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Counsel - Box 032 - Folder 003

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the commands were already available. There is no evidence in this case that the commands available in 1-2-3 were common commands at the time of Lotus' authorship.

The district court also held that there was nothing innovative in the order in which the commands were listed. *Id.* Borland has submitted in this case a copy of the list of commands at issue in *Ashton-Tate*. Borland's Mem. in Supp. of Cross-Mot. for Summ. J. (Docket No. 141) at 85-86. That list contains well under one hundred commands scrawled on one sheet of paper segregated into under one dozen functional groups. In form, detail, arrangement, and content, it bears almost no resemblance to the hundreds of menu commands arranged in Lotus' dozens of menus. The relevance of the court's conclusion to the case at bar extends, if at all, only to the copyrightability of subelements of the 1-2-3 menu hierarchy, and depends upon factual inquiries that remain to be made.

Finally, the court concluded that in the absence of any contribution to the user interface other than the command list (including, especially, any contribution to the program code), the contribution of the command list was a mere contribution of ideas. As Judge Learned Hand observed, however, and many others have agreed, decisions in which a line is drawn between idea and expression have an ad hoc character. They tend to be fact sensitive and case specific. The absence of other copyrightable contributions in *Ashton-Tate* may have caused the court to reach a determination in that case with respect to the copyrightability of menu commands that it might not have reached had the defendant contributed other copyrightable elements.

In the interest of completeness and candor, I note as well that courts in one circuit are not bound by the decisions of other circuits. I view my obligation as one of determining the law manifested in the Copyright Act as it would be interpreted and applied to this case by the Court of Appeals for the First Circuit and the Supreme Court should this case reach either or both of those courts.

IV. SUBSTANTIAL SIMILARITY (ILLICIT COPYING)

For the reasons stated in Part II, above, and supplemented briefly here, I cannot conclude that Borland has copied substantially the whole of the Lotus 1-2-3 user interface.

In *Paperback*, although witnesses called attention to "look and feel" as a descriptive metaphor, counsel for Lotus did not base their contentions on this metaphor, and the court in its decision did not rely upon it. 740 F.Supp. at 62-63. One reason the metaphor did not seem useful in that case is that the concept of "look and feel" relates more to substantial similarity (in the mixed law-fact sense) than to copyrightability. In *Paperback*, so much of the 1-2-3 user interface had been copied that it was not difficult to resolve questions of substantial similarity in the mixed law-fact sense. The difficult questions in that case centered only around copyrightability of the user interface.

Paperback involved an appropriation by the defendant of the entire "look and feel" of 1-2-3. In this case, Borland has appropriated, to a great extent, the "feel" of the 1-2-3 user interface and only to a lesser extent the "look" of 1-2-3. Indeed, Borland has designed an interface that in many respects looks substantially different from the 1-2-3 user interface. Borland's colors and pull-down menus are but two examples of the differences in "look" in the Quattro programs. Of course, the menu commands and the menu command hierarchy look the same in both programs.

The "feel," on the other hand, of the emulation modes of the Quattro programs depends in large part on the keystroke sequences one enters to perform spreadsheet operations. One enters the same keystroke sequence to perform the same spreadsheet operations in both 1-2-3 and Quattro Pro's emulation mode. They feel the same. Thus, an experienced user accustomed to the 1-2-3 interface needs to look seldom, if at all, to achieve the desired result in the emulation modes of the Quattro programs.

This conclusion may be expressed in a more straightforward way without use of any part of the "look and feel metaphor." Lotus is entitled to a judgment of infringement only if Borland appropriated copyrightable elements of 1-2-3 and those copyrightable elements, taken together, make relevant portions of Borland's program substantially similar to 1-2-3. The evaluation of substantial similarity (in the mixed law-fact sense) therefore depends upon determining what copyrightable elements of the Lotus 1-2-3 user interface Borland copied. Even if I assume, however, that Borland did not copy the long prompts, and that some aspects of the menu commands, menu command hierarchy, macro language, and keystroke sequences of 1-2-3 are not copyrightable, I conclude that no reasonable jury, applying the law, could find other than that the Quattro programs infringe 1-2-3. That is, a reasonable factfinder must conclude that the Quattro programs derive from illicit copying. The emulation interfaces are substantially similar in the mixed law-fact sense to the Lotus 1-2-3 user interface. (Returning to the metaphor, one may say that is why they "feel" the same.)

I am not able to determine on motion for summary judgment the precise scope of Borland's infringement. Genuinely disputable factual questions exist that may affect the scope of substantial similarity and therefore the nature and scope of the remedies for infringement in this case. Nevertheless, it is clear that Borland has infringed the 1-2-3 user interface, at least in substantial part.

Lotus argues that questions of substantial similarity in the mixed law-fact sense ought not to be put to a jury. I understand Borland to contend otherwise (though it does not explicitly address the point in its latest submissions, perhaps because the Memorandum and Order of March 20 may have left the impression that I would submit such questions to a jury if a genuine dispute of fact existed). The scope of issues to be put to the jury is significantly reduced by my ruling that the emulation modes of the Quattro programs have a core that is substantially similar to 1-2-3. Borland's request that I put questions of fact concerning substantial similarity in the

mixed law-fact sense to a jury other than the one I empanel to hear evidence regarding substantial similarity in the evidentiary sense is now moot.

Borland's Quattro programs infringe Lotus 1-2-3 because the extent of copying of copyrightable elements of 1-2-3 renders the Quattro programs substantially similar to 1-2-3. If the jury finds that Borland also copied other copyrightable elements, then the Quattro programs will, as a matter of law, be even more substantially similar to 1-2-3; that is, the scope of Borland's infringement will necessarily be broader. For example, if the jury finds that Borland copied the Lotus 1-2-3 long prompts, and if I conclude that the long prompts are copyrightable expressive elements of 1-2-3, those two determinations, without any further finding that Borland's long prompts are substantially similar to Lotus' long prompts in the mixed law-fact sense, support a conclusion that Borland's Quattro programs infringe the long prompts of 1-2-3. There would be no need to ask separately whether the copying of the long prompts would alone, or in combination, render the Quattro programs substantially similar to Lotus 1-2-3. Substantial similarity (in the mixed law-fact sense) is determined by comparing the copied copyrightable elements of the infringing work *all together* with the copyrighted work as a whole. I have already determined that this comparison, even if the long prompts were not copied, requires a determination of infringement.

In reaching these conclusions, I once again reject Borland's contention that it is entitled to place in evidence at trial all the elements *of Quattro Pro* that were not copied from Lotus. Despite Borland's otherwise detailed (if not precisely accurate) explication of the *Computer Associates* case, Borland has failed to acknowledge an express conclusion of the Second Circuit that is contrary to Borland's position:

> [I]n some cases, the defendant's program structure might contain protectable expression and/or other elements that are not found in the plaintiff's program. Since it is extraneous to the allegedly copied work, this material would have no bearing on any potential substantial sim-

> ilarity between the two programs. . . . Furthermore, by focusing the analysis on the infringing rather than on the infringed material, a court may mistakenly place too little emphasis on a quantitatively small misappropriation which is, in reality, a qualitatively vital aspect of the plaintiff's protected expression.

Computer Assocs., 1992 WL 139364, at *22, No. 92-7893, slip op. at 47-48, 1992 U.S.App. LEXIS 14305, at *64-*65.

That Borland, in developing the Quattro programs, has added functional and expressive elements that do not exist in 1-2-3 is irrelevant in view of the fact that Borland copied virtually the whole menu command structure of 1-2-3 into its emulation interfaces. Borland's additions have caused some variation in the manner in which the elements taken from 1-2-3 are expressed in the Quattro programs. For example, in the main menu, the "View" command, a command not present in the main menu of 1-2-3, is interposed between the "System" and "Quit" commands. A decisionmaker in this case (whether judge or jury) must ignore the added expression *to the extent that it does not change the expression Borland copied from Lotus*. I conclude that no reasonable jury could find for Borland that Borland did not take the menu commands, menu command structure, macro language, and keystroke sequences substantially as they were.

V. BORLAND'S DEFENSES

Lotus has renewed its motion for summary judgment that Borland's affirmative defenses fail. Borland has raised three affirmative defenses in this action: waiver, laches, and estoppel. The issue of Borland's affirmative defenses was raised and fully briefed by the parties in conjunction with their previous motions for summary judgment. Because I denied both motions on other grounds by Memorandum and Order of March 20, there was no need to consider Borland's affirmative defenses at that time and I did not do so. Having concluded that Borland has infringed Lotus' copyright in 1-2-3,

I proceed to address Lotus' motion for summary judgment on Borland's alleged defenses.

A. Waiver

The parties agree that to succeed in its defense of waiver, Borland must demonstrate that Lotus voluntarily and intentionally relinquished its right to pursue Borland in this action. Borland's argument, however, is based upon *Borland's* "state of mind" and Lotus' alleged *concealment* of Lotus' "state of mind." Borland has not presented any evidence that Lotus manifested to either Borland or the world that it would not pursue Borland in this action. Borland's allegation that Lotus sought to play down the import of the *Paperback* litigation in its public relations campaigns by stating that *Paperback* involved "99% clones" does not amount to waiver, even if proved. Therefore, I grant Lotus' motion for summary judgment on the defense of waiver.

B. Laches

The parties agree that to succeed in its laches defense, Borland must demonstrate that Lotus delayed unreasonably in bringing this action and that as a result Borland suffered undue prejudice. Borland argues that it expended $18 million developing the Quattro programs, at least in part because, by not suing earlier, Lotus led Borland to believe that Lotus would not sue. Borland has admitted that it would have developed a spreadsheet program in any event at substantial cost. Nevertheless, Borland argues that the costs of releasing the entire spreadsheet constitute prejudice. This argument is plainly without merit.

Borland also argues that its decision to offer a 123-compatible interface is hard to undo and that it has expended large sums in advertising keystroke and macro compatibility of the Quattro programs with Lotus 1-2-3.

Without deciding at this time issues regarding alleged undue delay, I note that the question of prejudice may depend

upon determinations yet to be made regarding the appropriate remedy or remedies for the kind and scope of infringement that has occurred in this case. I take note also that precedents on laches derive from equity, and I may rule at trial that evidence admissible only in relation to equitable defenses must be received out of the presence of the jury, or in a later phase of trial. I deny Lotus' motion for summary judgment on the laches defense without prejudice to Lotus' renewing its arguments in support of the motion at a later date.

C. Estoppel

Estoppel, like laches, has its origins in equity. Without finally ruling on the matter at this time, I take note that it may be appropriate either to receive evidence bearing solely on estoppel (or only on estoppel and laches) out of the presence of the jury, or at a phase of trial after that in which issues relating to the scope of infringement are finally resolved.

Borland argues that Lotus' intentional concealment of its belief that the Quattro programs infringe 1-2-3 is a ground for estoppel. Borland's argument rests on a premise borrowed from an explicit statutory requirement in the law of patents, that Lotus owed a duty to Borland to notify Borland of its infringement. The law of copyright has not imported that requirement. Thus, Borland's arguments that Lotus concealed its intentions and that Borland did not and could not have known Lotus would sue are meritless. Lotus 1-2-3 is copyrighted. Borland copied copyrightable elements of 1-2-3 that constitute a substantial part of that program. Lotus has sued, and Borland is liable.

I reject as well Borland's argument that Lotus' delay in filing suit is a ground for estoppel. That argument is merely a repetition of the argument Borland raised in support of its laches defense.

Borland's identification of the alleged Lotus misrepresentation on which Borland relied to its detriment is less than pellucid. Borland refers to affirmative indications by Lotus that it would not sue, but fails to identify what indications Borland alleges, if any, other than comments made for public

relations purposes and reported in trade publications and position papers. Borland says, for example, that Lotus characterized the *Paperback* litigation as involving "99% clones." Borland argues that the Quattro programs are not clones of 1-2-3 and that it reasonably came to believe, therefore, that Lotus would not sue. If this is the best argument Borland can advance for justifiable reliance, the likelihood that it can present an issue on estoppel for a factfinder (judge, if this is treated as an issue in equity, and jury otherwise) seems very remote. Though I will not grant Lotus' motion for summary judgment at this time, the Order Regulating Trial in this case will require evidence bearing only on estoppel (or on estoppel and laches) to be proffered first outside the presence of the jury.

VI. CONCLUSION

It is my conclusion that, as a matter of law, Borland's Quattro products infringe the Lotus 1-2-3 copyright because of (1) the extent of copying of the "menu commands" and "menu structure" that is not *genuinely* disputed in this case, (2) the extent to which the copied elements of the "menu commands" and "menu structure" contain expressive aspects separable from the functions of the "menu commands" and "menu structure," and (3) the scope of those copied expressive aspects as an integral part of Lotus 1-2-3. Nevertheless, I conclude that a jury trial is essential before final disposition of this case because the scope of relief available will depend in part on whether the jury finds for Lotus on disputed factual contentions that the copying of separable expressive elements of the Lotus 1-2-3 user interface into the Quattro programs was greater than the minimum essential to constituting a substantial part of the Lotus 1-2-3 work.

In summary, Lotus' Motion for Summary Judgment is allowed in part and denied in part, as stated in the foregoing rulings. Borland's motion for summary judgment is denied.

Having reached this conclusion, I will state these rulings in the form of Determinations of Undisputed Facts and Con-

clusions of Law incorporated as a section of a draft Order Regulating Trial, to be distributed to counsel separately from this Memorandum and Order. An Order Regulating Trial will be entered at or after the Pre-Trial conference scheduled for September 23, 1992. Each party is invited to submit, by Memorandum filed on or before September 1, 1992, proposed modifications, deletions, and additions to the draft Order Regulating Trial. Responses may be filed on or before September 15, 1992.

UNITED STATES DISTRICT COURT
D. MASSACHUSETTS

Civ. A. No. 90-11662-K

March 20, 1992

LOTUS DEVELOPMENT CORPORATION,
Plaintiff,

—v.—

BORLAND INTERNATIONAL, INC.,
Defendant.

James C. Burling, Jeffrey B. Rudman, Hale & Dorr, Boston, Mass., Henry B. Gutman, Kerry L. Konrad, O'Sullivan, Graev & Karabell, New York City, *for plaintiff.*

Laura Steinberg, Sullivan & Worcester, Boston, Mass., Lynn H. Pasahow, McCutchen, Doyle, Brown & Enersen, San Francisco, Cal., David L. Hayes, Fenwick & West, Gary L. Reback, Wilson, Sonsini, Goodrich & Rosati, Mitchell Zimmerman, Fenwick & West, Palo Alto, Cal., Peter Erich Gelhaar, Donnelly, Conroy & Gelhaar, Boston, Mass., *for defendant.*

MEMORANDUM AND ORDER

KEETON, *District Judge.*

In this civil action, the plaintiff, Lotus Development Corporation ("Lotus"), seeks damages and equitable relief for alleged infringement by defendant, Borland International, Inc. ("Borland"), of the Lotus copyright in its computer software

program, Lotus 1-2-3. This is the same copyright for the infringement of which Lotus has obtained relief under this court's decision in *Lotus Dev. Corp. v. Paperback Software Int'l*, 740 F.Supp. 37 (D.Mass. 1990) (holding that Paperback's VP Planner was an infringing software product).

Lotus contends that on undisputed facts Borland's Quattro and Quattro Pro (herein, collectively, the "Quattro programs") are likewise infringing. Borland responds that its products are materially different from both Lotus 1-2-3 and VP Planner and that the court should determine on undisputed facts that the Quattro programs do not infringe the Lotus copyright. Borland argues that this result follows under the rules and standards of law applied by this court in *Lotus v. Paperback*. In the alternative, Borland contends that this court should reconsider its rulings of law in the *Paperback* case and now hold that the elements of Lotus 1-2-3 it determined previously to be copyrightable are not copyrightable. Also, Borland contends that in any event it has valid defenses that Paperback did not have.

Pending before the court are cross-motions for summary judgment, fully briefed and with factual submissions complete except for confidential materials to be presented to the court pursuant to a stipulation and protective order.

For the reasons explained in this Memorandum, I conclude that neither party's motion is supported by the record now before the court.

The primary contention of Lotus that Borland copied the Lotus user interface as a whole fails because there is a genuine dispute of fact as to whether Borland did so. Borland's primary contention that it is entitled to a summary judgment on copyrightability fails on legal grounds for reasons explained in Part VI of the Memorandum.

Each party has advanced alternative contentions for summary judgment. Each of the submissions before me, however, fails to meet the movant's burden of identifying both a clearly stated legal theory and a clear statement of undisputed facts sufficient to demonstrate an entitlement to summary judgment. In these circumstances, I conclude that it is appropriate

to deny the cross-motions for summary judgment. Explicitly, however, I do not preclude the filing of another motion by either party if one can be presented consistently with the rulings stated and explained in this Memorandum.

I. *Redacted Submissions*

Redacted submissions (Docket Nos. 141 and 147 and certain affidavits, declarations, and exhibits) now before the court were filed pursuant to this court's practice (for the protection of parties, counsel, and court personnel from risks of inadvertent disclosure) not to allow protected materials to be filed with the Clerk before the judge (not any other person acting under a delegation of authority) has approved in writing the specific filing.

In this instance, I have concluded that the description of the protected materials, appearing in the redacted filings, is sufficient for me to determine that they are not material to any of the rulings stated and explained in this Memorandum. If counsel think otherwise, however, they may, with notice to the court and opposing counsel, bring the protected materials to the next scheduled conference to be presented to the court for examination during that conference. In light of this ruling, the parties' motions regarding the submission of confidential documents (Docket Nos. 140, 156, and 160) are dismissed as moot.

II. *Disposition of the Cross-Motions for Summary Judgment*

This court held in *Paperback* that the 1-2-3 user interface, taken as a whole, was copyrightable. That ruling was never appealed or vacated and continues to have the limited precedential force of a district court decision. The applicability of that precedent to this case is disputed, however, because Borland contends that its allegedly infringing products are materially different from VP Planner (the computer work involved in *Paperback*). VP Planner has been described, both in and

outside this court, as an imitation (or look-alike, or clone) of 1-2-3. The conclusion that the user interface of 1-2-3, as a whole, was copyrightable was outcome determinative as to a computer work like VP Planner because, without dispute, the 1-2-3 user interface as a whole was copied. Lotus has maintained, however, both before this court and elsewhere that there is a distinction between imitations of 1-2-3 and other products such as Microsoft Excel.

In the present case, unless other issues are dispositive, it will be necessary to determine on which side of an unmarked boundary, between imitations of 1-2-3 and products such as Excel, the Quattro programs fall. I cannot determine on the record before me that the "1-2-3 interface" (also called the "emulation interface") of the Quattro programs is indisputably an imitation of the 1-2-3 user interface. Thus, for Lotus to meet its burden of showing entitlement to a summary judgment of infringement it must (a) identify expressive elements in 1-2-3 that were indisputably copied in the Quattro programs, (b) establish that those expressive elements, either separately or together, are as a matter of law copyrightable, and (c) establish that the copied expressive elements of the Quattro programs' emulation interfaces are substantially similar to copyrightable elements of the 1-2-3 interface.

The conclusion that the user interface as a whole is copyrightable (which this court reached in *Paperback*) does not resolve the further questions that may now have to be resolved regarding the copying and copyrightability of individual parts or a sum of parts less than the user interface as a whole. The Lotus motion and supporting submission fail to focus precisely, even in the alternative, any claim of copyrightability and undisputed copying of something less than the user interface as a whole. In these circumstances, having concluded that the claim of copying the user interface as a whole has not been demonstrated, I must conclude also that Lotus has failed to demonstrate it is entitled to summary judgment.

Similarly, Borland has failed to demonstrate support for its contention that, even if it copied something from 1-2-3, nothing Borland copied was copyrightable. As far as I am now

able to determine, a factfinder may find on disputed evidence that Borland copied the 1-2-3 user interface as a whole. I have previously determined, and as explained in this Memorandum now adhere to the view, that the 1-2-3 user interface as a whole is copyrightable. Moreover, the present record suggests that a factfinder surely could find that Borland copied some expressive elements of the 1-2-3 user interface. The outcome of this case may depend on a more precise focus than Borland has presented as to what elements Borland copied and whether one, or more, or some set or sets of those elements are copyrightable.

One effective way of focusing contentions and considering whether they present genuine disputes of fact that are material under the court's resolution of contested issues of law is to consider how any fact questions might be framed for the factfinder's consideration. Especially is this so when a demand for jury trial has been filed. Questions to be submitted to the jury must at some point during full preparation for trial be framed precisely. The trial judge and trial lawyers may well commence this task early, to aid as well the focusing of arguments on motions for summary judgment. A lawyer who contends that a genuine dispute exists as to some material fact should be able to frame clearly a "written question[ ] susceptible of categorical or other brief answer," proposed for use in a "special verdict," Fed.R.Civ.P. 49(a). If, when challenged to do so, counsel cannot state precisely any proposed question of fact that is disputed and material, summary judgment is almost certainly appropriate. If, on the other hand, counsel can frame even a single disputed and material question of fact, summary judgment is inappropriate.

On the present submissions, I am not able to conclude that either party has met its burden of showing a basis for summary judgment in its favor. I therefore deny the motions at this time; however, I conclude that it is appropriate to allow the parties an immediate opportunity to focus their arguments more precisely, on the chance this may lead to disposition without the high costs of trial, and in any event will better focus issues for trial if a trial is necessary. Therefore, I deny

the motions now before me, but will allow each party, on the schedule stated below, to file a new, better focused motion if the party concludes it can surmount the serious obstacles identified in this Memorandum.

The claims and defenses in dispute in this case present issues of law and issues of fact that are independently complex. The relationships among the law and fact issues dramatically enhance complexity. A jury demand and the resulting need for clear and explicit explanations to jurors of the law they need to understand in order to identify and resolve material disputes of fact produce still more consequences of significance, and perhaps more complexity as well. Complexities and their consequences have significant implications for fundamental issues of fair adjudication. They present also some pragmatic issues of case management in both pretrial and trial proceedings. The Order entered at this time is aimed at creating a context in which the parties and their attorneys will have incentives to use their adversary presentations in ways that will better focus and illumine issues for the decisionmakers, judge and jury, and will save the parties, their counsel, and the public from needlessly excessive litigation costs. Suggestions of counsel in aid of this aim are invited and encouraged.

III. *Entanglement of Law and Fact as to Copyrightability and Substantial Similarity*

A. Basic Methods of Separating Law and Fact

In general, an issue of law is decided by a court—not by a jury in a jury trial and not by a trial judge as factfinder in a nonjury trial. Also, in general if reasonable persons can differ about how a fact question should be decided on the evidence received in the trial, the jury decides it in a jury trial, and the jury decision is final; in a nonjury trial, the judge as factfinder decides, and the decision is subject to review under a deferential standard. Fed. R.Civ.P. 52(a) (findings sustained unless "clearly erroneous").

These clear and straightforward rules sometimes require supplementation, however, when the issues of law and fact are "mixed." If a court can clearly separate law from fact, it may use either of two basic methods of submitting questions to a jury. One method asks the jury to answer a mixed law-fact question; the other, a strictly factual question.

Under the first method, the court submits a combined law-fact question to the jury. To use this method properly the court must first decide the issues of law so it can give the jury clear instructions on the law. The jury's answer, if they discharge their responsibility well and truly, decides only fact questions even though their answer is in form an answer to the mixed law-fact question.

This first option may be used either for a "special verdict" under Rule 49(a), or for a "general verdict accompanied by answers to interrogatories" under Rule 49(b) of the Federal Rules of Civil Procedure.

The second option open to the trial judge is to frame "special questions" for the jury under Rule 49(a), or "interrogatories" under Rule 49(b), that ask only fact questions, not mixed law-fact questions.

A charge that directs the jury to return only a general verdict cannot use the second method because the general verdict is necessarily a mixed law-fact finding (the type required under the first option). Thus, a verdict "for the plaintiff" or "for the defendant" does not provide any basis for a reasoned determination by the court that the verdict rests on findings of fact supported by evidence and not on a different view from that of the court about the legal elements of mixed law-fact determinations.

If only a "special verdict" under Rule 19(a) is to be returned, and the questions are well framed, the jury need not have any explanation of the legal rule or rules the court will apply to determine what judgment to enter in view of the jury's findings. The judge may choose to explain anyway, but giving the explanation is a matter of choice rather than necessity.

When two or more questions of fact must be submitted, the court may submit one or more questions by one of these meth-

ods and one or more by the other. Also, the court may use a mixture of general verdict and "interrogatories," Fed. R.Civ.P. 49(b).

When issues of law and fact are easily separable, the court, when it perceives a need to do so to avoid jury confusion or bias, may use a "special verdict" form under Rule 49(a) that strictly submits fact questions; also, the court may cleanly separate the hearings before the court on the legal issues from those before the jury on the fact questions. A key purpose of trying a case in this way is to reduce the risk that the jury will be improperly influenced by evidence and arguments not admissible in relation to the strictly factual issues submitted to them.

When law and fact are not easily separable—regardless of how deep the entanglement may be—it nevertheless remains exclusively the responsibility of the court to decide the legal questions.

Ordinarily, it is the responsibility of the factfinder (jury or, in a nonjury case, trial judge) to decide the fact questions, but exceptions exist, as will be noted in Parts IV, VI, and VII below.

B. Problems of Entanglement

In order to use a strictly factual special verdict form, a court must cleanly separate law from fact. Not all mixed questions of law and fact can be easily separated. Indeed, there may be instances in which law and fact are so deeply intertwined that, at least as a practical matter if not strictly in principle as well, total separation cannot be achieved. In copyright cases, is "substantial similarity" such an instance? Is "copy-rightability" such an instance?

1. *Substantial Similarity*

"Substantial similarity" is not consistently used with a single, settled meaning. In the law of copyright this phrase is used in at least two distinct senses. For this reason, the use of the term "substantial similarity," absent some contextual guidance, may be very misleading.

As part of its prima facie case, a plaintiff must prove substantial similarity between copied copyrightable elements of the copyrighted work and expressive elements of the allegedly infringing work. "Substantial similarity," as used in this statement, indicates a degree of similarity between the allegedly infringing material and what is copyrightable (that is, the copyrightable part or parts). It is not enough for a plaintiff to prove great similarity of the allegedly infringing work to uncopyrightable parts of the copyrighted work.

The similarity to copyrightable parts, it is said, must be such that an "ordinary observer" would find that there has been "unlawful appropriation." *Concrete Machinery Co. v. Classic Lawn Ornaments*, 843 F.2d 600, 608 (1st Cir.1988). Thus, the copying must be extensive enough to be "substantial." This is "substantial similarity" in a mixed law-fact evaluative sense. Thus, the test for determining whether there is "substantial similarity" in this sense involves not merely a ministerial task of measuring by a yardstick or word count, but a judgmental task of weighing the quantitative measurements along with other relevant factors and coming to an overall evaluation that applies a legal test for "unlawful appropriation" to the facts.

The plaintiff must also demonstrate copying of the copyrighted work. Unlike patent law, copyright law never determines that an infringement occurs merely because two works are similar, or even identical, so long as the works are independently created. Therefore, to be successful, a plaintiff must demonstrate that the defendant had access to plaintiff's work. Such access is not disputed in this case. Nevertheless, to prove copying, plaintiff must show more than access. Copying can, of course, be proved directly, and there is some direct evidence of copying in this case. However, once access is proved, copying can also be proved by demonstrating "substantial similarity." In this context, "substantial similarity" simply means sufficient similarity of a given element of a work to an element in the allegedly infringing work to support a reasoned inference that more probably than not the element was copied from the copyrighted work. This is not similarity

in a mixed law-fact sense that includes being similar enough to constitute "unlawful appropriation." Rather, the elements of the copyrighted and allegedly infringing work must be shown to be substantially (i.e., notably) similar in a purely factual sense. This is "substantial similarity" in an evidentiary sense. "Substantial similarity" in this sense is one kind of circumstantial evidence of copying.

In this Memorandum, I will try in each instance to indicate clearly (by explicit statement, by context, or by both) to which usage of substantial similarity I am referring.

2. *Consequences of Entanglement*

The complexity introduced by the entanglement of law and fact, bearing on "substantial similarity" (in the mixed law-fact evaluative sense) and on copyrightability has important consequences, including distinctive problems of adjudication and case management both during pretrial proceedings and during trial. Some of these consequences are relevant to the present case.

First, fashioning appropriate verdict forms and instructions to the jury is more difficult when law and fact are so entangled that the usual mode of stating an issue is in the mixed law-fact form.

Second, determining the scope of evidence that is admissible in relation to questions to be decided by the factfinder (jury or trial judge in a nonjury case) is far more difficult. Moreover, failure of the trial judge to resolve problems of admissibility, especially in relation to proffered expert opinion testimony, may substantially impede fair trial because of risks of jury confusion and the incentives to counsel and experts to try to influence the jury with arguments on the law cast in the form of opinions on the mixed law-fact questions.

Third, when the applicable law requires the application of a standard for decisionmaking that is derived from a congressionally mandated accommodation among conflicting public policy interests and thus "reflects a balance of competing claims upon the public interest," *Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417, 431, 104 S.Ct. 774,

783, 78 L.Ed.2d 574 (1984), consequences of the first and second types are enhanced, sometimes beyond measure. Difficult as the task of applying that balance in particular cases may be, however, it is not open to a court to ease the task either by revising that balance, *Feist Publications, Inc. v. Rural Telephone Service Co.*, ___ U.S. ___, 111 S.Ct. 1282, 113 L.Ed.2d 358 (1991), or by leaving the jury free to revise that balance. A congressionally mandated balance must be respected by courts and juries alike.

The mixed law-fact evaluative "substantial similarity" issue in copyright law inevitably produces the first and second of these types of consequences, and in particular cases may produce the third as well unless effective measures of judicial control are used. For example, consider whether or not expert opinion evidence about the ways in which two computer software programs are similar and dissimilar should be heard by a jury. One may argue for a negative answer under the authority of *Concrete Machinery Co. v. Classic Lawn Ornaments, Inc.*, 843 F.2d 600, 608 (1st Cir.1988) (substantial similarity is to be judged under the "ordinary observer" test "unaided by expert testimony"). Even if it may be appropriate and useful to a jury in understanding purely historical facts about characteristics of computer programs to hear expert opinions bearing on historical facts, still opinions that explicitly or implicitly depend on policy premises inconsistent with the law (as determined by the trial judge, subject to correction on appeal) should not be heard by the jury.

Affidavits of experts and arguments of counsel before me in this case illustrate the risks of contentious and potentially unfair proceedings incident to the strong tendency of witnesses and lawyers to intertwine every statement about factual similarity with opinions and arguments about what is, or even should be, the kind of similarity that is legally significant. These opinions are, of course, opinions on the law. Allowing a jury to hear them expressed by witnesses and lawyers is fundamentally inconsistent with the rule that jurors take their instructions on the law solely from the court.

I will return to the issue of "substantial similarity" in the mixed law-fact evaluative sense in Part IV, below.

3. *Copyrightability*

Issues of "copyrightability" in computer software programs present the third type of consequence of entanglement of law and fact in a dimension so extreme that the problem is appropriately viewed as one different in kind and not merely degree. This is one reason, though not the only one, for concluding that at least in the present case, and perhaps more generally, all questions of law and fact bearing on copyrightability of elements of a computer software program are to be decided by a court, not a jury. That issue is considered more fully in Parts IV, VI, and VII, below.

IV. *Entanglement of Copyrightability and Substantial Similarity*

The complexity of entanglement of issues in this case extends not only to issues bearing only on copyrightability, and to issues bearing only on substantial similarity in the mixed law-fact evaluative sense, but also to the interdependence of copyrightability and substantial similarity.

The point is illustrated by Borland's argument that Borland is entitled to summary judgment *on the issue of copyrightability*, Docket No. 141, at 1 (emphasis added), because the elements of Quattro and Quattro Pro that are alleged to be *substantially similar* to elements of Lotus 1-2-3 concern only the way certain parts of the programs function, not copyrightable expressions. *Id.* at 4-8.

Borland argues that *Concrete Machinery*, 843 F.2d at 600, requires that issues of substantial similarity be addressed first, to determine whether "there are sufficient articulable similarities to justify a finding that the defendant has copied from the protected work." Borland's Memorandum, Docket No. 141, at 114 (quoting *Concrete Machinery*, 843 F.2d at 608) (citing *Arnstein v. Porter*, 154 F.2d 464 (2d Cir.1946)). (In this argument, one may note, Borland is using "substantial similarity" in the evidentiary sense.) Then, Borland argues, "the court must determine whether the copying is sufficiently substantial to constitute 'unlawful appropriation' ('illicit

copying')." *Id.* at 114 (quoting *Concrete Machinery*, 843 F.2d at 608). (This argument, it may be noted, focuses both on a strictly factual question about copying and a mixed law-fact question about whether the copying is sufficient to constitute "unlawful appropriation.") "Assuming copying of protected aspects is established, the trier of fact can then assess pursuant to the 'ordinary observer' test whether there is substantial similarity between the protected expression and the accused work." *Id.* (quoting *Concrete Machinery*, 843 F.2d at 609).

