PART THREE
UNIQUE ISSUES FACING THE PATENT SYSTEM

XI. PROTECTION OF COMPUTER-RELATED INVENTIONS

A. Introduction and Overview

The growth of the United States computer industry over the past quarter century can only be described as phenomenal. During this period, the number of U.S. software firms has quadrupled, and the size of the software product market has doubled every five years. Twenty-five years ago revenue from marketing of computer programs in the United States totaled an estimated $250 million, excluding software distributed by hardware manufacturers. The latter constituted a large share of the software commercialized at that time. Today, several thousand U.S. software producers—ranging from individuals to large, highly organized teams of computer scientists, software engineers and programmers—generate tens of billions of dollars of revenues.[1] For example, in 1990 the worldwide software market generated revenues of a hundred billion dollars, over half of which was generated in the United States. Packaged software revenues for U.S. software firms alone totaled nearly $20 billion in 1990 and accounted for more than forty percent of the world market of packaged software.[2] Significant additional value is represented by software that is custom developed by enterprises for internal use. Some experts predict that worldwide software revenues will reach one trillion dollars in the year 2000.[3]

Besides being a major industry in its own right, software is a "driver technology" critical to many other industries. Advances in software technology drive technological developments in industries such as aerospace, chemicals and allied products, computers, construction, drugs and pharmaceuticals, electronic components and equipment, machine tools, motor vehicles, and telecommunications. The impact of software development in such industries illustrates the magnitude of importance of software development.

The success of the U.S. software industry has not gone unnoticed. Both Japan and the European Community have targeted the software industry as critical to their worldwide industrial competitiveness. The importance of this industry to them is further evidenced by the rapid increase in the number of patent applications being filed in Japan and Europe for this area of technology. As the market and impact of the software industry grows, this attention will only increase.

B. Overview of the Public Comment

The Commission received over 400 individual comments from the public on the protection of computer-related inventions.[4] The following summary reflects the essence of the public comments that were received.

A broad spectrum of viewpoints on this issue was received from individuals, small and large software or hardware businesses, trade associations, academics, patent attorneys, and bar associations in response to a Request for Comments. The majority of the responses from the public addressed the broad issue of the patentability of computer program-related inventions. Some supported the position that computer program-related inventions should continue to be protected through the patent laws, and others expressed a viewpoint that computer program-related inventions should not be patentable.

Regardless of the viewpoint expressed, there were suggestions that procedural improvements in the patent examination process are needed to adequately protect computer program-related inventions. In addition, a few responses discussed the issue of sui generis protection.

1. Patentability of Computer Program-Related Inventions

(a) Supporting Viewpoint

Many respondents favoring continued protection of computer program-related

inventions through the patent laws pointed out benefits associated with providing such protection, and cited several serious problems which would stem from any change toward restriction of patentability of computer program-related inventions.

Generally, these responses indicated that the current framework of laws provide appropriate protection for computer program-related inventions and that no conflict exists between the co-existence of patent, copyright, and mask work protection. It was pointed out that the Copyright Act does not grant copyright protection for any idea, procedure, process, system, method of operation, concept, principle, or discovery. In contrast, the Patent Act protects the new, useful, and nonobvious process, machine or manufacture embodying the computer program-related invention, but not for the expression of the computer program. When properly granted or registered, these forms of protection cover different aspects of an article, and thus do not conflict with each other.

Any change to the definition of statutory subject matter was strongly opposed by respondents espousing the above view, from both a practical perspective and a Constitutional perspective. It is believed that the present body of court decisions strikes an appropriate balance between the rewards given to an inventor of computer program-related inventions and the public policy against removing mathematical algorithms and laws of nature from the public domain. Many comments stated that, although computer program-related inventions use mathematics or can be understood in terms of mathematics, patents for such computer program-related inventions do not preempt abstract ideas, mental operations, or mathematics. Rather, patents for computer-related inventions are directed to performing commercial and technological methods or processes or to apparatus using programs to control the operations of hardware. These responses reflected a belief that any change to the patentability of computer program-related inventions would have a chain reaction throughout other industries and technologies that use computer technology, e.g., chemical processes, medical technology, automobile industry, televisions, electronics industry, etc.

In addressing the issue of whether computer program-related patents are helpful or harmful to the software industry, computer science, mathematics, or society as a whole, economic studies were cited showing a correlation between economic development and the strength of patent protection. The biotechnology industry was cited as an example of the positive effects of strong patent protection. Some noted the absence of any fundamental difference among the tests imposed under U.S. law, the Japanese Patent Office (JPO) practice, and the European Patent Office (EPO) practice for determining which computer program-related inventions constitute statutory subject matter. Some comments added that any change in the U.S. law would cause those relying on such limited U.S. protection to be at a commercial disadvantage in the foreign marketplace. Several respondents stressed the need for harmonizing or maintaining the harmony of U.S. computer program-related protection with that of other nations. It is believed that any perceived denigration of patent protection in the U.S. when compared to other countries could result in a technology drain from the U.S.

Additionally, it was pointed out that a patent results in the disclosure of valuable technical information that benefits researchers throughout the industry. Such information might otherwise be kept secret if patent protection were not available.

The viewpoint was expressed that patent protection should be afforded to computer program-related inventions in the same fashion that it applies to other inventions. It is believed that the disadvantages of patent protection that are enumerated by others can be addressed by changes in the operation of the USPTO and not by statutory changes that would restrict the definition of statutory subject matter under 35 U.S.C. § 101. This issue is addressed in greater detail in the third position as discussed below.

(b) Alternate Viewpoint

From the group of responses that did not, in general, favor patent protection for computer program-related inventions, the existence of patents in the field of software was stated as being the primary problem with the current framework of laws. These respondents stated that risk, difficulty, and

cost are added to software development activity because techniques used in, and features provided by computer programs may be patented. It was also stated that smaller companies are placed at a relatively greater disadvantage than larger companies in this situation. Specific risks and problems identified by these responses included:

- not being able to find the patents which apply to a program being developed;
- not being able to determine if the patent applies to a particular program;
- not being able to find prior art (e.g., evidence that a technique had been previously used although not published); and
- being able to achieve any amount of certainty requires a lawsuit which is costly in both time and money.

One general viewpoint taken by these responses was that in the field of software, patents do more harm than good. The position was taken that trade secrecy will not be reduced or discouraged with respect to patented features because the general idea will be patented but the detailed code will be kept as a trade secret. It was further urged that patents are not needed for disclosure since many software techniques are reinvented over and over again. It was stated that patents can do harm which is difficult to assess because a program that can be written in a few months can use hundreds of techniques and provide hundreds of features that could easily infringe dozens of patents. The statement was made that more time would be spent in avoiding a patent infringement than in writing code. It was further stated that even getting a patent license for just a few of the innovations common to a new software product would be too costly.

It was further argued that in the past, progress in software development has not been held back by the absence of patent protection. It was pointed out that there has been a profusion of new techniques and features tried out in software, with relatively few being patented. Additionally, it was stated that there is little benefit to society from software patents because technological advances in software development were flourishing before software patents became common.

Another viewpoint within this general position took the approach that the development, distribution, and/or use of a computer program should never be held to infringe any patent. Application of this standard would dictate that a combined hardware/software system could infringe a patent only if the hardware alone does so. Some advocated the idea that every mental process is equivalent in all senses to a mathematical algorithm. It was, therefore, proposed that all patents on mental processes be eliminated, and that a new definition for mental processes be developed which would include mental processes performed by a computer.

In addition, the position was taken that patents have been improperly granted on software features and techniques which are well known to the programming community. Many believed that these patents are being granted because there is an inadequate means for discovering prior art. This topic is further discussed in depth below.

2. *Procedural Improvements in the Examination Process of Computer Program-Related Inventions*

Criticism of the quality of issued computer program-related patents was not limited to respondents objecting to continued patent protection for computer program-related inventions, but came from those generally in favor of such protection as well. Both groups of respondents identified specific problems, and made suggestions for procedural improvement in the patent examination process of computer program-related inventions to address the asserted problems. For example, several commentators suggested that patents were being issued for "obvious" inventions due to a lack of patent examiner appreciation for the state of the computer program-related art.

Many suggested that a large amount of non-patent prior art exists in forms that are not accessible to the patent examiners. Accordingly, several respondents recommended that better art collections and information be provided to patent examiners. An expansion of non-patent art collections was encouraged, and the efforts

begun by the Software Patent Institute to develop a database of prior art were endorsed and supported.

Some pointed to the classification of computer program-related art as a problem making it impossible for examiners to conduct effective searches. Many respondents supported improvements to the classification system for USPTO prior art collections, and expressed support and encouragement for the on-going efforts to reclassify the current USPTO Class 364. However, others submitted that classification of computer program-related technology was impossible and that alternate forms of prior art discovery should be implemented. The need for adequate examiner search tools and the provision of sufficient examination time was stressed regardless of the classification scheme.

Still others submitted that patent examiners handling computer program-related cases lack training and experience in the field due to examiner recruitment policies and procedures that exclude "computer scientists" from the patent examining corps and the patent bar. Thus, recommendations for improving examiner skill levels of those examiners assigned to computer program-related applications were provided. These recommendations included measures such as:

- examiner skill enhancement through internal and external technology training exercises;
- recruitment of examiners from a pool of technically competent software professionals;
- increased pay scales for examiners in this art area; and
- recognition of "computer science" as a "science" for purposes of patent agent registration and examiner recruitment.

Other respondents suggested that it is necessary that software professionals be directly involved in the examination process through peer review activities or through publication for opposition of pending applications. Recommendations directed at post-issuance improvements included establishing streamlined reexamination procedures, or establishing a nullification procedure either within or outside of the USPTO. Some respondents suggested that reexamination or nullification proceedings be *inter partes*.

3. Sui Generis Protection

A few responses expressed the viewpoint that sui generis protection for computer programs should be considered.

The viewpoint was taken that an economic study should be undertaken before the Commission takes a position on the adequacy and appropriateness of patent protection for novel computer program-related inventions. Supporters of this economic study suggested that it analyze not only the economic usefulness of copyrights, patents, and trade secrets for the software industry, but that it also make a broader inquiry about the kind of legal regime which is most likely to ensure that the computer software industry remain a highly innovative and competitive industry. Such responses further stated that if it is found that legal measures currently used to protect innovative computer programs are inadequate, the Commission ought to consider the possibility that sui generis legislation may be necessary irrespective of its specific findings about patents.

C. Recommendations and Discussion

In formulating this report and the following recommendations, the Commission took into consideration the state of the computer software industry, the importance of computer program technology worldwide, the various laws protecting computer programs and related inventions, the deliberations of the Commission, and the viewpoints represented in the public comment. The Commission believes that the following recommendations with respect to patent policy, law, and procedure will strengthen the U.S. patent system as a successful vehicle for promoting the progress of the useful arts, particularly in computer program-related technologies.

Recommendation XI-A

The current framework of laws protecting computer program-related inventions should be maintained.

