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Copyright Protection for United States Government Computer Programs

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[*225] I. INTRODUCTION

In the early 90s, some United States government agencies requested permission to copyright the computer programs they create. n1 Just like every other organization, these agencies create computer programs to organize, process, and compile information necessary to carry out their daily business.

The federal government works in almost every industry including research and development, banking, medicine, hotels, transportation, and space flight. Working in all these industries requires creating computer programs to achieve daily business goals efficiently. In many cases, these same computer programs if commercialized could effectively serve the needs of nongovernment parties. Many of these agencies believe that their computer programs are commercially valuable. n2 Additionally, these agencies believe that private enterprise will not invest in commercializing government created computer programs unless some form of intellectual property protection is available. n3

Frequently, developers use copyright to protect their computer programs. Alternatively, developers can patent their programs. The differences between patent and copyright protection are significant. A developer seeking to patent a computer program might not receive the

[*226] patent grant, if at all, until after the computer program is obsolete. On the other hand, copyright is very easy to obtain. A developer only needs to file an application, pay a small filing fee, and provide a sample of the copyrighted product to the Copyright Office. For these reasons, copyright is the intellectual property protection most frequently chosen for computer programs.

Currently, there is no prohibition on U.S. government patents. n4 However, the Copyright Act prohibits the United States government from copyrighting its works. n5 Since computer programs typically derive protection through copyright, prohibiting the United States government from copyrighting its works includes prohibiting protection for its computer programs.

Congress' purpose in preventing copyright of government works derives from a determination to ensure the free flow of information about the government. n6 Some people maintain that permitting the government to copyright computer programs will not result in restricting the free flow of government information. n7 Because the data is in electronic form, the usefulness of the data depends on the program used to process it. n8 Also, much of a computer program's value stems from the ease with which the user can reprocess information to realize completely new perspectives. Restricting the availability of computer programs by prohibiting the U.S. government from copyrighting those programs, could effectively result in restricting information access, if not just making the data less useful. n9 Such an effect would be counter to the basic premise of open government. Is there a solution to this problem of protecting computer programs without restricting the free flow of government information?

To date, giving the government permission to copyright its computer programs has been the only solution considered. This paper suggests an alternative to withholding copyright privileges for the U.S. government computer programs. n10 This author proposes that Congress set up an independent trust chartered to copyright and manage all

[*227] government created computer programs. The trust participants could include members of government, industry, and academia who are independent of the government agencies and businesses who will profit from commercializing these programs. The trust would administer this intellectual property in the interest of the citizens of the United States without the conflict of interest that may affect the decisions of the government agency responsible for the development of the computer program. Thus, this proposal minimizes the possibility of information restriction while providing a return on the government's huge investment in information processing.

Section II of this paper presents a short discussion of the anatomy of a computer program and its relationship with the form of intellectual property frequently employed to protect it. Section III reviews the legislative history and both federal and state judicial decisions underlying the policies on copyright of government works. Section IV focuses on the recent legislative thrusts and the arguments presented before Congress. Section V analyzes and summarizes the arguments for and against permitting federal government copyright of computer programs. Section VI describes the proposal for a government copyright trust and explains how this solution effectively satisfies the legal and legislative constraints. Finally, Section VII summarizes the major themes of this paper.

II. THE RELATIONSHIP BETWEEN COMPUTER PROGRAMS AND INTELLECTUAL PROPERTY PROTECTION

The nature and subject matter of computer programs plays a significant role in distinguishing which form of intellectual property protection is appropriate. Traditionally, computer programmers protected their intellectual property through copyright because patents were generally unavailable. n11 However, some aspects of computer programs seem more suited to patent protection. Overlying this dichotomy is the rapid obsolescence computer programs encounter. This rapid obsolescence occurs because of computer industry dynamics that result in frequent, significant advances in hardware, operating systems, and software. This section presents a short summary of the properties and nature of computer programs, while focusing on how these properties relate to available intellectual property protection.

[*228] Programmers develop computer programs to model processes that accomplish one or more functions. Programmers develop models of the processes used to manipulate raw information into a finished product. These models, developed with mathematical algorithms, provide a specification for implementing the computer program. n12 Programmers implement algorithms by writing logical computer instructions using one of many computer languages. Computer languages span a wide spectrum from the basic, assembler language, a step above the actual machine instructions, to high-level languages resembling English but with a limited set of words that have very precise logical or mathematical meanings. Most languages require computer programmers to compile their highlevel language instructions to convert them into machine instructions. Finally, when executed by a computer, these machine instructions devolve to a set of electronic on or off switches that tell the computer what to do based on the pattern of the switches.

[*229] Computer program development results in many products. These include design materials such as flow charts, n13 source code, n14 object code, n15 program executable, and user's instruction manuals. n16 Not only can computer programs organize, process, and compile information, but they allow for new and more useful forms of information, rapid ability to reorganize and recompile data, and the ability to complete complex calculations in seconds. For these reasons, computers own a prominent place in our way of life. Today, computers are a necessity.

Unfortunately, information input to a computer program or output from a computer program frequently is not in human-readable form. For performance and storage reasons, most data is input, stored, and output from computer programs in a packed binary format that requires the computer program to unlock the data and make it available for human use. This fact clearly links the computer programs to the data they use and produce. Without the program to read, manipulate, or report the results of processed data, the information contained in the electronic files may not be useful. The result has obvious implications for information restriction. n17

The reason for copyrighting computer programs rather than patenting them is two-fold. First, the patent process is long and expensive, requiring very precise wording. n18 Obtaining copyright

[*230] protection on the other hand, is quick, requiring only a deposit, registration form, and small fee to obtain a certificate of registration. n19 Second, the state-of-the-art in computers and computer programs changes at an increasingly rapid pace. Many computer programs become obsolete in a matter of a few years. In fact, since the average time to obtain a patent is just less than 2 years, it is important to consider that some programs come and go within that time. n20 Thus, copyright is the right choice for many computer programs because of its quick availability that allows for the rapid ability to enforce the developer's intellectual property rights.

Contributing to the preference for copyright is the difficulty in obtaining a patent due to the mathematical nature of computer programs. n21 Computer programs are a collection of instructions telling the computer exactly what to do with the data it manipulates or the process it performs. Computer instructions bare a high similarity with any other language, but are more mathematically precise to implement processes that are mathematically modeled. The fundamental nature of a mathematical algorithm makes it inappropriate material for a patent. n22

To have a valid copyright only requires a creator to use a modicum of originality n23 and to fix the work in a tangible medium. n24 To enforce a copyright and obtain damages, a developer must register the copyrighted work. n25 Copyright only protects the expression of an idea, not the idea itself. n26 This protected expression includes all the literal elements such as the source code, object code, manuals, design materials, and executable, as well as some nonliteral elements of the program. n27 In

[*231] recent years, the courts have limited the nonliteral protection significantly. n28

Since developers most often protect computer programs by copyright, any protection authorized for government computer programs requires a change in the law prohibiting copyright of federal government works. n29

III. GOVERNMENT WORKS AND COPYRIGHT--DECISIONS, STATUTES, AND PROBLEMS

On July 4, 1966, President Lyndon Johnson signed the Freedom of Information Act into law. n30 Congress deemed this Act necessary to ensure that no government agency could obstruct the public's right to know by restricting the free flow of information. n31 The Freedom of Information Act "resulted from years of congressional examination of executive department and agency impediments to public access to information." n32 In the Paperwork Reduction Act of 1995, n33 the House Report emphasized the desire to maintain the free flow of government information.

Support from a diversity of sources for government information is an essential feature of the structure of government information activities. The First Amendment to the Constitution, Copyright Act of 1976, Freedom of Information Act, the Paperwork Reduction Act, and other laws are consistent in supporting a completely free marketplace in government information. In a democratic society, the government should not exclusively control how its own information can be used or interpreted. n34

[*232] The House Report cites several significant and important congressional acts that enforce the free flow of government information. n35 In the most recently enacted legislation, Congress continues to work at removing all impediments to the free flow of government information by requiring agencies to be able to provide information electronically. n36

The first part of this section will review some of these acts to identify the constraints on the policy underlying open government and the prohibition against copyright protection for federal government works. The second part of this section will review and analyze the relevant case law and the judicial policies. Lastly, this section summarizes the characteristics of the underlying congressional and judicial policy to use in analyzing the recommended solution.