The first step formulated in the *Concrete Machinery* opinion may be perceived as itself composed of two parts—determining what are the "protected aspects of the copyrighted work" (that is, the "copyrightability" issue) and determining whether there has been copying of one or more of those aspects. It is not clear that one of these two need precede the other in an analysis of the evidence and arguments presented to a court. Indeed, they may be sufficiently interrelated that in most cases they are best addressed together—a possibility at least suggested by the First Circuit's combining the two into the first "step" of its "two-step" test.

In any event, the argument that First Circuit precedent *requires* a particular order of analysis of a given problem is contrary to a substantial body of precedent in the circuit. For example, the First Circuit spoke quite early to make clear, in the context of discrimination cases, that the factors analysis set forth in *McDonnell-Douglas Corp. v. Greer*, 411 U.S. 792, 93 S.Ct. 1817, 36 L.Ed.2d 668 (1973), is intended as a useful guideline and not a mandatory straitjacket. *See, e.g., Dance v. Ripley*, 776 F.2d 370, 373 (1st Cir.1985) ("This circuit, along with other circuits, has rejected the argument that *McDonnell Douglas* and [*Texas Dept. of Community Affairs v.*] *Burdine* [450 U.S. 248, 101 S.Ct. 1089, 67 L.Ed.2d 207 (1980)] set forth a 'rigid, three-step proof process in Title VII cases.' ") For like reasons, I conclude that the pattern of analysis and decisionmaking presented in *Concrete Machinery* is not meant to be a straitjacket. Thus, I conclude that the order of addressing the various elements of a prima facie case fashioned in *Concrete Machinery* need not be applied to a case in which

there are compelling practical reasons for a different order of proceeding.

Perhaps the procedure discussed in Part V, below, fits the *Concrete Machinery* model because the "first" step of that model is itself two-fold, as noted above. In any event, regardless of whether the procedure discussed in Part V precisely fits the *Concrete Machinery* model, I conclude, for reasons explained in Part V, that it is appropriate to consider an order of proceeding in this case that places issues of substantial similarity (in the evidentiary sense) ahead of issues of copyrightability.

V. *Sharpening the Focus*

In this case, if it is determined that neither a motion for summary judgment nor a motion for directed verdict should be sustained, how might issues involving substantial similarity (in the evidentiary sense) be submitted to the jury in a verdict form in the trial of this case?

To establish infringement, Lotus must prove, either directly or circumstantially, that Borland copied. Circumstantial proof of copying is made by showing access to the copyrighted work and substantial similarity (in the evidentiary sense). In the present case, I conclude that a reasonable trier of fact could find that the Quattro programs' user interfaces were not copied in their entirety from Lotus 1-2-3. However, because access is admitted, the record before me contains both circumstantial proof of copying (e.g., all of the commands in the Lotus 1-2-3 menu structure appear verbatim in the Quattro programs' menu structures in similar hierarchies) and direct proof of copying (e.g., Borland named certain files involved in the 1-2-3 emulation "123.rsc" and "123.mu"). It does not necessarily follow, however, that a jury must on this record find that some particular element was copied from Lotus 1-2-3 rather than being either independently created or copied from some other source.

For any elements of 1-2-3 that Lotus wishes to argue were copied, Lotus must demonstrate (either beyond dispute on motion for summary judgment, or else at trial by a prepon-

derance of the evidence) that the alleged copying from 1-2-3 occurred. Lotus may do so either directly or circumstantially. To demonstrate that the copying was illicit Lotus must also show substantial similarity in the mixed law-fact evaluative sense and copyrightability of those elements.

Returning to the question posed above (How might issues involving substantial similarity in the evidentiary sense be submitted to the jury?) I take note that one option to be considered is to begin with the less complex issue of copying and with a broad focus, then moving toward narrower questions concerning what elements of Quattro or Quattro Pro were copied from 1-2-3.

Would it be appropriate to frame the first question on a Verdict Form in a way such as this (with a similar question to follow for the other allegedly infringing work)?

Question 1

(a) Do you find that the Quattro Pro user interface as a whole was copied from the Lotus 1-2-3 user interface as a whole?[1]

____YES ____NO

(b) Do you find that the part of the Quattro Pro user interface called the "emulation interface" (also called the "1-2-3 compatible interface") as a whole was copied from the Lotus 1-2-3 user interface as a whole?

____YES ____NO

[1] It is not entirely clear that Lotus contents that part (a) of Question I should be answered YES, or that Borland contends that a NO answer to part (a) would be material if part (b) were answered YES. Perhaps the parties will agree, or one will persuade the court, that part (a) may be omitted.

(c) If NO, do you find that some part, and, if so, which of the following part or parts of the Lotus 1-2-3 user interface were copied into some part of the Quattro Pro "emulation interface" (also called the "1-2-3 compatible interface")?

(1)	The menu commands	____YES	____NO
(2)	The menu structure	____YES	____NO
(3)	The command sequence	____YES	____NO
(4)	The long prompts	____YES	____NO
(5)	The macro facility	____YES	____NO

To avoid any misunderstanding, I state explicitly that I have not determined that the foregoing draft of Question 1 is appropriate for use in this case. Nor have I determined what, if any, explanatory instructions should be given to the jury along with such a question. Even if a question of this general type is to be used, I will invite submissions by counsel of any different way of framing the question (and associated instructions) and why that different way would be more appropriate. Of course, counsel are invited to submit additional specific elements of alleged similarity about which there is dispute. Also, I do not suggest that all five elements on the present list ought to be included.

In particular, the term "macro facility" is not adequately defined in the parties' present submissions and would require definition. If "macro facility" means some element or characteristic of the user interface distinct from and not including the menu commands, menu structure, and command sequence, Question 1(c) might be appropriate as drafted. If, on the other hand, "macro facility" is to be defined in a broader sense that includes the menu command, menu structure, and command sequence elements, as well perhaps as the long prompts, but does not include other aspects of the 1-2-3 interface and for that reason is not the same as "the user interface as a whole,"

the foregoing draft of part (c) might be replaced by the following parts (c) and (d):

(c) Do you find that the Lotus 1-2-3 macro facility as a whole was copied into some part of the Quattro Pro macro facility?

____YES ____NO

(d) Do you find that some part, and, if so, which of the following part or parts of the Lotus 1-2-3 macro facility were copied into some part of the Quattro Pro macro facility?

(1)	The menu commands	____YES	____NO
(2)	The menu structure	____YES	____NO
(3)	The command sequence	____YES	____NO
(4)	The long prompts	____YES	____NO

The purpose of including these alternative drafts in this Memorandum is to begin the process of focusing issues more precisely.

An advantage of beginning a Verdict Form with a question of this type on the subject of copying is that findings of the jury on the various parts of such a question would enable counsel and the court to focus more precisely on (a) the legal elements of "substantial similarity" (in the mixed law-fact evaluative sense) that are material after taking account of the jury findings, and (b) the legal (and factual, if any) elements of copyrightability that are material after taking account of the jury findings. Surely some of the legal and factual issues that cannot be dismissed as immaterial before taking account of the jury findings would be mooted by the findings. For example, if a jury finds that the emulation interface as a whole was copied from the 1-2-3 interface as a whole, copyrightability questions with respect to less of the user interface

than the whole might be moot. On the other hand, if the jury finds that neither the emulation interface nor certain individual elements of it were copied from Lotus 1-2-3, but certain other elements were copied, the material copyrightability questions would be limited, others having been mooted.

I have proposed presenting the question to the jury as one of "copying" rather than "substantial similarity" even though access is undisputed. I have done so because a mere finding of "substantial similarity" in the circumstantial evidentiary sense may be inconclusive on the issue of copying. That is, even if "substantial similarity" in the evidentiary sense creates a presumption of copying, it may be that the presumption is rebuttable and that the jury should be so instructed. If so, Borland might still persuade the jury that the circumstantial inference of copying has been rebutted by extrinsic evidence offered by Borland. I do not at this time decide any of the questions of law suggested in this paragraph.

Consideration may be given to trying Phase One on copying and commencing Phase Two of trial immediately after Phase One, and before the same jury, to address any remaining questions that could properly be submitted to the jury on issues of "substantial similarity" in the mixed law-fact evaluative sense and "copyrightability."

VI. *Framing the Issues of Copyrightability*

A good place to begin the exploration of potential options in this case regarding submission to a jury of issues of copyrightability (if such issues are to be submitted to a jury) is to consider whether it would be appropriate to submit a single copyrightability mixed law-fact question, framed in terms of the applicable legal standard. Before I suggest such a jury question, I first state the standard for deciding copyrightability that will be used in this case, absent further guidance from higher authority before the date of trial.

A. The Standard for Deciding Copyrightability

Having fully considered the submissions now before the court, I conclude that, for reasons stated in the *Paperback* Opinion, 740 F.Supp. at 54-62, and supplemented here, the copyrightability issues in this case should be determined by the legal standard used there and summarized as follows:

> FIRST, in making the determination of "copyrightability," the decisionmaker must focus upon alternatives that counsel may suggest, or the court may conceive, *along the scale from the most generalized conception to the most particularized*, and choose some formulation—some conception or definition of the "idea"—for the purpose of distinguishing between the idea and its expression.
>
> * * *
>
> SECOND, the decisionmaker must focus upon whether an alleged expression of the idea is limited to elements essential to expression of *that* idea (or is one of only a few ways of expressing the idea) or instead includes identifiable elements of expression not essential to every expression of that idea.
>
> THIRD, having identified elements of expression not essential to every expression of the idea, the decisionmaker must focus on whether those elements are a substantial part of the allegedly copyrightable "work."

Id. at 60-61.

In reaching this conclusion, I have fully considered *amicus curiae* briefs filed in this case, with leave of court. Compared with the great majority of *amicus curiae* briefs filed in courts, two of the *amicus* submissions in this case are distinctive: they do not purport to advise the court how the present case should be decided, and they are not filed on behalf of clients who have a special interest aligned with that of one or the other of the parties to the case.[2] The *amicus* submission of the

[2] A third *amicus* brief filed by the Software Entrepreneur's Forum does take the position that Quattro and Quattro Pro ought to be determined not to infringe Lotus' copyright. However, that brief suggests find-

Register of Copyrights concerns issues that I do not reach in this Memorandum, and I do not discuss it further.

The second *amicus* submission was filed by eleven professors of law, teachers of courses in the intellectual property field, who express a concern that the Opinion in *Lotus v. Paperback* and the standard of decision developed in that Opinion, quoted above, give inadequate attention and emphasis to the distinction between a copyrightable expression and a useful process. Although this distinction is noted in the *Lotus v. Paperback* Opinion—*e.g.*, 740 F.Supp. at 53-58—I accept the point that no explicit reference to "process" appears in the standard of decision quoted above. Because I recognize the value of reminding decisionmakers (whether judges or jurors, a point to which I return later in this Memorandum) of the distinction between a useful process and an original expression, I will add a reference to that distinction, restating the standard in the following way:

> FIRST, in making the determination of "copyrightability," the decisionmaker must focus upon alternatives that counsel may suggest, or the court may conceive, along the scale from the most generalized conception to the most particularized, and choose some formulation—some conception or definition of the "idea," "*system*," "*process*," "*procedure*," or "*method*"—for the purpose of distinguishing between the idea, *system, process, procedure, or method* and its expression.
>
> * * *
>
> SECOND, the decisionmaker must focus upon whether an alleged expression of the idea, *system, process, procedure, or method* is limited to elements essential to expression of that idea, *system, process, procedure, or method* (or is one of only a few ways of expressing the idea, *system, process, procedure, or method*) or instead includes identifiable elements of expression not essential to every expression of that idea, *system, process, procedure, or method.*

ings that ought to be made rather than the legal rule that must be applied. Because the court does not make findings on motions for summary judgment, and even as to other matters addressed in this Memorandum I am not making findings, I do not address that brief further.

> THIRD, having identified elements of expression not essential to every expression of the idea, *system, process, procedure, or method*, the decisionmaker must focus on whether those *expressive* elements, *taken together*, are a substantial part of the allegedly copyrightable "work."

Id. at 60-61 (added words emphasized, other emphasis deleted). If the answer to the THIRD step is YES, then the expressive elements of the work, taken together, are copyrightable. Copyright protection extends, of course, only to the expressive elements—not to anything more. To demonstrate entitlement to relief, Lotus will be required to prove that Borland copied expressive elements (that is, the particular form of expression and not just the methodology, process, or idea of the user interface of Lotus 1-2-3) and that as a result there is a substantial similarity (in the mixed law-fact evaluative sense) between expressive elements of 1-2-3 and an allegedly infringing Borland program.

I need not and do not tarry over whether this refinement of the stated standard of decision simply makes explicit something that was implicit in *Lotus v. Paperback* or instead is a modification of the standard stated there. In any event, laboring as I am in territory that is uncharted, I conclude that the sources of authority I am bound to respect—constitutional, statutory, and decisional—leave me the choice and perhaps even the responsibility to make this refinement and to do so explicitly.

Apparently, if not explicitly, a premise of Borland's argument is that once some aspect of a "computer program" (as that phrase is used in the statute, 17 U.S.C. § 101) is determined to be a "process" or "system" (as those words are used in the statute, 17 U.S.C. § 102(b)), no part of that functional aspect is copyrightable. (It is not entirely clear whether the argument is that anything "functional" is not "expressive," or instead that even "expressive" elements of anything that is "functional" are not "copyrightable." The choice between

these two different ways of phrasing the argument seems, in any event, more linguistic than substantive.) Once functionality is demonstrated, Borland argues, the inquiry about copyrightability ends, and no copyright is possible. This premise of Borland's position is flawed.

The Professors' Amicus Brief might be interpreted as implicitly if not explicitly supporting Borland's premise. In any event, Borland broadly asserts that "all systems are uncopyrightable." Docket No. 141, at 94. Of course, if Borland means only that being a "system" does not make something copyrightable, the point is plainly meritorious but does not help one decide a case such as this one. But Borland appears to be asserting more—that if some part of a computer program is a "system, process, procedure, or method," 17 U.S.C. § 102(b), no copyright of any aspect of that part of the program is possible. If, in so arguing, Borland means that the fact that a computer program is a "system" precludes copyrightability of every part and aspect of that program (or even that if some part of a program is a "system," copyrightability is precluded as to all aspects of that part) the argument is deeply flawed. *See Kieselstein-Cord v. Accessories By Pearl, Inc.*, 632 F.2d 989 (2d Cir.1980) (holding that expressive elements of utilitarian belt buckles were copyrightable). The fallacy becomes apparent as we examine more closely the proposed bright-line rule that "all systems are uncopyrightable." Even source code and object code would not be copyrightable if this rule were the law.

It is worth noting that in this discussion I do not depend upon judicially or academically developed conclusions about fundamental truths, even though the basic nature of copyright law is relevant. Rather, the central point is that because courts are bound by the congressional mandate that something in computer programs is copyrightable, I must reject Borland's premise. Of course, if Congress should at some future time determine that the balance it has struck with respect to the copyrightability of computer programs is not in the best interests of the programming industry and the public, Congress (but not this court) is free to change that balance.

In discussing this issue, as shorthand for convenience only (and with readiness to reconsider should it be suggested that the shorthand has different substantive implications from the longer phrase), I will use the term "process" to refer to "system, process, procedure, or method" as that phrase is used in the statute.

"Process," like "idea," is an abstraction—a creature of the human intellect. A machine may be constructed of pieces of metal, wood plastic, and other materials, put together with nuts, bolts, bearings, and adhesives. A process, on the other hand, is not composed of materials. Instead it is a set of ideas about how to do something. The fact that it is an idea about doing does not make it any less an idea.

Patent law establishes legal rules for process patents that are different in some respects, and not in others, from the rules applying to other patents. The mere fact that patent law allows a means of legal protection for a process, however, does not establish that there is not also some protection in copyright law. Certainly the area of legal protection under the separate legal regimes is not co-extensive, but it is equally clear that there is no particular reason to believe there should never be any area of overlap. Indeed, precedent recognizes some overlap. *E.g., Mazer v. Stein*, 347 U.S. 201, 217, 74 S.Ct. 460, 470, 98 L.Ed. 630 (1954) ("We do hold that . . . patentability . . . does not bar copyright. . . ."). Thus, the fact that a particular computer program may be protected to some extent under one of these legal regimes does not mean it cannot be protected to any extent under the other.

Thinking about copyright protection for computer programs may begin with the point that a person who conceives a "process" shows or tells—uses some form of communication—to make the "process" accessible to another. Showing and telling are modes of expression.

Thus, there is a closely analogous if not precisely identical dilemma about distinguishing an idea from expressions of the idea and a "process" from expressions of the "process." I need not, and do not, repeat here the explanation of that dilemma and of statutory and decisional markers that led me in *Lotus*

v. Paperback to the formulation of a standard to be applied to the facts of a particular case to decide whether an aspect of a computer program is a copyrightable expression.

In a broad sense of the term "process" (or the longer phrase for which it stands here), every aspect of a "computer program" is part of a process. Nevertheless, we have a statutory mandate that some aspects of a "computer program" may be copyrightable. Borland and virtually all others who discuss the matter recognize that "source code" and "object code" have copyrightable elements. Yet each "code" is surely a part of a "system, process, procedure, or method." Imagine the response you would receive from a good programmer if you told her that her "source code," or "object code," or both, lacked "system" and "method" and, either taken together or separately, simply could not be regarded as an effective "process" or "procedure" for communicating to the computer what it should do!

Bowing to the congressional mandate and to widely expressed views about the copyrightability of code, Borland—after full explication of a proposed interpretation of *Baker v. Selden*, 101 U.S. 99, 25 L.Ed. 841 (1879), and its progeny—continues with the point that the "long-standing copyright principles" applicable to novels, poems, and other traditional literary works have been applied also to computer programs to provide significant protection to software developers.

> For example, under those long-standing principles, *the sequence, structure and organization of the program's code*, in addition to the text of the code itself, *may be protected by copyright*—under the same rationale that protects the detailed plot line and structure of a play in addition to the play's actual dialog.

Docket No. 141 (emphasis added). Borland also concedes, as it must, that this protection of the sequence, structure, and organization may extend to the user interface as well as source code and object code.

Borland's flawed argument (for a bright-line rule that a finding of "process" defeats "copyrightability," regardless of the originality of any particular expression that enables a person other than the creator to use it) must be rejected because it is fundamentally inconsistent with the congressional balance struck in the Copyright Act. The argument is in its nature a one-conclusive-element argument. Expressed in the form of if-then logical operations of the sort a computer might execute upon pairs of binary values, such an argument asks the court to conclude (a) "if process, then not copyrightable," (b) "if idea, then not copyrightable," and (c) "if patent protection for process, then no copyright protection for process." Arguments of this type, urging courts to adopt an overriding rule that one element of a total set of interwoven circumstances be declared the only legally relevant element are like discredited arguments that courts should select one among all the antecedents of an event in human affairs and declare it to be *the* proximate cause. *See* W. Page Keeton et al., *Prosser & Keeton on the Law of Torts* 266 (5th ed. 1984). These are arguments that one aspect of the total circumstances be treated in law as overriding and conclusive. Arguments of this type are often encountered in the legal system, but far less often sustained. Common sense tells us that life and life's experiences are not so neatly separated into discrete categories, without overlap. The legal system aims at reasonable accommodations among conflicting legitimate interests and rarely holds that one such interest totally overrides all others. Moreover, in the present context, respect for the congressional mandates in the Copyright Act requires that Borland's proposed bright-line rule be rejected.

Borland's argument that *Baker v. Selden* adopted a bright-line rule that governs this case is a gross overstatement not only of what the Supreme Court *did* in that case but as well of what the Court *said*. The Court did not there face the issues presented in the present case. Indeed, the Court did not even address issues of expression within the plot, sequence, organization, or structure of artistic works—issues that were

addressed by Learned Hand in his opinions from which I took guidance in deciding *Paperback*.

Attributing to the Supreme Court one's own extrapolations beyond what the Court did and said is a form of reasoning a lower court should not adopt. It is wiser and more in keeping with the judicial role to recognize candidly that we, not the Justices of the Court, are doing the extrapolating. In hearing and deciding *Baker v. Selden* in 1879 the Court did not, and indeed could not, foresee computer programs. The Court was not speaking about computer programs or even about the kinds of issues, more readily inferred to be foreseeable in 1879, that were explicitly addressed in Learned Hand's opinions a half-century later and beyond. Attributing to the Court's decision in 1879 conclusions that counsel or courts may draw today from *Baker v. Selden* by extrapolation is being less than fully candid about the extent to which decisions must be and are being made today. Nor can we attribute to Congress, in its much more recent action, a manifestation of intent drawn from a supposed legislative history arguably appearing in a CONTU report to Congress. Congress speaks primarily by what *Congress says* formally by its enactment. Even though legislative history regarding expressions *by* members of Congress during the legislative process is sometimes used by courts in aid of determining the meaning of the formal enactments of Congress, there is no support for treating as legislative history what another person or entity says *to* Congress. Thus, to be candid about what we are doing and faithful to congressional as well as precedential guidance, we cannot say that *Baker v. Selden*, or the CONTU Commission's interpretation of that decision, established a bright-line rule, "if functional, not copyrightable." As with "causation," we must delve more deeply to understand such concepts as "process," "expression," "copyrightability," and "substantial similarity."

B. Drafting a Jury Interrogatory to Test Its Viability

In deciding copyrightability issues in the present case I will apply the standard formulated in *Lotus v. Paperback*, with the

refinement described above to take account of the concern appropriately expressed in the Professors' Amicus Brief. If "copyrightability" is to be submitted to the jury, then Question 2 of a Verdict Form in which Question 1 concerned copying might read as follows:

Question 2

In answering this question, you are to apply the following legal standard:

FIRST, in making the determination of "copyrightability" of the user interface of 1-2-3 as a whole, or of some element or elements of that interface, focus upon alternatives that counsel may suggest, or that you may conceive, along the scale from the most generalized conception of that user interface, or some element or elements of that interface, to the most particularized, and choose some formulation—some conception or definition of the "idea," "system," "process," "procedure," or "method" of the interface, element, or elements—for the purpose of distinguishing between the idea, system, process, procedure, or method and its expression.

SECOND, focus upon whether an alleged expression of the idea, system, process, procedure, or method is limited to elements essential to expression of that idea, system, process, procedure, or method (or is one of only a few ways of expressing the idea, system, process, procedure, or method) or instead includes identifiable elements of expression not essential to every expression of that idea, system, process, procedure, or method.

THIRD, having identified elements of expression not essential to every expression of the idea, system, process, procedure, or method, focus on whether those expressive elements, taken together, are a substantial part of the allegedly copyrightable "work." If they are, then you will find those expressive elements, and no more, copyrightable.

Applying this standard, do you find by a preponderance of the evidence that the user interface of Lotus 1-2-3 contained copyrightable elements?

____YES ____NO

As one considers this option, it becomes immediately apparent that its effect is to give the jury virtually uncontrolled discretion. Prohibitions against probing into jury deliberations—*e.g.*, Fed.R.Evid. 606(b)—would preclude courts from determining whether a jury understood and correctly applied the court's explanation of the standard in its charge to the jury. The only judicial control against improper verdicts would be in decisions whether or not to direct a verdict and whether or not to grant a motion for judgment notwithstanding the verdict.

Might counsel and the court devise some greater measure of assurance that the jury understands and faithfully applies congressional directives regarding the scope of copyright protection for computer software programs? Would it be a step in that direction to use the foregoing formulation as part (a) of a question, with something like the following as part (b)?

(b) If YES, is each of the following a part of the user interface in which you find expressive elements, which you also find to be at least part of the basis for your answering YES to Question 2(a)?

(1)	The menu commands	____YES	____NO
(2)	The menu structure	____YES	____NO
(3)	The command sequence	____YES	____NO
(4)	The long prompts	____YES	____NO
(5)	The macro facility	____YES	____NO
(6)	The overall appearance of some part of the user interface	____YES	____NO

Answers to the subparts of a question of this kind might at least enable a court, after verdict, to give somewhat more reasoned consideration to the relevance and validity of an argument—such as is advanced by Borland here—that, as precedent, *Lotus v. Paperback* should be limited by the finding that Paperback copied the "user interface as a whole," and that the present case is materially different because here, even if the facts are construed most favorably to Lotus, Quattro and Quattro Pro are substantially similar to less of the user interface of Lotus 1-2-3 than was VP Planner. (I do not now determine the validity of this argument.)

Even if an addition such as part (b) might be useful in some circumstances, however, it would not eliminate, or even substantially mitigate, another serious problem to which I turn next.

VII. *Should Any Copyrightability Issues Be Submitted to a Jury?*

Is a fact question bearing upon copyrightability to be submitted to a jury if a timely demand for jury trial has been filed and the fact is genuinely in dispute—that is, reasonable persons might differ about the answer to the question?

Though debated often, as yet this question has not been explicitly answered either by statute or by precedents. Cases that arguably bear upon the question can at the least be distinguished on the facts and thus do not speak directly to the precise kinds of copyrightability issues that are presented in this case. *E.g.*, *Kregos v. Associated Press*, 937 F.2d 700 (2d Cir. 1991) (reversing summary judgment on issue of "creativity"). *Kregos* did not involve the distinctive entanglement problems that are presented in computer-program copyrightability cases.

In *Lotus v. Paperback*, even though the question as to whether copyrightability might be a jury issue had been discussed extensively in pretrial conferences, the court was not required to and did not decide it. The parties removed it from contention by entering into a stipulation. As part of an agree-

ment for a phased trial in which Phase One was to be before the court without a jury, the parties to that case stipulated that any fact question relevant to copyrightability would be decided by the court. No such stipulation has been made in this case, and I now address the issue.

A. Role of Judge, Jury, and Witnesses

The legal test for determining copyrightability both as formulated in *Lotus v. Paperback* and as refined in Part VI, above, is a standard requiring an evaluative mixed law-fact determination, as distinguished from a bright-line rule calling for a finding about disputed historical facts such as who did what, where, and when. Moreover, this standard is far more heavily loaded with public policy implications than most other standards more commonly used in law, of which the negligence standard is an example. Juries applying the copyrightability standard would not be required or even permitted to explain their reasoning. They would be free as a practical matter to reach decisions inconsistent with the balance struck by Congress, as interpreted by the courts. Inconsistencies among verdicts could be expected to introduce a lawless element into the administration of justice in copyright cases, quite inconsistent with the aim of treating like cases alike.

In the circumstances of a particular case, the answer to Question 2 (or any alternatives to Question 2 we might envision), is an essential premise of a reasoned application of the accommodation of conflicting policy interests reached by Congress in determining that computer software programs are copyrightable. For this reason, I conclude that the application of the standard to a particular case is a ruling more closely analogous to traditional judicial lawmaking to fill the interstices of statutes than to traditional factfinding. It is appropriately treated as a ruling of law. Thus, even if a court treats the answer to Question 2 as a "factfinding," the court may conclude also that the answer is a finding of a premise fact—a finding of a fact that serves solely as a premise for a ruling of law. *See* Robert E. Keeton, *Legislative Facts and Similar Things: Deciding Disputed Premise Facts*, 73 Minn. L.Rev. 1

(1988). Like a finding about whether transporting gasoline on a public highway, or blasting with dynamite, or cropdusting, or building an earthen dam is an abnormally dangerous activity, *id.* at 19-20, 57-69, perhaps, this is a finding to be made not by juries, case by case, but by a lawmaker (Congress, to the extent that it can do so in broadly applicable statutory guidelines, and courts to the extent necessary to fill out details essential to application of those broad guidelines in particular types of cases).

The position that this kind of finding is a premise factfinding is supported also by the certainty that even if patterns of jury verdicts might develop over time and become sufficiently predictable to be reasonably described as part of the "law" of copyright, this element of the law would be developed undercover rather than, as is expected of lawmaking through judicial precedents, by "reasoned decisionmaking, candidly explained." Robert E. Keeton, *Judging* 1-2 (1990). Moreover, even if patterns were to develop sufficiently to enable lawyers to predict outcomes for clients with some confidence, still the patterns could not be employed to protect an individual litigant, plaintiff or defendant, against the harsh consequences of a deviant verdict.

The length and complexity of a jury trial of issues of copyrightability would be affected also by disputes regarding admissibility of opinion evidence. The affidavits submitted in this case by the parties, in support of their respective positions on the cross-motions for summary judgment, present what is in essence a clash of policy arguments by experts. Moreover, an impartial factfinder may reasonably infer that the policy positions the experts advance correlate better with their respective views about what the law of copyrightability should be than with considered opinions about the policy accommodation Congress has struck and courts and juries are bound by oath to respect. This point is supported by the following passage from Borland's Memorandum (Docket No. 141):

> More importantly, Borland's witnesses include distinguished industry executives who have years and years

> of actual experience in bringing software products to market. Galler [a Lotus witness], in contrast, can only theorize and speculate about such issues. Unlike Galler, Borland's experts can authoritatively discuss the consequences to software development of the untoward extension of copyright law Lotus seeks in this case.

Id. at 28. Thus, the affidavits of experts submitted to this court for consideration in ruling on the motions for summary judgment are aimed more at persuading this court to a view of the law than to the existence or nonexistence of a genuine dispute of fact.

If copyrightability is held to be an issue for jury determination, courts and counsel must work out answers to extraordinarily difficult issues regarding admissibility of opinion evidence.

No provision of the Copyright Act declares explicitly that issues of fact bearing on copyrightability shall be submitted to juries, or instead shall be decided nonjury. Nor does the Constitution, including the Seventh Amendment. Thus, the answer to the question who shall decide such issues must necessarily be fashioned by courts. Courts are not free, however, to fashion whatever answers they may deem best. They must, instead, seek answers consistent not only with the explicit constitutional and statutory mandates but also with the implications of those mandates for other issues not explicitly addressed. A determination that issues of copyrightability are to be resolved by juries would have such severe adverse effects on the aim of assuring that like cases are treated alike and on the complexity and cost of litigation in computer software copyright cases that in practical effect the scope of copyright protection congress manifestly intended could not be achieved. The practical certainty of many outcomes inconsistent with the congressional accommodation among highly valued but conflicting interests, manifested in the Copyright Act, weighs heavily in favor of the conclusion that treating copyrightability issues as exclusively for courts, not juries, at least in computer software cases, is the decision more compatible with the congressional mandate. So also does the

object of avoiding the practical certainty of increased length, complexity, and cost of litigation.

For all these reasons, I reach the tentative conclusion (which I will be prepared to reconsider as explained in Section B, below) that at least in the circumstances of this case (and probably more generally, though I need not so determine here), the issue or issues of copyrightability, including any fact questions bearing upon them, must be determined by the court, not the jury.

B. Reconsideration

Part II, above, alludes to the value of thinking seriously about the framing of jury questions and instructions well in advance of trial because the attempt to do so helps sharpen the focus on issues that are best considered early in the history of the case. Part VII-A tentatively determines that copyrightability issues in this case are to be determined by the court, not the jury. Before so ruling finally, however, I will allow each party an opportunity to submit a proposed draft of any question bearing on copyrightability that it contends, even in the alternative, is a question that should be submitted to the jury. If the draft question uses legal jargon rather than plain English only, the draft must be accompanied by proposed instructions to the jury explaining the jargon. Submissions and responses may be filed on the schedule set in the Order below.

C. Ambiguity of the Parties' Contention Regarding Copyrightability

It is not now apparent which individual elements of 1-2-3 the plaintiff (Lotus) alleges to be copyrightable, nor has either party made clear its contention about what aspects of various elements of the 1-2-3 user interface are or are not expressive aspects.

Lotus' Statement of Material Facts as to Which There is No Genuine Issue Pursuant to Local Rule 56.1 (Docket No. 149) includes the following paragraphs:

32. The selection of which, and how many, commands to place in each menu level, and the organization of the successive menu levels into a coherent and intuitive menu structure, was an important and creative consideration in the development of 1-2-3. 1-2-3's creators, particularly Mr. Kapor, devoted substantial effort during the late stages of the program's development to selecting the words and structural organization for 1-2-3's menus. (Kapor Aff., ¶¶ 72-101.)

33. Thus, the 1-2-3 menu commands, their organization and sequence, the 1-2-3 menu tree, and the overall user interface reflect an original expression of a spreadsheet program. This expression is not dictated by functional constraints and contains a significant degree of communicative content to the user. (First Galler Dec., ¶ 207.)