The Commission, after conducting an extensive analysis of the levels of protection of computer program-related inventions under current laws, and after full consideration of alternatives, concludes that the existing framework of laws should not be changed. The patent laws have successfully adapted to new technologies for over two hundred years, and in each instance have fulfilled their role in promoting the technological innovation and commercial application of such technologies. The basic concept of a limited grant of exclusivity for a full disclosure of the invention continues to provide the most effective incentive for inventors to develop and disclose their innovations. Furthermore, any statutory change in either the levels or nature of available protection will cause more difficulties than benefits, and will risk the effectiveness of protection of U.S. technological innovations abroad. Thus, the most appropriate course for the United States to take is to promote and facilitate the adaptation of the patent system to computer program-related inventions, rather than change the framework of laws which protect such inventions.

1. Overview of the Framework of Laws which Protect Computer Program-Related Inventions

Federal laws for patents, copyrights, trademarks and mask works, and state laws for trade secrets and contracts, make up the current framework of laws protecting computer program-related technology. Each of these has a separate purpose and a separate scope of protection. This framework of protection can be illustrated by considering a hypothetical semiconductor chip which contains a computer program stored in its active and passive elements.

During the development of the chip and its program, the research and development work, internal designs, and specifications may be protected as trade secrets, and, to the extent that these are documented, documentation will receive copyright protection as unpublished works at the time of its creation. Inventions may be made during that development process, for example, in a manufacturing process for the chip, or in a process or machine that includes the computer program. Patents may be applied for to protect these inventions, and any claims which are ultimately allowed may be broad enough to cover a number of different implementations of the invention, whether in hardware alone or in some combination of hardware and software. The statements and instructions making up the program and the expression in the program's structure, sequence and organization will be protected by copyright automatically upon their creation. Those copyright rights may then be registered in the United States Copyright Office. Protection for the photolithographic masks used to create the multiple layers that form the circuits on the chip is available through the Semiconductor Chip Protection Act. Such "mask work" protection is a special purpose ("sui generis") industrial protection that was created just for semiconductor chip technology. This narrow form of protection stands apart from both copyright and patent, as it covers only the physical layout of the metal, insulator and semiconductor layers on the semiconductor base, and does not protect patentable processes, systems, or articles, or copyrightable expression.

Once the chip is produced and commercialized, another intellectual property right can be used to protect the product. Under trademark law, a manufacturer could put a marking on the chip which identifies the source and origin of the chip as being that manufacturer. That marking may function as a trademark, and therefore be protected under the common law of trademarks. These trademark rights can be further protected nationally by registering the marks in the USPTO.

This framework of laws provides balanced protection for different aspects of computer-related technology. There is no conflict between the various Federal laws; there is no preemption of one over the other; and each is complementary to the other. There is also generally no preemption of state trade secret laws or contract law.[5] Thus, the simultaneous existence of different types of property rights in the same object is not a new concept in our legal system. The different forms of protection exist independently under different laws and for different reasons.

2. *Patent and Copyright Protection Compared*

Patents and copyrights have separate and independent statutory bases, require different formalities for protection, have different natures and scopes of protection and confer different rights. Any computer program that is an original work of authorship is entitled to copyright at the time of its creation, but relatively few computer program-related concepts will meet all the tests of patentability. The most basic distinction is that patents may be used to protect a process, machine or manufacture embodying computer program-related inventions, whereas copyrights are designed to protect creative expressions including those contained in computer programs.

Patent protection is established in Title 35 of the United States Code. A patentable invention must fall within defined statutory subject matter, i.e., it must be a machine, process, article of manufacture, or composition of matter. Judicially developed exceptions may exclude inventions that are considered a law of nature, pure mathematics, or a business method. Although one cannot patent a mere idea, one can patent an embodiment of an idea and its functional equivalents. Likewise, if a mathematical algorithm is sufficiently applied to a process or apparatus, the claimed invention can be patented. An examination process ensures that patented inventions are new, useful, and unobvious. These requirements for obtaining a patent are substantially higher than the requirements described below for obtaining a copyright.

A patent gives the patent owner the right to exclude others from making, selling or using the claimed invention for seventeen years. This right applies not only to the invention as described by the claim language but also to functional equivalents of the claimed invention implemented in substantially the same way to achieve the same result. Independent creation is no defense to a claim of patent infringement, even without actual access to the patented work. In exchange for this right to exclude others, the patent owner must disclose the preferred embodiment of the invention in sufficient detail so that others may understand and learn from it. This disclosure furthers the constitutional goal of promoting progress in the useful arts by encouraging disclosure of inventions that might otherwise be held as trade secrets by their inventors.

Copyright protects against copying of a computer program or the use of the program for creation of a derivative work, whether or not the program in question is also used as a part of an inventive process or system. The statutory basis for copyright protection is in Title 17 of the United States Code. This statute specifically precludes the extension of copyright protection to any idea, procedure, process, system, method of operation, concept, principle, or discovery. It is the expression contained in a work of authorship that is protected by copyright. Expression includes literal expression, i.e., the actual expressive words, and non-literal expressions.

International treaty obligations require treaty members to provide copyright protection to literary works, including computer programs, and other works upon their creation. This protection is given without requiring preconditions such as filing, examination, registration or publication. Copyright requires simply that a work of authorship be original. The originality requirement is met if the work originates with the author and has some modicum of creativity. In addition, most copyright laws also require the work to be fixed in some tangible medium of expression.

In the United States, copyright protection gives the owner the exclusive right to make copies, distribute, make derivative works, and publish the work for 50 years after the death of the author or 75 years from the date of first publication of the copyrighted work. The primary function of copyright is to protect against copying. One who independently creates a computer program cannot be a copyright infringer. In other words, independent creation, or originality, is a defense to copyright infringement. However, if an independently created computer program embodies an invention protected by an issued patent, then the fact that the program was independently created will not avoid a finding of patent infringement.

Since patents and copyrights are both created by Federal law, each carries out a

legislative objective of Congress and one is not preempted by the other. Patents and copyrights supplement each other to provide the software innovator with an adequate and effective level of protection of his or her innovation. This is further illustrated by the following resolution which was passed in 1989 by the Patent, Trademark and Copyright Law Section of the American Bar Association:

> [T]he Section of Patent, Trademark and Copyright Law opposes in principle any exclusion of software expression from copyright protection, merely because the software implements, or is part of a patented or patentable process, and opposes in principle any exclusion of software from patent protection merely because the software expression is protected by copyright.

Thus, the Commission recommends that patent and copyright protection should not be altered since both patent and copyright provide balanced and complementary protection for the different aspects of computer program-related inventions. While there may be some issues yet to be resolved in this area, these are best addressed through the evolving case law. This Commission supports the position that any perceived overlap between patent and copyright protection, if it exists, is not a problem.

3. Sui Generis Protection is Unnecessary

History has shown that the intellectual property laws are able to assimilate new technologies as they arise—examples include sound recordings, movies, television, telecommunications, and biotechnology. All of these industries have flourished in part due to the consistent protection which is available. Despite this, some commentators believe that computer programs should have a special or sui generis form of protection because the existing framework of laws does not adequately protect them. The Commission did not find persuasive evidence that existing laws are inadequate or that there exists a need for sui generis protection. The Commission concludes that sui generis protection for computer programs or computer program-related inventions is not necessary, and in fact, is potentially harmful.

The existing intellectual property laws provide a well-balanced set of rights in various aspects of computer-related technology and computer programs. In their current form, the patent laws appropriately protect new and useful computer program-related inventions, and copyright laws appropriately protect creative expression contained in computer programs.

Any new law creating sui generis protection for computer programs would necessarily require interpretation of the meaning of the legislation through case law. Significant development of such case law will require years. Such a lengthy process is not appropriate for rapidly changing technologies—developments in the technology will outstrip the interpretation of the law. For example, some of the basic definitions in the sui generis Semiconductor Chip Protection Act are already obsolete, leaving important parts of mask work technology outside the protection of that legislation. It is better to develop and refine further the body of case law relating to the existing laws than to legislate new laws and begin the interpretive process anew.

Assimilating new technologies into the existing laws is preferable to creating new laws since numerous international treaties relate only to the existing laws. *Sui generis* laws would require new, separately negotiated treaties, and international recognition of the sui generis protection would be limited or nonexistent until the lengthy process of treaty negotiation could be completed, if ever. Such a lacuna in the fabric of protection could pose a disastrous setback for U.S. industry in commercializing products on an international level.

The conclusions of the Commission are consistent with the findings of the international intellectual property community. Specifically, in the late 1970's, the World Intellectual Property Organization (WIPO) sponsored an effort to develop a sui generis system of protection for computer programs. After several years of work, the participants concluded that existing intellectual property systems are adequate, and abandoned their efforts.

For the above-stated reasons, the Commission recommends that the current framework of laws protecting computer program-related inventions not be altered, and in particular that the patent law remain unchanged with respect to those inventions.

Recommendation XI-B

(i) Patent protection should continue to be available for computer program-related inventions.

(ii) No special test or interpretation of the law should be applied to computer program-related patent applications.

(iii) The patent examination process should be improved as specified in Recommendations XI-E through XI-H.

The Commission takes the position that no persuasive rationale exists for excluding new and useful computer program-related inventions from the protection of patent law.

Issues relating to U.S. patent protection for computer program-related inventions include whether such inventions should be patentable, whether Congress should legislate the parameters of such patentability, and whether the present patent system provides an incentive to research and development of computer program-related technology.

4. Patentable Subject Matter

Congress established a broad definition of patentable subject matter in the Patent Act of 1952. As the Supreme Court stated in *Diamond v. Chakrabarty*,

> The committee Reports accompanying the 1952 act inform us that Congress intended statutory subject matter to "include anything under the sun that is made by man." The subject matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting "the progress of science and the useful arts". Congress employed broad language in drafting Section 101 precisely because such inventions are often unforeseeable.[6]

Unqualified denial of patent protection for computer program-related inventions would amount to a legislative declaration that patents on such inventions are, per se, not capable of promoting the "progress of ... useful arts," where "useful arts" is understood to be the entire realm of technological and industrial improvements.[7] To legislate that computer program-related inventions do not constitute such an improvement would necessarily give a new and very limited meaning to what is technological innovation, and would have a broad, chilling effect upon such innovations in the future. There is no fundamental difference between invention in the computer program-related technologies and in other technologies which warrants rendering computer program-related subject matter unpatentable. The Commission, therefore, finds no justification for excluding computer program-related inventions from the broad category of patentable subject matter established by Congress.

While some viewpoints suggest that the development, distribution or use of a computer program should never be held to infringe a patent, the Commission concludes that there should continue to be uniform application of the laws of patent infringement to computer program-related products.

Furthermore, it is considered inappropriate for an all-hardware implementation to be patentable while a program-controlled implementation is not. Computer developments can be implemented in either software or hardware. The option frequently exists to implement inventive electronic systems in fixed (all hardware) circuit form, however, economics and flexibility of design often favor implementations which are inventively controlled in part by software. Whether an invention is implemented in software or hardware should be a choice based solely on technological and economic grounds and not on the availability of patent protection. Furthermore, as a practical matter, it would be administratively impossible for the USPTO to draw a line between a hardware invention and a computer program-related invention.

The Commission takes the position that copyright alone does not adequately protect computer program-related technology since it protects only the creative expressions in computer programs. Much of the value of computer program-related techniques is not in the details of the program code, but in the functional aspects of the methods, processes, and apparatus carried out by the program itself or by its use, all of which are appropriately protected by patent.