A. *Statutes*

The United States Constitution's First Amendment guarantees freedom of the press. n37 In a concurring opinion, Justice Black, joined by Justice Douglas, explained the meaning of the First Amendment in *New York Times Co. v. United States*: n38

In the First Amendment, the Founding Fathers gave the free press the protection it must have to fulfill its essential role in our democracy. The press was to serve the governed, not the governors. The Government's power to censor the press was abolished so that the press would remain forever free to censure the Government. The press was protected so that it could bare the secrets of government and inform the people. Only a free and unrestrained press can effectively expose deception in government. And paramount among the responsibilities of a free press is the duty to prevent any part of the government from deceiving the people and sending them off to distant lands to die of foreign fevers and foreign shot and shell. In my view, far from deserving condemnation for their courageous reporting, the New York Times, the Washington Post, and other newspapers should be commended for serving the purpose that the Founding Fathers saw so clearly. In revealing the workings of government that led to the Vietnam war, the newspapers nobly did precisely that which the Founders hoped and trusted they would do. n39

[*233] The concurrence in the *New York Times Co. v. United States* not only reasserts the founding father's intent, but also denies government claims of national security as reason to prohibit publication. n40 In his concurring opinion, Justice Black stated:

The word 'security' is a broad, vague generality whose contours should not be invoked to abrogate the fundamental law embodied in the First Amendment. The guarding of military and diplomatic secrets at the expense of informed representative government provides no real security for our Republic. The Framers of the First Amendment, fully aware of both the need to defend a new nation and the abuses of the English and Colonial Governments, sought to give this new society strength and security by providing that freedom of speech, press, religion, and assembly should not be abridged. n41

These emphatic words amplify the policy behind the set of congressional acts requiring open government and the free flow of government information. These congressional acts include, among others, the Government in the Sunshine Act ("Sunshine Act"), n42 the Freedom of Information Act of 1966 ("FOIA"), n43 the Paperwork Reduction Act of 1995, n44 the Electronic Freedom of Information Act Amendments of 1996, n45 and the Copyright Act of 1976. n46

In the House Report adopting the Sunshine Act, Congress declared:
It is the policy of the United States that the public is entitled to the fullest practicable information regarding the decision making processes of the Federal Government, and that it is the purpose of this Act to provide the public with such information while protecting the rights of individuals and the ability of the Government to carry out its responsibilities. n47

In a recent congressional work to amend the Paperwork Reduction

[*234] Act, a House of Representatives' report concluded that government agencies must not control government information without good cause. n48 "Agencies also must develop effective dissemination capabilities, while avoiding proprietary-like information operations." n49 This report goes on to emphasize the need for providing the public with all the information necessary to ensure that the agencies are working toward their public purpose. The House Report specifically directs that "[the agencies] should avoid copyright-like controls (e.g., restrictions on reuse of information) or pricing arrangements that restrict the flow of public information." n50

These policy statements provide a clear message that Congress will not tolerate restrictions on the flow of information. Certainly, permission to copyright government works provides a tool for agencies that wish to violate the requirement for open government and the free flow of information. Mr. Robert Gellman, n51 in his testimony before the Subcommittee on Government Management, Information and Technology, named a few foundations for federal government freedom of information activities. n52 The foundations named by Mr. Gellman include the First Amendment of United States Constitution, n53 the Freedom of Information Act, n54 possibly the Paperwork Reduction Act, n55 and § 105 of the Copyright Act. n56

[*235] Congress reinforced the mandate for open government and the free flow of information in 1976 when it prohibited copyright protection of government works. n57 The 1976 statute explicitly states that "copyright protection under this title is not available for any work of the United States Government . . . ." n58 This prohibition existed in the 1909 Copyright Act and was made more explicit in 1976 when Congress most recently overhauled the copyright statutes. n59 In the House Report, Congress states:

The effect of section 105 is intended to place all works of the United States Government, published or unpublished, in the public domain. This means that the individual Government official or employee who wrote the work could not secure copyright in it or restrain its dissemination by the Government or anyone else, but it also means that, as far as the copyright law is concerned, the Government could not restrain the employee or official from disseminating the work if he or she chooses to do so. n60 The Copyright Act effectively avoids the possibility of restraint by putting all works in the public domain. n61 Works in the public domain are available to everyone and unprotected by the Copyright Act. n62 Thus, any United States citizen may copy or distribute government works.

B. *Decisions on Copyright of Judicial Opinions, Statutes, and Administrative Regulations*

In *Wheaton v. Peters*, n63 the United States Supreme Court deliberated on copyright ownership for the Supreme Court's reporter. The Court stated in dicta that "the court are unanimously of opinion, that no reporter has or can have any copyright of the judicial opinions handed down by the Court." n64 More importantly, the Court's *Wheaton* holding

[*236] established that copyright is a creature of statute, not of common law. n65 As such, the Court stated that copyright "does not exist at common law--it originated . . . under the acts of congress . . . [who has] the power to prescribe the conditions on which such right shall be enjoyed . . . ." n66 It was not until the Court heard *Banks v. Manchester* n67 that the Court held judicial opinions were uncopyrightable. n68 In *Banks*, the Court stated:

The question is one of public policy, and there has always been a judicial consensus, from the time of the decision in the case of Wheaton v. Peters, that no copyright could, under the statutes passed by congress, be secured in the products of the labor done by judicial officers in the discharge of their judicial duties. The whole work done by the judges constitutes the authentic exposition and interpretation of the law, which binding every citizen, is free for publication to all, whether it is a declaration of unwritten law, or an interpretation of a constitution or a statute. n69

The Court's reasoning for prohibiting copyright of judicial opinions on public policy grounds rings a familiar chord. This same reasoning pervades many of the congressional acts aimed at open government; however, the courts narrowly restrict their copyright prohibition to the law. n70 The Supreme Court's last statement on uncopyrightable material is that the law must be openly available to everyone. n71

Other federal courts have cited the public policy reasoning of the Supreme Court. In *Howell v. Miller* n72 the Court of Appeals for the Sixth Circuit extended the openness requirement to *Howell's Annotated Statutes of Michigan*. n73 The *Howell* court held "that any person desiring to publish the statutes of a state may use any copy of such statutes to be found in any printed book, whether such book be the property of the state or the property of an individual." n74 The *Howell* court restricted the uncopyrightable material to the statutes only, preserving the author's

[*237] copyright on the remaining author-generated material including such parts of the annotated statutes as the case abstracts. n75

More recently, a decision by the United States District Court for the Northern District of Georgia ruled against the State of Georgia holding:
The rationale behind the rule that statutes cannot be copyrighted applies with equal force regardless of whether it is the state or an individual who seeks to obtain a copyright in those statutes. The public must have free access to state laws, unhampered by any claim of copyright, whether that claim be made by an individual or the state itself. n76

In 1980, the Court of Appeals for the First Circuit vacated a preliminary injunction prohibiting Code Technology, Inc. ("CTI"), from publishing the Commonwealth of Massachusetts State Building Code ("Massachusetts building code") modeled on the standard developed by Building Officials and Code Administrators International, Inc. ("BOCA"). n77 The court reasoned, "regulations such as the Massachusetts building code have the effect of law and carry sanctions of fine and imprisonment for violations . . . . Due process requires people to have notice of what the law requires of them so that they may obey it and avoid its sanctions." n78 The court's reasoning in this case would require all government regulations and laws to be openly available to the public. However, the *BOCA* court stopped short of holding that the BOCA copyrighted material belonged in the public domain upon adoption by Massachusetts as the Massachusetts building code. n79

