony that none of the works in suit contain "microcode." Moreover, Apple does not seek to protect the ROM's architecture but only the program encoded upon it.

[8] We are unpersuaded by Franklin's initial contention that Apple is bound to this position because some of Apple's witnesses in the preliminary injunction hearing used these terms in describing the works in suit. As the CONTU Report itself recognized, the distinction between copyrightable computer programs and uncopyrightable processes or methods of operation does not always seem to "shimmer with clarity." CONTU Report at 18. The witnesses undoubtedly had the not uncommon difficulty of finding the precisely correct words of description in this field. It would be both unreasonable and arbitrary to consider the statements of non-lawyer witnesses without experience in using statutory language as words of art to be binding admissions against Apple.

[9] Apparently the Register of Copyrights utilizes its rule of doubt when the deposit of a computer program is made in object code form because its examiners cannot interpret such code to determine if there has been copyrightable authorship.