The Commission believes that computer program-related inventions, as a class, are not inherently mathematical and, therefore, should not be excluded automatically from patent protection as preempting abstract ideas, mental operations, or mathematics itself. Although many computer program-related inventions either use or can be understood in terms of mathematics, other types of inventions such as mechanical and electrical systems can be understood in terms of mathematics as well. An invention that can be described in terms of mathematics does not preempt mathematics, just as a mechanical device which can be described in terms of physics does not preempt physics. In the field of chemical technology, inventions are described in terms of chemical formulas and notations. In many cases, the formula is the essential part of the claimed invention. This does not preempt a chemist from working with their own notations and making further creations. The claims in virtually all patents issued on computer program-related technology are directed to commercial and technological processes, machines or manufactures which use programs to control the operation of hardware systems. Such claims do not preempt abstract ideas, mental operations, or mathematics, and are clearly patentable.

5. *No Need for Legislation to Change the Scope of Statutory Subject Matter under the Patent Laws*

Although there are some views that Congress should redefine the boundaries of patentability to exclude or restrict patents on most computer program-related inventions, the Commission finds no rationale for excluding new and useful computer program-related inventions from the protection of the patent law. Patent protection should continue to be available for computer program-related inventions. No additional legislative action is needed by Congress in this area.

Congress already legislated the boundary for subject matter eligible for protection under the patent laws, and this includes computer program-related inventions. In enacting the Patent Act in 1952, Congress intended the statutory subject matter to "include anything under the sun that is made by man." It left for the courts the task of applying this expansive definition of statutory subject matter to new and unforeseen technologies, within the broad boundaries legislated by Congress.

The role of the courts in determining the boundaries of statutory subject matter is described in *Chakrabarty*, a landmark Supreme Court decision, which found micro-organisms to be patentable subject matter.

> [O]ur obligation is to take statutes as we find them, guided, if ambiguity appears, by the legislative history and statutory purpose. Here, we perceive no ambiguity. The subject matter provisions of the patent law have been cast in broad terms to fulfill the constitutional and statutory goal of promoting "the Progress of Science and the useful Arts"....
>
> Nothing in Flook is to the contrary. That case applied our prior precedents to determine that a "claim for an improved method of calculation, even when tied to a specific end use, is unpatentable subject matter under § 101"....The Court carefully scrutinized the claim at issue to determine whether it was precluded from patent protection under "the principles underlying the prohibition against patents for 'ideas' or phenomena of nature"....We have done that here. Flook did not announce a new principle that inventions in areas not contemplated by Congress when the patent laws were enacted are unpatentable per se.
>
> To read that concept into Flook would frustrate the purposes of patent law....A rule that unanticipated inventions are without pro-

> tection would conflict with the core concept of the patent law that anticipation undermines patentability.... Congress employed broad general language in drafting § 101 precisely because such inventions are often unforeseeable.[8]

Any continued fine tuning of the interpretation of statutory subject matter can be and has been undertaken appropriately by the courts.[9]

Since boundary issues of patentability are typically quite fact intensive, they are best left to the courts for resolution on a case-by-case basis. Moreover, boundary issues are not unique to the field of computer program-related inventions. The issue of whether Congress or the courts should assume the task of defining the boundaries of patentability for an emerging technology also arose early in the development of the biotechnology industry when the issue was whether novel, non-naturally occurring micro-organisms should be eligible for patent protection. There, the Supreme Court was able to appropriately apply the statute to a new and unforeseen technology. Its holding in *Chakraborty* confirmed the constitutionally prescribed balance between public interest and the rights of the inventor as set forth in 35 U.S.C. § 101.

The Federal courts have successfully met the challenge of applying the broad mandate of Congress to new and unforeseen technologies. By determining the appropriate boundaries at the same time as the technology develops, the courts operate at a pace commensurate with the growth of such technology. No distortion of the Congressional intent behind the patent laws as to statutory subject matter is demonstrated by this pattern of court decisions.

Furthermore, Congress has not acted to amend the broad definition of eligible subject matter it provided 40 years ago. It can be fairly presumed that Congress recognizes the appropriate role of the courts in resolving these fact intensive issues and acknowledges that their application of the laws is reasonable. Indeed, instead of becoming embroiled in patent boundary issues, Congress has affirmed the jurisdiction of the Federal courts over these issues by the creation of the Court of Appeals for the Federal Circuit.

Accordingly, the Commission sees no reason for Congressional action in this area, and favors continued reliance on statutory interpretation by the courts.

6. *Patent Incentive to Software Development*

This Commission takes the affirmative position that patents do promote the progress of the "useful arts," and that patents on computer program-related inventions are no exception.

Some argue that computer program-related patents do not provide an incentive to conduct research and development on new products, do not promote the development of new technology, and do not fulfill the Constitutional mandate of prompting progress in the "useful arts." The Commission notes, however, that during the period of exclusivity, patents foster others to invent around them by finding new solutions and reduce unproductive duplicative research efforts. To this is added the powerful lure of the prospect of exclusive rights to make, use or sell an invention covered by the patent. In many cases, entire industries have developed out of a single patented, technological innovation. Examples of such industries are instant photography, xerography, and telephony.

The Commission also considered the term of patent protection and noted that many inventions in this area of technology have outlived the seventeen-year patent term and continue to be useful beyond their expiration date. For example, the pioneering patent on the use of a cursor has long expired, but that technology is still in use today. Likewise, the technique used in spreadsheet software that recalculates columns when a value in one of the columns changes was patented in the 1960's. That patent has long expired also, but the technique is still in use today.

While some may believe that patents are not necessary for progress in this area of technology because programming techniques and ideas are freely published without patents, the Commission concludes that computer program-related technology is not freely published to a significant degree. Commercial enterprises that

compete in the computer program marketplace do not freely publish their discoveries. Instead, many of the discoveries are kept as trade secrets. Patents are as important to encourage disclosure in the computer program-related technologies as in all other technologies.

There is the viewpoint that patents should not be applicable to this area of technology because of difficulty in finding the patents relevant to particular products, difficulty in determining whether such patents cover those products, difficulty in determining the validity of such patents, and the difficulty and expense of patent litigation. These concerns are not unique to the field of computer program-related technology, but apply to all areas of technology. Nevertheless, some of these concerns may be minimized by the recommendations made to improve the patent examination process for inventions in this field of technology, as well as other recommendations of the Commission.

There is some speculation that new software products may be subject to hundreds of claims of patent infringement. There is no evidence, however, that small or large enterprises are experiencing such a problem. Furthermore, the Commission concludes that computer program-related patents do not hinder new software development products. To the contrary, new products are brought forth into the market everyday.

The Commission believes that some of the concerns expressed above are due to the maturing phase in the time cycle of this technology. In the early life of a new technology, fields of potential innovation are quite broad and one can easily create new products without concern of preceding patents. As the technology matures, innovation becomes more incremental and more attention must be placed on what others have done before. In this respect, computer program-related technology is no different than other technologies.

7. *Research and Development Investment and Patents*

The Commission believes that patents are a valuable catalyst in promoting and advancing research and development, and patents on computer program-related inventions can be expected to equally stimulate industrial and technological development.

Smaller companies believe that their ability to attract investment would not be forthcoming if patent protection is not available for their computer program-related technology. Major companies may have annual R&D budgets of several billion dollars with large portions of those funds directed towards software research and development. Such investment and expenditures can only be justified if it is clear that the valuable results of such research and development can be protected, such as through patent protection.

An innovator has substantial costs due to investments in research and development, and cannot compete long in a marketplace where competitors who have lower or no costs associated with research and development are free to exploit and imitate the originator's innovations. In this regard, patents help "level the playing field" between the innovator with higher research and development costs and the imitator with relatively low research and development costs.

One or two patents on key features may be enough to give an innovator the ability to compete with others in the marketplace. A patent protects against late-comers in the field regardless of the size of the late coming party. In reality, patents may be more beneficial to smaller companies in this regard. The purpose of a patent was never to guarantee the financial success of the patent holder. A patent, however, may provide the opportunity to invest in new technologies and the opportunity for success which may not have existed without patent protection.

Software developers in other countries are filing increasing numbers of patent applications covering computer program-related inventions. These filings reflect the perceived value of this kind of intellectual property protection in the marketplace. The increased filings in this technology throughout the world also suggest that business regards patents as necessary to protect research and development investment.

There is no reason to believe that the patent-created research and development incentive operates in a fundamentally

different way in the computer program-related technologies than in other fields. With any industry, the more rapid the technological progress and product turnover, the greater will be the need for innovation. Patent protection allows the innovator, who has higher costs due to research and development investment, to compete with the imitator or copyist who has lower costs due to little or no research and development expense.

Recommendation XI-C

No change should be made in the U.S. patent laws or in U.S. patent policy that would substantively or procedurally disadvantage U.S. inventors compared to their international competitors.

Recommendation XI-D

The U.S. Government should continue to place emphasis in its negotiations with other countries or multinational bodies that categorically do not grant patents for computer program-related inventions to encourage modification of their systems to allow the grant of such patents.

---

8. Global Competition and Patent Protection

The Commission believes that the competitiveness and growth of industries relying upon computer program-related technology depends upon the strength of the intellectual property protection available to protect this technology. Presently, the United States is the leader—the "innovator"—in this area of technology and has the strongest market for computer program-related products. The U.S. software industry is the largest in the world by any measure. This industry, however, is facing stronger and broader global competition. As this industry matures, competition from abroad will increase, and patents will assume an even greater, and more influential role in protecting U.S.-originated technological innovations. As one report on this industry summarized,

> [w]ith world software sales predicted to reach $1 trillion by the year 2000, software firms could be one of the biggest manufacturing sectors in the United States by the end of the decade.... If American software firms are to continue their world market share expansion and retain their competitive lead, one of their principal challenges is to slow the spread of software infringement around the globe.... As global competition for product innovation and new markets becomes keener, industry relies more heavily on the protection of intellectual property rights.[10]

The continued patentability of computer program-related technology is, therefore, important for the United States' worldwide competitiveness.

In the report from the Council on Competitiveness entitled "Gaining New Ground: Technology Priorities for America's Future", software was identified as one of the critical technologies driving the American economy.[11] That report reflects the strong conviction among leading domestic private-sector executives that unless the Nation acts immediately to promote its position in the critical technologies, U.S. technological competitiveness will erode further with disastrous consequences for American jobs, economic growth, and national security. The report stated that U.S. industry was competing successfully in fields such as computer software that rely heavily on individual ingenuity, and that software was critical to every industry studied under the report. Software technology was also identified as a critical technology by the U.S. Department of Commerce, the U.S. Department of Defense, the Japanese Ministry of International Trade and Industry (MITI) and the European Community.

Advances in computers and software have driven major changes in virtually every other sector of the U.S. economy and are also critical to the national defense. U.S. computer system firms are still the dominant producers in world equipment and software markets, but U.S. leadership is under assault. The U.S. balance of trade has deteriorated substantially in the last decade.