In *BOCA*, the issue centered on the incorporation of the copyrighted BOCA model code into the Massachusetts building code. n80 Since *BOCA*, several litigants have asked the courts to accept the implications of *BOCA* and extend it. These litigants want the courts to place copyrighted material in the public domain because a law or regulation requires use of the copyrighted material as reference or as part of a legal filing. These cases include *Rand McNally & Co. v. Fleet Management Systems*, n81 *Del Madera Properties v. Rhodes & Gardner, Inc.*, n82 *CCC*

[*238] *Information Services, Inc. v. Maclean Hunter Market Reports, Inc.*, n83 and *Practice Management Information Corp. v. American Medical Ass'n.* n84

Rand McNally and *Del Madera* are both district court cases. In *Rand McNally*, Fleet Management, accused of infringing Rand McNally's copyright, defended its actions by claiming that the law required it to use Rand McNally's mileage tables in filing interstate fare computations. n85 Fleet claimed that because Rand McNally's mileage tables or an alternate were required references, the tables belonged in the public domain. n86 The court held that Rand McNally's mileage guide is not equivalent to a statute or judicial opinion, citing the fact that this guide is just one of several available for use. n87 In *Del Madera*, the defendants developed property according to a tentative map copyrighted by the initial developer who went bankrupt. n88 The court held that submission of a copyrighted tentative map as part of a subdivision application does not convert the map into part of a self-executing ordinance, thus necessitating open availability to the public. n89 Both cases support the proposition that privately developed and properly copyrighted material should remain copyrighted material unless the material falls into the strict definition of statute or judicial opinion.

CCC Information Services, Inc. ("CCC") sought to invalidate Maclean Hunter Market Reports, Inc.'s ("Maclean") copyright for their *Red Book* which contains values for used vehicles. n90 In part, CCC claimed that the *Red Book* belonged in the public domain because the statute requires valuation using either the *Red Book* or an alternative. n91 The court upheld Maclean's copyright reasoning that invalidating the copyright would be taking Maclean's property without compensation. n92 In its analysis, the court compared the situation to that of requiring textbooks for schools and stated that CCC's claim would also invalidate

[*239] the copyright on textbooks. n93 What CCC and Fleet Management wanted would be contrary to Congress's purpose of providing copyright protection to authors as provided in the Constitution. If their arguments were to prevail, it would become easy to defeat any copyright by simply passing a law that required reference to or the use of any copyrighted material.

Practice Management Information, Inc. ("PMI") sued the American Medical Association ("AMA") claiming, among other things, that the AMA's copyright was invalid. n94 The AMA developed a code, the Current Procedural Terminology ("CPT") that is a shorthand notation for medical services performed. n95 The service providers use the CPT to explain the rendered services to insurers such as Medicare and Medicaid. n96 At the direction of Congress, the Health Care Financing Administration ("HCFA") adopted regulations requiring use of a single code. n97 After negotiating an agreement with the AMA, HCFA documented the requirement for CPT as their exclusive coding system. n98 The AMA provided the license to use the CPT in the HCFA regulations as part of an agreement that required HCFA to make the CPT the exclusive coding system. n99 The Court of Appeals for the Ninth Circuit held that the AMA possessed a valid copyright. n100 However, the court also held that the AMA misused their copyright by attempting to require HCFA to use only the AMA's code as specified in the agreement between the parties. n101 The court's holding in this case reflects a strong desire to avoid invalidating a copyright even when it was not part of a set of alternatives.

To summarize these rulings, the courts have enforced copyright-protection as a statutory grant, not a natural right. As a statutory grant, Congress may set the limits and the courts will enforce those limits, except for narrowly defined areas such as judicial opinions and statutes, that is, the "law."

[*240] C. *Computer Related Judicial Decisions and Copyright Like Controls*

The Copyright Act of 1976 ("Act") prohibits copyright for government works. n102 However, the Act only denies copyright to federal government works. n103 The states may copyright anything within the limits established by the United States Supreme Court. n104 In spite of the fact that states may copyright their works, the following case demonstrates that copyright is not necessary to control public access to information. *Legi-Tech, Inc. v. Keiper*, n105 involved the State of New York's Electronic Legislative Retrieval System ("LRS"), and it exemplifies the open access to government information issue under review. In *Legi-Tech*, the State of New York began supplying online, up-to-the-minute information on the legislative bills submitted by members of the legislature; thus providing those with access the opportunity to influence the proceedings. n106 Legi-Tech, an online information service provider, attempted to subscribe to the electronic service in order to make it available to Legi-Tech's subscribers. n107 In response to Legi-Tech's request, the New York legislature passed a law, Chapter 257, n108 preventing online service providers from subscribing to and retransmitting the LRS information. n109

The New York legislature reasoned that permitting other information services access to the LRS data would erode the government's customer base. n110 Superficially, this may seem to be an adequate reason. However, the legislature could have computed a price based on an estimate of customer erosion and charged the information services appropriately for access to the LRS. n111 Instead, the legislature chose not to provide the service at any price. n112

[*241] Legi-Tech went to court, and the Court of Appeals for the Second Circuit held that the law would stand only if the legislative information was available to Legi-Tech on "substantially the same terms as LRS" n113 The Court of Appeals noted the flaw in the state's reasoning: "the profit motive's weakness where government is concerned is starkly evident in Chapter 257's own provisions, which prohibit potential retransmitters from subscribing to LRS rather than offering subscriptions to them at prices that eliminate the potential for free riding [on the State of New York's efforts]." n114

Legi-Tech identifies several important conclusions for later discussion. First, electronic information is considered significantly more valuable than printed information because it is powerful, versatile, and immediate. Second, government is not motivated by profit because government will continue whether there is a profit or not. n115 Supporting these conclusions is New York's refusal to negotiate any price that would adequately compensate the state for the service it provided. Instead, New York chose to keep LRS as a state monopoly, claiming that it was too complex to derive a price that would adequately compensate it for the loss in subscribers. n116

The Court of Appeals in *Legi-Tech* concluded that the profit motive behind copyrighting a creation serves both as an incentive and as a disincentive. n117 "The unspoken premise of the copyright law, however, is that the profit motive which is the incentive for creation is also a disincentive for suppression of the work created, a premise of doubtful strength in the case of government." n118 Perhaps that is why there are so few cases involving state government copyrights. In fact, in *Legi-Tech*, neither copyright nor licensing was an issue. What was at issue was information control.

Controls over electronic information are an issue for the federal government as well. In *SDC Development Corp. v. Mathews*, n119 SDC sued the Secretary of Health, Education, and Welfare to obtain tapes of the

[*242] Medical Literature Analysis and Retrieval System ("MEDLARS") through the Freedom of Information Act. n120 The United States Court of Appeals for the Ninth Circuit held that the MEDLARS database was not an agency record. n121 The court based its holding on an interpretation of what Congress meant by agency records. n122 However, in dicta, the court provided a revealing reason for protecting the database. The court stated that "the agency is seeking to protect not its information, but rather its system for delivering that information. Congress specifically mandated the agency to prepare this system and hold it as its stock in trade for sale to the public. As such the system constitutes a highly valuable commodity." n123 Because of the court's ruling, SDC could only obtain the MEDLARS tapes through the National Technical Information Service and by paying $ 50,000 per year. n124 However, if SDC purchased the tapes, they were the first to pay that sum. n125 Before this case, not one of the more than 350 institutions using MEDLARS had paid the $ 50,000 per year for the tapes. n126 As in the *Legi-Tech* case, profit was not the motive behind the controls placed on the information. The information was controlled because it was electronic, it was a valuable commodity, and it was useful in bartering with other agencies and organizations to obtain additional agency services or products. n127

In the Electronic Freedom of Information Act Amendments of 1996, n128 Congress specifically overturned *SDC*. n129 The intention of the act was for all "information an agency has created and is directly or indirectly disseminating [to be] subject to the FOIA in any of its forms or

[*243] formats." n130 President Clinton signed the Electronic Freedom of Information Amendments of 1996 into law on October 2, 1996. n131

D. *Summary of Copyright Constraints on Government Information*

To summarize, in recent decisions the courts consistently chose not to invalidate copyrights as a matter of public policy. In each of the discussed cases, the courts agreed that laws and judicial opinions are not copyrightable, but the courts adopted very narrow definitions of *laws* and *judicial opinions* to avoid invalidating preexisting copyrights.