Id. at ¶¶ 32, 33.

Borland responds that paragraph 32 is uncontested and immaterial and that paragraph 33 is contested or non-factual. Borland adds, *inter alia*, that "[t]he suggestion in the first sentence of No. 33 that the 1-2-3 commands and command hierarchy represent copyrightable 'expression' is not a statement of fact but rather constitutes an asserted conclusion of law," which Borland disputes. Even though contending that this is an issue of law, Borland has nevertheless resisted trying it separately and first. Thus, I understand Borland's position to be that if the court does not decide this issue for Borland as a matter of law, Borland wishes not to be foreclosed from contending, in the alternative, that copyrightability in general, and this issue in particular, should be submitted to the jury.

I conclude that a decisionmaker (judge or jury) cannot determine the answer to the dispute over Lotus' ¶ 33 without making an evaluative application, to this case, of the standard formulated in Part VI of this Memorandum. One might reasonably argue that an issue such as this, if one for determination by the court, can properly be decided on motion (or

cross-motions) for summary judgment, even if the issue is one on which reasonable persons may differ in the circumstances of this case. Nevertheless, even without so deciding now, I conclude that on the present submissions I am left with a sense that this is a genuinely disputed and debatable issue. Unless one of the parties can persuade me otherwise in further submissions permitted by the attached Order, I will leave this issue to be decided on a full record developed in a first phase of trial, and with the benefit of a sharper focus than present submissions accomplish as to precisely what issues of fact and law should be decisive of this case.

In particular, the dispute between the parties regarding paragraph 33 is one I cannot decide on the present submissions. If the menu commands or menu command structure were dictated solely by functional concerns, then those elements may not be copyrightable. *See Brandir Int'l, Inc. v. Cascade Pac. Lumber Co.*, 834 F.2d 1142, 1145 (2d Cir.1987) ("conceptual separability" test examines whether expression exercised independent of functional influences). But the mere fact that functional concerns were influential does not establish that no copyrightable expression appears in the menu commands, the command structure, or elsewhere in the user interface.

VIII. *Substantial Similarity Revisited (Illicit Copying)*

It is not enough that an allegedly infringing work contain matter copied from a copyrighted work. Lotus must demonstrate that similarities between the works are substantial. However, not all similarities may be taken into account. For example, the fact that both programs are spreadsheet programs renders them substantially similar in many respects. Nevertheless, such similarities may form no part of a conclusion that the works are substantially similar in the mixed law-fact evaluative sense—that is, for purposes of assessing *illicit* copying—because the idea (or process) of a spreadsheet program is not copyrightable. It is naturally to plaintiff's

advantage to place as many copyrightable elements before the court and jury on the issue of substantial similarity as possible not only because the sum increases with each added element but also because the whole may be more than the sum of its parts. Therefore, a determination as to which elements of Lotus 1-2-3 are copyrightable, alone or together, is interwoven with the issue of substantial similarity.

On the other hand, as I have concluded above, it is by no means apparent that all copyrightable elements of 1-2-3 have been copied in the Quattro programs. Lotus, presenting as its primary contention that *Paperback* is controlling, has not formulated for the court or for Borland its precise contentions (in the alternative to its contention that the user interface as a whole was copyrightable and was copied) as to which elements of 1-2-3, separately or in combination, were copyrightable and were copied.

Borland, on the other hand, at points in its submissions, appears to contend that it is entitled to summary judgment both on the issue of substantial similarity and on the issue of copyrightability because if anything at all in a computer program's user interface is copyrightable it is only the user interface as a whole, and the elements of the Quattro and Quattro Pro user interfaces that are like elements of the Lotus 1-2-3 interface are only a very small part *of the Quattro and Quattro Pro user interfaces*. This is an argument not likely to prevail in any court. Copyrightability is determined by the characteristics of the allegedly protected work, not by the characteristics of the allegedly infringing work. A copier who incorporates a copyrighted short story of twenty pages length into a multi-volume set of books will not get far with the contention, in litigation between the copyright owner of the short story and the copier, that the short story is not copyrightable because it is such a small part of the multi-volume set. Nor will the copier win on the substantial similarity issue by showing that although the entire copyrighted work was copied it constituted only a very small part of the overall set of books produced by the copier.

I need not and do not rule at this time on the appropriate framing of the issues that must be decided in this case about the legal significance that may attach to findings of fact about the disputed scope of similarities between the user interfaces of the different works. To say the least, however, Borland is not entitled to a summary judgment on this extraordinary ground it appears to be asserting.

If Borland responds that I have misinterpreted its submissions and it did not mean to assert such an extreme position, its future submissions regarding precisely what questions it proposes to submit to the jury and what expert opinions it proposes to proffer may clarify its contentions. As to opinion testimony, it seems likely indeed the court should preclude the expression in the presence of a jury of an opinion that "substantial similarity" does not exist when the elements of the user interfaces that are alike constitute only a small percentage *of the allegedly infringing product*. Whether that is correct or not is not a question of fact on which expert opinion may properly be placed before a jury.

The argument that a little copying—beyond "fair use," 17 U.S.C. § 107— here and there in a very large work should be allowed to promote the development of great works is a policy argument Congress has rejected. It should not be heard by a jury. The issue is one of law as to which the court will receive arguments of counsel, outside the presence of the jury, both to determine the scope of admissible opinion testimony and to determine the framing of questions of fact to be submitted to the jury.

Neither, on the other hand, will the jury hear the argument that copying just the menu terms, or just the menu structure, or just a command sequence, is enough to establish infringement. Whether this is so or not is a question of law to be argued to the court, not the jury. To the extent that strictly factual answers from the jury may be helpful to the court and counsel to focus the legal issues to be argued, however, questions may be framed to elicit those answers.

ORDER

For the foregoing reasons, it is ORDERED:

(1) The cross-motions for summary judgment (Docket Nos. 30 and 87) are denied.

(2) Renewed motions for summary judgment may be filed by April 10, 1992 and responses by April 20, 1992.

(3) Submissions of both parties pursuant to Part VI of the foregoing Memorandum shall be filed on the schedule in (2).

(4) The several motions regarding the submission of confidential materials (Docket Nos. 140, 156, and 160) are dismissed as moot.

A conference to consider all pending matters and to set a trial date is scheduled.

UNITED STATES DISTRICT COURT
D. MASSACHUSETTS

Civ. A. No. 87-76-K

June 28, 1990

LOTUS DEVELOPMENT CORPORATION,

Plaintiff,

—v.—

PAPERBACK SOFTWARE INTERNATIONAL
and Stephenson Software, Limited,

Defendants.

Henry B. Gutman, Kerry L. Konrad, John S. Beckerman, Karen F. Conway, O'Sullivan Graev & Karabell, New York City, and Thomas J. Dougherty, Skadden, Arps, Slate, Meagher & Flom, Boston, Mass., *for Lotus Development Corp.*

Lawrence G. Papale, Cannata, Genovese & Papale, San Francisco, Cal., and Edward C. Saltzberg, Warner & Stackpole, Boston, Mass., *for Stephenson Software, Ltd.*

Paul R. Gupta, David A. Guberman, Barbara O'Donnell, Brian C. Levey, Nereyda F. Garcia, Kenneth R. Berman, Sherin and Lodgen, Boston, Mass., and Walter G. Murphy, Peter C. Kober, Murphy, DeMarco & O'Neill, P.C., Boston, Mass., *for Paperback Software Intern.*

OPINION

KEETON, District Judge.

The expression of an idea is copyrightable. The idea itself is not. When applying these two settled rules of law, how can a decisionmaker distinguish between an idea and its expression?

Answering this riddle is the first step—but only the first—toward disposition of this case in which the court must decide, among other issues, (1) whether and to what extent plaintiff's computer spreadsheet program, Lotus 1-2-3, is copyrightable, (2) whether defendants' VP-Planner was, on undisputable facts, an infringing work containing elements substantially similar to copyrightable elements of 1-2-3, and (3) whether defendants' proffered jurisdictional and equitable defenses are meritorious.

Phase One of this case was tried to the bench. By agreement of the parties, in Phase One, the court shall

> resolve all legal and factual issues concerning the liability, if any, of defendants . . . for the claims of copyright infringement brought by plaintiff . . . and all defenses thereto, including but not limited to all factual and legal issues concerning the copyrightability of Lotus' Works [1-2-3, releases 1.0, 1A, and 2.0], and *excluding only:* (1) issues of fact, if any, requiring jury determination concerning defendants' alleged copying of any protected expression from Lotus' Works in Defendants' Works [VP-Planner and VP-Planner Plus]; [and] (2) factual issues concerning defendants' possible copying of the source or object code for Lotus' Works. . . .

Stipulation and Order Regulating Phased Trial, § I(A) (Docket No. 246).[1]

[1] This case was originally consolidated with *Lotus Development Corporation v. Mosaic Software*, Civil Action No. 87-74-K, which involves Mosaic's computer spreadsheet program The Twin. Although Phase One of this case was intended to resolve certain additional legal and factual issues concerning the liability of Mosaic Software for plaintiff's claims of copyright infringement, that case was severed on the second day of this first phase of trial for reasons not here relevant. *See* Docket No. 174 (February 8, 1990).

This Opinion sets forth findings of fact and conclusions of law that are central to deciding this controversy. Fed.R.Civ.P. 52(a). The court adopts, as additional findings, all proposed findings to which no party objected. *See* Docket Nos. 250, 251.

The outcome of this case depends on how this court, and higher courts on appeal, should answer a central question about the scope of copyrightability of computer programs. For the reasons explained in this Opinion, I conclude that this question must be resolved in favor of the plaintiff, Lotus.

I. A BACKGROUND STATEMENT ABOUT COMPUTERS, COMPUTER PROGRAMS, AND COPYRIGHTABILITY

Though their influence in our society is already pervasive, digital computers—along with computer "programs" and "user interfaces"—are relatively new to the market, and newer still to litigation over "works" protected by intellectual property law.

Digital computers (hereinafter referred to as "computers") are machines currently used to perform three types of functions electronically: (1) arithmetic calculations; (2) logical operations (*e.g.*, comparing values to determine whether one is larger); and (3) storage and display of the results. Because computers can perform millions of operations of these types in a single second, they can be used to solve problems too complex, or too repetitious and boring, to be solved manually. Developments to the current state of the art have already transformed many areas of business, educational, and recreational activity, and they support speculations about more striking achievements in the future.

A personal computer system consists of hardware and software. The hardware includes the central processing unit ("CPU"), which contains the electronic circuits that control the computer and perform the arithmetic and logical func-

tions, the internal memory of the computer ("random access memory," or "RAM"), input devices such as a keyboard and mouse, output devices such as a display screen and printer, and storage devices such as hard and floppy disk drives. The software includes one or more computer programs, usually stored magnetically on hard or floppy disks, along with such items as instruction manuals and "templates," which are pieces of plastic that fit around the function keys on the keyboard, identifying the specific functions or commands that can be invoked by those keys. A personal computer system can also include "firmware," or "microcode":

> Microcode is a set of encoded instructions . . . that controls the fine details of the execution of one or more primitive functions of a computer. Microcode serves as a substitute for certain elements of the hardware circuitry that had previously controlled that function.

Samuelson, *CONTU Revisited: The Case Against Copyright Protection for Computer Programs in Machine-Readable Form*, 1984 Duke L.J. 663, 677.

Computer programs are, in general, divided into two types: operating system programs and application programs. Operating system programs—such as DOS, XE-NIX, and OS/2—are programs that control the basic functions of the computer hardware, such as the efficient utilization of memory and the starting and stopping of application programs. Application programs are programs that permit a user to perform some particular task such as word processing, database management, or spreadsheet calculations, or that permit a user to play video games.

This case concerns two competing application programs—Lotus 1-2-3 and VP-Planner—which are primarily spreadsheet programs, but which also support other tasks such as limited database management and graphics creation. Programs such as these, because they can perform several different kinds of tasks, are called "integrated" application programs.

Congress has defined "computer program" as follows:

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

17 U.S.C. § 101 (1988). This "set of statements or instructions," in its literal or written manifestation, may be in the form of object code or source code. It may also be represented, in a partially literal manifestation, by a flowchart. A copyrightable work designed for use on a computer may include, as well, text that appears, for example, in a problem manual or a manual of instructions. These elements of text, however, ordinarily are not referred to in the industry as part of a "computer program" unless they appear on the computer screen and serve a purpose like that of the components of a "help screen" available to a user whenever needed. Elements of this textual type are not at issue in this phase of this case.

Computer programs are typically written in some form of computer programming "language." The "lowest"-level computer programming language is machine language, which is a binary language written in "bits" (*BI*nary digi*TS*). Each bit is equal to one binary decision—that is, to the designation of one of two possible and equally likely values, such as an "on"-"off" or "yes"—"no" choice. These binary decisions, the only kind that a typical computer can understand directly, are commonly represented by 0's and 1's. A sequence of eight bits (which allows 256 unique combinations of bits) is commonly called a "byte" ("by eight"), and 1024 bytes form a "kilobyte" (commonly referred to as "K," *e.g.*, sixty-four kilobytes is "64K"). Machine language may also be represented in hexadecimal form, rather than in binary form, by the characters 0-9 and A-F, where "A" represents 10, "B" represents 11, and so on through "F," which represents "15." In hexadecimal machine language, only two rather than eight characters are required to allow for 256 unique combinations (*e.g.*, 37 instead of 00110111, each of which represents the 55th of 256 combinations; 7B instead of 01111011, each of which represents the 123rd of 256 combinations; EA instead

of 11101010, each of which represents the 234th of 256 combinations). The computer is able to translate these hexadecimal instructions into binary form. Other versions of machine language are represented in decimal (0-9) and octal (0-7) form.

An object program, or object code, is a program written in machine language that can be executed directly by the computer's CPU without need for translation. For example, in the machine language of a certain computer, the instructions to divide the value in "B" by the value in "C" and add that number to the value in "A" may be represented by the following sequence of instructions (in binary form):

0010000000010001; 1000000011010010;
1101000000010000.

An "intermediate"-level programming language is assembly language. Rather than in bits, assembly code is written in simple symbolic names, or alphanumeric symbols, more easily understandable by human programmers. For example, the calculation described above may be represented, in the assembly language of a certain computer, as follows:

LOAD B; DIV C; ADD A.

Because of the primitive nature of assembly language, even relatively simple computations can require long and complex programs.

During the early period of computing, "programmers" ordinarily wrote programs exclusively in machine language. Today, object code is rarely written directly by computer programmers. Rather, modern programmers typically write computer programs in a "higher"-level programming language. These programs are called source programs, or source code. Although "source code" has been defined far more broadly in some of the literature in the field, and in some of the expert testimony in this case, more commonly the term "source code" refers to a computer program written in some programming language—such as FORTRAN (*FOR*mula *TRAN*slation), COBOL (*CO*mmon *B*usiness *O*riented *L*anguage), Pascal, BASIC, or C—that uses complex symbolic

names, along with complex rules of syntax. In a typical higher-level programming language, for example, the above-described computation—that is, (A) + (B/C)—might be represented as follows:

A + B/C.

Unlike machine language, which is unique to each kind of CPU and which is executed directly by the computer, source code programming languages are universal to almost all computers. As a consequence, source code is executed indirectly. Thus, a program written in source code must be translated into the appropriate object code for execution in one type of computer, and into a different object code for execution in another type of computer. The translation can be effectuated by an "interpreter" program or by a "compiler" program. An "interpreter" program is a simultaneous translator that works in conjunction with the application program every time the application program is run, carrying out the instructions of the program one step at a time. In contrast, a "compiler" program translates the program once and for all into machine language, after which the translated program can be executed directly by the CPU without the need for any further resort to the compiler. A distinctive "interpreter" or "compiler" program is available for each type of source code programming language and each type of CPU.

A partly literal and partly pictorial manifestation of a computer program, still farther removed from direct use with the computer, is the flowchart. A flowchart is a graphic representation of a computer program that is written in symbols, rather than in bits or symbolic names, and with a syntax that is graphic rather than grammatical. *See, e.g.*, Breyer, *The Uneasy Case for Copyright: A Study of Copyright in Books, Photocopies, and Computer Programs*, 84 Harv.L.Rev. 281, 341 n. 235 (1970) (providing simple flowchart). A flowchart can be thought of as a kind of symbolic outline or schematic representation of a computer program's logic, which is written by a programmer once he or she has a conceptualization of the goals of the program. Creating a flowchart (at least, an

early draft) is thus, typically an early phase in the development of a software system, which is followed by the translation of the flowchart into source code. *See* Menell, *An Analysis of the Scope of Copyright Protection for Application Programs,* 41 Stan.L.Rev. 1045, 1051 (1989) (identifying five stages in the development of most application programs: (1) defining the desired task; (2) flowcharting; (3) encoding; (4) debugging; and (5) preparing documentation). On computers and computer programs in general, *see* Lewis Affidavit, ¶¶ 18–42 (Docket No. 274); Galler Declaration, ¶¶ 8–20 (Docket No. 257); A. Clapes, *Software, Copyright & Competition: The "Look and Feel" of the Law* 47–64 (1989); R. Bradbeer, P. DeBono & P. Laurie, *The Beginner's Guide to Computers* (1982); *McGraw-Hill Dictionary of Scientific and Technical Terms* (3d ed. 1984).

The parties agree, as a general proposition, that literal manifestations of a computer program—including both source code and object code—if original, are copyrightable. *Stern Electronics, Inc. v. Kaufman,* 669 F.2d 852, 855 n. 3 (2d Cir. 1982) ("written computer programs are copyrightable as literary works"); *Williams Electronics Inc. v. Artic International, Inc.,* 685 F.2d 870, 876–77 (3d Cir.1982) (object code copyrightable); *Hubco Data Products, Corp. v. Management Assistance Inc.,* 219 U.S.P.Q. 450, 454 (D.Id.1983) (same); *Apple Computer, Inc. v. Franklin Computer Corp.,* 714 F.2d 1240, 1243 (3d Cir.1983) (source and object code copyrightable), *cert. dismissed,* 464 U.S. 1033, 104 S.Ct. 690, 79 L.Ed.2d 158 (1984); *GCA Corp. v. Chance,* 217 U.S.P.Q. 718, 720 (N.D.Cal.1982) (same); *Midway Manufacturing Co. v. Strohon,* 564 F.Supp. 741, 750 (N.D.Ill.1983) (same); *Digital Communications Associates, Inc. v. Softklone Distributing Corp.,* 659 F.Supp. 449, 454 (N.D.Ga.1987) (same). Also, it appears that flowcharts, if sufficiently detailed and original, are entitled to copyright protection:

> Flowcharts . . . are works of authorship in which copyright subsists, provided they are the product of sufficient intellectual labor to surpass the "insufficient intellectual labor hurdle". . . .

National Commission on New Technological Uses of Copyrighted Works, *Final Report and Recommendations* 43 (1978) hereinafter "*Final Report*"), *reprinted in* 5 *Copyright, Congress and Technology: The Public Record* (N. Henry, ed.1980), *cited with approval in Whelan Associates, Inc. v. Jaslow Dental Laboratory, Inc.,* 797 F.2d 1222, 1241 (3d Cir.1986), *cert. denied,* 479 U.S. 1031, 107 S.Ct. 877, 93 L.Ed.2d 831 (1987). *See also Synercom Technology, Inc. v. University Computing Co.,* 462 F.Supp. 1003, 1013 n. 5 (N.D.Tex. 1978) (although taking a very narrow view of the scope of copyrightability of nonliteral elements of computer programs, court nevertheless noted in *obiter dictum* that "it would probably be a violation to take a detailed description of a particular problem solution, such as a flowchart . . . and program such a description in computer language") (Higginbotham, J.); *Data Cash Systems, Inc. v. JS & A Group, Inc.,* 480 F.Supp. 1063, 1067 n. 4 (N.D.Ill.1979) (holding that copyright protection extends "to computer programs in their flow chart, source and assembly phases but not in their object phase," court concluded that computer program written in object code was not copyrightable), *aff'd on other grounds,* 628 F.2d 1038 (7th Cir.1980) (program at issue not copyrightable because publication without notice forfeited any copyright protection); *Williams v. Arndt,* 626 F.Supp. 571, 578 (D.Mass.1985) (violation to take detailed prose description and program such description in source code).

Defendants vigorously dispute, however, the copyrightability of any nonliteral elements of computer programs. That is, defendants assert that only literal manifestations of computer programs are copyrightable. Plaintiff, on the other hand, maintains that copyright protection extends to all elements of computer programs that embody original expression, whether literal or nonliteral, including any original expression embodied in a program's "user interface."

One difficulty with plaintiff's argument is the amorphous nature of "nonliteral" elements of computer programs. Unlike the written code of a program or a flowchart that can be printed on paper, nonliteral elements—including such elements as the overall organization of a program, the structure

of a program's command system, and the presentation of information on the screen—may be less tangibly represented. Whether these elements are copyrightable, and if so, how the nonliteral elements that are copyrightable may be identified, are central to deciding this case.

II. CONSTITUTIONAL CONSTRAINTS

In considering the legal issues relevant to whether nonliteral elements of Lotus 1-2-3 are copyrightable, and if so, to what extent, one may appropriately begin with a provision of the Constitution of the United States:

> The Congress shall have Power . . . To promote the Progress of Science . . . by securing for limited Time to Authors . . . the exclusive Right to their . . . Writings. . . .

U.S. Const., Art. I, § 8, cl. 8. The copyright law, codified in Title 17 of the United States Code, rests upon this explicit grant of legislative authority.

Under this constitutional mandate, Congress has broad though not unlimited authority to grant copyright monopolies as needed to promote progress. If Congress were to determine, for example, that copyright protection is unnecessary to "promote the Progress of" computer programming—because, for example, in Congress' view the financial incentives alone of developing new computer programs (without the added benefit of copyright) are enough to encourage innovation, or because incremental innovation might be stifled by expansive copyright protection—then Congress could, without offending the Constitution, provide no copyright protection for computer programs. At the other extreme, were Congress to find that strong copyright protection is necessary to promote the progress of computer programming, Congress could provide for expansive copyright protection for all aspects of computer programs, again without having strayed beyond the bounds of the constitutionally permissible.

Because the constitutional grant of power authorizes Congress to take either path—or to chart some middle course—

this case does not raise constitutional issues. Rather, the issues at stake here are issues of statutory meaning. The central question is not whether Congress could render nonliteral elements such as those of 1-2-3 copyrightable, but whether it has done so. *Banks v. Manchester, Ohio*, 128 U.S. 244, 252, 9 S.Ct. 36, 39, 32 L.Ed. 425 (1888) ("No authority exists for obtaining a copyright beyond the extent to which Congress has authorized it. A copyright cannot be sustained as a right existing at common law; but, as it exists in the United States, it depends wholly on the legislation of Congress.").

III. CONGRESSIONAL MANDATES AND JUDICIAL INTERPRETATION

A. *Sources of Guidance*

1. Precedent on Determining Statutory Meaning

In *Kelly v. Robinson*, 479 U.S. 36, 107 S.Ct. 353, 93 L.Ed.2d 216 (1986) (Powell, J., joined by Rehnquist, C.J., and Brennan, White, Blackmun, O'Connor, and Scalia, JJ.), the Supreme Court explained the various sources of guidance to which a court should look in determining the manifested meaning of a statute and the manifestations of congressional intent:

> [T]he "starting point in every case involving construction of a statute is the language itself." *Blue Chip Stamps v. Manor Drug Stores*, 421 U.S. 723, 756 [95 S.Ct. 1917, 1935, 44 L.Ed.2d 539] (1975) (Powell, J., concurring). But the text is only the starting point. As Justice O'Connor explained last Term, " ' "In expounding a statute, we must not be guided by a single sentence or member of a sentence, but look to the provisions of the whole law, and to its object and policy." ' " *Offshore Logistics, Inc. v. Tallentire*, 477 U.S. 207, 221 [106 S.Ct. 2485, 2493, 91 L.Ed.2d 174] (1986) (quoting *Mastro Plastics Corp. v. NLRB*, 350 U.S. 270, 285 [76 S.Ct. 349, 359, 100 L.Ed. 309] (1956) (in turn quoting *United States v. Heirs of Boisdoré*, 8 How. [49 U.S.] 113, 122 [12 L.Ed. 1009] (1850))).

Id. at 43, 107 S.Ct. at 358. Accordingly, to determine whether Congress has extended copyright protection to nonliteral elements of computer programs, and if so, to what extent, a court must examine, first, the relevant language of the copyright statutes, second, "the provisions of the whole law," and third, "its object and policy." *Id.*

Examination of these sources exposes mandates inconsistent with the principal argument advanced by defendants—that copyright protection extends only to literal manifestations of computer programs and not to any nonliteral elements. Close examination also discloses that Congress has not explicitly addressed some of the questions that must be decided in this case. In these circumstances, it is appropriate to consider legislative history as well as statutory text.

2. The Statutory Language and the History of Amendments

a. *Pre-1976 Legislation*

The First Congress extended copyright protection to "any map, chart, book or books already printed." Act of May 31, 1790, ch. 15, § 1, 1 Stat. 124, 124 (repealed 1831). Congress quickly expanded this limited scope of copyright protection, adding designs, prints, etchings and engravings in 1802, "musical composition" in 1831, "dramatic composition" in 1856, "photographs and the negatives thereof" in 1865, and "statuary" and "models or designs intended to be perfected as works of the fine arts" in 1870. Act of Apr. 29, 1802, ch. 36, § 2, 2 Stat. 171, 171, *repealed by* Act of Feb. 3, 1831, ch. 16, §§ 1, 14, 4 Stat. 436, 436, 439, *amended by* Act of Aug. 18, 1856, ch. 169, 11 Stat. 138, 139, *amended by* Act of Mar. 3, 1865, ch. 126, §§ 1, 2, 13 Stat. 540, 540, *repealed by* Act of July 8, 1870, ch. 180, § 86, 16 Stat. 198, 212 (repealed 1909).

In 1909, Congress abandoned the effort to list exhaustively all works in which copyright may subsist, instead adopting a more generalized approach to copyrightability:

> The works for which copyright may be secured under this title shall include *all the writings of an author.*

Act of Mar. 4, 1909, ch. 320, § 4, 35 Stat. 1075, 1076 (emphasis added) (previously codified at 17 U.S.C. § 4, *reprinted in* 17 U.S.C.A. App. § 4 (West Supp.1990); recodified 1947; repealed 1976). To clarify the meaning of "all the writings of an author," Congress also provided a non-exclusive list of examples. *Id.* at § 5 (listing the various kinds of works previously entitled to explicit copyright protection). Even this generalized statement of the scope of copyrightability along with the explanatory list proved inadequate. In 1912, Congress added "motion pictures" as a further example of "all the writings of an author." Act of Aug. 24, 1912, ch. 356, § 5(1)-(m), 37 Stat. 488, 488 (previously codified at 17 U.S.C. § 5(1)-(m), *reprinted in* 17 U.S.C.A. App. § 5(1)-(m); recodified 1947; repealed 1976), and in 1972, Congress added "sound recordings" to the list, Act of Oct. 15, 1971, Pub.L. 92-140, § 1(b), 85 Stat. 391, 391 (previously codified at 17 U.S.C. § 5(n), *reprinted in* 17 U.S.C.A. App. § 5(n); repealed 1976).

In 1955, Congress began to consider another major revision of the copyright law. After twenty years of hearings, study, debate, and redrafting, that revision was signed into law in 1976. Act of Oct. 19, 1976, Pub.L. 94-553, 90 Stat. 2541 (codified at 17 U.S.C. §§ 101 *et seq.*). That law—the Copyright Act of 1976—and the 1980 amendments to the Act provide the relevant statutory mandates for this case.

b. *The Copyright Act of 1976*

Like the Copyright Act of 1909, the Copyright Act of 1976 eschews the prescription of an exclusive list of the kinds of works that are copyrightable:

> 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.

17 U.S.C. § 102(a) (1988) (emphasis added).

It is axiomatic that the designation "original" is not intended to be limited to works that are novel or unique. Rather, the word "original," which was "purposely left undefined" by Congress, refers to works that have been "independently created by an author," regardless of their literary or aesthetic merit, or ingenuity, or qualitative value. H.R.Rep. No. 1476, 94th Cong., 2d Sess. 51, *reprinted at* 1976 U.S. Code Cong. & Admin. News 5659, 5664 (hereinafter "House Report"); *Hutchinson Telephone Co. v. Fronteer Directory Co.*, 770 F.2d 128, 131 (8th Cir.1985); *Puddu v. Buonamici Statuary, Inc.*, 450 F.2d 401, 402 (2d Cir.1971) ("originality has been considered to mean 'only that the work owes its *origin* to the author' ") (emphasis added; *quoting* Nimmer, *Copyright* § 10 at 32 (1971 ed.)). *See also Bleistein v. Donaldson Lithographing Co.*, 188 U.S. 239, 251, 23 S.Ct. 298, 300, 47 L.Ed. 460 (1903) (Holmes, J.) ("It would be a dangerous undertaking for persons trained only in the law to constitute themselves final judges of the worth of" a work.).

Also, the designation "works of authorship" is not meant to be limited to traditional works of authorship such as novels or plays. Rather, Congress used this phrase to extend copyright to new methods of expression as they evolve:

> The history of copyright law has been one of gradual expansion in the types of works accorded protection, and the subject matter affected has fallen into two general categories. In the first, scientific discoveries and technological developments have made possible new forms of creative expression that never existed before. In some of these cases the new expressive forms—electronic music, filmstrips, and *computer programs*, for example—could be regarded as an extension of copyrightable subject matter Congress had already intended to protect, and were thus considered copyrightable from the outset without need of new Legislation. In other cases, such as photographs, sound recordings, and motion pictures, statutory enactment was deemed necessary to give them full recognition as copyrightable works.

> Authors are continually finding new ways of expressing themselves, but it is impossible to foresee the forms that these new expressive methods will take. The bill does not intend either to freeze the scope of copyrightable subject matter at the present stage of communications technology or to allow unlimited expansion into areas outside the present congressional intent.

House Report at 51, *reprinted at* 5664 (emphasis added).

To help illumine the meaning of "works of authorship," Congress, as it had done in the 1909 Act, again provided a statutory list of examples of those kinds of works that, if original, merit copyright protection:

> Works of authorship include the following categories: (1) literary works; (2) musical works, including any accompanying words; (3) dramatic works, including any accompanying music; (4) pantomimes and choreographic works; (5) pictorial, graphic, and sculptural works; (6) motion pictures and other audiovisual works; and (7) sound recordings.

17 U.S.C. § 102(a) (1988). This listing was intended to be " 'illustrative and not limitative,' and . . . the seven categories do not necessarily exhaust the scope of 'original works of authorship' that the bill is intended to protect." House Report at 53, *reprinted at* 5666. Consequently, in addition to these explicitly-listed items, courts have extended copyright protection to such works as artistic features of masquerade costumes, *National Theme Productions, Inc. v. Jerry B. Beck, Inc.*, 696 F.Supp. 1348, 1354 (S.D.Cal.1988); the arrangement of public-domain legal decisions in reporters, *West Publishing Co. v. Mead Data Central, Inc.*, 799 F.2d 1219 (8th Cir.1986), *cert. denied*, 479 U.S. 1070, 107 S.Ct. 962, 93 L.Ed.2d 1010 (1987); telephone books, *Southern Bell Telephone & Telegraph Co. v. Associated Telephone Directory Publishers*, 756 F.2d 801 (11th Cir.1985); televised news reports, *Pacific and Southern Co. v. Duncan*, 744 F.2d 1490, 1494, *reh'g denied*, 749 F.2d 733 (11th Cir.1984), *cert. denied*, 471 U.S. 1004, 105 S.Ct. 1867, 85 L.Ed.2d 161

(1985); blank answer sheets for use with student achievement and intelligence tests that are designed to be corrected by optical scanning machines, *Harcourt, Brace & World, Inc. v. Graphic Controls Corp.*, 329 F.Supp. 517 (S.D.N.Y.1971) (applying the 1909 Act); maps, *C.S. Hammond & Co. v. International College Globe, Inc.*, 210 F.Supp. 206, 216 (S.D.N.Y. 1962) (applying the 1909 Act); and a code book for cable correspondence consisting of 6,325 coined, otherwise meaningless, words of five letters each, *Reiss v. National Quotation Bureau, Inc.*, 276 F. 717 (S.D.N.Y.1921) (L. Hand, J.) (applying the 1909 Act).

Although Congress did not include "computer programs" in this list of examples of "works of authorship," computer programs fall squarely within the statutory definition of literary works:

> "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 (1988). *See also* House Report at 54, *reprinted at* 5667 ("[t]he term 'literary works' . . . includes . . . computer programs") *id.* at 51, *reprinted at* 5664 ("computer programs . . . were . . . considered copyrightable from the outset"); *id.* at 116, *reprinted at* 5731 (1976 Act governs "copyright-ability [sic] of computer programs").