The United States leads the world in highly creative technologies such as software, networks and communications, and computer architecture. Continued success in the knowledge-intensive parts of the industry depends on effective intellectual property protection. [12]

9. Patentability of Computer Program-Related Inventions Internationally

Recent trends in Europe and Japan show strong support for the patentability of computer program-related inventions. All indications are that the patent offices in Europe, Japan, and the United States are operating with substantial harmony with respect to the patentability of computer program-related inventions. In September of 1989, the European Patent Office (EPO), the Japanese Patent Office (JPO), and the USPTO issued a trilateral cooperation document entitled "Patentability of Computer Related Inventions - A Comparative Study."[13] One of the major conclusions of this study was the following:

> It would appear that the concepts of patentable inventions, including those which are computer-related, are not fundamentally different from each other. The basic patentability criterion, namely the technical character of an invention considered as a whole, appears to be commonly accepted. The test or methods used to assess patentability appear to lead, in spite of their different approach, to substantially the same results as can be seen from the typical cases and examples.

For example, the EPO Guidelines interpret the European Patent Convention in a manner similar to the Supreme Court holding in *Diamond v. Diehr*. The guidelines state: "If ... the subject-matter as claimed makes a technical contribution to the known art, patentability should not be denied merely on the ground that a computer program is involved in its implementation."[14] This means, for example, that program-controlled manufacturing and control process should normally be regarded as patentable subject matter. It follows also that, where the claimed subject matter is concerned only with the program-controlled internal working of a known computer, the subject matter may be patented if it provides a technical effect.

In addition, the EPO's Technical Board of Appeals has carried the Guideline's direction farther than the examining corps, overturning a number of subject matter rejections. One German commentator concluded, "[t]he trend in Europe is towards the most generous possible extension, always excluding pure calculating or bookkeeping programs."[15]

In Japan there has not been the same sort of questioning or debate about subject matter coverage, as the JPO published Examination Guidelines for computer-related inventions first in 1975, and again in 1982 and 1988. The distinction between what is or is not patentable computer-related subject matter in Japan appears to parallel U.S. practice. For example, the JPO will accept:

- control system supervised by program computer;
- combinations of software running on a computer and specific hardware to be used in a particular field such as word processors, calculators, and games; and
- methods of controlling or making use of hardware resources and combinations of computer implemented functions and hardware such as operating systems, file access control, file management, microprogram control, error handling, virtual memories, and multiprogram control.[16]

Patent protection for computer program-related inventions is now sufficiently established practice in Japan.[17] The number of such applications has doubled in the past five years, exceeding 12,000 in 1990.[18] These filings, like filings in any other country, reflect the importance of patents in this area of technology and the perceived value of this kind of intellectual property protection in the marketplace.

10. The Example of Biotechnology

The linkage between patentability and international competitiveness is illustrated by the biotechnology industry. After the 1980 Supreme Court decision in *Diamond v.*

Chakrabarty clarified that Congress intended the patent laws to include a wide variety of genetic, plant, and biological methods and processes within the scope of patentable subject matter, the biotechnology industry grew rapidly in the U.S., and significantly less in other countries. In Europe, the patentability of such biological methods and processes has been less certain since 1980. This uncertainty with respect to biotechnology's patent protection in Europe has led a number of European biotechnology businesses to relocate to the U.S. to benefit from protection under U.S. law.

Without strong U.S. patent protection for computer program-related technology, research and development might be shifted to other countries where the protection is more certain. The Commission believes that the worldwide competitiveness of the U.S. industry will be weakened if patent laws in the U.S. give less protection to this technology than the laws in other countries.

11. Disadvantaging U.S. Inventors

U.S. industry is the clear leader in this field of technology, and has been the "innovator" since the inception of computer industry. If computer program-related inventions are no longer protected by patents in the United States, or the effectiveness of existing protection is altered, the U.S. software industry will face an unnecessary and difficult obstacle to domestic and international competition. As patent protection for computer program-related inventions is now established practice in Japan and Europe, any diminishment of such protection in the U.S. will put U.S. inventors and industry at a procedural and substantive disadvantage with respect to their foreign competitors in the United States and overseas. This can be illustrated by considering several facts.

Procedurally, it is more difficult to file for patent protection abroad based upon an invention developed in the United States if a U.S. patent application is not filed first. If computer program-related patent applications cannot be filed here, U.S. inventors would be less likely to patent their inventions in countries which continue to grant computer program-related patents. Foreign inventors would not suffer this procedural obstacle, would not face this disincentive, and would continue to seek and to obtain foreign computer program-related patents.

Substantively, foreign-owned patents could prevent U.S. firms from competing effectively in foreign markets. At the same time, U.S. inventions would be open to appropriation and use worldwide. Since the United States represents the greatest single market in the world for software, U.S. software innovators would not be able to exercise patent rights to protect their products in the U.S. vis-a-vis foreign competitors but would be excluded from counterpart markets in other countries. This situation would seriously disadvantage U.S. software innovators relative to their principal competitors in other advanced industrial nations.

A history of the semiconductor industry shows that U.S. firms need not only a strong foundation in the U.S. market, but significant foreign market penetration as well to achieve economies of scale and amortize research and development costs. The U.S. software and software-driven industries will be seriously disadvantaged if their ability to penetrate foreign markets is weakened.

The Commission opposes any change in laws that would place such a burden on the thriving U.S. software industry and its inventors. Restrictions on computer program-related patentable subject matter could set back U.S. competitiveness at home and abroad.

Recommendation XI-E

The USPTO should assemble a larger, more complete non-patent art collection, and provide its examiners better access to the non-patent prior art in the computer program-related technologies.

The Commission believes that many of the concerns regarding patent protection for computer program-related inventions relate to the effectiveness of the patent application examination process. The problems that are identified with respect to the examination process generally relate to the lack of access by examiners to pertinent prior art, and the level of skill of the

examiners handling computer program-related applications.

Efforts to make available to the examining corps the non-patent literature of computer science are strongly encouraged due to the importance of such non-patent literature in making examination determinations in relation to the rather sparse patent literature at the present time. Examiners need to have access to an excellent, current technical library. In the computer program-related arts, this requires access to the major commercial computerized literature search services. Technical publications, including but not limited to those published by ACM (Association for Computing Machinery), IEEE (Institute for Electrical and Electronics Engineers), and the various special interest groups (SIG), should be available to the examiners for searching.

The Commission recognizes that there are several technical problems facing the USPTO in its efforts to expand its prior art collection in this field. For example, one obstacle is the inconsistent usage of terminology across software trade literature. Another problem the USPTO faces in increasing its collection of non-patent literature is using the format in which much of the computer-program related prior art resides. Existing prior art is not well indexed nor is it easily accessible through traditional literature researching techniques. Solutions to these problems are a necessary element of any comprehensive program to improve the USPTO's prior art collection for computer program-related inventions.

The Commission commends the ongoing efforts of the USPTO in providing patent examiners with up-to-date prior art. For example, the USPTO is pursuing collaborative projects with the private sector, such as the Software Patent Institute, to enhance its collection of non-patent prior art.

The USPTO should continue to support such independent efforts to assist examiners in providing access to information and retrieval resources, and by providing technical support in the form of educational and training programs. Industry support through independent not-for-profit institutions is necessary in this regard, and should be strongly encouraged. The Software Patent Institute, is an example of such an industry effort. Its primary goal is to provide the best available prior art information in the field for utilization by the public and the USPTO. Although the USPTO is responsible for the administration of the U.S. patent system, including the assembly of prior art, public-spirited industry involvement in support of the USPTO's attempts to solve the difficulties associated with the assembly of prior art is appropriate and should be fully supported by the USPTO.

Recommendation XI-F

The USPTO should make further efforts to classify the patent and non-patent computer program-related art to maximize the ability to search inventions in this field.

As in all technologies, a robust, up-to-date, in-depth classification system is essential to effective searching and examination of computer program-related inventions. Increased efficiency could be achieved if the claims-oriented classification system used by the USPTO could be correlated with on-line databases of non-patent prior art. Any such classification of patent and non-patent literature should be widely available for searching by the public, especially programmers, software developers, researchers, inventors and others involved in the technology, as well as by the USPTO patent examiners.

The exploration and adoption of improved data search and retrieval techniques is supported to make these classification efforts even more useful.

The Commission recognizes that the USPTO has undertaken efforts in this area. For example, the USPTO has recently published a proposed revision to the classification schedule for the computer program-related art for the express purpose of obtaining public input.[19] In addition, the USPTO is currently evaluating a flexible concept-based classification searching system which is a step towards its goal of effectively classifying technology in this area. These efforts are commended, and follow up is encouraged.

Recommendation XI-G

(i) The USPTO should train patent examiners in the computer program-related technologies to raise and maintain their level of technical expertise.

(ii) The USPTO should recruit, as examiners, individuals who are experienced in this technology, and take special action to retain experienced examiners.

The Commission recognizes that it is essential for the USPTO to attract and retain examiners who are qualified to effectively and accurately examine patent applications in the field of computer program-related inventions. To do this, the USPTO must hire, retain, and ensure the competence of examiners working in this field through creation of adequate incentives for examiners to remain at the USPTO, and to provide effective training in current technology.

The Commission notes that the USPTO has pursued several initiatives in recent years related to ensuring the level of competence of examiners in this area of technology, including:

- specialized training of examiners for examination of computer program-related inventions;
- publication of USPTO standards for examination of computer program-related inventions;
- efforts to conduct in-house examiner training using experts from the private sector and universities; and
- increased off-site technical training through tuition assistance when funds permit.

It is further noted that the USPTO engages in an aggressive recruiting effort to hire qualified examiners. The USPTO places special emphasis on recruiting candidates with advanced degrees, as well as degrees which provide the candidate with an adequate background in both hardware and software concepts.

All efforts to raise the level of examiner training in this technology are endorsed. The USPTO must make a strong commitment to training of examiners to ensure effective examination. To complement these efforts, public-spirited assistance is needed from industry in providing technical seminars for examiners, on-site visits by examiners, and acting as a source of general technical knowledge and advice (not, however, with respect to any particular application under examination).

Yet, the Commission recognizes that training alone will not provide a long-term benefit if examiners do not stay in their positions long enough to apply their education and experience. Remuneration, working conditions, and benefits should be reviewed to ensure that those who are trained are willing and financially able to remain at the USPTO. Reasonable changes in personnel policies should be considered to encourage the retention of a core of skilled examiners. A special pay scale should be considered for examiners in the computer program-related arts similar to the special pay scale that is now used to hire and retain experienced examiners in the biotechnology field.

The Commission recognizes that recruitment of qualified patent examiners by the USPTO for this field of technology is difficult. Problems are encountered because, unlike other fields, universities do not provide a consistent or uniform standard for degree requirements for computer science. To address this problem, the Commission recommends that the USPTO recruit computer scientists as examiners. An individual should qualify as a computer scientist if the individual had a computer science degree or similar degree from a four-year undergraduate college degree program which meets reasonable standards for computer science curricula. The curriculum should impart a working knowledge of both computer hardware technology and computer software technology, and should be sufficient to enable a graduate to be gainfully employed in the computer industry. The USPTO should not restrict the recruitment of such computer scientists to those computer scientists who also possess engineering or science degrees. The USPTO should hire qualified personnel

in this area of technology without regard to their later ability to transfer these examiners to other art areas.

In addition, the Commission recommends that the USPTO recognize such computer science degree programs or an equivalent level of technical training in the field of computer technology or computer program-related technology for the purpose of qualification to take the USPTO registration examination.