In sharp contrast to the courts' narrow definition of uncopyrightable material, Congress continues to restrict copyright on all federal government works. In *Wheaton*, the Court held that copyright is a statutory grant that Congress may alter as they desire. n132 Thus, Congress may decide to permit copyright of government works without fear of constitutional issues. In fact, the courts have supported copyright of works made under contract to the government and as permitted in the Copyright Act. n133

IV. HISTORY AND DEBATE FOR LEGISLATION PROPOSED TO PERMIT COPYRIGHT OF GOVERNMENT CREATED COMPUTER PROGRAMS

During the past several years, some government agencies attempted to obtain permission to copyright government created computer programs. n134 These agencies initially sought broad permission to copyright. n135 However, after a few hearings, these agencies confined their

[*244] request to an amendment of the Stevenson-Wydler Technology Innovation Act of 1980. n136

Congress adopted the Stevenson-Wydler Technology Innovation Act of 1980 to encourage the transfer of technology and inventions from federal research and development laboratories to american industry. n137 The Federal Technology Transfer Act of 1986 n138 modified the Stevenson-Wydler Act to provide, among other things, that at least fifteen percent of all technology transfer patent royalties be shared by participating government employees. n139 Congress decided that sharing royalties would encourage creativity and participation in the cooperative research and development agreements ("CRADAs") with private industry as authorized by the Stevenson-Wydler Act. n140

A. *History of Proposed Legislation*

In 1986, Congress passed legislation that permitted government agencies and agency employees participating in a CRADA that resulted in a patent, to receive some of the royalties and to negotiate with the non-government partner over the patent rights. n141 In response to this new source of income, proponents for technology transfer of computer programs got their opportunity to lobby for legislation when Congress began holding hearings in 1990 to study the issue. n142 Central to the discussion was the need to have a copyright similar to the patent right to facilitate technology transfer from the United States Government to private industry. n143 The motivation behind this need to be able to

[*245] transfer government technology was the highly valuable commercial potential of government works and the desire to see government work used to help in areas such as education. n144

On April 26, 1990, the United States House of Representatives Subcommittee on Science, Research and Technology held a hearing on the issue of permitting the United States Government to copyright computer programs. n145 The hearing focused on computer programs created by government employees. n146 The testimony was mostly favorable. n147 Several months after that April hearing, Representative Constance Morella (R-Md) introduced legislation amending the Stevenson-Wydler Technology Innovation Act of 1980 to add the right of United States government agencies to copyright computer programs developed under CRADAs. n148 The House of Representatives Bill entitled the Technology Transfer Act of 1991, n149 was referred to the House Science, Space, and Technology Committee and to the Judiciary Committee. n150 Representative Morella urged support for her bill citing two specific reasons. First, Representative Morella claimed that the royalty sharing incentive would stimulate the commercialization of computer programs in government laboratories. n151 Second, she noted that

[*246] most private enterprise organizations would not invest in commercializing computer programs if they were unable to obtain exclusive rights. n152

House Bill 191, submitted by Representative Morella, contained several provisions for dealing with the copyright issue. n153 First, the bill provided that the government could copyright computer programs and transfer these rights to a commercial developer. n154 Second, her bill provided at least fifteen percent of the royalties generated by a commercialized, government created computer program to the employees who developed it. n155 After hearings by a variety of House committees, her bill was modified in two ways. The first modification was to delete the proposed ability to claim copyright from the amendment to the Stevenson-Wydler Act and instead, add it to the Copyright Act as a new subpart. n156 The second modification was to exclude all data, databases, and all database retrieval software from copyright under the Stevenson-Wydler Act amendment to the Copyright Act. n157

On July 29, 1991, Senator John D. Rockefeller (D-WVa) submitted Senate Bill S. 1581, which was identical to the bill submitted by Representative Morella in the House of Representatives. n158 Senator Rockefeller stated in his introduction of the bill that it had been "drafted by technology transfer experts at the Department of Commerce." n159

After significant debate and testimony, the House incorporated Morella's bill into the National Competitiveness Act of 1992, H.R.

[*247] 5231. n160 The House passed H.R. 5231 and inserted the language into a similar Senate Bill, S. 1330. n161 However, the revised bill, S. 1330, received no further action in the Senate. n162 Representative Morella resubmitted the bill again in the next session of Congress. n163 However, after testimony, debate, and committee consideration, Congress dropped the proposed amendments permitting copyright of computer programs. n164

Since Morella's last attempt, no one else has submitted any bills to permit copyright of government created computer programs. However, the debate and testimony brought forth a number of valid reasons for permitting copyright protection for government computer programs. These reasons remain unaddressed today.

B. *Debate on the Proposed Legislation*

Congressional debate and hearing testimony evidenced three major themes on the side of the proponents. Those against permitting copyright focused their arguments primarily on the potential for blocking the public's access to information. The details supporting each side's arguments follow.

1. Arguments in Favor of Government Copyright Privileges

There are three basic reasons given by those in favor of permitting government computer program copyrights. First, private industry will not commercialize U.S. government computer programs if they cannot get exclusive rights. Second, many government computer programs are commercially valuable. Third, foreign governments, enterprises, and individuals benefit from placing U.S. government works into the public domain. Additionally, proponents believe there is no incentive for the civil servants, or the agencies where they work, to

[*248] develop commercial programs if they cannot benefit from the development. So, any permission to copyright should include an incentive package in which the agencies and employees can share.

a) Exclusive Rights

In testimony before a House Subcommittee on Technology and Competitiveness, Mr. Robert White, Under Secretary for Technology at the Commerce Department, gave an example of a computer program developed by employees at the National Institute of Standards (NIST). n165 NIST advertised the computer program, named DATAPLOT, as available for commercialization. n166 Twelve companies responded and each turned down the opportunity after learning that no exclusive copyright would be available. n167 Most government created computer programs require investment to make them marketable, but most commercial software companies will not invest without some exclusive rights to the product. n168 Since the government cannot claim a copyright, computer programs, along with other government works, belong in the public domain and are available to anyone who wants them. However, if consideration were given to the cost of commercializing these computer programs, compared with the cost of re-creating them, there would appear to be a balance that justifies the investment. The balance results from being able to market the computer program at a significantly lower price and risk than is otherwise possible.

b) Commercially Valuable Computer Programs

During a House Subcommittee Hearing, proponents of permitting the government to copyright its computer programs pointed to existing

[*249] valuable programs they considered commercially viable. n169 The federal government loses billions of dollars each year due to the prohibition on protecting information technology ("IT"). n170 The federal government creates all kinds of computer programs for a variety of fields such as medical care, land use, banking, transportation, astronomy, geology, tax systems, social security, licensing, space, weather, and assorted directories. n171 One can easily conclude that among all these different industries, the government has created some commercially valuable programs. Mr. Ralph Oman, Register of Copyrights, stated that these computer programs collectively have an immense economic value. n172

c) Protection from Use by Foreigners

Several individuals also testified before the Subcommittee on Technology and Competitiveness about the threat of foreign governments, enterprises, and individuals who use computer programs created by the U.S. government agencies. Mr. James Chandler, Professor of Law at George Washington University, testified that forty-eight percent of the requests for computer source code from U.S. public computer program libraries were made by the Japanese. n173 Mr. Mauro Togneri, representing the Institute for Electrical and Electronic Engineers ("IEEE"), confirmed Mr. Chandler's statements and added that the Japanese can do this because they do not require as high a level of intellectual property protection to obtain investment financing. n174 Of course, without