Like all other works of authorship, however, computer programs, even if certain elements of them are copyrightable, are not entitled to an unlimited scope of copyright protection. Most relevant to this case is the following limitation:

> In no case does copyright protection for an original work of authorship extend to an *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.

17 U.S.C. § 102(b) (1988) (emphasis added). Noting that this section applies to computer programs, the House Report declares: "Section 102(b) is intended, among other things, to make clear that the *expression* adopted by the programmer is the copyrightable element in a computer program, and that the actual *processes or methods* embodied in the program are not within the scope of the copyright law." *House Report* at 57, *reprinted at* 5670 (emphasis added); *see also id.* at 54, *reprinted at* 5667 (computer programs are copyrightable only "to the extent that they incorporate authorship in the programmer's *expression* of original ideas, as distinguished from the *ideas* themselves") (emphasis added).

c. CONTU and the 1980 Amendments

Most contemporaneous observers expected that the bill that eventually became the Copyright Act of 1976 would apply to computer programs. Toward the end of the twenty-year process of reconsidering the copyright law, however, Congress recognized that certain problems raised by computer and other new technologies were not adequately addressed in the pending bill. *See* House Report at 116, *reprinted at* 5731. Accordingly, in 1974, Congress created the National Commission on New Technological Uses of Copyrighted Works ("CONTU"). Congress gave the Commission the following mandate:

> (b) The purpose of the Commission is to study and compile data on:
>
> (1) the reproduction and use of copyrighted works of authorship—
>
> (A) in conjunction with automatic systems capable of storing, processing, retrieving, and transferring information . . . .
>
> (c) The Commission shall make recommendations as to such changes in copyright law or procedures that may be necessary to assure for such purposes access to copyrighted works, and to provide recognition of the rights of copyright owners.

Act of Dec. 31, 1974, Pub.L. 93-573, § 201(b)-(c), 88 Stat. 1873, 1873-74 (1974).

It took seven months after enactment of the bill to constitute the Commission and appoint the Commissioners. Because of this delay, CONTU did not begin its deliberations until October 1975, and did not release its report and recommendations until July 1978, almost two years after the passage of the 1976 Act.

CONTU observed a need for copyright protection of creative expression embodied in computer programs:

> The cost of developing computer programs is far greater than the cost of their duplication. Consequently, computer programs . . . are likely to be disseminated only if . . . [t]he creator can spread its costs over multiple copies of the work with some form of protection against unauthorized duplication of the work. . . . The Commission is, therefore satisfied that some form of protection is necessary to encourage the creation and broad distribution of computer programs in a competitive market, . . . [and] that the continued availability of copyright protection for computer programs is desirable.

CONTU, *Final Report* at 20-21. Concluding, however, that the Act of 1976 already provided adequate protection, CONTU did not propose any statutory changes with respect to *copyrightability* of computer programs. On the other hand, CONTU did propose two amendments with respect to *permissible copying* of computer programs. These proposed amendments were subsequently adopted by Congress with only minor modifications and with little additional legislative history.

First, tracking verbatim CONTU's recommendation, Congress amended section 101 to include the following definition:

> 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.

Act of Dec. 12, 1980, Pub.L. 96-517, 94 Stat. 3015, 3028 (codified at 17 U.S.C. § 101). Second, Congress also followed CONTU's recommendation by amending section 117 to allow the owner of a computer program to make additional copies or adaptations of the program:

> Notwithstanding the provisions of section 106 [which grants the copyright owner the exclusive rights to reproduce the copyrighted work], it is not an infringement for the owner of a copy of a computer program to make or authorize the making of another copy or adaptation of that computer program provided:
>
> (1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or
>
> (2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.
>
> Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

Id. (codified at 17 U.S.C. § 117).

Finally, although the Commission did not address explicitly the central issue of the present case—whether copyright protection extends to the nonliteral elements of computer programs at issue here—CONTU did re-emphasize, for purposes of copyrightability of computer programs, the fundamental distinction between copyrightable expression on the one hand, and noncopyrightable methods, processes and ideas on the other. *Id.* at 37-46. Indeed, although his personal views are entitled to very little if any weight in the context of the

court's determination of the statutory mandates, *Whelan*, 797 F.2d at 1241, n. 37, it is interesting to note that Melville Nimmer, Vice-Chairperson of CONTU, testified about the Commission's intent. in *Evergreen Consulting v. NCR Comten, Inc.*, No. 82-5946-KN (C.D.Cal. filed 1982). According to Nimmer, CONTU understood that the proposed repeal of former section 117 would extend copyright protection to nonliteral elements of computer programs:

> CONTU had no views, and made no recommendations which would negate the availability of copyright protection for the detailed design, structure and flow of a [computer] program under the copyright principles that make copyright protection available, in appropriate circumstances, for the structure and flow of a novel, a play or a motion picture.

Nimmer Decl. in *Evergreen Consulting*, ¶ 28, *reprinted in* Note, *Idea, Process, or Protected Expression?: Determining the Scope of Copyright Protection of the Structure of Computer Programs*, 88 Mich.L.Rev. 866, 889 (1990). *But cf.* conflicting views of Commissioner Arthur Miller and Executive Director Arthur Levine, discussed in *id.* at 888-90.

3. Relevant Aspects of the Whole Law of Copyright

a. *"Nonliteral" Expression*

With respect to such things as musical, dramatic, and motion picture works, and works of "literature" (as contrasted with "literary" works in the broader statutory sense, *see* Samuelson, *Reflections on the State of American Software Copyright Law and the Perils of Teaching It*, 13 Colum.-VLA J.L. & Arts 61, 65 n. 15 (1988)), it is crystal clear that, to the extent original, the literal manifestations of such works are protected by copyright. Thus, during a period of copyright protection, one cannot copy an author's book, score, or script without authorization in law or in fact. It is also well settled that a copyright in a musical, dramatic, or motion picture work, or a work of literature, may be infringed even if the infringer has not copied the literal aspects of the work. That

is, even if an infringer does not copy the words or dialogue of a book or play, or the score of a musical work, infringement may be found if there is copying of the work's expression of setting, characters, or plot with a resulting substantial similarity. *Nichols v. Universal Pictures Corp.*, 45 F.2d 119, 121 (2d Cir.1930) (L. Hand. J.) ("the right cannot be limited literally to the text, else a plagiarism would escape by immaterial variations"). *cert. denied*, 282 U.S. 902, 51 S.Ct. 216, 75 L.Ed. 795 (1931); *Sheldon v. Metro-Goldwyn Pictures Corp.*, 81 F.2d 49, 55 (2d Cir.) (L. Hand. J.) ("a play may be pirated without using the dialogue"), *cert. denied*, 298 U.S. 669, 56 S.Ct. 835, 80 L.Ed. 1392 (1936); *Detective Comics, Inc., v. Bruns Publications, Inc.*, 111 F.2d 432, 433 (2d Cir.1940) (defendant's comic book "Wonderman" adjudged to infringe plaintiff's copyright in the comic book series "Superman" where both comic books' central characters have miraculous strength and speed; conceal their strength, along with their skin-tight acrobatic costumes, beneath ordinary clothing; are termed champions of the oppressed; crush guns; stop bullets; and leap over or from buildings); *Bradbury v. Columbia Broadcasting System, Inc.*, 287 F.2d 478, 482-84 (9th Cir.) (twenty-two nonliteral similarities between plaintiff's *Fahrenheit 451* and *The Fireman* and defendants' television production), *cert. dismissed*, 368 U.S. 801, 82 S.Ct. 19, 7 L.Ed.2d 15 (1961); *Roth Greeting Cards v. United Card Co.*, 429 F.2d 1106 (9th Cir.1970) (substantial similarity between nonliteral expressive elements embodied in defendant's cards and plaintiff's cards); *Sid & Marty Krofft Television Productions, Inc. v. McDonald's Corp.*, 562 F.2d 1157 (9th Cir.1977) (defendant's television commercial substantially similar in locale, characters, and plot to plaintiff's children's television series); *Twentieth Century-Fox Film Corp. v. MCA, Inc.*, 715 F.2d 1327 (9th Cir.1983) (thirteen alleged similarities between plaintiff's motion picture, *Star Wars*, and defendant's motion picture and derivative television series, *Battlestar: Gallactica*—including totality of setting, characters and their relationships, and elements of plot—were sufficient to create genuine dispute of material fact to defeat

defendant's motion for summary judgment); *Horgan v. Macmillan, Inc.*, 789 F.2d 157, 162 (2d Cir.1986) (copyright in choreography for *The Nutcracker* ballet may be infringed by a book of photographs of the ballet if the series of photographs is substantially similar to the ballet). *See also Stewart v. Abend*, ___ U.S. ___, 110 S.Ct. 1750, 1759, 109 L.Ed.2d 184 (1990) (noting that a motion picture may infringe a book by using "the story's unique setting, characters, plot, and sequence of events"). This type of copying of nonliteral expression, if sufficiently extensive, has never been upheld as permissible copying; rather, it has always been viewed as copying of elements of an expression of creative originality.

b. *"Useful Articles"*

A "useful article" is defined by the Copyright Act as

> an article having an intrinsic utilitarian function that is not merely to portray the appearance of the article or to convey information. An article that is normally a part of a useful article is considered a "useful article."

17 U.S.C. § 101 (1988). Such articles—or more accurately, the utilitarian aspects of such articles—are not works of authorship in which copyright can subsist. House Report at 55, *reprinted at* 5668. However:

> [T]he design of a useful article . . . shall be considered a pictorial, graphic, or sculptural work [which *is* copyrightable] . . . if, and only to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.

17 U.S.C. § 101 (1988) (defining "pictorial, graphic, and sculptural works"). Put more broadly, the point is that those elements of a useful article that can exist independently of the utilitarian aspects of the article are potentially copyrightable because those elements are elements of *expression* that can be distinguished from the utilitarian functions of the article. *See*

Whelan, 797 F.2d at 1236 ("the purpose or function of a utilitarian work [is] the work's idea, and everything that is not necessary to that purpose or function [is] part of the expression of the idea"); *Williams Electronics, Inc. v. Bally Manufacturing Corp.*, 568 F.Supp. 1274, 1279-80 (N.D Ill.1983) (Congress intended to exclude from copyright protection functional elements of work, leaving only those aspects of work separable from utilitarian aspects copyrightable).

4. The Objects and Policies of Copyright Law

The court's final task in divining the statutory mandates is to look to the "object and policy" of the copyright law. *Kelly*, 479 U.S. at 43, 107 S.Ct. at 358. This inquiry has received heightened attention in this case (*see* Part VII, *infra*) because defendants contend that extending copyright protection to nonliteral elements of computer programs is contrary to the objects and policies of copyright law as expressed in the copyright statute and in precedents. Although, of course, disputing defendants' conclusion, plaintiff does not contest the premise of this contention—that in construing the manifested meaning of the Copyright Act, the court is directed to look to the "object and policy" of the copyright law.

Copyright monopolies are not granted for the purpose of rewarding authors. Rather, Congress has granted copyright monopolies to serve the public welfare by encouraging authors (broadly defined) to generate new ideas and disclose them to the public, being free to do so in any uniquely expressed way they may choose. *Harper & Row, Publishers, Inc. v. Nation Enterprises*, 471 U.S. 539, 546, 105 S.Ct. 2218, 2223, 85 L.Ed.2d 588 (1985). As the Supreme Court has concluded, "encouragement of individual effort by personal gain is the best way to advance public welfare through talents of authors and inventors in 'Science and useful Arts.' " *Mazer v. Stein*, 347 U.S. 201, 219, 74 S.Ct. 460, 471, 98 L.Ed. 630 *reh'g denied*, 347 U.S. 949, 74 S.Ct. 637, 98 L.Ed. 1096 (1954). *See also Sony Corp. v. Universal City Studios, Inc.*, 464 U.S. 417, 432, 104 S.Ct. 774, 783, 78 L.Ed.2d 574 (1984) (" 'The immediate effect of our copyright

law is to secure a fair return for an "author's" creative labor. But the ultimate aim is, by this incentive, to stimulate artistic creativity for the general public good.' ") *(quoting Twentieth Century Music Corp. v. Aiken*, 422 U.S. 151, 156, 95 S.Ct. 2040, 2043, 45 L.Ed.2d 84 (1975)).

In construing the relevant statutory mandates, the court must be faithful to the statutory language and mindful of both the ultimate goal of copyright law—the advancement of public welfare—and Congress' chosen method of achieving this goal—private reward to the individual author. Courts should not draw the line between copyrightable and non-copyrightable elements of computer programs in such a way as to harm the public welfare, nor should courts ignore the accommodation struck by Congress in choosing to advance the public welfare by rewarding authors. These mandates leave courts with a delicate task:

> Drawing the line too liberally in favor of copyright protection would bestow strong monopolies over specific applications upon the first to write programs performing those applications and would thereby inhibit other creators from developing improved products. Drawing the line too conservatively would allow programmer's efforts to be copied easily, thus discouraging the creation of all but modest incremental advances.

Menell, *Scope of Copyright Protection for Programs*, 41 Stan.L.Rev. at 1047-48. *See also* Note, *Scope of Copyright Protection of Computer Program Structure*, 88 Mich.L.Rev. at 895; Note, *Defining the Scope of Copyright Protection for Computer Software*, 38 Stan.L.Rev. 497, 498 (1986).

Rather than itself drawing the boundary line between copyrightable and non-copyrightable elements of computer programs, Congress has mandated that courts use an evaluative standard in determining this boundary line—that is, a standard that distinguishes idea from expression and requires that a court, in applying this distinction, be sensitive to the object and policy of copyright law as manifested by Congress.

When statutes establish evaluative standards for deciding cases, courts—by necessity—must locate boundaries in unchartered terrain, using the markers that Congress has placed. At some places a boundary may run straight as a surveyor's sight-line between markers; at others, it may meander like a stream, moving toward resolution of clashing objects and policies the markers identify. No marker Congress has placed may be disregarded or relocated by courts. Even in those instances where text and context make clear that literal description of a marker is contrary to manifested meaning (as where "not" must be inserted or deleted to make sense of the statutory language) what the court is doing is aptly described as "locating," not "relocating," the marker Congress mandated. The fewer the markers Congress has placed, the more critical it becomes that courts assure that no marker escapes notice.

B. The Idea-Expression and Useful-Expressive Distinctions

Although the statutory mandates are ambiguous in some critical respects, one point on which they are clear (one marker of the boundary line) is this: at least some, but clearly not all, aspects of computer programs, if original, are "works of authorship" in which copyright can subsist. 17 U.S.C. § 102(a)(1); House Report at 54, reprinted at 5667; CONTU, *Final Report* at 21. How can a court determine which aspects are copyrightable?

The interplay between sections 102(a) and 102(b), illumined by the related legislative history, manifests that the statute extends copyright protection to expressive elements of computer programs, but not to the ideas, processes, and methods embodied in computer programs. House Report at 54, 57, *reprinted at* 5667, 5670. This dichotomy—which is often referred to as the "idea-expression distinction," and which embraces also the process-expression, method-expression, and useful-expressive distinctions, *see* Note, *Determining the Scope of Copyright Protection of Computer Program Structure*, 88 Mich.L.Rev. at 866-67—has long been a fundamental part of our copyright law. *Baker v. Selden*, 101 U.S. 99, 25 L.Ed. 841 (1879). In that seminal case, the Court held that the

text of a book describing a special method of double-entry accounting on paper spreadsheets—the now almost universal T-accounts system—was copyrightable *expression*, but that the method itself, which embodied the *idea* of this particular kind of double-entry bookkeeping, was not. The Court thus concluded that Baker did not infringe Selden's copyright when Baker wrote his own treatise, in his own words, describing the special double-entry method of bookkeeping.

CONTU, too, concluded that the idea-expression distinction should be used to determine which aspects of computer programs are copyrightable. CONTU, *Final Report* at 37-46. The Commission recognized, though, that "[i]t is difficult, either as a matter of legal interpretation or technological determination, to draw the line between the copyrightable element of style and expression in a computer program and the process which underlies it." *Id.* at 44.

CONTU, of course, was not an official voice of Congress, and its views are not, without more, attributable to Congress. Thus, courts must not treat the CONTU report as legislative history, in the ordinary sense, much less as an authoritative statement about manifested legislative intent. *Whelan*, 797 F.2d at 1241-42. The privately held views of Vice-Chairperson Nimmer and Commissioner Miller, and especially the privately held views of Executive Director Levine, *see* declarations in *Evergreen Consulting*, without some manifestation of congressional endorsement, are even less relevant to the determination of manifested congressional intent. *Id* at 1241 n. 37.

Congress, however, did not ignore CONTU. Indeed, as already noted, Congress adopted practically verbatim the Commission's proposed statutory changes with respect to computer programs. Thus, the expressed views of the Commission, to the extent not repudiated by Congress, may help to explain the context in which Congress acted, which in turn may support inferences about the meaning of any otherwise ambiguous passages in what Congress declared.

I conclude that, with the Copyright Act of 1976 and the 1980 amendments to that Act, Congress manifested an intention to use the idea-expression distinction as part of the test of copyrightability for computer programs. That is, rather than adopting some other test of copyrightability that made the idea-expression dichotomy irrelevant (such as defendants' proposed literal-nonliteral distinction), Congress chose to extend copyright protection to original expression embodied in computer programs, but not to any idea, method, or process described by that expression. 17 U.S.C. §§ 102(a), 102(b); House Report at 54, 57, *reprinted at* 5667, 5670.

That conclusion is consistent with the treatment of other kinds of intellectual works—specifically, with the treatment of nonliteral elements of expression in musical, dramatic, and motion picture works, and works of literature. It is also consistent with the treatment of useful articles. That is, as explained more fully in Part IV(A), *infra*, I conclude that the user interface and some other nonliteral aspects of computer programs are *not merely* articles "having an intrinsic utilitarian function." 17 U.S.C. § 101 (defining "useful article"). When computer programs include elements—both literal and nonliteral—"that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article," *id.* (defining "pictorial, graphic, and sculptural works"), they are potentially copyrightable.

Finally, this conclusion is also consistent with the objects and policies of copyright—to encourage the creation and dissemination of new *ideas* by protecting, for limited times, the specific way that an author has *expressed* those ideas.

IV. THE LEGAL TEST FOR COPYRIGHTABILITY APPLICABLE TO THIS CASE

A. *Functionality, Useful Articles, and the Useful-Expressive Distinction*

Defendants suggest that the user interface of Lotus 1-2-3 is a useful, "function[al]" object like the functional layout of gears in an "H" pattern on a standard transmission, the functional assignment of letters to keys on a standard QWERTY keyboard, and the functional configuration of controls on a

musical instrument (*e.g.*, keys of a piano). Lewis Affdvt. ¶¶ 52-54. These "functional" "useful articles," defendants contend, are not entitled to copyright protection.

A similar analogy was made in *Synercom* where the court concluded that a sequence of data inputs for a statistical analysis program was like the "figure-H" pattern of a standard transmission. 462 F.Supp. at 1013. *Synercom*, though, was published less than a month after the publication of the CONTU report (which it never cites) and well before the 1980 amendments. Since then, congressional and judicial development of the law of copyrightability of computer programs has advanced considerably, and *Synercom's* central proposition—that the expression of nonliteral sequence and order is inseparable from the idea and accordingly is not copyrightable—has been explicitly rejected by several courts. *E.g.*, *Whelan*, 797 F.2d at 1240, 1248 ("copyright protection of computer programs may extend beyond the programs' literal code to their structure, sequence, and organization"); *Broderbund Software, Inc. v. Unison World, Inc.*, 648 F.Supp. 1127, 1133 (N.D.Cal.1986) ("copyright protection is not limited to the literal aspects of a computer program, but rather . . . it extends to the overall structure of a program, including its audiovisual displays"). Moreover, even those courts that have not gone as far as *Whelan* and *Broderbund* have still gone much farther in protecting computer programs than *Synercom*. *E.g.*, *SAS Institute, Inc. v. S & H Computer Systems, Inc.*, 605 F.Supp. 816, 830 (M.D.Tenn.1985) ("copying of the organization and structural details" can form basis for infringement); *Manufacturers Technologies, Inc. v. CAMS, Inc.*, 706 F.Supp. 984, 993 (D.Conn.1989) ("screen displays or user interface" copyrightable); *Johnson Controls, Inc. v. Phoenix Control Systems, Inc.*, 886 F.2d 1173, 1175 (9th Cir.1989) (nonliteral aspects such as "structure, sequence and/or organization of the program, the user interface, and the function, or purpose, of the program", are copyrightable to the extent that they embody expression rather than idea); *Telemarketing Resources v. Symantec Corp.*, 12 U.S.P.Q.2d 1991, 1993, 1989 WL 200350 (N.D. Cal.1989) (holding that "[c]opyright protection applies to the user interface, or overall structure and organization of a computer program, including its audiovisual displays, or screen 'look and feel,' " but finding no infringement in this case); *Q-Co. Industries v. Hoffman*, 625 F.Supp. 608, 615-16 (S.D.N.Y.1985) (similarity of "structure and arrangement" can form basis of infringement suit, but here, structural similarities were dictated by functional considerations and hence were non-copyrightable ideas rather than copyrightable expression); *Pearl Systems, Inc. v. Competition Electronics, Inc.*, 8 U.S.P.Q.2d 1520, 1524, 1988 WL 146047 (S.D.Fla.1988) ("Copyright protection of computer software is not limited to the text of the source or object code"). *But see Softklone*, 659 F.Supp. at 455, 465 (rejecting *Broderbund's* conclusion that audiovisual screen displays are copyrightable, although holding that separate copyright on status screen display was infringed where "total concept and feel" was copied); *Plains Cotton Cooperative Association v. Goodpasture Computer Service, Inc.*, 807 F.2d 1256, 1262 (rejecting *Whelan's* protection for structure, sequence, and organization, court instead held that sequence and organization, where dictated by market forces, is non-copyrightable idea rather than copyrightable expression), *reh'g denied*, 813 F.2d 407 (5th Cir.), *cert. denied*, 484 U.S. 821, 108 S.Ct. 80, 98 L.Ed.2d 42 (1987). In any event, *Synercom's* input formats are quite different from, and distinguishable from, the nonliteral aspects of 1-2-3 at issue in this case.

Defendant's proposed analogy is also similar to the analogy drawn by Commissioner Hersey between a computer program and an object that is designated to do work—for example, the cam of a drill. CONTU, *Final Report at* 58-60 (Hersey, C., dissenting). His view, however, was in dissent, and not a view advanced by CONTU. Because Congress adopted CONTU's recommendations practically verbatim, it is reasonable to infer that Congress did not adopt Commissioner Hersey's view.

Moreover, I conclude that defendants' contentions, to the extent they are similar to *Synercom's* central proposition and to Commissioner Hersey's views in dissent, are inconsistent

with the legislative history and statutory mandates explained above. If, in a context such as that of *Synercom* or of this case, an idea and its expression were taken to be inseparable and the expression therefore not copyrightable, copyright law never would, as a practical matter, provide computer programs with protection as substantial as Congress has mandated—protection designed to extend to original elements of expression however embodied. I credit the testimony of expert witnesses that the bulk of the creative work is in the conceptualization of a computer program and its user interface, rather than in its encoding, and that creating a suitable user interface is a more difficult intellectual task, requiring greater creativity, originality, and insight, than converting the user interface design into instructions to the machine. *See* Galler Decl. ¶¶ 37, 39; Emery Decl. ¶¶ 22, 25-28 (Docket No. 265); Reed Decl. ¶¶ 26-27 (Docket No. 290). Defendants' contentions would attribute to the statute a purpose to protect only a narrowly defined segment of the creative development of computer programs, and to preclude from protection even more significant creative elements of the process. Such a result is fundamentally inconsistent with the statutory mandates.

Also, defendants' contention would have the additional consequence that computer programmers would have little, if any, more protection for nonliteral elements of expression embodied in their original works of authorship than is already provided by trade secret law. If the intellectual effort and creativity embodied in a user interface were protectable only by trade secret law, the length of protection for computer programs would be very short—merely the time it takes to examine a program and then duplicate the nonliteral elements in a newly written computer program. This short period of protection is fundamentally inconsistent with the mandates of the copyright law.

Defendants have advanced their "useful article" (or "functionality") argument in many forms. Never, however, have they stated every premise that is a step of the reasoning implicit in the argument. One set of unstated premises is the

assumed meanings of "useful," "article," and "useful article." Indeed, different forms of their argument have depended on different assumed meanings for one or more of these three terms. Some illustrations will clarify this point.

Suppose, first, the form of the argument is this:

> A "useful article" is not copyrightable; a "computer program" is an "article," and a good "computer program" is "useful"; therefore, a good "computer program" is not copyrightable.

In this illustration, "useful," "article," and "useful article" are assumed to have meanings consistent with ordinary usage (with an exception to be noted below). The proposition that emerges when the words are interpreted in this way is, of course, plainly contrary to congressional mandates. Congress must have had some purpose in defining "computer program" and declaring that an "owner of a copy of a computer program" may make additional copies, in specified circumstances, without violating copyright laws. 17 U.S.C. §§ 101, 117. The clear implication of the 1980 amendments is that in some circumstances, at least, a good computer program *is* copyrightable. Otherwise, there would have been no need for Congress to enact these two provisions about a "computer program" and additional "copies."

It follows that, for this defense argument to make any sense and also be consistent with congressional mandates, defendants must be proposing that "useful", or "article," or "useful article," or all three, be interpreted in some sense different from their ordinary meanings. In what sense, though, they never say.

Suppose, second, a different form of the argument:

> A "useful article" is not copyrightable; a "screen display" is an "article," and a good "screen display" is "useful"; therefore, a good "screen display" is not copyrightable.

Here, the implicit meaning of "article" is being stretched beyond ordinary usage to apply to what one would ordinarily think of as just one part of an article, rather than itself an arti-

cle. Also, the implicit meaning of "article" stretches beyond what one would ordinarily think of as something that, as part of a larger "article," is itself an "article." Thus, the implicit meaning of "article" is broader still than the statutory mandate that "[a]n *article* that is normally a part of a useful article is considered a 'useful article.' " 17 U.S.C. § 101 (emphasis added). Are these expansions of the meaning of "article" consistent with the text and with the object and policy manifested in the statute? We may be better prepared to answer after considering one more illustrative form of the argument.

Suppose, third, this form of the argument:

> A "useful article" is not copyrightable; a "user interface" is an "article," and a good "user interface" is "useful"; therefore, a good "user interface" is not copyrightable.

Here, the meaning of "article" is plainly stretched beyond ordinary usage, and especially when we understand "user interface" in a sense broad enough to include nonliteral elements such as the command structure. Moreover, unease that we are being led into a departure from statutory text and manifested object and policy grows deeper as we reflect still more on this illustrative form of the argument.

One problem is that the argument depends on changing the assumed meaning of one or all of "useful," "article," and "useful article," to suit the needs of the copier who is advancing the argument as a defense against a claim of copyright infringement.

An even deeper fallacy of the argument, however, is that it assumes a meaning of "useful article" in step one ("a 'useful article' is not copyrightable") that goes far beyond ordinary meanings of "useful" and "article" combined. That is, not merely does it assume a *descriptive* meaning of something that is an "article" and is also "useful," but in addition it assumes that the definition of "useful article" includes, as something built into it, a rule of law: Everything that is a "useful article" in a descriptive sense is also, by rule of law, not copyrightable, and under this rule of law, nothing about a

"useful article"—no element, no aspect, no part of it—can ever be copyrighted. Merely to expose this assumed prescriptive meaning of "useful article," as defendants persistently use the phrase, is to demonstrate that any argument founded upon this meaning is fundamentally inconsistent with the mandates of the copyright statute.

It may be quite true, with respect to "useful articles"—indeed I believe it to be so—that their utilitarian aspects are not copyrightable, and that things that *merely* utter work, such as the cam of a drill, are not copyrightable. It is not true, however, that every aspect of a user interface that is "useful" is therefore not copyrightable. For example, Lotus 1-2-3 is surely "useful." It does not follow that when an intellectual work achieves the feat of being useful as well as expressive and original, the moment of creative triumph is also a moment of devastating financial loss—because the triumph destroys copyrightability of all expressive elements that would have been protected if only they had not contributed so much to the public interest by helping to make some article useful.

Defendants' contention misses this point by proceeding on an erroneous assumption about the role of "functionality" in copyright law. It is true that "functionality" of an article does not itself support copyrightability. Thus, it never strengthens a claim for copyright to show that the "work" for which copyright protection is claimed is useful. A congressional mandate that "proof that an intellectual work is a 'useful article' does not support the author's claim for copyright" is not, however, a mandate that "if one who copied the author's work proves that the work was 'useful' or 'functional,' the author loses *all* copyright protection." Transforming a mandate that "proof of usefulness *does not strengthen* a copyright claim" to a mandate that "proof of usefulness *destroys* a copyright claim" is, to say the least, a remarkable intellectual leap. Defendants have not advanced such a proposition explicitly. But this is in fact an implicit premise of their contention—or a consequence of it, if one takes a hindsight view of having applied their proposed rule in decisionmaking. In effect, their proposed rule would work this way: Anything that is useful is a "use-

ful article"; nothing about a "useful article" is ever copyrightable; because 1-2-3 is useful, and is an article, it is not copyrightable.

A more sensible interpretation of the statutory mandate is that the mere fact that an intellectual work is useful or functional—be it a dictionary, directory, map, book of meaningless code words, or computer program—does not mean that none of the elements of the work can be copyrightable. Also, the statute does not bar copyrightability merely because the originality of the expression becomes associated, in the marketplace, with usefulness of the work to a degree and in dimensions not previously achieved by other products on the market. *Brandir International, Inc. v. Cascade Pacific Lumber Co.*, 834 F.2d 1142, 1147 (2d Cir.1987) ("[A] copyrighted work . . . does not lose its protected status merely because it subsequently is put to functional use."); *NEC Corp. v. Intel Corp.*, 645 F.Supp. 590, 595 (N.D.Cal.1986) ("function performed by defendant's microprograms . . . does not affect their status as copyrightable subject matter"), *vacated on grounds of judge's recusal, see* 835 F.2d 1546 (9th Cir.1988). To hold otherwise would be to deny copyright protection to the most original and least obvious products of the creative mind merely because the marketplace accepts them as distinctively "functional." Such a rule would grant copyright protection for only those products that fall far short of being the best available. Rather than promoting and encouraging both the development and disclosure of the best, such a rule would offer incentives to market only the second, or third or tenth best, and hold back the best for fear that it is too good for copyrightability. Copyrightability is not a synonym for imperfection.

Accordingly, I conclude that a court, in determining whether a particular element is copyrightable, must not allow one statutory mandate—that functionality or usefulness is not itself a basis for copyrightability—to absorb and destroy another statutory mandate—that elements of expression are copyrightable. Elements of expression, even if embodied in useful articles, are copyrightable if capable of identification

and recognition independently of the functional ideas that make the article useful. This mandate may be viewed as a corollary of the central distinction of copyright law between idea and expression, which is explored further immediately below.

B. The Idea-Expression Riddle: Four Additional Concepts

It is by now plain that an idea is not copyrightable and an expression may be. It does not follow, though, that every expression of an idea is copyrightable. To begin to get an understanding of the legally significant contrasts among an idea, noncopyrightable expressions of the idea, and a copyrightable expression, we must take account of four more concepts.

Earlier parts of this Opinion refer to two of these four—"originality" and "functionality." The expression of an idea is copyrightable only if it is original—that is, if the expression originated with the author. 17 U.S.C. § 102(a); *see* Part III(A)(2)(b), *supra*. Even then the expression of the idea is not copyrightable if the expression does no more than embody elements of the idea that are functional in the utilitarian sense. 17 U.S.C. § 102(b); *see* Part IV(A) *supra*.

The third concept is "obviousness." When a particular expression goes no farther than the obvious, it is inseparable from the idea itself. Protecting an expression of this limited kind would effectively amount to protection of the idea, a result inconsistent which the plain meaning of the statute. *E.H. Tate Co. v. Jiffy Enterprises, Inc.*, 16 F.R.D. 571, 573 (E.D.Pa.1954) (small sketch and accompanying instruction "Apply hook to wall" so obvious that it is not entitled to copyright protection).