Recommendation XI-H

(i) Encourage the public to use the citation procedure under 35 U.S.C. § 301 and 37 C.F.R. § 1.501 to cite to the USPTO patents or printed publications pertinent to any issued patent. The USPTO should use non-patent citations, where possible, to expand the collection of art available for use in examining pending applications.

(ii) Encourage the public to use the "Protest proceeding" under 37 C.F.R. § 1.291 and the "Public use proceeding" under 37 C.F.R. § 1.292 for pending applications and instruct the public how to become aware of some pending U.S. applications through a database search of foreign applications or through published information on reissue applications. Furthermore, encourage the public to use the "Protest Proceeding" under 37 C.F.R. § 1.291 and the "Public use proceeding" under 37 C.F.R. § 1.292 if the U.S. adopts a system that provides for publication of pending applications.

(iii) The Commissioner should implement a study and/or program under 35 U.S.C. § 6 that expands the citation of prior art under 35 U.S.C. § 301 and 37 C.F.R. § 1.501 to include the citation of not only patents or printed publications but also other material evidencing a verifiable date of prior public use or sale which is shown to be pertinent to an issued patent. Such a study and/or program should be limited to the computer program-related arts, if possible, for a limited period of time. Such a study should be used to determine a) the effectiveness and usefulness of the citation of material evidencing a verifiable date of a prior public use or sale, b) whether this new procedure should be expanded to include other areas of technology, and c) whether a statutory rule change should be made to make this a permanent procedure for all technologies.

(iv) The USPTO should adjust its fee schedule, as it deems appropriate, for the citation of patents or printed publications or other material evidencing a verifiable date of prior public use or sale. Any such fee should discourage the public from submitting non-relevant information, but should not have the effect of discouraging the public from submitting pertinent information which may be used by the USPTO in its examination of patent applications. Such submissions assist the USPTO in fulfilling its mission of issuing valid and enforceable patents.

(v) The USPTO should establish submission guidelines to help ensure the relevancy of the material being submitted and to control the amount of material being submitted including, but not limited to, the following: a) the minimum prima facie standard that the material being submitted must meet, b) the minimum requirement needed to establish a verifiable date of prior public use or sale, e.g., the requirement of

declarations, affidavits, and/or identification of at least one party having knowledge of the evidence, c) the requirement of a precise explanation of relevance of the evidence to at least one claim of a patent, d) a limitation on the number of pages submitted, and e) a minimal level of evaluation by the USPTO of the submitted material to ensure that it meets the submission guidelines as established by the USPTO.

(vi) The USPTO should encourage private efforts directed towards assimilating and organizing information with respect to prior public use or sale of technological advances. The USPTO should initiate studies with the private sector in determining other forms and mediums of information useful to the USPTO in expanding its collection of art for examining pending applications.

---

12. Prior Information Overview

Some believe that in the computer program-related arts, patent examiners may not have ready access to all of the relevant art during examination of computer program-related patent applications. As a consequence, there may be some patents that would not have been granted had the examiners had access to such information. Recommendation XI-H attempts to address this perceived problem by encouraging the public to use existing procedures relating to protest and public use proceedings for pending applications, and existing procedures relating to the citation of patents and printed publications which may be pertinent to one or more claims of an issued United States patent. The Commission also recommends that existing procedures be expanded, via a test program initiated by the Commissioner of Patents and Trademarks, to permit citation of other material having a verifiable date of prior public use or sale which is shown to be pertinent to at least one claim of an issued patent. Such submitted material, if it meets the requisite standard of pertinence and provides a verifiable date of its first disclosure, would then be placed in the file wrapper of the issued patent.

It is important to stress that not all material will preclude patentability of a particular invention for which patent protection is sought. Only material which is disclosed in a sufficient and adequate manner, is pertinent to the claims of a patent, and is in a form which permits the evaluation of its date of first disclosure can be used as a basis for precluding patentability or invalidating an issued patent. Furthermore, "patent defeating" material must be used in the context of statutory standards defining the relationship of patent rights to material in the prior art; namely, to bar patentability, the material must bar the novelty of the claimed invention, or render the claimed invention obvious, through the standards defined in 35 U.S.C. § 102 and § 103.

For example, information that has been kept as a trade secret is not prior art, and is not effective to invalidate patent rights. Also, information which may pertain to the technology disclosed in a patent document but which does not directly pertain to the claimed invention will not be relevant prior art and cannot be used to negate the validity of the patent. In this respect, it is important to recognize that a patent grant does not extend to everything disclosed in the patent document; it only extends to that which is distinctly claimed in the "claims" section of the patent document.

Material not qualifying as "patent defeating" prior art therefore should not, and will not be placed in the official file wrapper of a patent. There is no practical necessity of inducing the public to place irrelevant or unusable information into the file wrapper of issued patents, nor is it desirable. Such a practice would create problems in evaluating the effect of cited information, would create administrative problems for the USPTO, and would provide an opportunity for abuse and harassment of owners of valid and enforceable patents. Above all, safeguards will be necessary to ensure that no endorsement of submitted information by the USPTO be permitted, whether implied or actual. Such safeguards will ensure that the presumption of validity stemming from the examination of patents by the USPTO

is in no way undermined. Such safeguards would also be consistent with the restrictions which preclude U.S. patent examiners from citing or placing prior art into a patent file after issuance.

To help clarify these points, part of the above recommendation suggests that the USPTO establish submission guidelines. The guidelines help ensure that parties submitting information are able to recognize the factors used to assess relevancy of the material being submitted. The guidelines will also establish an appropriate fee which encourages the submission of pertinent information but discourages the submission of irrelevant or duplicative information. In establishing the submission guidelines, the USPTO should consider whether the guidelines include a requirement that material being submitted meet a minimum prima facie standard for date of disclosure and for relevance to the issued patent. The Commission notes that to prove the date of disclosure in the prior art, objective evidence will be required, and not simply a subjective statement that the person submitting the prior art believes the information was available prior to the filing date of the patent. In addition, any guidelines formulated should address the question of the types and amount of evidence that will be required to establish a verifiable date.

Finally, the above recommendation suggests that the USPTO work together with private efforts, such as the Software Patent Institute, in establishing other alternate mediums of expression or disclosure which would qualify as "patent defeating" prior art.

(a) Encourage use of Existing USPTO Prior Art Submission Procedures

This first part of Recommendation XI-H merely encourages the use of existing procedures citing U.S. patents and printed publications. The patent statute under 35 U.S.C. § 301 and the Federal regulations under 37 C.F.R. § 1.501 currently provide the authority for third parties to submit prior art patents and printed publications to the USPTO which are pertinent to an issued patent. If the patent owner or a member of the public cites a prior art patent or printed publication, the citation is included in the file wrapper of the patent, the official record of the patent within the USPTO, if there is a written explanation of the pertinency and manner of applying such prior art to at least one claim of the patent.

Recommendation XI-H(i) further encourages the USPTO to use submitted non-patent citations to update its collection of prior art for use in examining other pending applications. There is no need for the USPTO to utilize cited patents in updating its collection of art since its collection of art already consists of all issued patents. Furthermore, the ability to cite patents under this existing procedure may not be as useful in the computer program-related arts as it may be for other art areas. Since in the early stages of this technology, patent protection was not as widely used as it was for other areas of technology, the most pertinent prior art may not necessarily reside in issued patents. Pertinent prior art may, however, reside in printed publications which the USPTO could not previously access. Thus, the citation of printed publications under the existing procedure will be useful to the USPTO in updating its collection of non-patent literature in the computer program-related art area.

It is also acknowledged that in the computer program-related arts, the most pertinent prior art may not reside in patents or printed publications, but in other evidence, such as evidence of a prior public use or sale. Evidence of a prior public use or sale cannot be cited with respect to an issued patent under the current statutory provisions. Evidence of prior public use or sale can be used by a member of the public, however, if it is pertinent to a pending U.S. application, in either a protest or public use proceeding.

(b) Encourage Use of Public Use and Protest Procedures

Recommendation XI-H(ii) suggests that the public be encouraged to use the existing procedures involving a protest or public use proceeding to have prior art or evidence of a prior public use or sale considered with respect to a pending application.

The two provisions under the current Federal regulations that provide for protest and public use proceedings allow a member of the public to raise issues only with respect to pending patent applications. Although the U.S. does not currently

publish any information with respect to pending applications in general, one may have knowledge of a specific pending application if it is a reissue application, or if it is the basis of a claim for priority of a foreign application which was published abroad. In the latter instance, the serial number of the pending U.S. application can be discovered through use of a database search of the foreign application. The third party will not, however, have access to the contents of the U.S. application file.

According to 37 C.F.R. § 1.291, any member of the public can file a protest against a pending application for consideration by the USPTO if the protest identifies patents, publications or other information, and includes a concise explanation of the relevance of each item to the patent application. Presumably, evidence of prior public use or sale is included within the meaning of the term "other information." The third party which submits the protest and the information will be given notice of receipt only, through the form of a self-addressed postcard if included with the protest papers, indicating that the USPTO received the protest. The USPTO will not have any further communication with the third party, and will communicate only with the applicant concerning the protest.

Another provision under the current Federal regulations allows for a proceeding for pending applications specifically for prior public use and on sale issues. Under 37 C.F.R. § 1.292, anyone having information on the pendency of an application and evidence of public use or sale greater than one year prior to the application filing date, can file a petition to have the Commissioner institute a public use proceeding. The petition and any accompanying affidavits and declarations must either reflect that they were served upon the applicant or filed in the USPTO in duplicate if service is not possible. If the petition is found to make a prima facie showing that the claimed invention was in public use or on sale more than one year before the filing of the application, there may be a hearing before the Commissioner to determine if a public use proceeding should be instituted. If such a proceeding is instituted, testimony similar to that under an interference proceeding will be solicited and received. The petitioner may be heard from during the proceedings, but once the decision is made as to the status of the cited information, the petitioner will not participate further in the prosecution of the patent application. The Examiner may use the information from the public use proceeding in formulating rejections to the claims of an application under 35 U.S.C. § 102. This restriction on the participation by the third party preserves the *ex parte* nature of the examination process.

The protest and public use proceedings may become even more useful and beneficial if the United States adopts a first-to-file system including a system for early publication of pending applications. Upon adoption of such a system, the USPTO should publicize the availability of and encourage the use of the protest proceeding under 37 C.F.R. § 1.291 and the public use proceeding under 37 C.F.R. § 1.292. Such proceedings may become more widely used not only in relation to pending applications in the computer program-related arts but in all areas of fast moving technologies once there is a procedure for early publication of pending applications.

The Commission takes notice of the fact that the USPTO may have to develop new rules to help it adjust to an increase in the use of these proceedings so as not to impact the flow of the normal examination process.

(c) Revise Prior Art Submission Procedures as Appropriate

Utilizing only the existing procedures as discussed above may not completely solve the perceived problem that computer program-related patents issued without being examined on the basis of the most relevant "patent defeating" prior art. Many argue that early inventions in this technology are not as readily or frequently patented as inventions in other technologies. Commentors also state that publication of such early innovations in computer program-related technology trade journals is not common. Consequently, citing patents and printed publication to the USPTO for placement in the official patent file may not completely address the problem.