[*250] specifics, it is difficult to assess why this is the case. Certainly, financing availability is commensurate with the risk involved. If the major part of the investment is complete, and the program is marketable as is, then there is little investment or risk. If there are substantial modifications necessary, then a copyright can be obtained for the derivative work, providing reduced risk and protection for the investment made.

d) Incentives

On the floor of the House of Representatives, in the introduction of the Technology Transfer Act of 1991, Representative Morella stated:

Federal employees are currently unable to obtain copyright protection for their works created in the course of their official duties. 'Consequently,' she charged, 'the incentives of proprietary rights and royalty sharing - so vital in the case of inventions - cannot be used to spur the development and commercialization of computer software in federal laboratories.' n175

Confirming Representative Morella's opinion in a hearing on July 18, 1991, Mr. Robert White from the Commerce Department spoke about the lack of incentive for government laboratories and agencies to think beyond their immediate needs. n176 He claims that the needed incentive is a monetary return to the individual and agency. n177

However, in his testimony before the House of Representatives in April 1990, Mr. John Ols of the Government Accounting Office admitted that the possibility of incentives might shift the federal laboratories and agencies from performing their primary functions to developing

[*251] commercial computer programs. n178 Mr. Ols' point is very important. As soon as the government provides incentives for creating commercially viable computer programs, those seeking additional incentives will focus on goals to earn the incentives, even if that goal conflicts with their regular duties and responsibilities. Although no one can predict what would happen, it is not out of the realm of possibilities to visualize a shifting focus from government missions to creating competitive commercial software.

2. Arguments Against Government Copyright Privileges

Free and open access to government information is the major reason expressed by those individuals who are against permitting the government to copyright computer programs. In the initial oversight hearing before the House Subcommittee on Science, Research, and Technology, Mr. Ols and Dr. James Curlin, of the Office of Technology Assesment, explained their thoughts on the proposed government copyright legislation. n179

Mr. Ols recognized the potential for information restriction and proposed limiting the copyright capability to CRADAs to reduce the risk. n180 He proposed this solution because he believed that without the ability to copyright, private enterprise would not join in a CRADA out of fear that any computer programs developed would fall into the public domain. n181 Also, Mr. Ols expressed concern about incentives causing a change in agency missions by altering the goals of government computer programmers to build commercial software rather than meeting only the

[*252] needs of the agency. n182 The likelihood, that incentives will change agency missions, is great for those agencies with large computer program development-budgets,.

Mr. James Curlin of the Office of Technology Assessment expressed concern about the proposed legislation. n183 He wanted further studies performed to determine more precisely, what the impact would be to public access of government information. n184 Also, Mr. Curlin claimed to have examples of computer programs that were commercialized precisely because they were in the public domain. n185 Mr. Curlin's comment on the use of public domain computer programs coincides with the reasoning discussed previously; that is, because these programs are in the public domain, they cost less to produce and result in lower prices and risk in the market.

Mr. Robert White from the Commerce Department, and Mr. Steven Metalitz from the Information Industry Association testified at a hearing of the House Subcommittee on Technology and Competitiveness on July 18, 1991. n186 Mr. White acknowledged that if data and computer programs are interlocked, that is, the information is available only through the computer program, then discretion must prevail before permitting copyright. n187 Unfortunately, it is not clear who would make

[*253] this decision. Certainly, the creators and agency would not be able to make an unbiased assessment of the impact. Similarly, Mr. Metalitz argued against the ability for the government to copyright. n188 Mr. Metalitz claimed that the ability to control programs would effectively control information because of the interlocking nature of electronic data and computer programs. n189

All the testimony and debate against permitting the government to copyright computer programs relates back to the free flow of information issue. In every case, these opponents argue that there will be an impact to the free and open flow of information from government agencies and laboratories.

V. ANALYSIS OF THE TESTIMONY ON PERMITTING COPYRIGHT OF GOVERNMENT COMPUTER PROGRAMS

There are two major perspectives permeating the discussion of permitting copyright for government-created computer programs. The first perspective is that it is possible to get a return on investment in government developed computer programs. The second perspective is that permission to copyright such programs will provide government agencies with yet another means to restrict the flow of information.

The first perspective predominantly reflects the opinions of the government agencies that believe a significant number of government created computer programs and databases are highly valuable commercial commodities. These government agencies have been under tremendous pressure to reduce spending without affecting service to the public. One alternative to a budget based on tax dollars is outside funding. A source of outside funding is the intellectual property resulting from high technology research and development, or even the low technology daily computer operations. This intellectual property includes both the inventions and discoveries made in laboratories and the computer programs created.

[*254] Currently, agencies may only capitalize on patented inventions resulting from CRADAs. n190

In contrast, the second perspective expresses the potential for information control that could result from the government's ability to copyright computer programs. Concerned individuals are already aware of the copyright-like controls that some government officials have used in the past. n191 These past events resulted in legislation such as the Freedom of Information Act of 1966, n192 the Government in the Sunshine Act, n193 and most recently, the Electronic Freedom of Information Amendments of 1996. n194

Both arguments are important and not necessarily inconsistent. Certainly, the government employs or finances a significant part of the scientific research and development performed in the United States today. Somehow, this investment and the resulting products, including computer programs, should provide some return to the country's economy. Yet, this goal should not result in the loss of our access to information.

A. *Analysis of Reasons for Denying Copyright Privileges*

Essentially, there are only two arguments against permitting the government to copyright computer programs. First, government agencies may restrict the free and open flow of information through copyright of computer programs. Second, there is concern that government agencies would shift their objectives to making money through the development of commercial computer programs rather than performing work necessary to run the agency.

The potential for government agencies to restrict the flow of information is a valid concern. If a government agency has reason to restrict information, then the copyright will become one more method in its bag of tricks to accomplish this goal. The fact is that government

[*255] agencies have restricted or tried to restrict embarrassing information many times in the past. However, the problem that Congress has tried to legislate away still exists without the ability of agencies to copyright government works. Allowing agencies the ability to copyright may not affect the flow of information at all. It is not the ability to copyright that causes the problem, but the decision about who gets a license to use the software that is a concern. That is, a copyrighted computer program licensed freely to everyone is effectively the same as it being in the public domain and does not restrict information. Thus, once permission is given to copyright government computer programs, the problem reduces to who makes the decision concerning the grant of licenses.

The potential to restrict the flow of information deliberately is not a characteristic of the computer program, but is due to the people at the agency who use it as a means to restrict information. However, if the agency does not decide who gets a license to use a copyrighted program, then the agency cannot deliberately restrict the flow of information. Thus, by taking away the agency's power to make a decision about licensing a program, there is no conflict of interest or problem of information restriction. Additionally, the function and context in which an agency uses a program will contribute to the possibility of information restriction. For example, a data plotting program used to display statistical analysis of census data that can only be read by the plotting program does impact the free flow of government information, but a data plotting program that is used for plotting temperatures in offices may not. Thus, any solution that permits copyrighting and licensing of government programs must provide for an independent evaluation of the computer program's function and the context of its use to ensure that public access to government information is not at risk.

Second, incentives for creating commercial computer programs as part of the work performed at government agencies elicits concerns about whether the agency and employees will focus on the agency mission or on creating commercially competitive computer programs. If monetary incentives are available for creating commercial computer programs, then it is a natural to expect agency personnel to respond to the stimulus. By responding to the incentive stimulus, the agency personnel's goals may be in conflict with the agency mission. For example, Bureau of the Census personnel should generally focus on the census and analysis of census data, not on competing with the commercial, statistical-analysis program publishers. In effect, if the government agencies are working toward developing and commercializing computer programs, they would be competing with private industry and perhaps shirking their duties as civil (or military) servants. Some civil servants would be spending their time administering and negotiating licenses for the works they create rather

[*256] than performing their agency's mission. By removing the ability for the agency to decide which computer programs to commercialize, the possibility that an agency will alter its mission to produce income generating computer programs is significantly reduced, though not eliminated. However, there is a way to determine whether this is a significant problem. A review of the successful CRADAs providing shared invention royalties to agencies, and agency personnel, may assist in determining if the incentives had an effect on the participating agency.