It is only a slight extension of the idea of "obviousness"—and one supported by precedent—to reach the fourth concept: "merger." If a particular expression is one of a quite limited number of the possible ways of expressing an idea, then, under this fourth concept, the expression is not copyrightable:

> When the uncopyrightable subject matter is very narrow, so that "the topic necessarily requires," if not only one

> form of expression, at best only a limited number, to permit copyrighting would mean that a party or parties, by copyrighting a mere handful of forms, could exhaust all possibility of future use of the substance. In such circumstances it does not seem accurate to say that any particular form of expression comes from the subject matter. However, it is necessary to say that the subject matter would be appropriated by permitting the copyrighting of its expression. We cannot recognize copyright as a game of chess in which the public can be checkmated.

Morissey v. Procter & Gamble Co., 379 F.2d 675, 678-79 (1st Cir.1967) (citations omitted). *See also Concrete Machinery Co. v. Classic Lawn Ornaments, Inc.*, 843 F.2d 600, 606 (1st Cir.1988) ("When there is essentially only one way to express an idea, the idea and its expression are inseparable and copyright is no bar to copying that expression."); *Herbert Rosenthal Jewelry Corp. v. Kalpakian*, 446 F.2d 738, 742 (9th Cir.1971) (idea of a jewel-encrusted life-like bee pin inseparable from expression; thus expression not copyrightable because "protecting the 'expression' in such circumstances would confer a monopoly of the 'idea' upon the copyright owner"). *Cf Atari, Inc. v. North American Philips Consumer Electronics Corp*, 672 F.2d 607, 616 (7th Cir.), *cert. denied*, 459 U.S. 880, 103 S.Ct. 176, 74 L.Ed.2d 145 (1982) (*scènes à faire* of literary works—"stock literary devices" such as "incidents, characters or settings which are as a practical matter indispensable, or at least standard, in the treatment of a given topic"—"are not protectible [sic] by copyright"); *Landsberg v. Scrabble Crossword Game Players, Inc.*, 736 F.2d 485, 489 (9th Cir.) (*scènes à faire* not copyrightable because granting a copyright "would give the first author a monopoly on the commonplace ideas behind the *scènes à faire*"), *cert. denied*, 469 U.S. 1037, 105 S.Ct. 513, 83 L.Ed.2d 403 (1984).

If, however, the expression of an idea has elements that go beyond all functional elements of the idea itself, and beyond the obvious, and if there are numerous other ways of expressing the non-copyrightable idea, then those elements of expression, if original and substantial, are copyrightable.

C. *Elements of the Legal Test for Copyrightability*

A "legal test," as I use the phrase here, is a statement of the elements of fact, or law, or both fact and law, that must be addressed by a decisionmaker to decide a question potentially decisive of some claim or defense. "Copyrightability" of non-literal elements of Lotus 1-2-3 is essential to the claim of the plaintiff in this case.

As already noted, the legal test for deciding copyrightability, in a factual context such as is presented here, has not been precisely defined either in the copyright statute or in precedents interpreting and applying it. Nevertheless, the statute and the precedents contain many mandates—"markers" of the borderline between copyrightability and non-copyrightability—that narrow the scope of the questions remaining to be answered to determine what test to apply.

Drawing into one statement the fundamental truths about ideas and their expression that were sketched above, one may accurately say that the issue of copyrightability of a "work" turns not on whether the work expresses ideas but instead on whether, in addition to expressing one or more ideas, in some material respect it does more, and in an original way. One need not totally disentangle the idea from its expression in order to conclude that a particular aspect is expression. Indeed, to speak as if it were ever possible completely to disentangle an idea from an expression of that idea is to speak abstract fiction rather than real-life fact. Disentanglement, then, is not an "either-or," "0-1," "negative-positive," or "binary" matter. It is, instead, a matter of degree.

Still, even if the "idea" cannot be completely disentangled from its expression, to determine what is copyrightable a decisionmaker must understand the meaning of "idea" within the idea-expression distinction. To do so one must take note also of another distinction—one between generality and specificity of conceptualizing the idea. Thus, a statement of

the most significant elements of the legal test for copyrightability, consistent with precedents, begins:

> FIRST, in making the determination of "copyrightability," the decisionmaker must focus upon alternatives that counsel may suggest, or the court may conceive, *along the scale from the most generalized conception to the most particularized,* and choose some formulation—some conception or definition of the "idea"—for the purpose of distinguishing between the idea and its expression.

As Learned Hand recognized in a 1930 case concerning the alleged infringement of the copyright of a play:

> Upon any work, and especially upon a play, a great number of patterns of increasing generality will fit equally well, as more and more of the incident is left out. The last may perhaps be no more than the most general statement of what the play is about, and at times might consist only of its title; but there is a point in this series of abstractions where they are no longer protected, since otherwise the playwright could prevent the use of his "ideas," to which, apart from their expression, his property is never extended. Nobody has ever been able to fix that boundary, and nobody ever can.

Nichols, 45 F.2d at 121 (citations omitted). *See also Shipman v. RKO, Radio Pictures,* 100 F.2d 533, 538 (2d Cir.1938) (L. Hand, J., concurring) ("*Nichols* . . . held that there is a point where the similarities are so little concrete (and therefore so abstract) that they become only 'theme', 'idea', or skeleton of the plot, and that these are always in the public domain; no copyright can protect them. The test is necessarily vague and nothing more definite can be said about it.") Thirty more years of experience in judging did not change Learned Hand's view: "Obviously, no principle can be stated as to when an imitator has gone beyond copying the 'idea,' and has borrowed its 'expression.' Decisions must therefore inevitably be ad hoc." *Peter Pan Fabrics, Inc. v. Martin Weiner Corp.*, 274 F.2d 487, 489 (2d Cir.1960) (L. Hand, J.). In another context,

Hand described such "ad hoc" decisionmaking as "fiat." *Sinram v. Pennsylvania Railroad Co.*, 61 F.2d 767, 771 (2d Cir.1932) (L. Hand, J.). In whatever way this kind of decisionmaking may be described, Hand offered us no formula for distinguishing between idea and expression like that he devised for the calculus of reasonable care in *United States v. Carroll Towing Co.*, 159 F.2d 169, 173 (L. Hand, J.) (articulating the "BPL" formula), *reh'g denied,* 160 F.2d 482 (2d Cir.1947). It seems the better part of wisdom, if not valor, not to press the search for a suitable brightline test of copyrightability where Learned Hand, even after decades of experience in judging, found none.

For all these reasons, as a practical necessity, whether explicitly or only implicitly, courts apply an abstractions scale in determining copyrightability. In doing so they make a decision involving choice and judgment of a type that human minds make regularly in daily affairs, but computers of the current state of the art cannot make.[2] Still, though "judgment" is required and the answer to be given is not precisely "calculable," analogies to arithmetic calculations and to "scales of justice" may aid the human mind in choosing and "weighing" factors that properly go into the metaphoric calculus.

In summary, one among the principal elements to be weighed in determining copyrightability when the idea-expression distinction applies is to conceive and define the idea in a way that places it somewhere along the scale of abstraction (somewhere between the most abstract and the most specific of all possible conceptions). Illustrations from the evidence in this case will help to explain in a more concrete way this element of the legal test for copyrightability. *See* Part V(C), *infra*. Before turning to those illustrations, however, I state in a similarly abstract way, to be explained

[2] Despite *Time* Magazine's decision to honor "the computer" as its 1982 "Man of the Year," and despite advances in the field of artificial intelligence, I take it as a premise of decisionmaking in this case that computers, for better or worse, do not yet have the human feelings, strengths, and failings that lie beyond those we describe as logical, or cognitive, or intellectual in the broadest sense.

later by illustrations, two more elements that I conclude a decisionmaker must consider to determine copyrightability of a computer program like that at issue in this case.

In addition to taking account of the distinction between generality and specificity, to make use of Hand's abstraction scale for applying the idea-expression distinction we need to identify and distinguish between essential and nonessential details of expressing the idea. Some, but of course not all, details, are so essential that their omission would result in a failure to express *that* idea, or in the expression of only a different and *more general* idea. Accordingly, two more elements in the legal test for copyrightability are:

> SECOND, the decisionmaker must focus upon whether an alleged expression of the idea is limited to elements essential to expression of *that* idea (or is one of only a few ways of expressing the idea) or instead includes identifiable elements of expression not essential to every expression of that idea.
>
> THIRD, having identified elements of expression not essential to every expression of the idea, the decisionmaker must focus on whether those elements are a substantial part of the allegedly copyrightable "work."

In addressing this third element of the test for copyrightability, the decisionmaker is measuring "substantiality" not merely on a quantum scale but by a test that is qualitative as well. *SAS Institute*, 605 F.Supp. at 829-30 ("the piracy of even a quantitatively small fragment ('a rose by any other name would smell as sweet') may be qualitatively substantial").

By its nature, a legal test that requires weighing of factors or elements such as these is not a bright-line or an either-or test. It requires of the decisionmaker, instead, an evaluative or "judgmental" weighing of all relevant characteristics of the work in which a copyright is claimed, all relevant characteristics of the allegedly infringing work, and all of the relevant circumstances of their development and use. It requires, also, not a step-by-step decisionmaking process, but a simultaneous weighing of all the factors or elements that the legal

test identifies as relevant. I do not suggest that the three elements identified here are an all-inclusive list. They do appear, however, to be the principal factors relevant to decision of copyrightability of a computer program such as Lotus 1-2-3.

If the decisionmaker, weighing the relevant factors, determines that the legal test applying the idea-expression distinction is satisfied, copyrightability is established. Issues may remain, of course. as to whether a copyright was perfected and whether the alleged infringing work, measured by the "substantial similarly" test, did contain elements that infringed upon the copyrightable elements of the copyrighted "work." Also, issues may remain as to whether damages have been proved, or whether the controversy over infringement is instead " 'a trivial pother,' a mere point of honor, of scarcely more than irritation, involving no substantial interest," *Fred Fisher, Inc. v. Dillingham*, 298 F. 145, 152 (S.D.N.Y.1924) (L. Hand, J.) (citations omitted), for which only statutory damages should be awarded. 17 U.S.C. § 504(c) (1988).

D. *Incentives and the Role of Advocacy*

The advocate of broad copyrightability who understands that the court will apply a legal test that focuses principally on these three elements has an incentive to urge that the court conceive the "idea" in a very generalized sense; then many different expressions of the idea would be possible, and protection might be claimed for the work. The advocate of freedom to copy—and of narrow copyrightability—has an incentive to urge that the court conceive the "idea" in a very particularized sense; then only one or a few expressions of an idea defined in such particularized terms would be possible, and no copyright protection for those few expressions would be available because the idea and expression would merge completely, or nearly so. Such extreme positions would fail to assist the court in determining, for purposes of the first element, where properly to place the idea along the abstractions scale.

There is risk for each advocate, however, in yielding too readily to these respective incentives. The argument of an

advocate who presses too far in one or the other of these directions of generality or specificity in defining the idea will not only lose the argument advanced but also lose credibility for later advancing a more sensible alternative that proposes a less extreme but still favorable position along the scale. Upon reflection, then, advocates on both sides will be—or at least should be—encouraged to moderate their ultra-contentious and extreme positions in favor of more supportable propositions that will more sharply focus the issue for adjudication.

There is an additional risk for the advocate of freedom to copy who attempts to persuade the court that Hand's abstractions scale, and the three-element test applying it, is irrelevant to computer programs. That advocate will be tempted to define the idea in the most generalized terms, hoping to persuade the court that, because the abstractions scale does not apply, all of the many different expressions of that idea are non-copyrightable and everyone is free to copy.

In this case, defendants have in fact advanced such an argument. Yielding only to the near-uniformity of precedent for copyrightability of source code and object code, defendants have argued that every other form of expression of the "spreadsheet metaphor" is non-copyrightable. For reasons now to be explained, neither this extreme contention nor any of the alternatives the defendants have advanced for non-copyrightability can be sustained.

V. APPLICATION OF THE LEGAL TEST TO LOTUS 1-2-3

A. *"Look and Feel"*

In musical, dramatic, and motion picture works, and works of literature, nonliteral elements that are copyrightable have sometimes been described as the "total concept and feel" of a work, *Roth Greeting Cards*, 429 F.2d at 1110; *Krofft Television*, 562 F.2d at 1167, "the fundamental essence or structure" of a work, 3 M. Nimmer & D. Nimmer, *Nimmer on Copyright* § 13.03[A][1] (1989), or "the 'pattern' of the

work," Chaffee, *Reflections on the Law of Copyright: Part I*, 45 Colum.L.Rev. 503, 513 (1945). In the context of computer programs, nonliteral elements have often been referred to as the "look and feel" of a program, *e.g.*, *Telemarketing Resources*, 12 U.S.P.Q.2d at 1993; Samuelson and Glushko, *Comparing the Views of Lawyers and User Interface Designers on the Software Copyright "Look and Feel" Lawsuits*, 30 Jurimetrics 121 (1989). Initially, plaintiff too referred to these elements as "look and feel," Amended Complaint ¶ 13 (Docket No. 15), though plaintiff—in trial, at least—has not rested its contentions primarily on this terminology.

Despite its widespread use in public discourse on the copyrightability of nonliteral elements of computer programs, I have not found the "look and feel" concept, standing alone, to be significantly helpful in distinguishing between nonliteral elements of a computer program that are copyrightable and those that are not.

One may argue that the phrase "look and feel" is analogous to the "total concept and feel" test developed in *Roth Greeting Cards*, 429 F.2d at 1110, and used in *Krofft Television*, 562 F.2d at 1167. In these cases, however, the "total concept and feel" test was not invoked—at least, not explicitly—as an aid to the court in determining which nonliteral elements were copyrightable and why. Rather, these courts used the concept, not in determining copyrightability, but, apparently assuming copyrightability, in applying the substantial similarity test to determine whether forbidden copying had occurred. For example, in *Roth Greeting Cards*, the court considered whether the "text, arrangement of text, art work, and association between art work and text" of defendant's greeting cards were substantially similar to (*e.g.*, copied the "total concept and feel" of) those elements of plaintiff's greeting cards. 429 F.2d at 1109. And in *Krofft Television*, the inquiry focused on whether defendant McDonald's, with its television commercials, copied the "total concept and feel" of plaintiff's H.R. Pufnstuf children's television series by copying its locale (both occurred in imaginary world with similar trees, caves, a pond, a road and a castle), fictional characters (both were

inhabited by talking trees, mayors with disproportionately large round heads and long wide mouths, "Keystone cops" characters, crazy scientists, and a multi-armed evil creature), costumes and sets (created for defendant by former employees of plaintiff), voices (executed for defendant by same voice expert who did the voices for plaintiff's television series), and plot. 562 F.2d at 1161, 1167 n. 9.

It may be true that the issues of copyrightability and substantial similarity are so interrelated that these precedents are relevant. The fact remains that they are not directly in point for determining copyrightability in this case. Moreover, "look and feel" is a conclusion, and the usefulness and applicability of a precedent depends on the *reasons* the conclusion was reached in a particular context, not on the *conclusion* itself. Thus, in trying to understand the relevance of "concept and feel" precedents, we need to look to details of those cases that appear to have been relied upon in reaching the conclusion, rather than merely embracing the conclusion without regard for underlying reasons. As we probe the circumstances of these precedents that closely, we are likely to do something akin to apply in the three-element test described above.

B. The User Interface

Plaintiff in the present case, not now pressing any argument that the phrase "look and feel" is a satisfactory description of the copyrightable elements of Lotus 1-2-3, suggests that the copyrightable nonliteral elements are more appropriately described by the phrase "user interface." According to plaintiff, the "user interface" of 1-2-3 includes such elements as "the menus (and their structure and organization), the long prompts, the screens on which they appear, the function key assignments, [and] the macro commands and language," Plaintiff's Post-Trial Brief at 53 (Docket No. 319). I turn now to examining these elements more closely.

Like manual spreadsheets, *Baker*, 101 U.S. at 100, the electronic spreadsheet presents a blank form on which numerical, statistical, financial or other data can be assimilated, organized, manipulated and calculated. Galler Decl. ¶¶ 101-103;

Lewis Affdvt. ¶ 92. In both Lotus 1-2-3 and VP-Planner, as in many other electronic spreadsheet programs, a highlighted element of the basic screen display resembles an "L" rotated ninety degrees clockwise with letters across the top to designate columns, and numbers down the left side to designate rows. *See* Appendices 1 (VisiCalc), 2 (1-2-3), and 3 (VP-Planner). *Cf.* Multiplan, which also has a rotated "L" screen display, but which uses numbers for both columns and rows (Tr. Ex. (Trial Exhibit) 132). The intersection of each column and row is a "cell" in which a value (*e.g.*, 31,963), formula (*e.g.*, one that adds a column of numbers), or label (*e.g.*, "Cost of Goods") may be entered.

Both programs utilize a "two-line moving-cursor menu," which presents the user with a list of command choices (*e.g.*, "file", "copy", "quit") and a moving cursor to use in communicating ("entering") the choice. The menu is called up to the screen by pressing the slash ("/") key, and is located either above the rotated "L" (as in 1-2-3, *see* Appendix 2) or below the rotated "L" as in VP-Planner, *see* Appendix 3). *Cf.* Multiplan, which uses a three-line moving cursor menu (Tr. Ex. 132); Excel, which has "pull-down" bar menus (Tr. Ex. 79).

The top line of the two-line menu contains a series of words, each of which represents a different command. For example, the top line of the first, or main, menu in 1-2-3 reads: "Worksheet Range Copy Move File Graph Data Quit". *See* Appendix 2; *cf.* Appendix 3 (main menu in VP-Planner). The first word of the line is highlighted to signify the command that will be chosen if the "enter" key is pressed; the highlighting, or "cursor," moves to the right or left if the right or left cursor key is pressed.

The second line of the menu displays a "long prompt," which contains further information about the highlighted command. In some cases, the long prompt is a description of the highlighted command (*e.g.*, for command "Copy", the long prompt reads: "Copy a cell or range of cells"); in other cases, the long prompt provides a list of the menu command subchoices that will be available if the highlighted command is chosen (*e.g.*, for command "Worksheet", the long prompt

reads: "Global, Insert, Delete, Column-Width, Erase, Titles, Window, Status"; *see* Appendix 2; *cf.* Appendix 3 (VP-Planner)). In the latter case, if the highlighted command is subsequently chosen, the words that appeared in the long prompt will now appear as second-level menu command choices on the top line of the menu, and a new long prompt will take its place on the second line.

In addition to having the option of selecting a command by moving the cursor to the command and pressing the "enter" key, a user may instead press the key representing the first letter of the command word (*e.g.*, "C" for "Copy", "W" for "Worksheet"). For this reason. each word representing each command on a given menu line must start with a different letter. *See* Galler Affdvt. ¶¶ 105-117; Lewis Decl. ¶¶ 96-97.

Function keys present an additional way for the user to communicate with and operate, the programmed computer. Each program assigns certain frequently-used commands to the various 'function keys" labelled "F1", "F2", "F3", etc.) on the keyboard. For example, in 1-2-3, "F1" corresponds to the command "Help", and "F2" to the command "Edit". Galler Decl. ¶ 125. VP-Planner, in contrast, assigns the function keys to the commands on the top line of the menu. Thus, for example, when VP-Planner is in its main menu mode, "F1" corresponds to the command "Help", "F2" to the command "Worksheet", "F3" to the command "Range", "F4" to the command "Copy", and so on. *See* Appendix 3 (function key numbers listed before command terms).

Typically, users adapt particular spreadsheets to their specific needs. Suppose, for example, that in order to achieve a desired result, a user must perform the same sequence of commands repeatedly in order to cause the computer to execute the same functions repeatedly (*e.g.*, calculating depreciation based on certain financial data, or saving the spreadsheet and printing a copy of it). Rather than going step-by-step through the same sequence of commands each time there is a need to perform a particular function, the user may store a sequence of command terms as a "macroinstruction," commonly called a "macro," and then, with one command stroke that invokes

the macro, cause the programmed computer to execute the entire sequence of commands.

In 1-2-3, the command terms within a macro may consist of menu choices (*e.g.*, "/C" to copy a cell or range of cells, or "/PPRA1.F19{enter}AGQ"—for the command sequence "Print, Printer, Range, Cell A1 to Cell F19, Align, Go, Quit"—to print the specified range of cells from the spreadsheet). Also a macro may include keyboard commands (such as function keys, cursor keys, or the "enter" key), and special macro commands invoked by the command "/X" (*e.g.*, "XI" is a macro command that performs an "if-then" logical function). Because macros may contain many menu choices, the exact hierarchy—or structure, sequence and organization—of the menu system is a fundamental part of the functionality of the macros. Also, because macro commands are typically invoked by entering the first letter of command choices (*e.g.*, "/C" for copying, "/PPRA1.F19{enter}AGQ" for printing the specified range of cells), the first letter of each command choice on a particular menu is a vital element of the functionality of macros. *See* Galler Decl. ¶¶ 121-124; Lewis Affdvt. ¶¶ 109-115.

C. *Elements of the User Interface as Expression*

Applying to 1-2-3 the legal test stated in Part IV(C), *supra*, I consider first where along the scale of abstraction to conceive the "idea" for the purpose of distinguishing between the idea and its expression.

At the most general level of Hand's abstractions scale, *Nichols*, 45 F.2d at 121—the computer programs at issue in this case, and other computer programs that have been considered during the course of trial, are expressions of the idea of a computer program for an electronic spreadsheet. Defendants are quite correct, then, in asserting that the idea of developing an electronic spreadsheet is not copyrightable—that the core idea of such a spreadsheet is both functional and obvious, even to computer users who claim no technical competence. Thus, even though programs like VisiCalc, 1-2-3, Multiplan, SuperCalc4, and Excel are very different in their

structure, appearance, and method of operation, each is, at the most basic level, just a different way of expressing the same idea: the electronic spreadsheet. It does not follow, however, that every possible method of designing a metaphorical spreadsheet is obvious, or that no form of expressing the idea of the spreadsheet metaphor can possibly have such originality in pressing beyond the obvious as is required for copyrightability, or that no special form of metaphorical spreadsheet can possibly be a distinctive expression of a particular method of preparing financial information.

The idea for a two-line moving cursor menu is also functional and obvious, and indeed, is used in a wide variety of computer programs including spreadsheet programs. Nevertheless, it does not follow that every possible method of designing a menu system that includes a two-line moving cursor is non-copyrightable.

Of course, if a particular expression of the idea of an electronic spreadsheet communicates no details beyond those essential to stating the idea itself, then that expression would not be copyrightable. The issue here is whether Lotus 1-2-3 does go beyond those details essential to any expression of the idea, and includes substantial elements of expression, distinctive and original, which are thus copyrightable.

The idea for an electronic spreadsheet was first rendered into commercial practice by Daniel Bricklin. As a student at Harvard Business School in the late 1970's, Bricklin envisioned a "magic blackboard" that would recalculate numbers automatically as changes were made in other parts of the spreadsheet. Eventually, aided by others, he transformed this idea into VisiCalc, the first commercial electronic spreadsheet. *See* Bricklin Affdvt. ¶ 48-96 (Docket No. 217). Bricklin's idea for VisiCalc was a revolutionary advance in the field of computer programming. Dauphinais Affdvt. ¶ 98 (Docket No. 280).

Although VisiCalc was a commercial success, implementational characteristics limited the scope and duration of its marketability as a spreadsheet product. Most notably, VisiCalc was originally programmed for use on the Apple II computer, which had limited memory (32K of RAM), limited

screen display capabilities (only 40 characters per line), and limited keys available on the keyboard (no function keys and no up and down cursor keys). When VisiCalc was later rewritten for use on the IBM PC which was introduced in August 1981), it was transferred with minimal changes and without taking advantage of many of the PC's more extensive capabilities.

Mitchell Kapor and Jonathan Sachs, the original authors of 1-2-3, exploited this opportunity. Building on Bricklin's revolutionary idea for an electronic spreadsheet, Kapor and Sachs expressed that idea in a different, more powerful way. 1-2-3 took advantage of the IBM PC's more expansive memory and more versatile screen display capabilities and keyboard. 1-2-3, like many electronic spreadsheet programs since, could thus be thought of as an evolutionary product that was built upon the shoulders of VisiCalc.

Just as 1-2-3 expressed the idea of an electronic spreadsheet differently from VisiCalc, so did Microsoft's Excel. Originally written for the Apple Macintosh computer, it exploits the enhanced graphics capabilities of the Macintosh, as well as the mouse input device that is standard with the Macintosh. Excel has pull-down bar menus rather than a two-line moving-cursor menu, and a very different menu-command hierarchy. Tr. Ex. 79.

As already noted, these three products—VisiCalc, 1-2-3, and Excel—share the general idea of an electronic spreadsheet but have expressed the idea in substantially different ways. These products also share some elements, however, at a somewhat more detailed or specific point along the abstractions scale. One element shared by these and many other programs is the basic spreadsheet screen display that resembles a rotated "L." *See* Appendices 1 (VisiCalc), 2 (1-2-3), and 3 (VP-Planner). Although Excel uses a different basic spreadsheet screen display that more closely resembles a paper spreadsheet, there is a rather low limit, as a factual matter, on the number of ways of making a computer screen resemble a spreadsheet. Accordingly, this aspect of electronic spreadsheet computer programs, if not present in every expression of such a program, is present in most expressions. Thus the

second element of the legal test weighs heavily against treating the rotated "L" screen display as a copyrightable element of a computer program. *Morrissey*, 379 F.2d at 678-79

Another expressive element that merges with the idea of an electronic spreadsheet—that is, that is an essential detail present in most if not all expressions of an electronic spreadsheet—is the designation of a particular key that, when pressed, will invoke the menu command system. The number of keys available for this designation is limited for two reasons. First, because most of the keys on the keyboard relate either to values (*e.g.*, the number keys and mathematical operation keys) or labels (*e.g.*, the letter keys), only a few keys are left that can be used, as a practical matter, to invoke the menu command system. Without something more, the programmed computer would interpret the activation of one of these keys as an attempt by the user to enter a value or label into a cell. Second, because users need to invoke the command system frequently, the key designated for this purpose must be easily accessible. For example, the user should not be required to press two keys at the same time (such as "Shift," "Alt," or "Ctrl" along with another key).

As just noted, when all the letter, number, and arithmetic keys are eliminated from consideration, the number of keys remaining that could be used to invoke the menu command system is quite limited. They include the slash key ("/") and the semi-colon key (";"). The choice of the creators of VisiCalc to designate the slash ("/") key to invoke the menu command system is not surprising. It is one of very few practical options. Thus the second element of the legal test weighs heavily against copyrightability of this aspect of VisiCalc—and of 1-2-3. This expression merges with the idea of having a readily available method of invoking the menu command system.

Other elements of expression a decisionmaker may regard as either essential to every expression of an electronic spreadsheet, or at least "obvious" if not essential, include the use of the "+" key to indicate addition, the "—" key to indicate subtraction, the "*" key to indicate multiplication, the "/" key within formulas to indicate division, and the "enter" key to place keystroke entries into the cells. *See* Dauphinais Affidavit, ¶ 78.

Each of the elements just described is present in, if not all, at least most expressions of an electronic spreadsheet computer program. Other aspects of these programs, however, need not be present in every expression of an electronic spreadsheet. An example of distinctive details of expression is the precise "structure, sequence, and organization," *Whelan*, 797 F.2d at 1248, of the menu command system.

Consider first the menu command system of VisiCalc. The main menu command line reads: "Command: BCDEFGIMPRSTVW-". *See* Appendix 1. Each of these letters (or, to use defendants' experts' preferred terminology, "symbolic tokens") stands for a different command—in this case: Blank, Clear, Delete, Edit, Format, Global, Insert, Move, Print, Replicate, Storage, Titles, Version Number, Window, and "-" for "Label Repeating." Many of these commands invoke submenus which also contain a series of letters, each of which represents a submenu command choice. *See* VisiCalc Command Structure Chart (Tr. Ex. 140, pp. 3-3 and 3-4).

This particular expression of a menu structure is not essential to the electronic spreadsheet idea, nor does it merge with the somewhat less abstract idea of a menu structure for an electronic spreadsheet. The idea of a menu structure—including the overall structure, the order of commands in each menu line, the choice of letters, words, or "symbolic tokens" to represent each command, the presentation of these symbolic tokens on the screen (*i.e.*, first letter only, abbreviations, full words, full words with one or more letters capitalized or underlined), the type of menu system used (*i.e.*, one-, two-, or three-line moving-cursor menus, pull-down menus, or command-driven interfaces), and the long prompts—could be expressed in a great many if not literally unlimited number of ways.

The fact that some of these specific command terms are quite obvious or merge with the idea of such a particular command term does not preclude copyrightability for the command structure taken as a whole. If particular characteristics

not distinctive individually have been brought together in a way that makes the "whole" a distinctive expression of an idea—one of many possible ways of expressing it—then the "whole" may be copyrightable. The statutory provisions regarding "compilation," 17 U.S.C. §§ 101, 103, are not essential to this conclusion, but do reinforce it. A different total structure may be developed even from individual components that are quite similar and limited in number. To determine copyrightability, a court need not—and, indeed, should not—dissect every element of the allegedly protected work. Rather, the court need only identify those elements that are copyrightable, and then determine whether those elements, *considered as a whole*, have been impermissibly copied. *Atari Games Corp. v. Oman*, 888 F.2d 878, 882-83 (D.C.Cir. 1989) (rejecting "component-by-component analysis," and ruling instead that focus must ultimately be on "work as a whole").

It is plain that plaintiff did not impermissibly copy copyrighted elements of VisiCalc. Lotus 1-2-3 uses a very different menu structure. In contrast with VisiCalc's one-line main menu that reads "Command: BCDEFGIMPRSTVW-", the main menu of Lotus 1-2-3, which uses a two-line moving-cursor menu system, reads: "Worksheet Range Copy Move File Graph Data Quit". *See* Appendix 2. Most of the submenus similarly present a list of up to about ten full-word menu choices, presented in order of predicted frequency of use rather than alphabetically. *See* Lotus 1-2-3 Command Tree Chart (Tr. Ex. 176, pp. 3-2 and 3-3). Other spreadsheet programs have also expressed their command structures in completely different ways. *Cf.* Multiplan (Tr. Ex. 132, p. 279-374), Framework II (Tr. Ex. 131, pp. QR7-QR8), SuperCalc4 (Tr. Ex. 133, Quick Reference Card Number 1), Excel (Tr. Ex. 79, Reference Guide, p. 90); Symphony (Tr. Ex. 130, Reference Manual, pp. 127-190); MathPlan (Tr. Ex. 134, pp. 169-380); and PFS: Professional Plan (Tr. Ex. 135).

I conclude that a menu command structure is capable of being expressed in many if not an unlimited number of ways, and that the command structure of 1-2-3 is an original and nonobvious way of expressing a command structure. Emery

Decl. ¶ 15. Accordingly, the menu structure, taken as a whole—including the choice of command terms, the structure and order of those terms, their presentation on the screen, and the long prompts—is an aspect of 1-2-3 that is not present in every expression of an electronic spreadsheet. It meets the requirements of the second element of the legal test for copyrightability.

Finally, I consider the third element of the legal test—whether the structure, sequence, and organization of the menu command system is a substantial part of the alleged copyrighted work—here Lotus 1-2-3. That the answer to this question is "yes" is incontrovertible. The user interface of 1-2-3 is its most unique element, and is the aspect that has made 1-2-3 so popular. That defendants went to such trouble to copy that element is a testament to its substantiality. Accordingly, evaluation of the third element of the legal test weighs heavily in favor of Lotus.

Taking account of all three elements of the legal test, I determine that copyrightability of the user interface of 1-2-3 is established.

VI. COPYING OF LOTUS 1-2-3

As noted at the beginning of this Opinion, the parties' stipulation regulating this first phase of trial reserved for a later, jury phase, any issues of fact requiring jury determination with respect to any alleged copying of Lotus 1-2-3. If in this first phase the court had rejected Lotus' claim of copyrightability of nonliteral elements of the user interface, a jury phase would plainly have been required under that stipulation to determine whether any copying of source code or object code had occurred. Because, however, the court has decided instead that Lotus prevails on this issue, the court must next consider whether any issue remains that must be submitted to a jury before the court considers whether defendants are liable for tnfringement of Lotus' copyright in 1-2-3.

For the reasons stated below, the answer to that inquiry must be "no." Not only is the copying in this case so "overwhelming and pervasive" as to preclude, as a matter of law, any assertion of independent creation, *see Midway Manufacturing Co. v. Bandai-America, Inc.*, 546 F.Supp. 125, 141 n. 11, 149 (D.N.J.1982) ("overwhelming and pervasive" copying can preclude, as a matter of law, finding of independent creation, and can support grant of summary judgment for plaintiff, but such virtual identity not shown in this case), but also, defendants in this case have *admitted* that they copied these elements of protected expression.