Furthermore, even if the most relevant "patent defeating" information

resides in facts relating to a prior public use or sale, such evidence of a prior public use or sale can be used only with respect to "known" pending applications. Not all pending applications are known and, therefore, not all pending applications are currently subject to these proceedings. In addition, there is no convenient and easy mechanism that allows such evidence to be brought forward in relation to an issued patent, nor to be made a part of the official patent file.

Recommendation XI-H(iii) suggests that the current procedures be expanded to allow the citation of evidence which would be pertinent to a prior public use or sale proceeding to the USPTO for placement into the official file wrapper of an issued patent. It should be noted that this recommendation only addresses the issue of citing, to the USPTO, patents, printed publications, and material evidencing a verifiable date of a prior public use or sale pertaining to an issued patent. This Commission is not addressing the issue of citations which may pertain to pending applications if the U.S. adopts a system of early publication of pending applications.

More specifically, it is recommended that the Commissioner adopt a study and/or program under the authority given to the Commissioner in 35 U.S.C. § 6, which would allow, for a limited period of time, the citation of evidence of prior public use or sale for inclusion into the official patent file of an issued patent. Such a study and/or program would then be used to determine the effectiveness of such a program and its applicability to other technologies. For example, if after the program is implemented it is not being used to any significant degree by the public, the program should be terminated and no further action should be taken. The Commission notes that the public interest in the trial program may be strong initially, and then may taper off once the prior evidence is made publicly available and accessible. Such an effect would suggest that a limited time period for submission of information is all that is needed to address the concerns of the public in this technology. Once the input of existing information to address specific perceived problems is accomplished, the Commissioner may conclude that it is not necessary to continue such a program. On the other hand, if the program is used and is determined to be beneficial, then a determination should be made as to whether to implement a statutory change which would allow such evidence to be submitted for all areas of technology.

If the above study is undertaken by the Commissioner, and it is determined from such study that the citation of a verifiable date of prior public use or sale would be beneficial for all areas of technology, then the patent statute and Federal regulations which currently allow for the citation of patents and printed publications would need to be amended to include the citation of this other evidence.

It should be noted that a reexamination can only be based on cited patents or printed publications. Therefore, if 35 U.S.C. § 301 and 37 C.F.R. § 1.501 were to be amended to include the citation of prior public use or sale, then 35 U.S.C. § 302 would have to be amended to limit reexamination to only the printed patents and publications cited under section 301, thereby excluding reexamination based on public use or sale that may have been cited under section 301. The Federal regulation 37 C.F.R. § 1.510 already limits reexamination to those patents or printed publications cited under the § 1.501 provision, and would not need further change in this regard.

Under such a program as described above, a notice requirement should be mandatory which requires the third party making the submission to notify the owner of the patent that such material will be submitted. Under both the existing prior art citation and public use proceeding provisions, the third party must either mail a copy to the patent owner/applicant of each paper being submitted to the USPTO, or file all of the papers in duplicate with the USPTO if it is not possible to send the papers to the patent owner/applicant. The advantage that this procedure has over merely having the USPTO send out a postcard to the patent owner/applicant when papers are made a part of the official patent file is that the patent owner/applicant has all of the information readily available without having to order a copy of the file wrapper to see what information was recently placed into the patent file wrapper.

In any event, some form of notice should be applicable to any procedure adopted by the Commissioner which expands the type of material that can be cited to the USPTO. The Commission believes that the obligations imposed on the USPTO and third parties through the current notice requirement are appropriate and makes no recommendation for changing the form of notice required.

Allowing evidence having a verifiable date of prior public use or sale to be made a part of the official patent file addresses a problem perceived by some with respect to the examination process of computer program-related inventions. Relevant information in this area of technology does not necessarily reside in printed patents and publications, but rather in the previous public use or sale by others of the invention. Since neither an applicant nor an examiner may have had knowledge of or access to information regarding pertinent prior public use or sale by a third party during the period of examination of a patent application, such information would at least be made available in the official patent file after the patent issued.

Although the USPTO may not be able to make use of evidence of prior public use or sale in expanding its collection of prior art for use during examination of patent applications, such information would still be beneficial if it were to be placed in the patent file wrapper. This information could then be evaluated by the patent owner, opponents in infringement actions, and potential licensees. In addition, this information would be available as a starting point if one were to litigate the validity of the patent in court. Also, upon evaluating the evidence of prior public use or sale that is placed into the patent file wrapper, a patent owner may decide to seek a reissuance of the patent with a different scope of claim coverage taking into consideration the evidence submitted, or the patent owner may decide not to enforce its rights in the patent and dedicate the patent to the public.

This also addresses another problem that was perceived by some with respect to patents on computer program-related inventions. Since a significant portion of the pertinent art may not be presently found in patents or printed publications, it may be difficult for one to find evidence of prior public use and sale by others that may indeed invalidate a patent. This recommendation would create a starting place to find such information. Other private efforts to assemble and organize such information should be encouraged, also, and are discussed below under subsection (f).

(d) Revise Fees for Submission of Prior Art as Necessary

It is recognized that the adoption of an expansion of the prior art submission program may create a financial burden for the USPTO if the participation in the program is extensive and a large amount of information is provided. As a result, the Commission recommends that the USPTO adjust its fee schedule, as it deems appropriate, for the citation of printed patents or publications or other material evidencing a verifiable date of prior public use or sale.

The Commission recognizes that one of the purposes of the above-described study and/or program would be to determine the appropriate fee for such a submission of evidence. Such a fee should be low enough to encourage the submission of pertinent information, while being high enough to help defray the USPTO's additional handling and filing costs and to discourage voluminous, repetitive, and unusable or unnecessary submissions of material. For example, a fee of $250 may be low enough to encourage the public to submit relevant evidence that is believed to be and can be shown to be pertinent to a claim of a patented invention, but yet may be high enough to discourage the public from submitting a voluminous amount of information that does not directly relate to the claimed invention. In addition, a submission which included hundreds of pages of program code listings far beyond the claimed feature of an invention should not be accepted by the USPTO and should not be made a part of the official patent file. Such a volume of material makes the patent file cumbersome to handle and interferes with the public access of information in the official patent file at a reasonable cost.

(e) Establish Submission Guidelines

To further limit the amount of material being submitted and to ensure the relevancy of such material, the USPTO

should establish submission guidelines for the expanded prior art citation procedure. These guidelines should clearly explain to the public what types of material will and will not be accepted by the USPTO. For example, the guidelines should state whether any submitted material must, on its face, meet some minimum standard of evidentiary value.

The necessary requirements for establishing a verifiable date should be considered and implemented into the guidelines. For example, affidavits or declarations may be required to establish a date of public disclosure. Alternatively, the identification of third parties having personal knowledge of the evidence may be all that will be necessary to establish the verifiable date.

The guidelines should require a precise explanation of the relevance of the evidence to at least one claim of the patent. In addition, the guidelines may want to address whether there should be a limitation on the number of pages being submitted. Any submission guidelines established by the USPTO should provide for anonymous submissions, in appropriate circumstances, and allow for the handling of copyrighted materials.

The USPTO should undertake a minimal level of evaluation of the submitted material to ensure that it meets the guidelines that are established. It should be noted that the requirement that the USPTO provide some minimal level of evaluation of the citations before any material is placed into the official patent file is already a requirement under the statute. Under 35 U.S.C. § 301 the USPTO must ensure that the pertinency of the citation is explained in writing with respect to at least one claim of the patent. Likewise, providing a minimum level of evaluation of the submitted material to ensure that the submitted material, on its face, appears to meet some minimum standard would require no greater level of evaluation than what is currently required under the statute. The USPTO is not being required to make a determination as to the merits of the citations.

(f) Encourage Private Efforts to Identify, Compile and Classify Prior Art

It is recognized that not all material submitted under the citation of art as described above will be in a form that the USPTO can readily assimilate into its collection of art. It is therefore recommended that the USPTO encourage private efforts, such as through the Software Patent Institute or any other similar program, to help organize and assimilate information that may be easily accessible by examiners during the examination of computer program-related patent applications. The USPTO should further support private efforts to help identify other forms and mediums of information in the computer program-related arts that could qualify as "patent defeating" art and further assimilate such information into a collection of art for use in examining pending applications.

Recommendation XI-I

Encourage implementation of a system allowing for early publication of pending applications, which would be particularly beneficial for faster-moving technologies, in accordance with any harmonization efforts that may be undertaken.

This Commission wishes to comment on certain other changes to the patent process that affect all technologies, since those changes would be especially relevant and beneficial to patents issued in the field of computer program-related technology as well.

Early publication of pending applications would provide more timely publication of the technology and would notify others that a patent on the invention may be in the process of being granted. Early disclosure is particularly beneficial in faster moving technologies such as computer program-related technology.

The specific requirements of an early publication system needs to be further considered before such a system is implemented. One consideration is whether a first Office action or examiner's search report should be required prior to

publication to allow the applicant an opportunity to withdraw the application prior to publication. Another consideration is the time period in which a pending application is automatically published. The Commission's findings and recommendations on early publication of patent applications are presented above.

Recommendation XI-J

The USPTO's development of the Patent Application Management (PAM) System for electronic filing and processing of patent applications is strongly supported.

The USPTO's Patent Application Management (PAM) System is believed to offer great benefit to the U.S. patent system. Electronic filing of patent applications under such a system should be encouraged, though it is not mandatory. Automation of the application process should reduce application pendency time through simplified procedures, allow faster pre- and post-processing, expedite the examination process without sacrificing quality, and ultimately reduce the cost of operations. Such a system could be adapted to automatically publish pending applications electronically if an early publication system is established.

Earlier public disclosure of technological advances would also be possible through use of a more efficient system. This earlier public disclosure would benefit the public by providing early notice of what is and is not patented and what techniques can or cannot be used. The USPTO should accordingly move forward with the development of the PAM system which is further described and discussed in Appendix A.

XII. THE UNITED STATES SECRECY ORDER PROGRAM

A. Introduction and Overview

The United States secrecy order program was identified by a number of members of the Commission as being an area of the patent system in need of reform. Steps were therefore taken to analyze the current state of the secrecy order program and the historical trends in imposition and rescission of secrecy orders. There has been a substantial increase in the number of secrecy orders imposed over the past decade, an increase which appears to be continuing. This trend, along with anecdotal evidence of problems experienced by patent applicants, led the Commission to undertake a study of the program and to reach the following conclusions and recommendations for reform.

1. Summary of the United States Secrecy Order Program

Since the early part of this century, the Patent and Trademark Office has been required to issue secrecy orders on patent applications containing certain sensitive subject matter. The purpose of the secrecy order program is to bar the further disclosure of certain inventions by restricting dissemination of the contents of the application and withholding the grant of a patent on the invention. The USPTO is vested with the authority to impose secrecy orders on patent applications through two Acts; namely, the Invention Secrecy Act of 1951,[20] and the Atomic Energy Act of 1954.[21] This authority extends to applications in which the Government has no property interest in the underlying technology, either in the form of Government funding of the research which led to the invention, or some other contractual relationship between the Government and the patent applicant.