Nevertheless, marketing government-created computer programs developed at government expense is an attractive means for financing government work. Additionally, transferring the results of government research and development to private enterprise makes U.S. businesses more competitive internationally. Thus, to take advantage of the corresponding financial benefits, but to avoid a conflict of interest on the part of the agency or agency employees, incentives must be tightly controlled.

B. ***Analysis of Reasons for Permitting Copyright Privileges***

The proponents wishing to permit copyright of government computer programs provide three basic arguments. These arguments, previously discussed, n195 are briefly summarized here.

First, private industry will not invest in commercializing government technology without exclusive rights. Second, many computer programs developed by the government are commercially valuable. Third, foreign governments and enterprises are freeloading on the U.S. government's investment in computer programs placed in the public domain.

The premise that exclusivity is required is a reasonable one and deserves consideration. The whole point of providing intellectual property protection is to incentivize creators and inventors so that they will be able to obtain a reasonable return on their personal and financial investment. Thus, the probability of successfully transferring technology from the government to private enterprise becomes more attractive to industry if exclusive use of the computer program is available. However, because there is only a small investment and low risk in bringing these programs to market, maybe exclusivity is not necessary, just desirable.

The value of government-created computer programs already in existence is probably enormous if the billions of dollars spent to create these programs translated to commercial value. The ability to assess the

[*257] commercial value of these computer programs requires a group skilled in evaluating each program based on knowledge of industry and business needs.

Lastly, the proponents argue that without copyright protection, foreign governments and businesses are capitalizing on the programs placed in the public domain. The testimony given in congressional hearings indicated a significant effort on the part of the Japanese to obtain and commercialize U.S. government-developed computer programs. n196 Providing free computer programs to foreign countries surely was not part of the open government desired by Congress.

C. ***Other Problems Affecting Technology Transfer***

Reviewing the arguments for and against permitting copyrights reveals some reason to doubt that the government would transfer the technology successfully, even with the availability of copyright.

For instance, after Beatrice Farr of the Army Research Institute contracted with Florida State University to develop computer based training, the University successfully completed the project and assigned the copyright to the Army. n197 The Army tried to find someone to commercialize the program but found no takers. n198 In this case copyright was readily available; thus, there must be another reason for the lack of commercialization. Some of the possibilities may include such actions as terms and conditions imposed by the agency, and exclusive versus nonexclusive use.

More evidence of additional factors affecting the transfer of technology are evident from congressional testimony provided by Bruce Winchell, General Patent Counsel for Martin Marietta Energy Systems, Inc., n199 and David Nixon, President of Nielsen Engineering & Research (NEAR). n200 Mr. Winchell complained of problems obtaining a copyright

[*258] for computer programs created under contract because of the government's data rights clause. n201

The data rights clause reserves a right for the U.S. government's contract officer to approve a claim by the contractor for copyright to computer programs created for the government with government funds. n202 These government contract clauses also provide the contract officer with authority to require the contractor to claim copyright and assign the claimed copyright to the government. n203 The result of this authority is to put the copyright under the control of the government agency or laboratory where it could be used to restrict the open and free flow of information. In fact, each agency desiring to keep information locked away could just contract the work out and use the data rights clause to obtain the copyright. Clearly, this violates the policy set by Congress and expressed in the legislation adopted by Congress to ensure open and free public access to government information.

Mr. Nixon complained about another problem under the current law; that is, the lack of dependability of agreements with the government. n204 Recognizing the future decrease in research funds available from the Navy, NEAR moved, as a means of funding future research, to commercialize a product that resulted from their past research for the Navy. n205 Although NEAR had reached an agreement with the Navy, the Navy sought to void the agreement, citing a contribution by civil servants in the development of the computer program. n206 The Navy argued that if

[*259] civil servants take part in the development of a computer program, the computer program belongs in the public domain unless the private enterprise can identify and isolate the contributions by the civil servant. n207 For NEAR, the value of the investment made to commercialize the product would be diminished because NEAR could not establish ownership over any portion well enough to avoid the possibility of future litigation. If the program belongs in the public domain, anyone would be able to obtain a copy, along with the right to use or distribute it.

These obstacles to achieving technology transfer could be avoided by permitting copyright of government computer programs and assigning this right to an independent group to negotiate with industry and manage the property. The independent group should establish standards as necessary to ensure that private enterprise can rely on an agreement, and that the government and private enterprise have a fair chance to obtain a return on their investments.

When Senator John Rockefeller introduced the Technology Commercialization Act of 1993, n208 which he cosponsored with Senator DeConcini, he made several key points n209 distinguishing the Stevenson-Wydler Technology Innovation Act of 1980 n210 from the Bayh-Dole Act. n211 In the Bayh-Dole Act, Rockefeller noted, Congress promoted commercialization of inventions resulting from federally funded research and development by granting the intellectual property rights to the individuals, small businesses, universities, and other nonprofit groups conducting the research. n212 In the Stevenson-Wydler Technology Innovation Act, Congress took a different approach to commercialization by defining a mechanism for use of government funded research, instead of granting the intellectual property rights to a private enterprise. n213 In the Stevenson-Wydler Act, the government agency can

[*260] negotiate to retain the intellectual property rights developed from participation in a CRADA. n214 Under this act the government laboratory or agency may keep all the rights, share the rights with private enterprise, or assign the rights to the private enterprise. n215 Thus, when a government laboratory or agency participates in a CRADA, they may retain a nontransferable, nonexclusive, irrevocable paid-up license to use the technology while providing only staff and facilities, but no funding. n216 Under the Bayh-Dole Act, all property rights are provided to the small business, university, local government group, or other nonprofit groups to develop while performing federally funded research and development. n217

Senator Rockefeller explained in his statements that the Bayh-Dole Act has been very successful by comparison with the Stevenson-Wydler Technology Innovation Act. n218 The Senator cited two General Accounting Office ("GAO") studies. n219

According to Senator Rockefeller, the first GAO study found that
the 25 universities [in the study were] granted 673 licenses for the commercialization of the inventions, more than 7 1/2 times as many as the Federal laboratories with only one-third of the R&D expenditure, and the[] [universities] received [a total of] $ 110.9 million in licensing income, almost 9 times more than the Federal laboratories. n220
Obviously, the non-government groups fared far better than the government groups.

The second GAO study identified 455 exclusive licenses granted to commercialize inventions developed in government laboratories from 1981 to 1991. n221 In the same period, only a single university, the Massachusetts Institute of Technology, granted more licenses. n222

Senator Rockefeller concluded that the private sector is significantly more capable of commercializing technology. n223 It is apparent

[*261] that the business of government is not the business of business. These GAO studies reveal that even if Congress granted copyright privileges to the government, the likelihood is against high commercialization of the technology developed. n224 Copyright privileges alone are not sufficient. The agencies are not skilled in the business of managing intellectual property. Profit and return on investment are not keystones in the overarching goals and objectives for government agencies and laboratories. Maximizing the available budget to achieve the agency's objectives is the skill they practice. Thus, to effectively transfer technology developed in government agencies and laboratories to the commercial market requires a group with experience in the business of managing intellectual property. This group should be independent of the agency performing the work. It should be comprised of individuals who have a clear understanding of the business principles involved.

Profit motivates industry to perform at least a minimal market analysis before developing a commercial product. Industry is usually conservative in decisions to do new and radical things. On the other hand, government agencies and laboratories will frequently venture into the unknown, sometimes successfully and sometimes not. While industry reacts in a measured response to an identified market need, the goal of government is to accomplish an agency mission because--risky or not--it is needed to meet their goals. Thus, agencies develop computer programs as tools to achieve their goals, and the possibility of commercializing these programs is an afterthought.

Government's purpose is to serve the people, the states, and the businesses of this country, and to work with the governments of other countries to ensure the safety of our citizens and their property. Making a profit has not been a traditional goal of government. More recently, however, in an era of smaller budgets and shrinking government, many agencies are looking for avenues to increase their revenues in order to achieve their mission. Unable to get more money from Congress, many agencies have recognized value in the computer programs and information that they control and disseminate. The idea of capitalizing on the government created computer programs is only natural.