Dr. James Stephenson, founder of defendant Stephenson Software, is the original developer of the program that was eventually released as VP-Planner. Like Kapor and Sacks, Stephenson recognized that VisiCalc, although a "pioneering spreadsheet approach," Stephenson Affdvt. ¶ 19 (Docket No. 287), was not sufficient to meet the financial planning needs of some companies and did not take advantage of technological advances in computer hardware. Accordingly, in January 1982, Stephenson began to develop his own electronic spreadsheet that he referred to as FIPS ("Financial Information and Planning System"). *See id.* at ¶¶ 13-59.

By January 1983, Stephenson had developed much of the user interface for his spreadsheet program including the menu command hierarchy. *See* Tr. Ex. 1014. By April 1983, Stephenson installed at his client's business an operational version of his spreadsheet program, which had substantially the same menu hierarchy as the January 1983 version. That hierarchy is differently expressed from the hierarchy of both VisiCalc and 1-2-3. *See* Tr. Ex. 1019; Stephenson Affdvt. ¶¶ 56-60.

Stephenson first saw 1-2-3 in operation in February 1983, after he had developed the menu hierarchy for FIPS. Throughout the rest of that year, he continued to improve FIPS, changed its name VP-Planner, and began to consider marketing his program. By December 1983, Stephenson entered into a letter of intent with Adam Osborne regarding publication of VP-Planner. Osborne thereafter organized defendant Paperback Software. Stephenson Affdvt. ¶¶ 66-82.

Throughout 1984, defendants continued to improve VP-Planner. In the autumn, they recognized the success of 1-2-3 and reached the conclusion that spawned this litigation: VP-Planner, in order to be a commercial success, would have to be "compatible" with 1-2-3. "The only way to accomplish this result," defendants believed, "was to ensure that *the arrangement and names of commands and menus in VP-Planner conformed to that of Lotus 1-2-3.*" *Id.* at ¶ 117(emphasis added). *See generally id.* at ¶¶ 99-130. Such compatibility would allow users to transfer spreadsheets created in 1-2-3 to VP-Planner without loss of functionality for any macros in the spreadsheet. Also, such compatibility would allow users to switch from 1-2-3 to VP-Planner without requiring retraining in the operation of VP-Planner.

To some degree at least, defendants' premises have proved incorrect in hindsight. That is, first, as Excel has proved, a spreadsheet program did not have to be exactly compatible with 1-2-3 in order to be a commercial success. Second, copying the menu structure was not the *only* way to achieve aspects of this desired compatibility. For example, defendants could have instead added a macro conversion capability as the creators of Excel have successfully done (the Microsoft Excel Macro Translation Assistant), and could have provided an online help function that would show users the VP-Planner equivalent for 1-2-3 commands. *See Excel Reference* Guide at 491, 425-26 (Tr. Ex. 79). *See also* Morgan Decl. ¶¶ 3-7 (Docket No. 308) (Lotus itself created a "macro conversion utility" to translate macros among different-language editions of 1-2-3 (*e.g.*, North American, international English, French, German, Italian, Spanish. and Swedish)); Turner Decl. ¶ 10 (Docket No. 309). These points do not weigh significantly in the present decision, however, because even if VP-Planner otherwise would have been a commercial failure, and even if no other technological ways of achieving macro and menu compatibility existed, the desire to achieve "compatibility" or "standardization" cannot override the rights of authors to a limited monopoly in the expression embodied in their intellectual "work."

Defendants admit that, once these fateful decisions were made by Stephenson and Osborne, defendants converted VP-Planner into a program more like 1-2-3—indeed, a program that they have publicly advertised as a "workalike for 1-2-3." *VP Planner* Manual 1.11 (1985) (Tr. Ex. 9). It is incontrovertible that, in the process, they copied the expressive elements of 1-2-3 that the court has concluded are copyrightable:

> [M]aking the changes required for macro compatibility meant that we had to revise existing elements of the [VP-Planner] spreadsheet interface, including the hierarchical menu structure; ensure that keystroke sequences would bring about the same operational result in both programs; add certain functional elements found in Lotus 1-2-3 which VP-Planner did not yet support; and discard certain features which, although beneficial, were inconsistent with the macro compatibility requirement . . . .
>
> Several types of changes were required in the VP-Planner program to achieve keystroke macro compatibility. First, the menu structure had to be altered so that all menu commands would have the same first letter and be in the same location in the menu hierarchy as in Lotus 1-2-3.

Stephenson Affdvt. ¶¶ 144, 146. *See generally id.* at ¶¶ 142-157. After these changes were made, the VP-Planner manual could truthfully declare:

> VP-Planner is designed to work like Lotus 1-2-3, keystroke for keystroke. . . . VP-Planner's worksheet is a feature-for-feature workalike for 1-2-3. It does macros. It has the same command tree. It allows the same kind of calculations, the same kind of numerical information. Everything 1-2-3 does, VP-Planner does.

VP-Planner Manual at xi. 1.11.

The court's comparison of the 1-2-3 menu command hierarchy and the VP-Planner menu hierarchy confirms that VP-Planner "has the same command tree" as 1-2-3—that is, that defendants copied the expression embodied in the 1-2-3 menu

hierarchy. It is true that there are some differences between 1-2-3's menu structure and VP-Planner's menu structure. For example, most VP-Planner menu lines begin with a help ("?") command, and some additional commands are included at the end of some menu lines (*i.e.*, "DBase, Multidimensional" on the "/File Erase" menu line; and "Page #, No Page #, Row/Col. #, Stop Row/Col. #, Background" on the "/Print Printer Options Other" menu line). Other differences between the two programs appear in the start-up screens, the placement on the screen of the menu lines, the exact wording of the long prompts, the organization of the help screens, the increased width of the VP-Planner screen, and the ability of VP-Planner to hide certain columns. *See* Stephenson Affdvt. ¶¶ 161-176. The works are, nevertheless, substantially, indeed, strikingly, similar. As Judge Learned Hand held in a copyright case involving a pattern on a bolt of cloth that was used to make dresses, infringement may be found despite some differences between two works:

> the ordinary observer, unless he set out to detect the disparities, would be disposed to overlook them, and regard their aesthetic appeal as the same. That is enough; and indeed, it is all that can be said, unless protection against infringement is to be denied because of variants irrelevant to the purpose for which the design is intended.

Peter Pan Fabrics, 274 F.2d at 489, *quoted in part with approval, Concrete Machinery*, 843 F.2d at 607. *See also Atari v. Philips*, 672 F.2d at 618 ("[A] laundry list of specific differences . . . will not preclude a finding of infringement where the works are substantially similar in other respects. . . . When analyzing two works to determine whether they are substantially similar, courts should be careful not to lose sight of the forest for the trees.").

From the perspective of both an expert and an ordinary viewer, the similarities overwhelm differences. Thus, as in *Peter Pan Fabrics*, the two works at issue are substantially similar. Indeed. by using the option in VP-Planner that allows a user to move, the menu from the bottom of the screen to the

top of the screen' a user could easily think 1-2-3 rather than VP-Planner was the program in use. Certainly purchasers of a book designed to teach users how to master 1-2-3, which is distributed with demonstration copies of *VP-Planner*, would be likely to overlook the disparities between 1-2-3 and VP-Planner. *See* L. Ingalsbe, *Lotus 1-2-3 with Version 2.0 for the IBM PC* (1987) (Tr. Ex. 215).

Moreover, even if some elements of VP-Planner were very different, it would not give defendants a license to copy other substantial elements of 1-2-3 verbatim. If one publishes a 1,000-page book of which only a 10-page segment is an unauthorized reproduction of copyrighted material, and if the 10-page segment is a qualitatively substantial part of the copyrighted work, it is not a defense to a claim of infringement that the book is 99% different from the copyrighted material. *Sheldon*, 81 F.2d at 56 ("no plagiarist can excuse the wrong by showing how much of his work he did not pirate"); *SAS Institute*, 605 F.Supp. at 829-30. Thus, defendants' proof that VP-Planner has many features that are different from Lotus 1-2-3 is off point. The more relevant question is: does it have significant features that are substantially similar? I conclude, on the record before me, that there is no genuine dispute of material fact on this question. The answer to this question must be "yes."

Accordingly, I conclude that it is indisputable that defendants have copied substantial copyrightable elements of plaintiff's copyrighted work. I therefore conclude that, subject to consideration of other contentions advanced by defendants, liability has been established.

VII. A POSTSCRIPT ON THE NATURE OF DECISIONMAKING IN THIS CASE

A. *Policy Arguments and Limitations on the Role of Courts*

Although Parts I through VI of this Opinion are sufficient to demonstrate that defendants have impermissibly copied copyrightable elements of expression embodied in 1-2-3, it may be useful to pause, before reaching the merits of defendants' proffered defenses to liability, to consider the proper use of policy in determining statutory meaning.

As noted in Part III(A)(1), *supra*. the court is directed to look to the "object and policy" of the law in determining the manifested meaning of the law. *Kelly*, 479 U.S. at 43, 107 S.Ct. at 358. The court must, however, be careful that its weighing of the "object and policy" implicit in the law does not override the mandates that are either explicit in the statutory text or implicit in the provisions of the whole law.

Defendants' arguments in this case have urged the court to violate that limitation on the judicial use of policy considerations. That is, in the name of the "object and policy" of copyright law, defendants have argued: (1) that the idea-expression distinction creates unnecessary and counter-productive uncertainty that could be avoided by a bright-line test of copyrightability; (2) that the policy of promoting creativity favors extremely narrow copyright protection in computer programs for anything beyond source code and object code; and (3) that the policy of encouraging standardization mandates the conclusion that a user interface is not copyrightable. Also, in advancing these policy arguments, defendants have obscured the nature of important issues in the case by strained analogies and word games.

Policy arguments advanced without focusing on whether they are inconsistent with the mandates of legislation—along with strained analogies and word games—are fundamentally flawed because they do not take account of limitations on the role of courts, to which counsel as well as courts are obliged to be sensitive. Courts must enforce the mandates of legislation, and even when answering questions of law not answered by those mandates, must do so in a way that respects legislative policy choices, whether explicit or implicit.

Each of defendants' policy arguments addressed below suffers from this fatal flaw.

B. *Strained Analogies and Word Games*

The reasoning that lawyers propose in arguments and judges use in deciding cases often builds on simile, metaphor,

and allusion. All such reasoning is within the scope of what we call analogy, in the broadest sense. When strictly logical deductions from authoritative declarations of law—in constitutions, statutes, and precedents—do not provide answers to questions of law that must be decided in the case before the court. the court turns to analogy. *Cf. Kelly*, 479 U.*S.* at 43. 107 S.Ct. at 358 ("we must . . . look to the provisions of the whole law"). Thus, similes, metaphors, and other forms of allusion are appropriately a part of our efforts to communicate ideas. They are not to be mistaken, however, for logically compelled inferences from authoritative declarations. They are aids to understanding the meaning, not yet authoritatively determined, of the authoritative declarations as applied to circumstances those declarations did not explicitly address.

Defendants strongly urged the court to accept an analogy between a computer program and a "useful article." As explained in Part IV(A) of this Opinion, that proposed analogy is deeply flawed because of an unstated implicit premise that the fact that a computer program is "useful" utterly precludes copyrightability of any expressive elements in it. In the same breath, though, defendants concede, that source code and object code are copyrightable. This concession is itself a demonstration of the vulnerability of the "useful article" argument. The concession makes clear a flaw in the analogical argument for treating a computer program that is "useful" as necessarily nothing more than a "useful article." If no explanation is offered for the exception other than precedent, the analogy itself is challenged by the precedent.

Thus, labeling a computer program as a "useful article" in relation to a claim for copyrightability of nonliteral elements of the user interface, but not a "useful article" in relation to a claim for copyrightability of source code and object code, is engaging in a word game rather than focusing on the merits of the copyrightability issue.

An even more striking word-game argument is defendants contention that in copying the 1-2-3 user interface, they have only copied a "language," and that languages are not copyrightable. *See, e.g.*, Deposition of Steven Cook at 153:23-

154:10 (Docket No. 327); Kocher Affdvt. ¶¶ 13-18 (Docket No. 272); Defendants' Post-Trial Brief at 87-103 (Docket No. 325). Although defendants have not explicitly stated all the essential steps of this argument, by filling the gaps in trying to understand the argument, one may infer the following elements and corollaries of the argument:

(1) Although expression is copyrightable, the language in which the expression is written is not copyrightable. Thus, a book written in English or French may be copyrightable, but the English and French "languages" are not works in which copyright may subsist.

(2) Like books, computer programs, written in computer programming "languages," may be copyrightable, but only the "sets of statements or instructions," and not the "language" in which they are written, are copyrightable.

(3) 1-2-3 has a macro capability or facility that allows a user to "write" her or his own macros. When the user writes a macro, he or she is actually writing a kind of computer "program." *See* 1-2-3 Release 1A User's Manual at 117 (macro "facility gives the 1-2-3 user a true programming capability") (Tr. Ex. 72); 1-2-3 Release 2.01 User's Manual at 3-10 ("1-2-3 includes a number of macro commands that create a powerful programming language") (Tr. Ex. 72B).

(5) The macro, or "program," that the user writes may be copyrightable if original and nonobvious. The "language" in which the macro is written is never copyrightable.

(6) Thus, when defendants copied the menu command hierarchy from 1-2-3, they did not copy a copyrightable element that embodied expression, but rather, copied only the "macro facility language" of 1-2-3, a non-copyrightable element in the public domain.

The vulnerable steps of this argument include, at a minimum:

(1) That "language" has a single, invariable meaning in all discourse about "languages";

(2) That not only languages such as English and French but all other languages as well—including Esperanto, and *Reiss'* coined words, 276 F. at 718, and Pascal—are automatically ineligible for copyright protection (as to vulnerability of this step of the argument, defendants, though invited at trial to do so, have cited no precedent that supports the contention that a "language," even if original, is not copyrightable);

(3) That "language" and "sets of statements or instructions" are opposites, and never the twain shall meet—that is, anything that is a "set of statements or instructions" is not a "programming language," and anything that is a "programming language" is not "a set of instructions."

Just to state these implicit elements of defendants' argument is sufficient to demonstrate that the argument depends on arbitrary definitions of words, adopted for undisclosed reasons. In human experience, words have variable meanings; dictionaries seldom list a single definition for a word. An argument that depends on the proponents' undisclosed definitions of words—and even different definitions as a word is used in different steps of the argument—becomes a word game that obscures the substantive meaning of the argument and is an obstruction rather than an aid to the court's use of the adversary process to inform and thus improve decisionmaking.

Having explored the argument fully to try to understand its true nature, I conclude that defendants' "language" argument about the macro facility of Lotus 1-2-3, like defendants' "useful article" argument examined in Part IV(a), *infra*, is totally without merit.

C. *Policy Arguments for Bright-Line Rules*

One of the themes in defendants' bundle of policy arguments is a plea for bright-line certainty. Indeed, it is a persistent theme throughout defendants' submissions: Software developers would like to know what they may and what they must not copy. The idea-expression distinction, defendants argue, fails to achieve this policy goal; therefore, the court

should adopt instead the bright-line literal-nonliteral distinction.

The yearning for certainty is not unique to this case or to copyright law. But certainty has a price. It reflects a hope that the court will apply hard-and-fast rules despite circumstances that cry out for a judgmental standard of decisionmaking that takes account of circumstances an impartial observer would think relevant to a "just" disposition of the case—which, after all, is one of the declared objectives of the legal system. *E.g.* Fed.R.Civ.P. 1 ("just, speedy, and inexpensive determination of every action").

The more deeply one probes, whether as lawyer or judge, or as an interested observer or critic of the legal system, the clearer it becomes that in many circumstances hard-and-fast rules, despite their initial attractiveness and false promise of certainty, have consequences that offend one's sense of justice. For example, hard-and-fast rules, because they allow for little or no evaluation and discretion, sometimes fail to take account of the competing values underlying the relevant law, and fail even to attempt to find an accommodation that serves conflicting high-value interests as well as possible, and at the lowest possible detriment to each. Professionals in law are forced by the nature of their work to do more probing into the disadvantages of bright-line rules than other observers generally are likely to do. For this reason, professionals are less likely than other observers to expect decisionmaking based on hard-and-fast rules that, in hindsight, seems arbitrarily to disregard relevant circumstances and to deserve the pejorative label "legalistic."

In this case, defendants have nevertheless proposed a bright-line rule that would extend copyright only to source code and object code, and never to nonliteral elements of computer programs. That proposal must be rejected. Not only is the proposed distinction contrary to the statutory mandates discussed throughout this Opinion, but also, it reflects the false hopes that are endemic to trying to apply brightline rules where judgmental, evaluative standards are more appropriate. *Nichols*, 45 F.2d at 121; *Peter Pan Fabrics*, 274 F.2d at 489.

In any event, as noted in Part II, Congress could have constitutionally drawn defendants' proposed bright-line—providing protection only to computer program code and not to nonliteral elements of computer programs—but Congress has not done so. Without a congressional mandate, it would be an abuse of authority for this court, in deciding this case, to use a bright-line test of copyrightability that makes the literal-nonliteral distinction decisive. Instead, the court must adjudicate within the area of protection mandated by Congress.

D. *Opinion Evidence and Premises of Legal Rulings*

Defendants, though disavowing any intent to invite the court to engage in lawmaking, have gone to extraordinary lengths in this case to advance policy arguments that a court can appropriately consider only if, in order to decide the case *sub judice*, it must answer previously unanswered questions about the meaning of relevant constitutional, statutory, and judicial sources of authority. Whether such a determination of previously undetermined meaning of an authoritative declaration is described as lawmaking, as I believe it to be, or instead in some other way—for example, as determining what "old statutes have since become" in circumstances materially different from those existing when the statute was enacted, R. Dworkin, *Law's Empire*, 248-50 (1986)—is of less consequence than how a court goes about deciding meaning for the case at hand. What "facts" or "evidence" shall the court consider? Shall the court consider expert opinions about what the circumstances were at the time the statute was enacted, and how they differ now?

Defendants' submissions have failed to address directly these basic questions about the appropriate role of courts. Implicitly, however, they have asked the court to consider policy arguments as freely as if the court were under no constraints in this respect. Defendants, for example, offered the following opinion testimony of a witness qualified as an expert in computer software development:

> If the law is interpreted to say that a developer may not make a new program that can use the data files and inputs accepted by existing programs, then computer advancement as we know it will be slowed. . . .
>
> I believe that such a decision would throw the entire software industry into confusion. . . . [T]here would be a chilling effect on development and advancement in many areas. . . .
>
> This case has implications about whether or not new, improved programs can read and execute data users created for themselves with an older program. The quantity of data to be affected by this decision is incomprehensively vast. It is not a case about "cheap copies".
>
> If aspects of screen displays that are governed by functionality (such as a command language like the 1-2-3 command structure) are held to be within the scope of copyright protection, then progress in application and systems computer programs could be dramatically slowed in the United States.

Bricklin Affdvt. ¶¶ 176-77, 179-80. *See also* Samuelson & Glushko, *Comparing the Views of Lawyers and User Interface Designers*, 30 Jurimetrics at 137 (concluding on basis of survey that leading user interface designers oppose strong copyright protection for elements of a user interface because such protection would be harmful, rather than helpful, to the industry).

By rulings during trial, the court received opinion evidence of this kind into the "record" in the broadest sense, even though excluding it from consideration in relation to any material adjudicative fact that might be in dispute. Not surprisingly, defendants, though explicitly invited to do so, were never able to identify any "adjudicative fact" question, as that term is used in Rule 201 of the Federal Rules of Evidence, to which opinion evidence such as this would be relevant. The court nevertheless received this evidence, over plaintiff's objection on the ground of irrelevance, because courts are free to consider "evidence" of this type when deciding "legislative" (or "premise") facts. That is, courts may consider

such evidence to resolve disputable assertions of an evaluative nature (either about the past or about the future) or assertions about historical facts, or predictions about future consequences of adopting one or another rule of law, as premises for deciding what legal ruling to make. *Cf.*: F.R.E. 201(a), Notes of Advisory Committee (explaining "legislative facts"). *See also In re Asbestos Litigation*, 829 F.2d 1233, 1245-52 (3d Cir.1987) (concurnng opinion of Becker, J.), *cert. denied*, 485 U.S. 1029, 108 S.Ct. 1586, 99 L.Ed.2d 901 (1988). This is not to say, however, that either the trial court that allows the evidence to be received into the record or an appellate court on review is limited by the rules of admissibility and the standards of review that apply to disputed issues of "adjudicative" fact. *Chastleton Corp. v. Sinclair*, 264 U.S. 543, 548, 44 S.Ct. 405, 406, 68 L.Ed. 841 (1924) ("the Court may ascertain as it sees fit any fact that is merely a ground for laying down a rule of law"). *Cf. Lockhart v. McCree*, 476 U.S. 162, 168-69 n. 3, 106 S.Ct. 1758, 1762-63 n. 3, 90 L.Ed.2d 137 (1986) ("We are far from persuaded, however, that the 'clearly erroneous' standard of Rule 52(a) applies to the kind of 'legislative' facts at issue here."). *See also Dunagin v. City of Oxford, Mississippi*, 718 F.2d 738, 748 n. 8 (5th Cir.1983) (en banc) ("legislative" fact discussion by Reavley, J.) ("If the legislative decision is not binding at this stage, at least it carries great weight. Certainly it cannot be thrust aside by two experts [who were called as witnesses before the trial court] and a judicial trier of fact."), *cert. denied*, 467 U.S. 1259, 104 S.Ct. 3554, 82 L.Ed.2d 855 (1984).

The court having received defendants' proffered evidence into the record for the limited purpose of considering its weight, if any, as bearing on premises of any legal ruling the court might find it necessary to make in deciding the case, plaintiff responded with sharply contrasting opinions in its post-trial brief:

> *First*, the tremendous growth and success of the U.S. software industry is the direct result of the creative and original efforts of its software developers, laboring under the protection of the copyright laws. Innovation has been the key to market success. . . .
>
> *Second*, to the extent that defendants attempt to characterize this struggle as pitting large heartless corporate giants against lonely and defenseless developers working out of their dens and basements, the defendants do not understand what is at stake here. If the elements of a computer program at issue here were to lose their copyright protection, the biggest losers of all would be the small developers. The history of this industry has been one of creative designers who identify an unfilled need in the market and then design and build a superior product to fill that need. . . . [T]he developers' ability to realize substantial rewards for their creative efforts has depended entirely upon the legal protection copyright has afforded their work.
>
> If the defendants could rewrite the law, however, those days would be over. The first time a developer demonstrated an attractive new product at Comdex or Softeach or some other industry gathering, hundreds of programmers in corporate research laboratories around the world would set to work creating their own versions of the program to compete with the original. A major firm, with a staff of talented programmers, could fairly promptly create a clone of almost any new program and, in so doing, rob the author of much of the value of his creative efforts. The original author might have a head start, but that would provide little comfort once the major firms hit the market with their "new" products. . . . If copying were legal, the creators would lose out. It is as simple as that.
>
> It is no accident that the world's strongest software industry is found in the United States, rather than in some other jurisdiction which provides weaker protection for computer programs. The system is working, and there is no reason to change it.

Plaintiff's Post-Trial Brief at 87-89; *see also* Tarter Decl. ¶¶ 72-73 (Docket No. 289) ("[I]nterface design represents one of the most crucial aspects of software design. In order to promote innovation and the evaluation of better software products, it is important that we protect the investment that the best developers make in interface design."); Clapes, *Software, Copyright, & Competition* at 202-03 (arguing that the user interface, which is often the most important feature of a computer program. requires strong copyright protection to encourage further innovation and advancement).

The opinion testimony offered in this case failed completely to focus on circumstances existing at any time Congress acted to enact or amend any part of the copyright law. For this reason, it has little, if any, value in illuminating issues of law presented in this case. It is relevant, of course, that both the text and history of the copyright law manifest a purpose of encouraging innovation and of doing so through copyright protection. At the time of congressional action. however—even as late as the 1976 Act and the 1980 amendments—it was not possible to know how the computer programming industry would change over the ensuing years, and what exact scope of protection would best advance the policy goals in newly developed and now foreseeably developing circumstances. In light of that uncertainty, shall the court consider expert opinions about what the law ought to be today? What if those opinions appear to be inconsistent with the accommodation, struck by the statute now in effect, among competing and to some extent conflicting public policy justifications for broader or narrower copyright protection?

I conclude that a court would be going well beyond even the precedents most receptive to consideration of legislative history if it took into account expert opinions of persons experienced in the field of computer software development that are manifestly inconsistent with the accommodation that Congress struck when it enacted the Copyright Act of 1976 and the most recent amendments of the copyright law. In the 1976 Act, Congress manifested an intention to encourage innovation in the computer programming field, and to do so

through copyright law that explicitly gives substantial protection to innovative *expression* in intellectual "works," including computer programs. Congress made this decision despite expert testimony that extending copyright protection to computer programs might have "disastrous consequences . . . on standardization in electronic data processing," *Copyright Law Revision: Hearings on S. 597 Before the Subcommittee on Patents, Trademarks, and Copyrights of the Senate Committee on the Judiciary*, 90th Congress, 1st Session 589 (1967) (Testimony of Professor Anthony Oettinger), despite academic criticism of the decision to extend copyright protection to computer programs, Breyer, *Uneasy Case for Copyright*, 84 Harv.L.Rev. at 340-351 (concluding that "[c]omputer programs should not receive copyright protection at the present time"), and despite explicit proposals that copyright protect only "the instructions themselves" while leaving others free to otherwise "replicate [another's] program exactly." *Hearings on S. 597* at 571-73 (Statement of EDUCOM) ("Broad copyright protection for programs is unwise and improper . . . [H]ad programming been constantly carried out under the threat of infringement actions charging plagiarism of existing copyrighted programs, it is doubtful whether the grouth of programs and programming techniques of recent years would have been possible."). The 1980 amendments, too, plainly went farther in protecting the interests of the creators of an original software product than defendants' experts now propose (and than some experts at the time proposed, *e.g.*, CONTU, *Final Report* at 56-76 (Hersey, C., dissenting)), even though they did not go as far as proposed by others to whose views Congress then had access.

When a court determines the meaning of the copyright statute in a new context, different from what could have been known to even the most prescient observer at the time Congress acted, the court must respect the congressional mandate—especially with respect to congressional determinations of premise facts—and is constrained to search not for what the court might now independently consider to be the best accommodation of competing interests but instead to deter-

mine an accommodation in this new context that is consistent with the accommodation that Congress enacted for the context to which it spoke. To the extent that expert opinions illumine the comparison between the context to which Congress spoke (the circumstances of software development then existing and predictable future circumstances) and the current context (the changing circumstances of software development now existing and now predictable for the future) the court may and should take them into account. To the extent, however, that expert opinions propose solutions inconsistent with the congressional accommodation, they must be disregarded.

On the basis of the complete record now before me, I conclude that defendants' policy arguments in this case are inconsistent with the accommodation struck by Congress in passing the Copyright Act and its amendments. Moreover, defendants have not demonstrated any significant changes in the premise facts upon which Congress acted, and upon which CONTU rested its recommendations. If anything, user interfaces have become more expressive and more communicative since 1976 and 1980. I thus conclude that I must disregard defendants' experts' prediction of doom for the computer programming industry if copyright is extended to the user interface and other nonliteral elements of computer programs that embody expression, just as Congress disregarded Professor Oettinger's gloomy prediction of "disastrous consequences" and Commissioner Hersey's dissent. Rather, this legal issue must be resolved in such a way as to extend copyright protection, clearly and unequivocally, to those nonliteral elements of computer programs that embody original expression.

E. *Defendants' Policy Arguments Founded On the OTSOG Principle*

One more of defendants' policy arguments deserves attention. Despite statutory mandates supporting the conclusion that elements of the user interface of 1-2-3 are copyrightable, defendants argue that the need to achieve compatibility and standardization compels rejection of that conclusion on policy grounds. Copyrightability of a user interface, they argue, will frustrate the public interest in allowing programmers to achieve innovation by "borrowing" and improving upon ideas of other programmers, and will undermine attempts to achieve compatibility and standardization among different programs. Especially in the vital area of user interfaces, defendants contend, copyrightability will have adverse consequences on encouraging innovation and on the broader public welfare.

Defendants' general contention—that "Progress of Science and useful Arts" cannot occur unless authors and inventors are privileged to build upon earlier progress and earlier innovation—has long been a virtually unchallenged premise in all branches of the law of intellectual property. An early expression of the point is Newton's declaration: "If I have seen further it is by standing on ye sholders of Giants." Sir Isaac Newton, Letter to Robert Hooke, February 5, 1675/1676, *quoted in* R. Merton, *On the Shoulders of Giants: A Shandean Postscript* 31 (1965).[3] This principle, which Merton has referred to as "OTSOG" (based on the modernized "on the shoulders of giants"), *id.* at 270, is also firmly established in our case law:

> In truth, in literature, in science and in art, there are, and can be, few if any, things, which in an abstract sense, are strictly new and original throughout. Every book in literature, science and art, borrows and must necessarily

[3] Newton's now-famous phrase—"on ye shoulders of Giants"—may have been copied, at least in its "total concept and feel," from Bernard of Chartres who, according to Merton, authored the OTSOG aphorism in the early twelfth century when he taught: "we are like dwarfs standing [or sitting, for those dwarfs who prefer safety to far-ranging vision] upon the shoulders of giants, and so able to see more and see farther than the ancients." Merton, *OTSOG* at 178-92. As Merton demonstrates, however, Bernard himself was standing on the shoulders of Priscian, a sixth-century grammarian, who wrote: "The younger [*e.g.*, the more recent] the scholars, the more sharp-sighted." *Id.* at 194-95 (brackets added by Merton). Of course, Prisclan's passage presents only the idea; it took Bernard to express that idea in the metaphor of giants and dwarfs.

borrow, and use much which was well known and used before.

Emerson v. Davies, 8 F.Cas. 615, 619 (C.C. D.Mass.1845) (No. 4,436) (Story, J.). *See also Ecclesiastes* 1:9-10 ("[T]here is no new thing under the sun. Men may say of something, 'Ah, this is new!'—but it existed long ago before our time."). Defendants, however, attempt to squeeze something from the OTSOG cornerstone that is not there.

Two possible applications of OTSOG in the field of computer programming are relevant to this case. First, innovation in computer programming is advanced as each programmer builds upon the ideas of previous programmers. Second, some of the innovative ideas may be expressed in a particular way that is so effective or efficient that the expression becomes standardized throughout the field even though the idea is capable of being expressed in other ways—that is, even though the particular expression is not an essential detail to every expression of the idea. Although both of these corollaries of OTSOG are important to the future of computer programming, neither was embraced by Congress (as explained below) in such a way as to override the public interest in conferring upon an author a right to a limited monopoly in the author's "work."

The metaphorical "shoulders of giants" on which successors may legally stand are not as broad as defendants contend. The legally relevant shoulders of programming giants are their ideas—and do not extend to all of their expressions. The encouragement of innovation requires no more. It is sufficient that programmers are privileged to borrow and improve upon previous ideas—such as the ideas for an electronic spreadsheet and a two-line moving cursor menu. Adequate room for innovation remains even though successors are barred from copying earlier authors' particular expressions—such as the particular structure, sequence, and organization of a menu command system. *Pearl Systems*, 8 U.S.P. Q.2d at 1525.

Of course, if a previous programmer's idea can be expressed in only one or a limited number of ways—such as the rotated "L" screen display or the use of the slash key to

invoke the menu command system—then the expression, too, may be copied. *Morrissey*, 379 F.2d at 678-79. Where, in contrast, the idea is capable of countless ways of being expressed, only inexpensive cloning, and not innovation, would be advanced by allowing programmers to copy the particular way the ideas have been expressed by others.

The second corollary of the "OTSOG" principle relevant to this case concerns standardization. Defendants have argued that 1-2-3, and specifically, 1-2-3's menu structure and macro command facility, has set a *de facto* industry standard for all electronic spreadsheets. Thus, defendants had no choice, they argue, but to copy these expressive elements from 1-2-3. Had they not copied these elements (including the macro facility), users, who had been trained in 1-2-3 and had written elaborate macros to run on 1-2-3 spreadsheets, would be unwilling to switch to VP-Planner. VP-Planner would be a commercial failure. Neither the factual nor the legal predicate of the argument is supportable.

First, defendants' argument ignores the commercial success of Excel, an innovative spreadsheet program that is not compatible with 1-2-3, either in its menu structure or in its macro command facility. Also, defendants argument ignores the alternatives to direct copying that were legally available to them.