The two Acts require the USPTO to make certain privately owned patent applications in sensitive technologies available to defense agencies for their review. If a defense agency then determines that the patent application contains sensitive subject matter, it will recommend that a secrecy order be imposed on the application. If so recommended, the USPTO is required to place a secrecy order on that application. Government entities which file patent applications, or control the work which is the subject matter of the application, must independently review their applications for sensitive subject matter.

Screening of patent applications for possible imposition of secrecy orders must be completed by both the USPTO and the defense agencies within six months of the U.S. filing date. This period derives from the effect of 35 U.S.C. § 184, which states that a patent application may not be filed abroad until the applicant obtains a foreign filing license from the USPTO, or has had an application pending in the United States for at least six months.[22] Thus, six months after the U.S. filing date, a patent applicant is free to file an application abroad, provided no secrecy order has been imposed.[23] In practice, the USPTO screens all privately owned patent applications within two weeks of filing, and identifies those applications which are to be made available to defense agencies for their review.

In conducting its screening process, the USPTO will make available to the defense agencies for their review those applications whose publication might be detrimental to the national security. To assist it in determining which applications meet this standard, the USPTO relies upon "Category Guide Lists" provided by the defense agencies. These lists identify areas of subject matter the agency wishes to review if it is raised in a patent application. In addition, all applications relating to atomic energy are made available to the Department of Energy irrespective of the sensitivity of the subject matter. In contrast to the USPTO standard, the defense agency will issue a recommendation for a secrecy order on those applications whose publication would be detrimental to the national security. If the defense agency so finds, and the recommendation is made, the USPTO will issue the secrecy order.

The review process for patent applications in which the Government has a property interest differs from that used to screen privately owned applications in which the Government has no property interest. First, each defense agency is required to review all applications filed by that agency for sensitive subject matter. Likewise, non-defense agencies must also screen applications which they file for sensitive subject matter. In each case, if the submitting agency determines that their patent application contains sensitive subject matter, the submitting agency must recommend that a secrecy order be imposed. A Government property interest is deemed to be present in an application if either a Government employee or a Government contractor made the invention.

Secrecy orders continue in force until withdrawn by the USPTO upon request by the sponsoring agency. While secrecy orders must be renewed annually by the USPTO to remain in force, renewal is a relatively simple process. If the agency which originally issued the order simply indicates that the order should be maintained, the secrecy order will remain in force. While in force, the secrecy order will prevent any patent application from maturing into a patent grant. Violation of a secrecy order through disclosure of the invention, or by unauthorized foreign filing, can lead to forfeiture of patent rights through abandonment of the patent application and may lead to criminal sanctions under 35 U.S.C. § 186.

An applicant desiring a rescission of a secrecy order must either wait for a unilateral decision of the recommending agency to rescind the order, or file a petition to the USPTO requesting rescission of the secrecy order. The USPTO does not review such petitions on the merits. Rather, it forwards the petition to the agency which recommended imposition of the secrecy order. That agency then reevaluates the appropriateness of the secrecy order. If the defense agency recommends continuance of the secrecy order, the petition is denied, and the applicant may appeal to the Secretary of Commerce.[24]

The most common basis for the recommending agency to order rescission of a secrecy order is when the applicant can show that the subject matter has entered the public domain. This encompasses situations where a party other than the patent applicant causes the subject matter to be made publicly known and available. More generally, if an applicant can show that the subject matter has entered into the public domain, either before or after the imposition of the secrecy order, rescission of a secrecy order may be appropriate, depending upon the degree of disclosure.

At one time, the issuance of a secrecy order meant almost certain loss of opportunity to file the application abroad within the one-year Paris Convention priority period. This difficulty has been alleviated by bilateral treaties which permit the filing abroad even though a secrecy order has been imposed.[25] However, a patent in those countries will not issue until the secrecy order has been rescinded. Where no patent secrecy agreement exists with a foreign country, U.S. law does not permit the filing of a patent application in that country until the secrecy order is lifted.

2. *Past Congressional Concerns for the Secrecy Order Program*

A number of issues relative to the secrecy order program have attracted the attention of Congress. For example, in 1980, the House Committee on Government Operations issued a report entitled "The Government Classification of Private Ideas." In 1982, hearings were held before the House Committee on Government Operations on the "Executive Order on Security Classification." The two sources provided several points for consideration.

First, both the report and the hearings discussed the appropriate standard necessary to impose a secrecy order on privately owned patent applications.

The current standard for imposing a secrecy order is that disclosure of the subject matter would be detrimental to the national security. This has been interpreted by those administering the secrecy order program as being a lower standard than the damage to the national security standard required to classify information.[26] More specifically, it has been interpreted as

encompassing both classified and unclassified, export controlled subject matter.

In contrast, the standard believed to be appropriate by the House and Senate Committees was stated to be the same used for national security classification, namely, a secrecy order would be appropriate only if disclosure of the subject matter would damage national security.

Second, the issue of first amendment rights and restrictions on disclosure following filing of patent applications was addressed in the subcommittee report. The debate on this issue centered on the question of whether the first amendment rights of an individual to publish or otherwise disclose his or her invention may outweigh the need for invention secrecy during peacetime.

Third, during the hearings, an apparent consensus of the subcommittee was reached regarding the question of Government interest in private inventions. The subcommittee concluded that privately owned information is not brought under Government "control" merely by the action of filing a patent application. Because of this conclusion, privately owned patent applications, and the information contained therein, as such, cannot be classified simply because the owner of the application filed the patent application.

Finally, in both the report and in the hearings, the subcommittee expressed a need to clarify the meaning of "Government property interest" as used in 35 U.S.C. § 181. Such a clarification was believed necessary because the presence of Government interest in an invention triggers whether the USPTO makes a patent application available to defense agencies for secrecy order review.

3. Areas of Concern and the Need for Reform

A review of the administration of this statutory requirement has uncovered a number of problems of concern to the Commission. The most significant problems can be summarized as follows:

- There is no centralized body which reviews the patent applications to ensure consistency. Each reviewing agency uses its own interpretation and criteria of "detrimental" to the national security, and as such, the standards vary widely.
- There is no requirement that review be conducted by personnel at any particular level within the reviewing agency. Thus, people at relatively low levels in the agencies are given discretion to use their personal notions of the standard "detrimental to the national security."
- The statute makes it very easy to extend the duration of secrecy orders. As such, it is not unusual for a secrecy order to remain in effect for decades.
- A private applicant having no relationship with the Federal Government (e.g., no funding or contract arrangement) other than having filed a patent application can fall victim to a secrecy order and be barred from publishing or even disclosing to others the technical information in the patent application. This is known to have happened on more than one occasion with applications relating to cryptography. If the applicant had chosen not to use the patent system, the Government would have no legal basis to prevent publication or disclosure, except in the narrow case of certain information subject to the restrictions of the Atomic Energy Act.[27] This anomaly triggered a Congressional investigation in 1980 and, although serious First Amendment questions were raised, nothing was done.
- Although the statute permits applicants to file a petition to rescind a secrecy order, there is no requirement that review of the petition be conducted by personnel at a higher level than the those which reviewed the application originally. Instances have been reported, for example, where petitions were denied notwithstanding incontrovertible proof that the contents of the application had already been widely published. Furthermore, the rescission process is extremely difficult even for a patent owner familiar with the ways

of the defense and intelligence agencies. A successful effort will likely require direct contact with the sponsoring defense agency by the patent applicant, and personal involvement of the applicant's Congressional representatives.

The problems associated with the current secrecy order program result in high transaction costs, particularly for private applicants who do not conduct business with the Government on a regular basis. The delay in acquiring a patent can also interfere with the raising of capital and early stage development efforts. Since secrecy orders are only imposed on inventions which are made in the United States, U.S. inventors are placed at a competitive disadvantage in relation to their foreign counterparts.

The problems with secrecy orders are growing. Until the mid-1980s, the percentage of patent applications on which orders were imposed was fairly small. Most were imposed on applications either owned by the Government or based on work funded under a defense contract with built-in provisions concerning security and filing of patent applications. However, during the past decade, there has been an alarming increase in the number of orders imposed, not only for applications in which there is a Government property interest, but also for applications in which no such interest exists.

Two identifiable factors have contributed to this increase. First, the threshold for imposing a secrecy order under the "detrimental to the national security" standard is interpreted to be lower than that required to impose a military security classification under the "damage to the national security." Thus, the standard is interpreted as including nonclassified technology which was subject to export control under the export control laws.

Second, the Department of Defense (DOD) began using the Military Critical Technology List (MCTL) as a guide for secrecy orders. However, the DOD uses the MCTL without evaluating the additional criteria of foreign availability and the extent of prior publication of the technical information—crucial elements used by the Departments of State and Commerce when making export control determinations. Thus, the secrecy order program under 35 U.S.C. § 181 is used as a tool to implement the export control laws but in a manner inconsistent with the criteria established for export of technical information by the Departments of State and Commerce. Furthermore, since the MCTL includes a wide range of important commercial technologies—including so-called "dual use" technologies having non-sensitive commercial uses—it is not surprising that the number of private applicants with no Government funding ensnared by secrecy orders has increased.

Finally, information that is owned or controlled by the Federal Government (e.g., produced under a Government contract or grant or directly by a Federal agency) may be withheld from disclosure if it is unclassified export-controlled technology. This authority was granted in 1983 under 10 U.S.C. § 140(c), was published as DOD Directive 5230.25 in November 1984, and was incorporated into the Federal Rules as 32 C.F.R. Part 250 in December 1984. However, neither 10 U.S.C. § 140(c) nor the related regulations authorize DOD to withhold disclosure of privately owned and developed information. The DOD effectively gains this authority through the interrelationship of these laws with the Invention Secrecy Act. Thus, by interpreting "detrimental to the national security" as including unclassified, export-controlled technology, the DOD routinely recommends secrecy orders on unclassified, export-controlled technology that is privately owned.

The Federal Government did take some measures during the 1980s to account for this new standard for information subject to secrecy order. A new type of secrecy order was created, the Type 1 secrecy order, which applies to unclassified technology that is export controlled.[28] This took some, but not all, of the sting out of a secrecy order imposed on an invention involving unclassified technology by permitting foreign filing in certain allied countries as well as disclosure of the invention for "legitimate business purposes." The sting it did not remove was the inability to get a patent granted either in the United States or abroad.

Thus, the problems are growing not only in incidence but also in competitive importance. The Commission is particularly

concerned over two classes of patent applicants; those who have developed their inventions completely independent of any relationship with the Federal Government, and those who, despite their contractual or funding relationship with the Government, own full title to their inventions. The same philosophy which underlies this allocation of rights also supports measures to encourage and permit commercialization of Government–funded research and development.

B. Summary of Public Comment

The Commission began study of the secrecy order program after the conclusion of the period for public comment. Despite this, the concerns of interested parties in the reform of the secrecy order program have been solicited and considered in formulating the proposed reform procedures. The concerns of the public, as articulated in earlier hearings and in open meetings of the Commission, also have provided a valuable source of public input in the proceedings on this issue.

C. Recommendations and Discussion

Recommendation XII-A

(i) Discontinue the use of secrecy orders in patent applications to implement the export control laws, and amend 35 U.S.C. § 181 to permit the imposition of secrecy orders only in patent applications that contain either:

(a) information that is or can be classified with then-current Federal security regulations, or

(b) previously unpublished information, the publication of which would be reasonably expected to cause damage to the National Security.