D. *Summary of Needs*

In summary, permitting the United States to copyright government created computer programs requires a solution that will:

* avoid diverting the agency from its mission;

[*262] * be administered by a group of skilled business professionals authorized and prepared to make agreements to license government intellectual property;
* provide for independent decision making on copyright and licensing;
* improve business competitiveness of the United States;
* provide limited incentives for agencies and agency employees;
* avoid agency conflict of interest concerns;
* not restrict the public's access to government information; and
* restrict free access to United States government computer programs by foreign governments or enterprises.

The recommendation suggested in the next section satisfies all these criteria. Essentially, the solution is to transform a copyright problem into a licensing problem.

VI. RECOMMENDATION

A solution satisfying all the criteria identified above is achievable by forming a trust to collect, copyright, and manage government created computer programs. The trust's charter should include the following functions:
* copyrighting the government's computer programs;
* evaluating these programs for commercial viability;
* assembling a business case for commercializing particular programs;
* selecting suitable private enterprises to commercialize the selected programs;
* negotiating and contracting with private enterprise to commercialize the selected programs;
* collecting and distributing royalties;
* collecting and cataloging all computer software; and
* working with agencies to ensure that each agency's needs are satisfied.

The trust would assume the role of intermediary between possible commercialization partners and the government agencies. The trust must be independent of the agencies and have the objective of developing the commercial potential and maximizing the government's return on investment as its sole mission. The trust should include trustees who are experienced in licensing and managing copyrighted computer programs. These trustees might include members of the government, academia, and

[*263] business who have no conflict of interest with the agencies or businesses likely to profit.

A. *Satisfying the Criteria Identified From Case Law and Legislative History*

In this section, each of the concerns, criteria, and needs established previously are evaluated in light of the proposed solution.

The most serious concern about copyrighting government computer programs results from the potential for restricting public access to government information. Government agencies have at least two ways around the current statute restricting copyright on government works. The agencies can give the work to a contractor, require the contractor to claim copyright, and require the contractor to assign the copyright to the agency, or the agency may use copyright-like controls like those used in *Legi-Tech* n225 or *SDC*. n226 The result is the same--restricted flow of information. The assignment of all computer programs to a trust would avoid any conflict of interest on the part of an agency. All decisions to license a copyright would be in the hands of the trust and thus would not play a role in deliberate restriction of information. Of course, another approach could be to require all agencies to store data in human readable formats. However, this would be inefficient, costly, and would not provide a return on the government's investment. Any inadvertent restriction of information is avoidable through appropriate licensing rather than by avoiding computer program copyrights altogether.

The copyrighting of computer programs by a trust responsible for administering the intellectual property to benefit the government and taxpayers would result in a return on the government's investment. The royalties received by commercialization of some programs could offset the amount of money spent yearly on computer program development. The trust itself could receive funding out of the royalties received. An added benefit results from having a broader user-population over which the cost of computer program maintenance can be spread. This could reduce the cost of maintenance to the government agencies using the programs--both through the commercial drive to keep up with current technology, and the sharing of royalties received by the government.

Foreign governments could not request and use these computer programs without paying royalties because the programs would no longer be in the public domain. In fact, for the noncommercialized computer

[*264] programs, the trust could automatically license every American citizen to use the programs. This avoids restricting access to information for the American public, but does restrict use by foreign citizens, governments, and enterprises.

American businesses could have the exclusivity of a copyright to protect an investment in commercializing these computer programs. Additionally, businesses would know at the outset what their licensing rights are, and would not have to worry about possible court challenges based on public domain issues.

Dealing with commercial licensing issues and managing intellectual property would not divert government agencies from their mission. The agencies would minimize their risk of conflict of interest. They would be free from accusations of mismanaging their budgets or competing with private industry. However, the government agencies, and perhaps the government employees involved, could receive some part of the royalties received from the commercialized computer programs.

Data rights issues would disappear because all computer programs would receive copyright protection. For instance, government computer programs developed by contractors would be copyrightable under the substantial body of law dealing with "works made for hire." Thus, every party would know where they stand because they would have to compete with other businesses to license and commercialize the computer programs created. The trust could restrict licensing and thus make commercialization possible.

Finally, the copyright would be within the guidelines set by the courts. n227 The courts have only denied copyright under very narrowly defined circumstances. These circumstances specifically include only laws and judicial opinions.

B. *Implementing the Solution*

To implement this solution, Congress must modify the Copyright Act to exempt computer programs from government works. Additionally, Congress would need to prepare legislation to establish and charter the trust, establish a means of accountability, decide on who would be the trust beneficiaries, identify how to dissolve the trust, specify what happens in the event the trust is dissolved, and explain how to remove the trustees.

After establishing the trust, the trust should be required to set documented standards for evaluating computer programs for commercial

[*265] potential, eliminating possible restriction of government information, and selecting a vendor to commercialize each program. The trust would claim copyright for the taxpayers of the United States rather than the government to affirm the independence of the group and to make it clear who they serve. Congress would select the trust members who would sit for limited terms and have a fiduciary responsibility to the beneficiaries. The trust group would register all computer programs. This step would facilitate an inventory that could be valued. After claiming copyright, the trust would establish, within a set period, whether to commercialize each computer program and how to license its use. If the trust decides to commercialize a computer program, that program would necessarily have to undergo an independent study to ensure that it would not restrict the public's access to vital agency information. If the study reveals no problems, the selected private enterprise could obtain an exclusive license. If problems with information access are found, or the agency requires the programs to carry out their mission, then some limitations on exclusive licensing may be needed. Finally, since the trust receives all computer programs, a national computer source code library could be formed, thus making all computer programs available to all government agencies, and as appropriate, any American citizens. This could benefit government agencies by providing a repository of potentially reusable computer programs and modules. Forming a computer program library would not be appropriate before adopting a means for securing intellectual property protection, since all government created computer programs would fall into the public domain making them readily available to foreign governments and others.

VII. CONCLUSION

An unrestricted privilege of the U.S. government to copyright computer software may adversely affect the dissemination of information. However, the enormous investment the government makes each year in developing and maintaining computer software must result in some commercially valuable computer programs. These valuable computer programs should not languish, wind up in the hands of foreigners, or become the property of some lucky entrepreneur who happens to be in the right place at the right time. The solution proposed above removes the problem of deliberate restriction of information without prohibiting copyright of these government works, and benefits the government agencies, citizens, and businesses.

Further, it seems possible that this solution could be used to manage all the intellectual property, not just computer programs. At this

[*266] time, it is not possible to account for all the government inventions patented and licensed. There does not seem to be any group responsible for ensuring that the government maximizes the return on its investment in intellectual property. Managing all patents and copyrights through a public trust would provide accountability and ensure maximum return on all these government assets, improve American business competitiveness, and possibly lower taxes.

n1 *See Legislation: House Panel Considers Copyright Protection for Federal Software*, 40 PAT. TRADEMARK & COPYRIGHT J. (BNA) 6, 6-7 (May 3, 1990).

n2 *See id.*

n3 *See id.*

n4 *See 35 U.S.C. § 207* (1994).

n5 *See 17 U.S.C. § 105* (1994).

n6 *See id.*

n7 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n8 *See Legislation: House Panel Witnesses Endorse Copyright for Government Software*, 42 PAT. TRADEMARK & COPYRIGHT J. (BNA) 291, 291-92 (July 25, 1991).

n9 *See id.*

n10 Possibly this same approach could be used to protect and manage all copyrightable and patentable government works.

n11 *See Conferences: AIPLA Midwinter Meeting Focuses on Computer Technology*, 35 PAT. TRADEMARK & COPYRIGHT J. (BNA) 443, 443-45 (Mar. 24, 1988).