As already explained, to the extent that VP-Planner was concerned with compatibility for macros written originally for 1-2-3, VP-Planner could have provided for a translation device that could read 1-2-3 macros and convert them, automatically, into macros that could be run on VP-Planner. Microsoft Corporation successfully included such a capability in Excel and Lotus itself has written such a capability for translating macros among different-language versions of 1-2-3. Defendants have not offered persuasive evidence to show that they could not have done the same with VP-Planner. That "[i]t would have been an extremely complicated task" and would have cost defendants more to do so, Dauphinais Affdvt. ¶ 163, is not a reason for denial of copyright protection to 1-2-3. Copyright protection always has consequences of this kind.

Moreover, to the extent that VP-Planner is an incremental improvement upon 1-2-3 because of its multidimensional database capabilities, defendants could have (1) sought a license to use 1-2-3's menu structure and command facility; (2) offered to sell their new expression of ideas to Lotus for inclusion in future versions of 1-2-3; or (3) marketed VP-Planner as an "add-in" to 1-2-3.

An "add-in" program is a program designed to be used in conjunction with another program. For example, HAL is a program that is used in conjunction with 1-2-3—a user must have both HAL and 1-2-3—which allows a 1-2-3 user to enter commands in simple sentences such as "copy column B to E" rather than by selecting commands from the menus. Tr. Ex. 176. To encourage the creation of add-in programs (which in turn, make 1-2-3 a more attractive program to potential customers), Lotus has published a product called Lotus Developer Tools that helps developers write add-in programs. Tr. Ex. 138. Thus, even if defendants found the first two alternatives unattractive or unattainable (for example, because of Lotus' nonconsent except on unfavorable terms, *see Stewart*, 110 S.Ct. at 1764 ("a copyright owner has the capacity arbitrarily to refuse to license one who seeks to exploit the work")), they could have marketed their multidimensional database capability as an "add-in" for those users interested in that capability. Transaction and marketing costs of the third option would tend to screen out the new product unless its innovative features made it very attractive to potential users, but this functional effect of copyright law would be entirely consistent with the objects and policies of that law as manifested in the copyright statute and judicial precedents. By instead selling a stand-alone product that completely replaces 1-2-3, defendants have not merely sold and profited from only their incremental additional expression. Rather, they seek permission to profit also from copying Lotus' protected expression.

Defendants' standardization argument is flawed for another reason as well. As explained above, one object of copyright law is to protect expression in order to encourage innovation.

It follows, then, that the more innovative the expression of an idea is, the more important is copyright protection for that expression. By arguing that 1-2-3 was so innovative that it occupied the field and set a *de facto* industry standard, and that, therefore, defendants were free to copy plaintiff's expression, defendants have flipped copyright on its head. Copyright protection would be perverse if it only protected mundane increments while leaving unprotected as part of the public domain those advancements that are more strikingly innovative.

Finally, the entire argument about standardization may be questioned on a more fundamental ground. Defendants have cited no statutory provision or precedent that has ever declared that standardization, when not achieved *de jure*, is necessarily in the public's best interest. The court is aware of no such precedent or legislative mandate. A moment's reflection is enough to disclose that the public interest in extensive standardization is a sharply debatable issue. *See, e.g.*, Tarter Decl. ¶¶ 34-45; *cf.* the QWERTY typewriter keyboard (discussed in Farrell, *Standardization and Intellectual Property*, 30 Jurimetrics 35, 36-38 (1989)). Decisive against defendants' contention, in any event, is that the particular way they propose that the court resolve this dispute would reduce copyright protection far below the mandate of the copyright act.

VIII. OTHER DEFENSES

A. *Lack of Subject Matter Jurisdiction*

Section 411 of Title 17 provides that an infringement action may not be brought unless the author has applied for registration of the copyright. If the application is denied, the infringement action may not be brought unless the author serves a copy of the complaint on the Register of Copyrights. "Copyright registration under § 411(a) is a [jurisdictional] condition precedent to filing an infringement action." *Quincy Cablesystems, Inc. v. Sully's Bar, Inc.*, 650 F.Supp. 838, 850 (D.Mass.1986).

Defendants argue that plaintiff's allegations of copyright infringement in 1-2-3's user interface are, in reality, allegations of copyright infringement in 1-2-3's "screen displays." Defendants further argue that plaintiff's registration certificate for 1-2-3 covers only the literal code of 1-2-3, that plaintiff has failed to register the "screen displays" of 1-2-3 as separate audiovisual works, and that this court consequently lacks jurisdiction over allegations of infringement of the "screen displays" of 1-2-3.

This contention borders on the frivolous. First, I emphatically reject defendants' premise, based on yet another word game, that equates the user interface of 1-2-3 with 1-2-3's "screen displays." In ruling that defendants have infringed plaintiff's copyright, I have not ruled that defendants are liable because they copied the "screen displays" of 1-2-3. Rather, I have concluded that defendants copied protected nonliteral elements of expression in the user interface and the underlying computer program.

Second, I conclude that, in any event, plaintiff's registration certificates are sufficient to extend to the "screen displays" of 1-2-3.

By focusing only on "screen displays," defendants have failed to take due notice of the statutory language as it bears on whether copyrightable elements of computer programs include the "user interface" and other nonliteral aspects.

Depending on the sense in which the phrase "screen display" is used, it may be quite correct to say that

> copyright protection of a computer program does not extend to screen displays generated by the program. . . . This distinction results from the fact that the same screen can be created by a variety of separate and independent computer programs. It is somewhat illogical to conclude that a screen can be a "copy" of many different programs.

Softklone, 659 F.Supp. at 455-56.

It is not, though, the screen display itself, in this narrow sense, that is a copyrightable "computer program"—that is, "a

set of statements or instructions . . . to bring about a certain result," 17 U.S.C. § 101. The screen display, understood in this narrow sense, is useless for this purpose unless it is integrated with other parts of the computer program so as to become indirectly part of the means by which the user communicates instructions through the total program to bring about the desired result. Thus, the copyrightable element is not, strictly speaking, the screen display, narrowly understood, but the literal and nonliteral elements of not only the display but also the distinctive way of creating it. Indeed, the *Softklone* court recognized this point:

> Therefore, it is this court's opinion that a computer program's copyright protection does not extend to the program's screen displays, and that copying of a program's screen displays, without evidence of copying of the program's source code, object code, *sequence, organization, or structure*, does not state a claim of infringement.

659 F.Supp. at 456 (emphasis added).

Accordingly, just as using different dialogue does not sanitize from claims of infringement a play that copies the plot and characters from some other copyrighted work with resulting substantial similarity, the fact that the screen display *could* easily be created in many other ways—either to perform the same or to perform very different functions—does not sanitize it from claims of copyright infringement. The critical question, instead, is whether copyright protection is available against creating and using such a screen display—including the manifestation of structure, sequence, and organization in that display—as a part of the "set of statements or instructions" in a program that is designed "to be used directly or indirectly in a computer in order to bring about a certain result."

In any event, it is appropriate to consider "screen displays" in a broader sense that also includes the structure, sequence, and organization of the underlying program as manifested in the menus presented on the screen displays. I conclude that plaintiff's certificates of copyright registration in the "entire

work" of 1-2-3 are sufficient to extend copyright protection to the "screen displays," in this broader sense, of Lotus 1-2-3. *See* TX 1-233-501 (Tr. Ex. 1, covering "entire work" of "1-2-3"), TX 1-233-502 (Tr. Ex. 2, covering "entire work" of "1-2-3 Release 1A"), and TX 1-694-602 (Tr. Ex. 3, covering "computer program text" of "1-2-3 Release 2").

The Copyright Office registers different works in different ways. One registration form may be used for nondramatic literary works (Form TX), different forms are required for audiovisual works (Forms PA and VA), and a different form for sound recordings (Form SR). *Compendium of Copyright Office Practices* § 604 (1984) (hereinafter "*Compendium II*"). *See also* 37 C.F.R. § 202.3(b)(1) (1989). As Congress recognized, however, the seven distinct categories of copyrightable works that are listed as examples in section 102(a) are not mutually exclusive:

> The items are . . . overlapping in the sense that a work falling within one class may encompass works coming within some or all of the other categories.

House Report at 53, *repnnted at* 5666. Thus, in registering a work that defies easy categorization, an author is directed to use the application form "in the class most appropriate to the type of authorship that *predominates* in the work being registered." *Compendium II* § 604 (emphasis added); 37 C.F.R. § 202.3(b)(2). *See also Compendium II* at § 708 ("The appropriate application form is generally determined by the nature of the authorship in which copyright is claimed."); 37 C.F.R. § 202.3(b)(2).

Most computer programs, like 1-2-3, are registered on Form TX as nondramatic literary works. *See Compendium II* at § 702.01 ("computer programs" should be registered as "nondramatic literary works" on Form TX). Some computer programmers, however—notably authors of video games—have instead registered for copyright the screen displays created by the program. *Stern Electronics*, 669 F.2d at 855 (plaintiff "eschewed registration of its program as a literary work and chose instead to register the sights and sounds of

[the video game] as an audiovisual work"); *M. Kramer Manufacturing Co. v. Andrews*, 783 F.2d 421, 442 (4th Cir.1986) ("a copyright in the audiovisual display, which display is created by a computer program, protects not only the audiovisual from copying, but also the underlying computer program to the extent the program embodies the game's expression"). *See also, Atari Games v. Oman*, 888 F.2d at 882 ("Video games, case law confirms, rank as 'audiovisual works' that may qualify for copyright protection."); *Midway Manufacturing Co. v. Artic International, Inc.*, 704 F.2d 1009, 1012 (7th Cir.) (same), *cert. denied*, 464 U.S. 823, 104 S.Ct. 90, 78 L.Ed.2d 98 (1983). This form of registration is particularly appropriate where the chief function, and the bulk of creative expression, of a particular computer program is the creation of a series of pictorial images on the computer screen as with video games.

Other authors of computer programs have applied for dual registrations for computer programs—one "literary" registration to cover the code, and a separate "audiovisual" registration to cover the screen displays. *See Softklone*, 659 F.Supp. at 455-56. This practice has since been rejected by the Copyright Office as duplicative. *See* Library of Congress, Copyright Office, *Registration of Computer Screen Displays*, Docket No. 87-4, 53 Fed.Reg. 21,817 (1988) ("all copyrightable expression owned by the same claimant and embodied in a computer program, including computer screen displays, is considered a single work and should by registered on a single application form"); Copyright Office, "Computer Programs and Related Screen Displays" (Tr. Ex. 1179) (single registration required for computer programs and their screen displays, including video game computer programs); *Compendium II* at § 607 (single registration covers single unitary work); *id.* at § 609 (copyright owner may "make only one basic registration per work"); 37 C.F.R. § 202.3(b)(6) (1989) (same); *Manufacturers Technologies*, 706 F.Supp. at 993; *Broderbund*, 648 F.Supp. at 1133.

In any event, when Lotus attempted to register separately the screen displays of 1-2-3 as an audiovisual work, the

Copyright Office denied the registration. In a letter to plaintiff, Copyright Examiner Julia Huff explained:

> textual screen displays embodied within the computer program that generates them are covered by the registration for the program, without either the need or justification for separate registration for the displays. Because the displays are considered to be an integral part of the program, the authorship in the displays appears to be the same as that contained in the program.

Letter of Jan. 20, 1987, from Huff to plaintiff (Tr. Ex. 1092).

Accordingly, I conclude that Lotus has properly registered 1-2-3 for copyright protection, and that this court does have subject matter jurisdiction over all aspects of this infringement suit.

B. Laches and Equitable Estoppel

Next, defendants argue that plaintiff is barred from any relief under the equitable doctrines of laches and equitable estoppel.

Defendants have the burden of proving laches. *Costello v. United States*, 365 U.S. 265, 282, 81 S.Ct. 534, 543, 5 L.Ed.2d 551 (1961). Thus, to prevail on this affirmative defense. defendants must prove by a preponderance of the evidence (1) that plaintiff inexcusably and unreasonably delayed in bringing this action; and (2) that the delay has prejudiced defendants. *Gardner v. Panama R. Co.*, 342 U.S. 29, 31, 72 S.Ct. 12, 13, 96 L.Ed. 31 (1951); *Puerto Rican-American Insurance Co. v. Benjamin Shipping Co.*, 829 F.2d 281, 283 (1st Cir.1987). Defendants have failed to sustain either part of that burden.

According to defendants, beginning as early as April 30, 1985, "the trade press trumpeted Paperback's soon-to-be-released spreadsheet product [VP-Planner], making no secret that it would look and work like Lotus 1-2-3." Defendants' Post-Trial Brief at 120. VP-Planner was eventually released on October 30, 1985, but, defendants' charge, Lotus waited until January 12, 1987, 438 days later, to bring suit. *Id.*

Even if Lotus did wait fourteen-and-a-half months after learning of VP-Planner's release before commencing this litigation, I find that this delay was neither unreasonable nor inexcusable. Defendants cite *Worcester Brewing Corp. v. Rueter & Co.*, 157 F. 217, 219 (1st Cir.1907), for the proposition that a fifteen-month delay barred plaintiff's trademark infringement damage claim. That case, though, involved a relatively simple claim that defendant infringed plaintiff's trademark "Sterling Ale." Here, as evidenced by the court's lengthy Opinion, plaintiff's claim of copyright infringement in nonliteral elements of the user interface of 1-2-3 was a far more complicated claim, and one that required much more time to evaluate and prepare.

In circumstances such as these, a delay of fourteen-and-a-half months is not only reasonable, but, in fact, is likely to serve both part and public interests in appropriate use of public and private resources for resolution of disputes. As plaintiff aptly asserts: "Prudent business judgment, Rule 11 and basic common sense required Lotus first to ascertain that the threat to its intellectual property interest was serious and that its legal position was sound before filing suit." Plaintiff's Post-Trial Brief at 83. *See* Manzi Decl. ¶¶ 8-11 (Docket No. 293); *Roulo v. Russ Berrie & Co., Inc.*, 886 F.2d 931, 942 (7th Cir.1989) (twenty-one-month delay in filing infringement suit reasonable where "delay in filing was due to [plaintiff's] inquiry into the facts to determine the merit of her claim against [defendant]"), *cert. denied*, ___ U.S. ___, 110 S.Ct. 1124, 107 L.Ed.2d 1030 (1990).

Defendants nevertheless argue that, during the fourteen-and-a-half-month delay, plaintiff at least had a duty to notify defendants that plaintiff considered VP-Planner objectionable and that plaintiff intended to claim proprietary rights in 1-2-3's user interface. Not only did plaintiff fail to so notify defendants, defendants assert, but. in fact, plaintiff affirmatively led defendants to infer that VP-Planner was not objectionable. Accordingly, defendants contend, plaintiff is estopped from recovering against defendant. Defendants' Post-Trial Brief at 131 n. 66 (*citing Precious Metals Associ-*

ates, Inc. v. Commodity Futures Trading Commission, 620 F.2d 900, 908 (1st Cir.1980) (" 'A person is estopped from denying the consequences of his conduct where the conduct has been such as to induce another to change his position in good faith or such that a reasonable man would rely upon the representations made.' ") (in turn *quoting Bergeron v. Mansour*, 152 F.2d 27, 30 (1st Cir.1945))).

In support of this contention, defendants cite a form letter that plaintiff's Supervisor of the Information Center sent to Paperback in January 1986 inquiring as to whether Lotus could use its copy of VP-Planner at any location at plaintiff's business. Tr. Ex. 201. Defendants argue that this letter "suggested that Lotus treated VP-Planner as it treated any other non-objectionable software product." Defendants Post-Trial Brief at 131.

First, defendants have failed to offer any evidence that they did, in fact, draw that inference. Indeed, Steven Cook, Paperback's former president, testified that the form letter was simply returned to plaintiff with the appropriate box checked. and that Paperback did not even retain a copy of the letter. Cook Affdvt. ¶ 24 (Docket No. 299). Second, the court is unable to fathom how any reasonable person could draw that inference from Lotus' form letter. In any event, defendants have cited no authority to support the proposition that Lotus' letter, and Lotus' failure to notify defendants of its internal investigation into possible legal action during the fourteen-and-a-half month hiatus, constitute the kind of actions that support laches or equitable estoppel.

Another reason that defendants have failed to sustain a laches defense is that they have failed to demonstrate, any prejudice.

At the core of defendants' asserted prejudice is the following contention advanced by Paperback's former president:

> If Lotus had sued Paperback within three or four months after the release of VP-Planner, then Paperback would not have continued to market, sell, or develop VP-Planner in its Lotus-compatible form, whether or not the litigation had any merit.

Cook Affdvt. ¶ 33.

In light of defendants' belief that their spreadsheet product, to be successful, had to be compatible with 1-2-3, and defendants' strident insistence that 1-2-3's user interface is not copyrightable, this contention is simply not credible. In hindsight, perhaps, the expense of this lawsuit looms immense, but the court does not credit the testimony that the mere threat of a lawsuit, especially one that defendants assert they deemed frivolous, would have caused defendants' to retreat from marketing a 1-2-3 "workalike" ' spreadsheet program. I find that defendants have not shown that they were prejudiced by any delay.

Accordingly, I find that defendants have failed to sustain either element of a laches defense, or an equitable estoppel defense.

IX. RESERVED RULINGS ON OBJECTIONS

Although ruling on most evidentiary objections during the trial, the court reserved ruling on some Rule 402 objections until after the court had an opportunity to consider the relevance of certain evidence in the context of the entire case. Most notable is evidence proffered by defendants with respect to VisiCalc, which plaintiff asserted was irrelevant to any issues raised by this case.

Although I agree that the "VisiCalc story," in the decisionmaking process reflected in this Opinion, has turned out to be not relevant to any of the equitable defenses, and not relevant to defendants' contention that Lotus itself copied aspects of VisiCalc with 1-2-3, I conclude that the "VisiCalc story" is relevant for background purposes. *See Granite Music Corp. v. United Artists Corp.*, 532 F.2d 718, 720-21 (9th Cir.1976) (admitting evidence of similar musical phrases appearing in works that predate both plaintiff's and defendant's song proper to show, for background purposes, that certain elements were of such ordinary and common occurrence that the probability of independent coincidental production was great). Also, I conclude that this evidence may appropriately be considered for the purpose of deciding premise

facts upon which the conclusions of law with respect to copyrightability rest. *See generally* Part VII(D), *supra*.

With respect to all other reserved evidentiary rulings, the court concludes that they are moot in view of the findings and rulings stated in this Opinion. Moreover, even if the court were to rule explicitly that all of the evidence was admissible, I find as factfinder that none of this evidence alone, nor all of it taken together, would change any of the findings and conclusions contained in this Opinion. That is, even when taken into account, this evidence has so little probative weight that it does not change any finding. Nevertheless, any party wishing an explicit ruling on any reserved evidentiary objection may so move on or before July 19, 1990, identifying specifically each objection on which a more explicit ruling is requested with references, if available, to specific pages in the transcript of the first phase of this trial.

ORDER

For the reasons explained in this Opinion and on the findings and conclusions stated, it is hereby ordered:

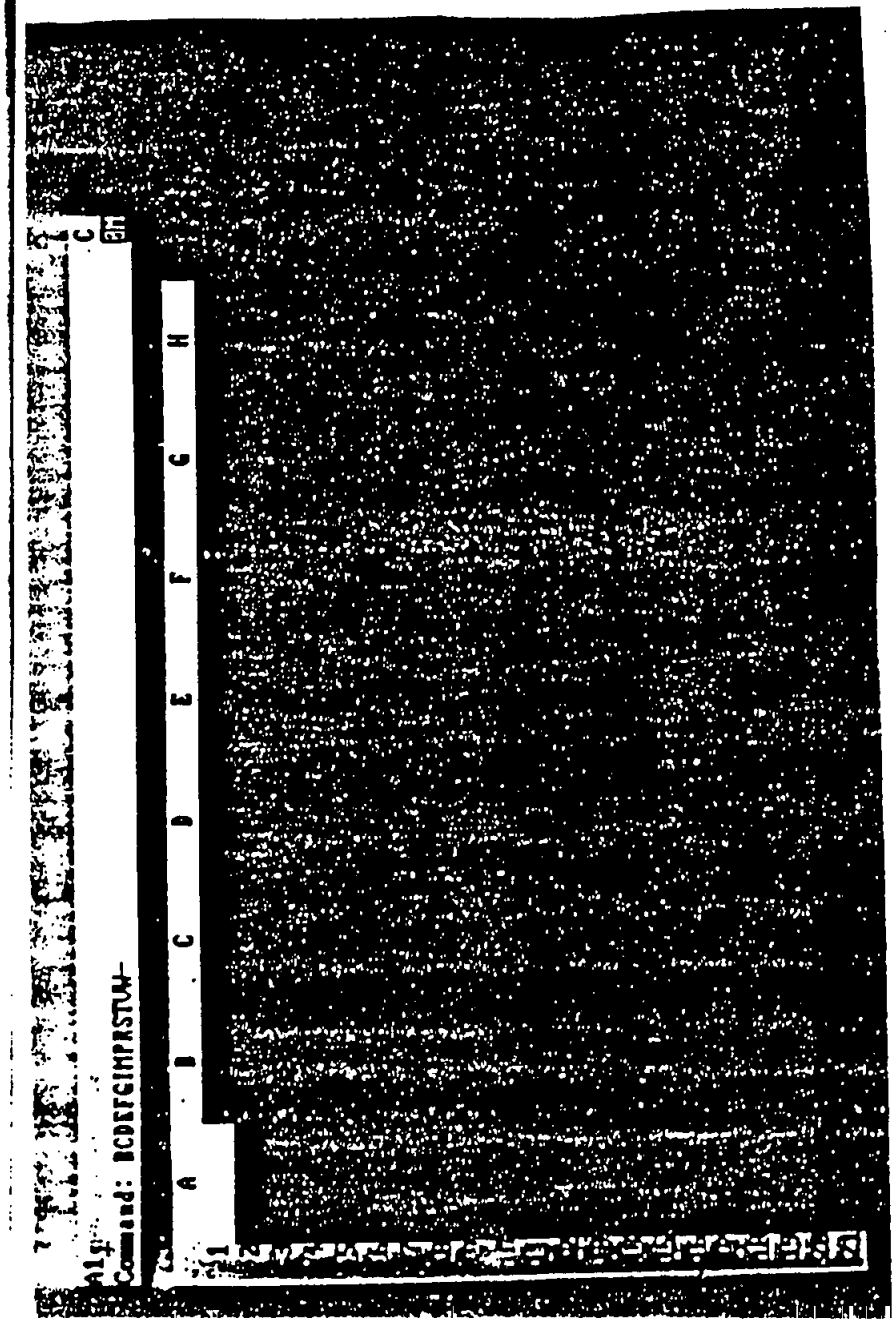
(1) Liability for infringement by defendants' is established.

(2) Any party wishing an explicit ruling on any reserved evidentiary objection may so move on or before July 19, 1990, identifying specifically each objection on which a more explicit ruling is requested with references, if available, to specific pages in the transcript of the first phase of this trial.

(3) A conference with respect to further proceedings will be held as specified in the Joint Procedural Order of this date.

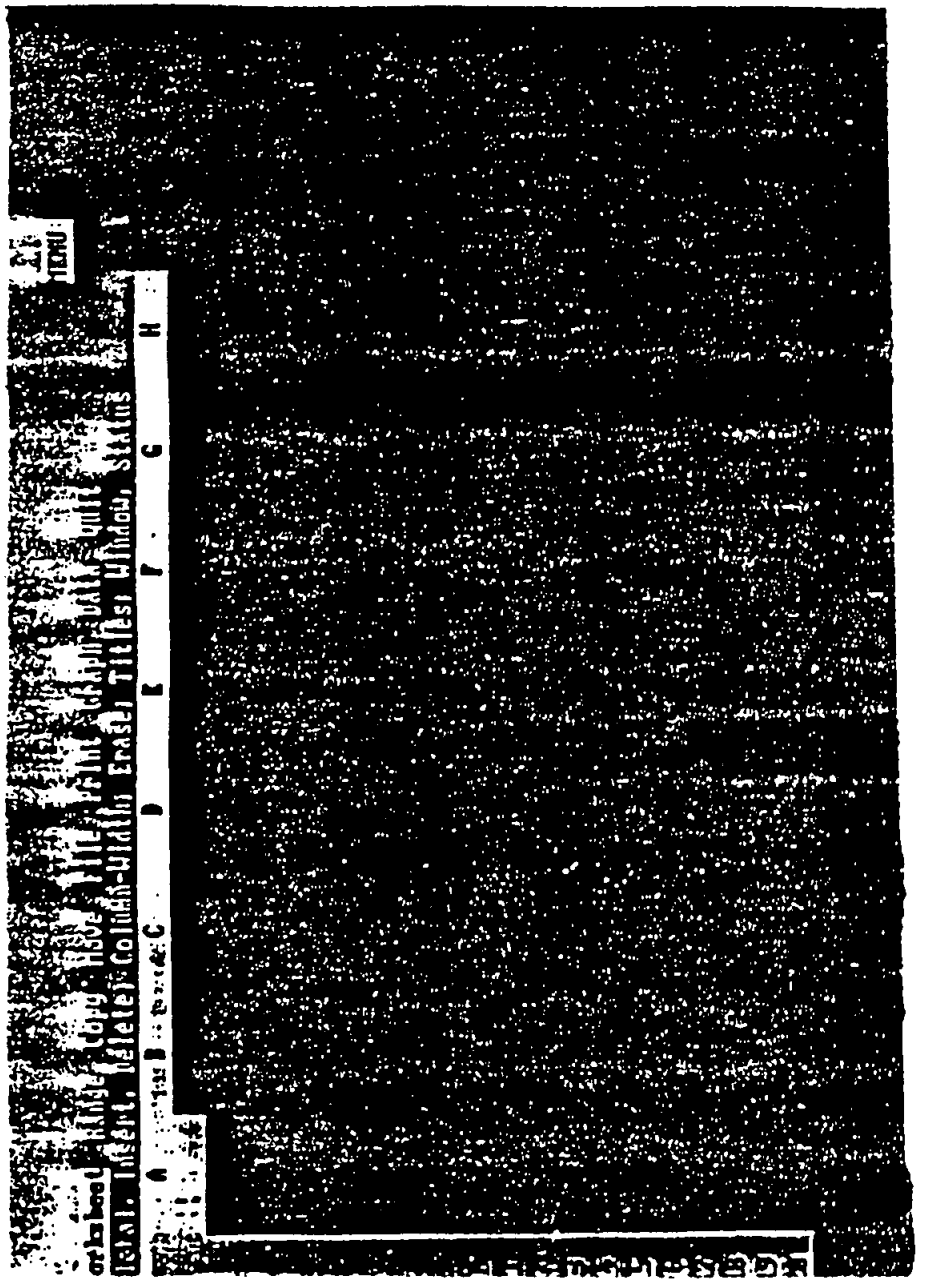
APPENDIX 1

VisiCalc Screen, Main Menu
Tr. Ex. 1047, Tab A1



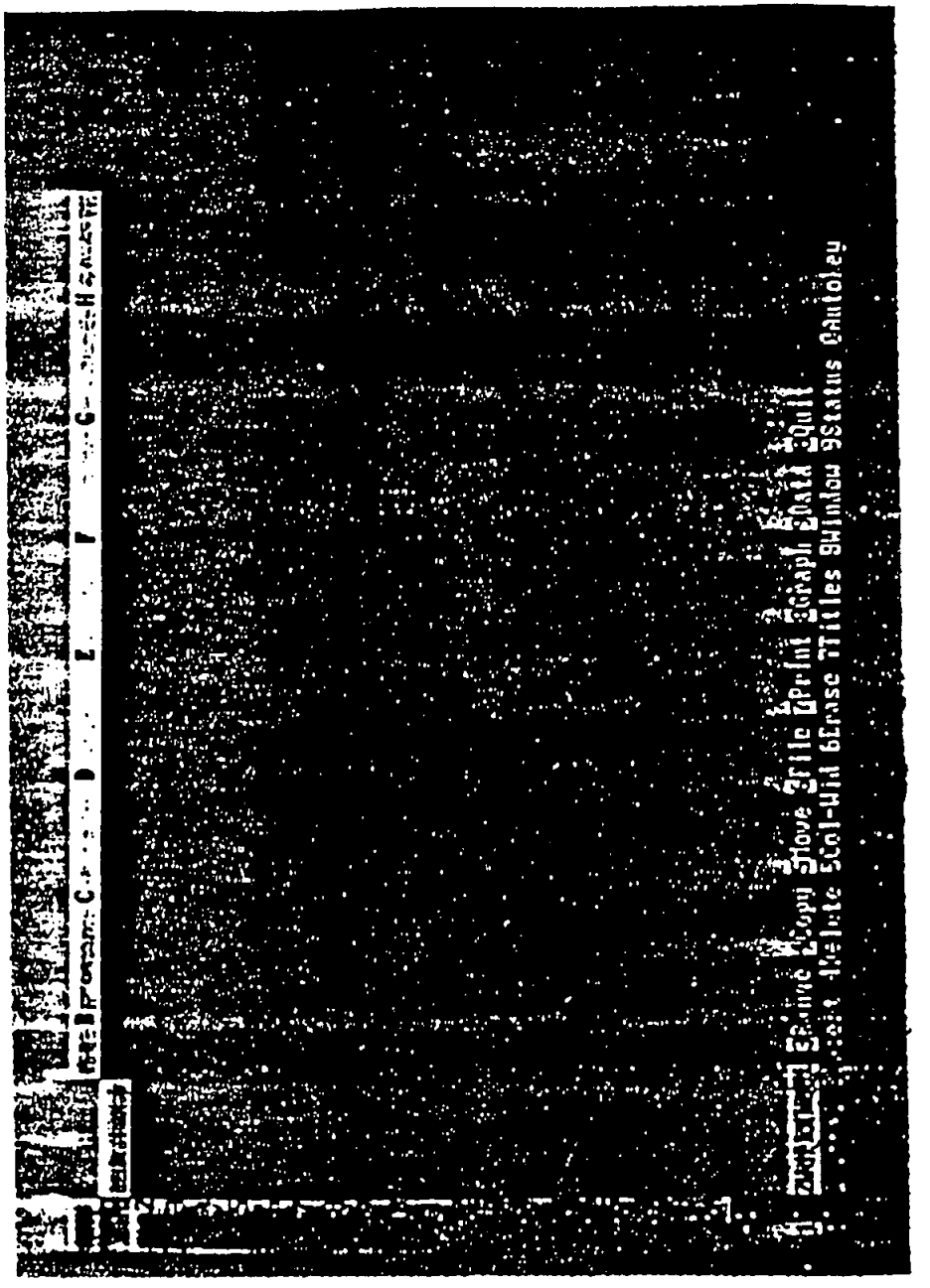
APPENDIX 2

1-2-3 Screen, Main Menu, Worksheet highlighted
Tr. Ex. 1047, Tab A2



APPENDIX 3

VP-Planner Screen, Main Menu, Worksheet highlighted
Tr. Ex. 1047, Tab A4



COPYRIGHT ACT

§ 101. Definitions

Except as otherwise provided in this title, as used in this title, the following terms and their variant forms mean the following:

An "anonymous work" is a work on the copies or phonorecords of which no natural person is identified as author.

An "architectural work" is the design of a building as embodied in any tangible medium of expression, including a building, architectural plans, or drawings. The work includes the overall form as well as the arrangement and composition of spaces and elements in the design, but does not include individual standard features.

"Audiovisual works" are works that consist of a series of related images which are intrinsically intended to be shown by the use of machines or devices such as projectors, viewers, or electronic equipment, together with accompanying sounds, if any, regardless of the nature of the material objects, such as films or tapes, in which the works are embodied.

The "Berne Convention" is the Convention for the Protection of Literary and Artistic Works, signed at Berne, Switzerland, on September 9, 1886, and all acts, protocols, and revisions thereto.*

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* Section 2 of the Berne Convention Implementation Act of 1988, Pub. L. 100-568, 102 Stat. 2853 (Oct 31, 1988), provides the following declarations:

The Congress makes the following declarations:

(1) The Convention for the Protection of Literary and Artistic Works, signed at Berne, Switzerland, on September 9, 1886, and all acts, protocols, and revisions thereto (hereafter in this Act referred to as the "Berne Convention") are not self-executing under the Constitution and laws of the United States.

(2) The obligations of the United States under the Berne Convention may be performed only pursuant to appropriate domestic law.

(*footnote continued*)

A work is a "Berne Convention work" if—

(1) in the case of an unpublished work, one or more of the authors is a national of a nation adhering to the Berne Convention, or in the case of a published work, one or more of the authors is a national of a nation adhering to the Berne Convention on the date of first publication;

(2) the work was first published in a nation adhering to the Berne Convention, or was simultaneously first published in a nation adhering to the Berne Convention and in a foreign nation that does not adhere to the Berne Convention;

(3) in the case of an audiovisual work—

(A) if one or more of the authors is a legal entity, that author has its headquarters in a nation adhering to the Berne Convention; or

(B) if one or more of the authors is an individual, that author is domiciled, or has his or her habitual residence in, a nation adhering to the Berne Convention;

(4) in the case of a pictorial, graphic, or sculptural work that is incorporated in a building or other structure, the building or structure is located in a nation adhering to the Berne Convention; or

(5) in the case of an architectural work embodied in a building, such building is erected in a country adhering to the Berne Convention.