(ii) If such use is not discontinued, amend 35 U.S.C. § 181 to require that secrecy orders may be imposed for export control purposes on inventions in which the Federal Government does not have a property interest only upon recommendation from the Government agencies responsible for administration of the export control laws.

The Commission is fully cognizant of the need to maintain national security. It is, however, skeptical of the efficacy of controls over the dissemination of privately owned unclassified information in an age of ever faster international diffusion of technology. It is also skeptical of the need to maintain the strict controls imposed during WW I and II in this modern, post-cold war era of substantially reduced international tension. In this respect, the Commission joins others in calling for reform of the practices of the Federal Government in controlling dissemination of unclassified privately owned information.[29]

The Commission sees two fundamental problems in the current structure and administration of the patent secrecy order program. First, the program is used inappropriately to implement the export control laws of the United States. Specifically, private developers of new technology are subjected to differing standards for exporting technology through the simple act of filing a patent application. Second, rights of private inventors to commercialize their privately owned technology have not been given the proper weight they deserve during the secrecy order review and application process.

For the reasons provided below, the Commission concludes that the patent secrecy laws are not an appropriate vehicle for implementing the export control laws. The program should be restricted in application to information that is either classified or is classifiable information of a sensitivity that would permit its classification if the Government owned a property interest therein.

The Commission is cognizant that this objective will encounter substantial resistance, both administratively and substantively. Thus, the Commission urges as an alternative to wholesale substantive reform, consideration of reform in the administration of the existing secrecy order authority. Such reforms would be a less drastic step to implement, yet would result

in substantial improvements for all patent applicants.

1. Private versus Government Interests in Inventions

The Commission views the possible degrees of Government interest in an invention as being on a continuum. At one extreme are those inventions which are developed in Federal laboratories by Federal employees in the course of their employment. For such inventions, the Federal Government has a clearly established interest which permits them to control disclosure and dissemination of the technical information regarding the invention. At the other extreme are inventions developed by private citizens with no involvement, funding or contract by the Federal Government. In between are several possible relationships between the Federal Government and the inventor which establish a Federal interest sufficient to justify restriction of disclosure and dissemination of the invention. For example, the Federal interest may stem from a Government grant or contract to develop the technology, a joint research agreement, or even a contractual relationship involving no Federal funding. In all cases except that extreme where the Federal Government has played no role in the development of the invention, it is reasonable to permit the Federal Government to exert some degree of control over dissemination of the information regarding the invention.

Patent applications which are based on Government contract-funded work should be subject to the security requirements, if any, of the contract supporting the work. The Commission's recommendations emphasize that the agencies which currently fund or have a contractual link to the technology must retain the authority to dictate the conditions regarding disclosure and dissemination of sensitive technical information stemming from that research. In particular, the DOD must remain able to use the authority provided by the Invention Secrecy Act as the primary vehicle for preventing disclosure of Government-owned technology in a patent application, where that technology is deemed to be sensitive and its premature or uncontrolled disclosure inappropriate. Thus, the DOD, along with the other Federal agencies which fund or have some contractual link to the research which produces a patentable invention must retain the authority to continue recommending that secrecy orders be imposed on patent applications filed to protect those inventions, even if the invention itself is not classified. If the sponsoring agency does not impose such restrictions in its funding or contractual agreements, applications which result from that research should be treated as "privately owned applications."

2. Differential Treatment Under Export Control Laws Caused by the Act of Filing a Patent Application

Patents contain detailed technical information and through patent document exchange agreements between the USPTO and patent offices around the world, that information is widely exported when the patent application is granted and printed.[30] Parties wishing to export such information if it were not contained in a patent document would have to satisfy the requirements of the export control laws. Thus, it seems consistent to withhold the grant or early publication of patent applications that contain non-exportable technical information, so as to prevent the unauthorized dissemination of the information in the patent document abroad.

For this process to remain consistent, however, the standards used to prevent disclosure of technical information abroad must be the same irrespective of the vehicle of information dissemination. Thus, the export control laws should only block dissemination of the technical information in a patent to the same degree that they block dissemination of technical information in non-patent literature. This, unfortunately, is not the current situation.

Under the existing export control laws, a private developer of export-controlled technology who does not seek a patent is free, under the law, to develop and market that technology within the United States without the restrictions of a Type I Secrecy Order. Indeed, he is free to publish that information in journals which may be more effectively disseminated into interested foreign reader groups than are U.S. patents. Furthermore, under the export laws as administered by the Departments of Commerce and State, that private developer may receive an export license if he can show that the export-

controlled technology has already been published, or has been disclosed and is readily available in foreign markets.

In contrast, if that private developer of an export-controlled technology files a patent application, that act alone will result in different treatment under the export laws if that developer wishes to export the technical information. Thus, the two factors used by the Departments of Commerce and State are not considered as part of the review process by those who administer the patent secrecy laws. As such, a private developer gains a distinct advantage in being able to export the technical information if he has not filed a patent application.

The only argument in support of this anomalous situation is that technical journal articles tend not to contain as much detailed information as is required for patent disclosures. This, however, is not always the case and is hardly a valid basis to support the significant difference in result.

Thus, it seems to the Commission that a private developer of non-classified but export-controlled technology is unfairly penalized for attempting to secure a United States patent. This Commission's jurisdiction, however, does not extend to the export control laws and does not suggest that these laws do not play a useful role in protecting national security. The Commission merely sees the competitive issues—which favor the early grant of patents—more clearly than it does the efficacy of the export control laws to contain the flow of privately owned unclassified information.

3. Weighing the Interests of the Federal Government in Controlling Export of Technical Information Against the Rights of Private Inventors to Commercialize Privately Developed Technology

The second substantive problem with the existing secrecy order program is that it does not properly weigh the rights of private parties to commercially exploit their privately developed innovations against the needs of the Federal Government in restricting disclosure of sensitive technical information. The Commission believes it is unfair for the Government to restrict or prevent the ability of private citizens to realize the value of such privately developed inventions without an adequate showing of need by the Government. As currently structured and as implemented, the secrecy order program does not require this showing. This can be illustrated by a simple comparison of the standards used to classify sensitive information and those used to implement the secrecy order program.

The current executive order for national security classification only permits the Government to classify information in which the Government has a property interest. Thus, the Government cannot classify patent applications filed and owned entirely by private individuals. However, the Invention Secrecy Act expressly authorizes the Government to place secrecy orders on privately owned patent applications.

In addition to permitting the Government to prohibit disclosure of information that it cannot restrict by a national security classification, the standard for imposing a secrecy order is also much lower than that necessary for classification. Information may only be classified if it would cause damage to the national security. In contrast, a secrecy order may be imposed under the lower "detrimental to the national security" standard.

Thus, the existing secrecy order program is based upon a relatively low standard of need on the part of the Federal Government, a standard which is clearly lower than that required for the Government to restrict disclosure of non-patent technical information. The Commission does not view this standard as an adequate basis for depriving private citizens of patent rights to inventions which have been developed with no Federal funding or contract. Accordingly, the Federal Government should be required to satisfy a more demanding standard when imposing a secrecy order—a standard which truly justifies the necessity of restraining and withholding the patent grant.

4. Administrative Reform as a Viable Alternative

If it proves impractical to limit the application of the patent secrecy laws for privately owned inventions to a classifiable information standard, the Commission urges in the alternative that administration of the

patent secrecy order program be transferred to and conducted by the agencies responsible for administration of the export control laws. The intent and purpose of this recommendation is to have the same criteria applied to both patent applications and technical information in general and, specifically, to require the taking into account of such factors as foreign availability and the extent of any prior publication as part of the evaluation process before a secrecy order is imposed. Centralizing or at a minimum improving the coordination between the reviewing agencies will also permit more effective and more efficient review of secrecy orders which have been imposed.

Along with this transfer of authority should be a statutory change to equate the standards for imposing a secrecy order on a patent application and for exporting technical information. This will ensure that inconsistent and illogical results are avoided. As such, the Commission urges that such a statutory change be implemented in conjunction with the administrative shift of the secrecy order review authority to the agencies which currently conduct screening for purposes of implementing the export control laws.

Recommendation XII-B

If the secrecy order program continues to function as a means to implement the export control laws, amend 35 U.S.C. § 181:

- **(i) to provide that, for the purposes of § 181, the Federal Government has a property interest in an invention only if the invention was made in the performance of work under a contract with the Federal Government which establishes such interests; and**
- **(ii) to specify that no secrecy order shall be renewed beyond the fifth year unless the head of any agency requesting such renewal first makes a finding that, based on his or her personal investigation, adequate grounds exist for continuation of the order.**

The Commission has serious concerns over the scope of the existing secrecy order program, as well as how this program has been implemented. Nevertheless, as part of its administratively oriented reform approach, the Commission can recommend a number of specific changes that will serve to clarify this area substantially.

First, the definition of Government property interest in an invention should be amended to reflect an easily interpretable standard that is in use in other Government regulations pertaining to control of sensitive information. The term "property interest" in § 181 needs to be defined to make it clear that, for secrecy order review pruposes, the Government does not acquire such an interest by the mere fact of the filing of a patent application. The proposed change in the definition of a "property interest" would mirror standards already in place for defining property interests appearing elsewhere in the patent code and in the Atomic Energy Act.[31] The scope of the proposed change also would extend the definition of "property interest" to include inventions developed under a Federal contract including contracts not involving funding or grants, and research which has been directly funded by a Federal agency.

Second, in view of the importance of the right of parties to obtain patent protection for their inventions, secrecy orders which have been imposed should be carefully monitored to ensure that they do not extend past the point in time where a threat to national security has been reduced or eliminated. As such, the statute should be amended to place a heavier burden on the Government to review and maintain in force orders which have been imposed. Requiring involvement at a higher level and a specific justification articulated in writing will provide this check on the unnecessary continuation of secrecy orders.

Recommendation XII-C

Agencies responsible for the review of patent applications for secrecy order purposes should coordinate their reviews on a regular basis to ensure consistent interpretation and application of the orders and regulations defining security requirements, both for the imposition of secrecy orders and for consideration of petitions to rescind such orders.

Perhaps the most fundamental practical problem facing the implementation of the secrecy order program is the inconsistent application of standards for imposing secrecy orders. The problem stems from the lack of a single central authority to set standards for review of patent applications, and from a lack of coordination among the reviewing agencies. To address this problem, the Commission is urging the reviewing agencies at a minimum to better coordinate their standards for imposing secrecy orders. This will require greater and more frequent communication between the reviewing agencies. Preferably, the Federal Government should consolidate the review process so as to have as few agencies as possible actually conduct the review of patent applications for secrecy order requirements.

Recommendation XII-D

Petitions for rescission should be reviewed at a higher agency level than that which requested the order.

A recurring problem that has anecdotal support is the inability of patent applicants to obtain meaningful review of a decision to impose or maintain a secrecy order. It is inappropriate for a party which has taken the often extensive effort of preparing an appeal of the imposition of a secrecy order to have the request reviewed by the same individual that originally determined that the secrecy order was necessary. Shifting the review of petitions to rescind secrecy orders to a higher level within the reviewing agency will make the appeal process more sound. It will also ensure that a meaningful consideration of such petitions will be provided in each case.