For purposes of paragraph (1), an author who is domiciled in or has his or her habitual residence in, a nation adhering to the Berne Convention is considered to be a national of that nation. For purposes of paragraph (2), a work is considered to

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(3) The amendments made by this Act, together with the law as it exists on the date of the enactment of this Act, satisfy the obligations of the United States in adhering to the Berne Convention and no further rights or interests shall be recognized or created for that purpose.

have been simultaneously published in two or more nations if its dates of publication are within 30 days of one another.

The "best edition" of a work is the edition, published in the United States at any time before the date of deposit, that the Library of Congress determines to be most suitable for its purposes.

A person's "children" are that person's immediate offspring, whether legitimate or not, and any children legally adopted by that person.

A "collective work" is a work, such as a periodical issue, anthology, or encyclopedia, in which a number of contributions, constituting separate and independent works in themselves, are assembled into a collective whole.

A "compilation" is 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. The term "compilation" includes collective works.

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.

"Copies" are material objects, other than phonorecords, in which a work is fixed by any method now known or later developed, and from which the work can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. The term "copies" includes the material object, other than a phonorecord, in which the work is first fixed.

"Copyright owner", with respect to any one of the exclusive rights comprised in a copyright, refers to the owner of that particular right.

The "country of origin" of a Berne Convention work, for purposes of section 411, is the United States if—

(1) in the case of a published work, the work is first published—

(A) in the United States;

(B) simultaneously in the United States and another nation or nations adhering to the Berne Convention, whose law grants a term of copyright protection that is the same as or longer than the term provided in the United States;

(C) simultaneously in the United States and a foreign nation that does not adhere to the Berne Convention; or

(D) in a foreign nation that does not adhere to the Berne Convention, and all of the authors of the work are nationals, domiciliaries, or habitual residents of, or in the case of an audiovisual work legal entities with headquarters in, the United States;

(2) in the case of an unpublished work, all the authors of the work are nationals, domiciliaries or habitual residents of the United States, or, in the case of an unpublished audiovisual work, all the authors are legal entities with headquarters in the United States; or

(3) in the case of a pictorial, graphic, or sculptural work incorporated in a building or structure, the building or structure is located in the United States.

For the purposes of section 411, the "country of origin" of any other Berne Convention work is not the United States.

A work is "created" when it is fixed in a copy or phonorecord for the first time; where a work is prepared over a period of time, the portion of it that has been fixed at any particular time constitutes the work as of that time, and where the work has been prepared in different versions, each version constitutes a separate work.

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

A "device", "machine", or "process" is one now known or later developed.

To "display" a work means to show a copy of it, either directly or by means of a film, slide, television image, or any other device or process or, in the case of a motion picture or other audiovisual work, to show individual images nonsequentially.

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.

The terms "including" and "such as" are illustrative and not limitative.

A "joint work" is a work prepared by two or more authors with the intention that their contributions be merged into inseparable or interdependent parts of a unitary whole.

"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.

"Motion pictures" are audiovisual works consisting of a series of related images which, when shown in succession, impart an impression of motion, together with accompanying sounds, if any.

To "perform" a work means to recite, render, play, dance, or act it, either directly or by means of any device or process or, in the case of a motion picture or other audiovisual work, to show its images in any sequence or to make the sounds accompanying it audible.

"Phonorecords" are material objects in which sounds, other than those accompanying a motion picture or other audiovisual work, are fixed by any method now known or later

developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. The term "phonorecords" includes the material object in which the sounds are first fixed.

"Pictorial, graphic, and sculptural works" include two-dimensional and three-dimensional works of fine, graphic, and applied art, photographs, prints and art reproductions, maps, globes, charts, diagrams, models, and technical drawings, including architectural plans. Such works shall include works of artistic craftsmanship insofar as their form but not their mechanical or utilitarian aspects are concerned; the design of a useful article, as defined in this section, shall be considered a pictorial, graphic, or sculptural work only if, and only to the extent that, such design incorporates pictorial, graphic, or sculptural features that can be identified separately from, and are capable of existing independently of, the utilitarian aspects of the article.

A "pseudonymous work" is a work on the copies or phonorecords of which the author is identified under a fictitious name.

"Publication" is the distribution of copies or phonorecords of a work to the public by sale or other transfer of ownership, or by rental, lease, or lending. The offering to distribute copies or phonorecords to a group of persons for purposes of further distribution, public performance, or public display, constitutes publication. A public performance or display of a work does not of itself constitute publication.

" 'Registration,' for purposes of sections 205(c)(2), 405, 406, 410(d), 411, 412, and 506(e), means a registration of a claim in the original or the renewed and extended term of copyright."

To perform or display a work "publicly" means—

(1) to perform or display it at a place open to the public or at any place where a substantial number of persons outside of a normal circle of a family and its social acquaintances is gathered; or

(2) to transmit or otherwise communicate a performance or display of the work to a place specified by clause (1) or to the public, by means of any device or process, whether the members of the public capable of receiving the performance or display receive it in the same place or in separate places and at the same time or at different times.

"Sound recordings" are works that result from the fixation of a sense of musical, spoken, or other sounds, but not including the sounds accompanying a motion picture or other audiovisual work, regardless of the nature of the material objects, such as disks, tapes, or other phonorecords, in which they are embodied.

"State" includes the District of Columbia and the Commonwealth of Puerto Rico, and any territories to which this title is made applicable by an Act of Congress.

A "transfer of copyright ownership" is an assignment, mortgage, exclusive license, or any other conveyance, alienation, or hypothecation of a copyright or of any of the exclusive rights comprised in a copyright, whether or not it is limited in time or place of effect, but not including a nonexclusive license.

A "transmission program" is a body of material that, as an aggregate, has been produced for the sole purpose of transmission to the public in sequence and as a unit.

To "transmit" a performance or display is to communicate it by any device or process whereby images or sounds are received beyond the place from which they are sent.

The "United States", when used in a geographical sense, comprises the several States, the District of Columbia and the Commonwealth of Puerto Rico, and the organized territories under the jurisdiction of the United States Government.

A "useful article" is an article having an intrinsic utilitarian function that is not merely to portray the appearance of the article or to convey information. An article that is normally a part of a useful article is considered a "useful article".

The author's "widow" or "widower" is the author's surviving spouse under the law of the author's domicile at the time of his or her death, whether or not the spouse has later remarried.

A "work of visual art" is—

(1) a painting, drawing, print, or sculpture, existing in a single copy, in a limited edition of 200 copies or fewer that are signed and consecutively numbered by the author, or, in the case of a sculpture, in multiple cast, carved, or fabricated sculptures of 200 or fewer that are consecutively numbered by the author and bear the signature or other identifying mark of the author, or

(2) a still photographic image produced for exhibition purposes only, existing in a single copy that is signed by the author, or in a limited edition of 200 copies or fewer that are signed and consecutively numbered by the author.

A work of visual art does not include—

(A)(i) any poster, map, globe, chart, technical drawing, diagram, model, applied art, motion picture or other audiovisual work, book, magazine, newspaper, periodical, data base, electronic information service, electronic publication, or similar publication; (ii) any merchandising item or advertising, promotional, descriptive, covering, or packaging material or container; (iii) any portion or part of any item described in clause (i) or (ii);

(B) any work made for hire; or

(C) any work not subject to copyright protection under this title.

A "work of the United States Government" is a work prepared by an officer or employee of the United States Government as part of that person's official duties.

A "work made for hire" is—

(1) a work prepared by an employee within the scope of his or her employment; or

(2) a work specially ordered or commissioned for use as a contribution to a collective work, as a part of a motion picture or other audiovisual work, as a translation, as a supplementary work, as a compilation, as an instructional text, as a test, as answer material for a test, or as an atlas, if the parties expressly agree in a written instrument signed by them that the work shall be considered a work made for hire. For the purpose of the foregoing sentence, a "supplementary work" is a work prepared for publication as a secondary adjunct to a work by another author for the purpose or introducing, concluding, illustrating, explaining, revising, commenting upon, or assisting in the use of the other work, such as forewords, afterwords, pictorial illustrations, maps, charts, tables, editorial notes, musical arrangements, answer material for tests, bibliographies, appendixes, and indexes, and an "instructional text" is a literary, pictorial, or graphic work prepared for publication and with the purpose of use in systematic instructional activities.

(As amended Dec. 12, 1980, Pub. L. 96-517, § 10(a), 94 Stat. 3028; Oct. 31, 1988, Pub. L. 100-568, § 4(a)(1), 102 Stat. 2854-55; Dec. 1, 1990, Pub. L. 101-650, Title VII, § 703, 104 Stat. 5133; June 26, 1992, Pub. L. 102-307, Title I, § 102, 106 Stat. 266.); Oct. 28, 1992, Pub. L. 102-563, § 3, 106 Stat. 4248.)

§ 102. Subject matter of copyright: In general

(a) Copyright protection subsists, in accordance with this title in original works or 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. Works of authorship include the following categories:

(1) literary works;

(2) musical works, including any accompanying words;

(3) dramatic works, including any accompanying music;

(4) pantomimes and choreographic works;

(5) pictorial, graphic, and sculptural works;

(6) motion pictures and other audiovisual works;

(7) sound recordings; and

(8) architectural works.

(b) 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.

(As amended Dec. 1, 1990, Pub. L. 101-650, Title VII, § 703, 104 Stat. 5133.)

§ 103. Subject matter of copyright: Compilations and derivative works

(a) The subject matter of copyright as specified by section 102 includes compilations and derivative works, but protection for a work employing preexisting material in which copyright subsists does not extend to any part of the work in which such material has been used unlawfully.

(b) The copyright in a compilation or derivative work extends only to the material contributed by the author of such work, as distinguished from the preexisting material employed in the work, and does not imply any exclusive right in the preexisting material. The copyright in such work is independent of, and does not affect or enlarge the scope, duration, ownership, or subsistence of, any copyright protection in the preexisting material.

§ 117. Limitations on exclusive rights: Computer programs*

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

(1) that such a new copy or adaptation is created as an essential step in the utilization of the computer program in conjunction with a machine and that it is used in no other manner, or

(2) that such new copy or adaptation is for archival purposes only and that all archival copies are destroyed in the event that continued possession of the computer program should cease to be rightful.

Any exact copies prepared in accordance with the provisions of this section may be leased, sold, or otherwise transferred, along with the copy from which such copies were prepared, only as part of the lease, sale, or other transfer of all rights in the program. Adaptations so prepared may be transferred only with the authorization of the copyright owner.

(As amended Dec. 12, 1980, P.L. 96-517, § 10(b), 94 Stat. 3028.

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* Section 117 as amended by the Act of Dec. 12, 1980, Pub. L. 96-517 (94 Stat. 3015). Prior to this amendment, Section 117 read as follows:

§ 117. Scope of exclusive rights: Use in conjunction with computers and similar information systems

Notwithstanding the provisions of sections 106 through 116 and 118, this title does not afford to the owner of copyright in a work any greater or lesser rights with respect to the use of the work in conjunction with automatic systems capable of storing, processing, retrieving, or transferring information, or in conjunction with any similar device, machine, or process, than those afforded to works under the law, whether title 17 or the common law or statutes of a State, in effect on December 31, 1977, as held applicable and construed by a court in an action brought under this title.

UNITED STATES DISTRICT COURT
DISTRICT OF MASSACHUSETTS

Civil Action No. 87-0076-K

LOTUS DEVELOPMENT CORPORATION,

Plaintiff,

—vs.—

PAPERBACK SOFTWARE INTERNATIONAL and STEPHENSON SOFTWARE, LTD.,

Defendants.

Civil Action No. 87-0074-K

LOTUS DEVELOPMENT CORPORATION,

Plaintiff,

—vs.—

MOSAIC SOFTWARE, INC.,

Defendant.

AFFIDAVIT OF MITCHELL D. KAPOR

MITCHELL D. KAPOR, being duly sworn, deposes and says:

1. My name is Mitchell D. Kapor and I reside in Brookline, Massachusetts.

2. I make this affidavit to provide testimony in the Phase I trial of the above-captioned actions.

3. I am the Chairman of the Board and Chief Executive Officer of ON Technology, Inc.

* * *

[*][1]

8. In November 1977, I purchased my first personal computer, a Radio Shack TRS-80, and began writing computer programs for use with that computer.

9. In July 1978 I bought an Apple II personal computer and became an independent software consultant, specializing in developing software for the Apple computer.

10. In early 1979 I formed Micro Finance Systems ("MFS"), a computer software development company.

11. By 1979 I had created, designed and written a computer program called Tiny Troll, the first graphics and statistics software package for the Apple II personal computer. Tiny Troll was published by MFS.

12. In 1979 I also enrolled in the Accelerated Masters Program at the Sloan School of Management at MIT, eventually completing three of the requisite four terms of the program.

13. In the fall of 1979, while at the Sloan School, I was approached by the principals of Personal Software, Inc. ("PSI") to inquire whether MFS was interested in creating a software program for PSI to publish, market and sell. I agreed

[1] Bracketed asterisks indicate beginning of page in original document.

to do so. (In addition, during the brief period from approximately April to August of 1980 I was employed by PSI in California).

14. Pursuant to a software distribution agreement between MFS and PSI dated November 3, 1979, I created, designed and wrote two computer software programs, known as VisiPlot and VisiTrend, which were first published, marketed and released for [*] sale by PSI in the spring of 1981. VisiPlot was a graphics program and VisiTrend was a statistical analysis and forecasting program.

15. Through the Data Interchange Format ("DIF"), a file format and data exchange protocol that I helped design (and which was eventually released to the public by Software Arts, Inc.), users of VisiCalc (a spreadsheet product), VisiPlot and VisiTrend could transfer data between those programs. For example, data stored in files created using VisiCalc could be displayed graphically by transferring the data to, and then using, the VisiPlot program.

16. In the fall of 1981, the software distribution agreement between MFS and PSI was terminated. I sold all rights to the VisiPlot and VisiTrend products to PSI pursuant to an Agreement and Bill of Sale. (A true and correct copy of the Agreement and Bill of Sale is attached as Exhibit A to this affidavit.)

17. In the Agreement and Bill of Sale, I explicitly retained rights to two of my own product concepts, "EBS" and "I-C-L language system and programs". EBS, or Executive Briefing System, a business/professional graphics program, later became Lotus' first product. I-C-L, a concept for an integrated software package that would include spreadsheet, graphics and other capabilities, served as the foundation for a long process of development resulting in the eventual creation of Lotus 1-2-3.

[*]

18. In January 1982, I founded Professional Software Technology, which in April 1982 was combined with Lotus

Development Company (another company I had created) to form Lotus Development Corporation.

The Conceptual Origins of Lotus 1-2-3

19. The original idea for Lotus 1-2-3 came to me in early 1981, while I was developing VisiPlot and VisiTrend. In the course of using DIF to transfer data from VisiCalc to VisiPlot—a cumbersome process—it occurred to me that a product which, unlike these independent, single-purpose programs, would combine spreadsheet and graphing capabilities in a single, integrated program, could have significant market appeal.

20. In the early summer of 1981, I met with Jonathan Sachs ("Sachs"), who was developing various electronic spreadsheet programs. That June, Sachs joined MFS with what I understood to be non-exclusive rights to one of his spreadsheet programs.

21. After Sachs joined MFS, it became our mutual goal and purpose to create an integrated business software product for a personal computer which would be centrally organized around the spreadsheet metaphor, and which would be superior to existing products.

22. The result of our efforts to attain that goal, Lotus 1-2-3, Release 1.0, was first commercially shipped (or "released") on January 26, 1983.

[*]

23. Throughout the preceding eighteen months, Sachs and I considered hundreds of alternative ideas for virtually every aspect of the product. 1-2-3 ultimately evolved from a careful selection process wherein concepts were often expressed in one form, later disappeared, and then reappeared in another guise—either in 1-2-3 itself or, frequently, in a subsequent Lotus product.

24. The ebb and flow of this continual selection process is reflected in thousands of pages of contemporaneous development notes and documents from my files. True and correct copies of some of these notes, handwritten by me during this development period, are attached to this affidavit as Exhibits B through K. These notes are from files that have been maintained, by me or my attorneys since their creation. It was my usual practice during that time to write on the face of my notes the date of their creation.

25. From the outset, I intended to create a product that would have value for, and appeal to, the broadest possible audience. I wanted the product to attract not only experienced computer programmers or users, but also individuals who had no prior computer or spreadsheet experience.

26. To accomplish this, I determined that it was essential to create a product with a user interface dramatically different from those provided in then-existing spreadsheet products—one that would be easy for the inexperienced to learn and [*] to use, while also providing speed, convenience, and advanced capabilities for the more sophisticated.

27. As my notes of June 18, 1981 (Exhibit B) reflect, early in the development process of 1-2-3 I perceived the user interface as something distinct and separable from the functionality that the spreadsheet program would provide to the user—*i.e.*, the set of operations and functions that the user could perform with the software.

28. Indeed, one of my earliest concepts was to provide a user interface which would permit the user to define his or her own menus of commands, corresponding to the elements of the program's underlying functionality that he or she desired to use. This would, in effect, allow each user to create an individually customized user interface, even if the user had no knowledge of the workings of the program's underlying source code.

29. I had conceived this idea previously in connection with my work on VisiPlot, as my notes of December 29, 1980 (Exhibit C) reflect.

30. This concept, which I came to refer to as a User Interface Generator ("UIG"), is reflected in my notes of March 3 and May 29, 1981 (Exhibits D and E respectively).

Prototype Development

31. From the summer of 1981 through the end of the year, Sachs and I worked on a prototype for a spreadsheet which

* * *

[*]

previous concept for allowing users also to define their own menus. (The concept reemerged later in modified fashion.)

40. I determined that a fixed menu structure was more suitable for the novice spreadsheet users to whom, in large part, we sought to appeal, because it would provide a framework in which such users could learn to approach the solution of spreadsheet problems generally. A fixed menu structure would also help to guide the user through the program's capabilities and to select appropriate operations to solve specific application problems.

41. My early thought to include user-defined menus did survive in one feature of the published version of 1-2-3, expressed as the "/XM" command, which allows experienced users to create their own alternative menus.

42. The fixed menu structure I chose to employ incorporated the two-line moving cursor menu (a concept I first introduced in VisiPlot), which permits the invocation of menu commands from predetermined arrays of choices, and which also provides information about those choices to the user, serving in that respect as a kind of on-line reference.

43. The main elements of the two-line moving cursor menu are: (a) words representing a set of available command options displayed in the top line; (b) long prompts displayed in the second, or lower line, containing information concerning the commands displayed in the top line; and (c) the ability to [*] review, by moving the cursor along the words in the top line, the information concerning each command option in that menu before selecting any command from that menu.

44. I decided to organize these menus hierarchically, meaning that the selection of one command option from the first level menu could lead in turn to another array of command options on a second level menu (or "submenu"), and so on, branching out in a sequence of descending menu levels. This organization enables the novice user to browse through the menu levels, in order to view the valid sequences of available options (and their corresponding explanations) and to map out a plan for performing a particular task.

45. This hierarchical organization of command menus can be described, or visualized, as a "menu tree". Indeed, the menu structure of Lotus 1-2-3 as released is depicted in the accompanying user's manual in an index entitled, "1-2-3 and PrintGraph Command Trees".

46. The choice of words selected to represent commands and their organization in the menu tree, I believed, would be critical to the success of the user interface, especially for the novice user. I believed that the words should not only inform, but also fit into the overall approach to spreadsheet problems reflected in the menu tree. I also believed that the flow of the menu tree—*i.e.*, its internal logic, moving from level to level—should be easy for the user to understand and reflect as [*] closely as possible the user's natural way of thinking, so that the user would never have to think like a computer.

47. These beliefs were, in part, derived from my familiarity with previous spreadsheet products, which I felt were deficient in this regard. For example, the alphabet-like menu structures of some existing products, such as VisiCalc, conveyed too little information to the user, required too much memorization and/or cross-referencing to the printed user's manual, and—because they were not, to a meaningful extent, arranged hierarchically—failed to provide the user with much insight into an effective approach to the solution of spread-

sheet problems or to harnessing the program's underlying functionality.

48. I also believed that two-line moving cursor menus would help the product to appeal to a broader audience because their usage requires only elementary typing skills. My sensitivity to this point was heightened because I cannot touch-type. To invoke the menu commands, the user would need only to use the cursor movement arrow keys and the "Enter" or "Return" key on the keyboard. Users could, however, also invoke commands by hitting the key corresponding to the first letter of the word representing that command on the menu.

Development of 1-2-3; Functional Specification

49. In developing the final product, Sachs was again primarily responsible for writing the source code of the program. [*] His primary focus in January and February 1982 was to reimplement the "core" of the prototype source code—meaning that portion of the code that caused the computer to execute basic spreadsheet operations—in assembly language for the IBM PC.

50. Thereafter through July 1982, Sachs and I concentrated on developing the program's design and continued to experiment with features for the product.

51. During this period, Sachs and I met approximately once a week at the Lotus office in Central Square in Cambridge, Massachusetts. (Sachs otherwise worked at an office in Hopkinton, Massachusetts).

52. Our method of collaboration was much the same as it had been in the prototype stage. At our meetings, Sachs typically demonstrated the latest version of the program, incrementally enhanced from the previous version as a result of his incorporation of our previous suggestions, comments and ideas. I would then provide him with my latest ideas for additions or refinements to the product's features, which he would then incorporate into the next version, if possible.

53. In addition to defining the functionality the product would contain, during this period I began the related process of specifying the user interface in more detail. My notes of March 9, 1982 (Exhibit F) contain some of my preliminary thoughts for the 1-2-3 user interface design (including the selection of words to represent individual commands).

* * *

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63. For many of the same reasons, I wanted the software documentation (*i.e.*, the printed user's manual and reference guides that accompany the software) to be written with an audience of new users in mind, and to address a variety of user's perspectives, including non-technical, business and general users. To do so, I believed the manual should be written in concise, non-technical language. In addition, I felt the manual should instruct the user how to accomplish specific tasks, rather than simply describe the manner in which the product performed, as many previous manuals had done.

64. Another issue we considered during this process was how to capitalize on the special function keys provided on the IBM PC keyboard. These keys could be programmed to perform virtually any specific preassigned function.

65. As early as November 1981, I recognized the potential power of these keys and determined to incorporate their usage in some manner in the final product.

66. As development progressed, Sachs and I discussed many possible uses for these keys. For example, we ultimately decided to permit the invocation of the "Help" feature by use of the function keys.

67. I recognized that the assignment to the function keys of commands that users were likely to invoke frequently would complement my overall vision of a product which would be accessible to novice users (for whom the keys would be easy to [*] identify), while also allowing advanced users to speed through the program.

68. Despite my decision to employ only a fixed menu structure for the product as a whole, during this time I continued to refine my ideas for user-definable menus. For many months I considered including a "command language" in the product, which would enable the user to automate repetitive command sequences. This idea ultimately resulted in the development and incorporation in 1-2-3 of keystroke "macros". A macro permits a user to store a sequence of keystrokes which the user can later instruct the computer to execute by invoking a single command.

69. I was aware of the concept of macros from prior experiences with text editor programs. To my knowledge, no other spreadsheet at the time expressed the macro idea the way we did in 1-2-3.

70. Although there was much give-and-take on the desirability of including macro capabilities, after lengthy experimentation I ultimately decided to do so in the belief that sophisticated users would find them valuable.

71. We also considered the selection of commands to provide to the user for construction and operation of macros. The universe of possible commands was very broad, some of which could present considerable complexity. Ultimately, we determind to include a set of eight commands that we believed would be relatively easy for users of some sophistication to grasp, but [*] would also enhance the functionality of the macro feature to a meaningful degree.

Development of 1-2-3; Menu Structure

72. The essential functionality the product would provide was settled approximately in August 1982. Our primary focus then turned to the precise iteration of the menu tree.

73. From August until about October 1982, I met with Sachs and the other members of our development team, including John Posner, Ezra Gottheil, Mary Goldschmidt and Steve Miller, several times a week to determine each word choice, location and menu arrangement.

74. On my own and collectively with this team, hundreds of hours were spent refining the menus, and dozens of iterations of menus and their organization were proposed. The process induced intense debate at times. In the end, the final decisions were mine.

75. In selecting words for the menus, we struggled to choose words that would intelligently convey to the user the purpose of each command and its underlying functionality, while at the same time ensuring that each word in a particular menu level began with a unique letter. The first concern was based on our desire to make the menus as informative and intuitive as possible. The latter concern derived from the previous design choice to permit the user to invoke menu commands by striking the key corresponding to the first letter of each word; obviously, if [*] more than one word began with the same first letter, the program could not determine which command the user intended by striking the key corresponding to both.

76. Another factor we considered in organizing the menus was my belief—based upon the principle of cognitive psychology that individuals can retain only seven pieces of information (plus or minus two) at a time—that each menu level should contain approximately seven items (or fewer), to be easier to learn and use.

77. I also believed that the hierarchical arrangement of the menus should reflect a structured approach that communicated the product's underlying functionality to the user. For example, I felt that commands representing related features should be grouped together on a single level of the menu tree, with subsequent dependent commands appearing on lower levels of the tree.

78. In addition, in organizing the menus I believed that the commands most likely to be used frequently should be grouped in a broad menu appearing at the top of the menu structure. Similarly, I felt that the commands displayed within a given menu level should appear from left to right in declining order of likely frequency of usage.

79. Because there was no precedent for the menu structure we envisioned, we had no formal market research or other data to guide us in making these determinations. We did, [*] however, conduct a number of informal user tests both internally at Lotus as well as outside the company. In the end, the menu tree organization was based largely on my intuition and subjective judgment, informed by feedback from the user tests, trying as best I could to imagine myself in the rule of a typical user.

80. The numerous possibilities considered in creating the final Lotus 1-2-3 menu structure are exemplified in my contemporaneous notes of May 29, July 24, and August 18, 1982 (Exhibits I, J, and K respectively), which depict the proposed menu structure at various stages of development.

81. Attached as Exhibits L through O to this affidavit are true and correct copies of documents maintained in my files created on or about August 4, August 17, September 22, and October 4, 1982, respectively, which I recognize as reflecting the Lotus 1-2-3 menu structure as it existed on or about those dates.

82. As Exhibits I through O reflect, there were several possible choices for almost every word selected, as well as for its location in the menu trees. For example, the "Copy" command could also have been called "Replicate", "Duplicate", "Repeat", or "Clone".

83. One example of an instance where both the word used to represent a command, and its location in the menu tree, underwent considerable change in the course of development is that of the "Range" command and the commands branching from it.

84. Its origin was an idea I had in April 1982 to [*] include a "named range" feature, whereby the user could refer to ranges of cells in the worksheet by assigning them user-defined names (in addition to referencing them by other means). I thought this feature, not present in any existing product, would be useful for specifying commonly referred-to

ranges on the worksheet, including tables, data to be graphed, and areas to be printed.

85. I originally contemplated implementing this feature through a command called "Name" located on the top menu level, which, when invoked, would display all named ranges the user had previously specified horizontally in the control panel. A user could select a desired named range by moving the cursor to the applicable name and striking the "Enter" key, which would then invoke a submenu containing the following options: Accept, Exit, Edit, Rename, Delete, and Cancel.

86. Throughout the summer I struggled to simplify and refine the "named range" feature. One alternative I considered was to assign a "Name" command to a function key, either instead of or in addition to a "Name" menu command.

87. Finally, following numerous meetings and discussions, in August I decided to replace "Name" in the top menu level with "Range", and to locate a "Name" menu command—permitting the user to create, modify or delete named ranges—in the branching submenu. The feature permitting the user to select previously-specified named ranges from a horizontal display was [*] assigned to a "Name" function key. In September, the command options for the submenu branching further from the "Range Name" commands were selected.

88. During the intensive phase of work on the menus from August to October 1982, another debate erupted regarding the "Worksheet Global" command options. These commands were intended to permit the user to set certain parameters for what we called the "worksheet", including the format, recalculation mode, recalculation order and current and default column widths.

89. These commands initially branched from a command called "Set" located in the top menu level. I became dissatisfied with this structure because I did not believe it gave sufficient emphasis to the "global" or worksheet-wide nature of most of the commands; at the same time, some of the com-

mands following "Set" were not, originally, of that same "global" nature.

90. My initial thought was to replace the "Set" command with a "Global" command option in the top menu. That, however, created an initial-letter conflict because the word "Graph" already appeared in that menu.

91. I had long discussions with my development team regarding alternative words to represent the "Global" command. One possibility suggested was "Default". Again, however, we already had chosen the word "Data" to represent the database branches of the menu tree in the top menu.

[*]

92. I ultimately decided that "Global" was the most descriptive and appropriate word. To resolve the initial-letter conflict with "Graph", I moved "Global" from the top menu to a submenu branching form the "Worksheet" command.

93. A related decision was to reorganize the features permitting the user to set current and default (or worksheet-wide) column widths, both of which originally branched form the "Global" command. I felt this was potentially confusing to the user. The feature allowing the user to set the width solely for the column he or she was then working in (the "current" column) did not logically fit with the rest of the "Global" commands.

94. To provide greater clarity and to present a better-structured approach in the menu tree, I broke these features apart, placing one "Column-Width" command in the submenu branching form "Global", to represent the capability to alter widths for all columns in the worksheet, and another "Column-Width" command in the same submenu as "Global", to represent the feature pertaining to the current column only. That way, the user would be unlikely to mistake the effect of a column-width adjustment, since the user would have to select the "Global" command only in instances when the user desired to make a global change.

95. It also became necessary to change the sequence of the "Global" command submenus as Sachs implemented new [*] functionality. For example, when Sachs initially added the "Iteration" and "Recalculation" features, they both appeared in the submenu directly branching from the "Worksheet Global" commands. Because of a shortage of space on the screen in that menu level, the word "Recalculation" was abbreviated to "Recalc".

96. Ultimately, however, as Sachs continued to refine the program's functionality, we decided to move "Iteration" down one menu level in the sequence, to branch from the "Recalc" command. Once this change was made and additional space was available, I restored "Recalc" to its original form—"Recalculation".

97. We also confronted difficulty in choosing a word to represent the feature that permitted a user to save a selected range of cells (including formulas), rather than an entire worksheet, in a separate file. Originally, and throughout the summer of 1982, this feature was represented by the term "File Extract".

98. In September, when we changed the "File Delete" command option to "File Erase" (to avoid the conflict that arose when we renamed the "File Current" command "File Disk" and, ultimately, "File Directory"), we encountered yet another initial-letter conflict, since it was not possible to have both "Erase" and "Extract" on the same menu level. We could not find an acceptable alternative for "Erase"; thus, we had to reconsider "Extract".

[*]

99. One suggestion was "Partial". As is reflected in Exhibit N, I did not think "Partial" was a satisfactory alternative, because it was not sufficiently informative. One of the members of the team suggested using the non-English word "Xtract", so we could convey the desired information without conflicting keystrokes. "Xtract" is, in fact, the alternative that we ultimately used.

100. In addition to selecting the words to represent each command and determining their organization in the menu tree, from August to October 1982 we also created the corresponding long prompts displayed in the lower line of the menus. Each of the above-mentioned team members participated.

101. In some instances, we wrote brief textual explanations for the commands appearing in the menus. In others, we chose to display the next submenu branching from a particular command. Our decisions in this regard were governed not by a mechanical principle but by a case-by-case consideration as to which type of long prompt would be appropriate to a particular command, with the ultimate goal of providing better information to the user.

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112. In September 1985, Lotus released a new version or upgrade of Lotus 1-2-3, called Release 2.0. I was involved in the development of Release 2.0 primarily in the roles of product design and project management and oversight.

113. Release 2.0's enhancements to the features provided in Release 1A resulted in the addition of a number of commands, and necessitated some changes to the existing menus. For example, the addition of the "Value" and "Transpose" commands to the submenu branching from the "Range" command required the abbreviation of the words "Label-Prefix" appearing in Release 1A to the single word "Label" in Release 2.0, to represent the same command. The addition of a "Hidden" command to the submenu branching from the "Range Format" commands led to a slight change in the order of items within that submenu.

114. However, the user interface of 1-2-3, Release 1A, expanded and modified as necessary to express new capabilities, was otherwise essentially incorporated in Release 2.0.

Signed under the penalties of perjury this 27th day of November, 1989.

/s/ MITCHELL D. KAPOR
Mitchell D. Kapor