n12 An example of a computer program may help the uninformed reader to distinguish the important characteristics that relate to the appropriate means of intellectual property protection. Suppose a bank wants to develop a program to assist in processing checks written on the bank by the bank's account holders. The check processor posts each check to the appropriate account and among other things checks to see if there are enough funds in the account to cover the check. A computer programmer will determine the actions that the check processor takes and determine the information needed to perform such functions. Next, the computer programmer determines the order of the process and begins to model the series of actions taken by the check processor who must manually process each check. Each action results in some activity such as sorting, comparing, computing, compiling, and reporting. Then the computer programmer breaks these activities into functions, some of which are repeated in modeling the activity of the check processor until finally, the programmer develops an algorithm for processing the information and performing all the necessary verifications and reports. Next, the computer programmer begins to implement the algorithm with a high-level computer language suited to the type of activity being performed. A high-level computer language looks similar to the English language except there are a limited number of words and

each sentence must use a precise syntax or it will not be useful to the computer. The sentences composed in a series represent the logic defined in the algorithm. They include definitions of data and actions to be performed. Once complete, the programmer compiles the computer language statements to generate a matching machine language set of statements that represent data and actions that the computer understands. There may be many instructions at the machine language level representing a single statement implemented by the computer programmer using a high-level computer language. The particular algorithm used to model the bank check processing activity is not specific to the bank problem. The models used to perform the series of check processing actions may apply to many other activities. The difference is in the particular data acted upon. Thus, any computer programmer developing a computer program to assist people in doing a job must use these same basic mathematical models in similar or different combinations to get the job done.

n13 The design materials created as part of developing a computer program include a process analysis as shown in a flow chart or other relationship diagram depending on the particular computer methodology chosen. These materials typically are a map of the process, data inputs, data outputs, interfaces, and computations that must be performed. These materials represent an intermediate step in the translation of a human process into a computer process.

n14 Source code is defined as the set of high-level computer language instructions written by the programmer to perform the functions identified for a computer program.

n15 The object code is generated from compiling the high-level language. A single high-level command may result in many machine-level instructions. Machine instructions are the lowest level instructions before the program is converted to electronic signals.

n16 User's instruction manuals contain information about running the computer program.

n17 It is possible to create non-infringing programs to read electronically formatted information. However, this could, be a costly and time-consuming process, especially if the data storage format is unknown and requires reverse engineering.

n18 *See generally 35 U.S.C. § § 101*-103 (1994 & Supp. IV 1998). Patents require an examination to determine if the invention is novel, nonobvious, and useful. The preparation of a patent is expensive, and the examination process is time-consuming. Patent preparation requires careful, precise claim wording to obtain protection and withstand later challenges. *See id.* § 112.

n19 *See generally 17 U.S.C. § § 408*-410 (1994 & Supp. IV 1998).

n20 *See* Jube Shiver, Jr., *Monday Business an Unlikely Group Fights Patent Reform Legislation: Bills to Overhaul the Centuries-Old System Bring Together Small Inventors, Perot and Others to Take on Big Business*, L.A. TIMES, Dec. 8, 1997, at D2 (reporting General Accounting Office (GAO) study finding average time to patent is twenty-one months with possible time to patent as long as twenty-five years).

n21 *See Conferences: AIPLA Midwinter Meeting Focuses on Computer Technology, supra* note 11, at 444.

n22 *See id.* Although a mathematical algorithm may not be patentable subject matter, computer programs are patentable under *State St. Bank & Trust Co. v. Signature Fin. Group, Inc., 149 F.3d 1368, 47 U.S.P.Q.2d (BNA) 1596 (Fed. Cir. 1998).*

n23 *See Feist Publications, Inc. v. Rural Tel. Serv. Co., 499 U.S. 340, 346, 18 U.S.P.Q.2d (BNA) 1275, 1280 (1991)* (requiring only a modicum of creativity and independent creation for an original work).

n24 *See 17 U.S.C. § 102* (1994).

n25 *See generally id.* § 412.

n26 *See id.* § 102.

n27 *See Whelan Assocs., Inc. v. Jaslow Dental Lab., Inc., 797 F.2d 1222, 1233-34, 230 U.S.P.Q. (BNA) 481 (3d Cir. 1986).*

n28 *See generally Lotus Dev. Corp. v. Borland Int'l Inc., 49 F.3d 807 (1st Cir. 1995); MiTek Indus., Inc. v. ARCE Eng'g Co., 89 F.3d 1548 (11th Cir. 1996).*

n29 *See 17 U.S.C. § 105* (1994).

n30 Freedom of Information of Act, Pub. L. No. 89-554, 80 Stat. 383 (1966) (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n31 *See* HON. WILLIAM F. CLINGER, JR., ELECTRONIC FREEDOM OF INFORMATION AMENDMENTS OF 1996, H.R. REP. NO. 104-795, at 6, *reprinted in* 1996 U.S.C.C.A.N. 3448, 3449.

n32 *Id.* at 7, *reprinted in* 1996 U.S.C.C.A.N. 3448, 3450 (citing *House Comm. on Gov't Operations, Availability of Info. from Fed. Dep'ts and Agencies: Hearings Before the House Comm. on Gov't Operations*, 84th-86th Congresses).

n33 Paperwork Reduction Act of 1995, Pub. L. No. 104-13, 109 Stat. 163 (codified as amended at *44 U.S.C. § § 3501*-3520 (1994 & Supp. IV 1998)).

n34 BOB WISE & GARY CONDIT, PAPERWORK REDUCTION ACT OF 1995, H.R. REP. NO. 104-37, at 111, *reprinted in* 1995 U.S.C.C.A.N. 164, 235.

n35 *See id.*

n36 *See* Electronic Freedom of Information Act Amendments of 1996, Pub. L. No. 104-231, 110 Stat. 3048 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n37 U.S. CONST. amend. I.

n38 *403 U.S. 713, 714 (1971)* (Black, J., concurring).

n39 *Id. at 717.*

n40 *Id. at 718.*

n41 *Id. at 719.*

n42 Pub. L. No. 94-409, 90 Stat. 1241 (1976) (codified as amended at *5 U.S.C. § 552b* (1994 & Supp. IV 1998)).

n43 Pub L. No. 89-487, 80 Stat. 250 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n44 Pub. L. No. 104-13, 109 Stat. 163 (codified as amended at *44 U.S.C. § § 3501-*3520 (1994 & Supp. IV 1998)).

n45 Pub. L. No. 104-231, 110 Stat. 3048 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n46 Pub. L. No. 94-553, 90 Stat. 2541 (codified as amended at *17 U.S.C. § § 101-*1301 (1994 & Supp. IV 1998)).

n47 H.R. CONF. REP. NO. 94-1441, at 9 (1976), *reprinted in* 1976 U.S.C.C.A.N. 2244, 2245.

n48 *See* H.R. REP. NO. 104-37, at 34 (1995), *reprinted in* 1995 U.S.C.C.A.N. 164, 197.

n49 *Id.* at 27, *reprinted in* 1995 U.S.C.C.A.N. 164, 190.

n50 *Id.*

n51 Mr. Gellman served on the staff of the House Government Operations Subcommittee with jurisdiction over the Freedom of Information Act from 1977 through 1994. He is currently an independent privacy and information policy consultant in Washington, D.C. Mr. Gellman stated his qualifications as part of his testimony on the Senate bill entitled, the Electronic Freedom of Information Improvement Act of 1996, S. 1090, 104th Cong. Mr. Gellman's testimony of June 14, 1996 before the subcommittee upon which he served is available from the *Federal Document Clearing House, 1996 WL 329703* (F.D.C.H.).

n52 *Electronic Freedom of Information Improvement Act of 1996: Hearings on S. 1090 Before the Subcomm. on Gov't Management, Info. and Tech. of the House Comm. on Gov't Reform and Oversight, 104th Cong., 1996 WL 329703* (F.D.C.H.) (testimony of Mr. Robert Gellman).

n53 U.S. CONST. amend. I.

n54 Pub L. No. 89-487, 80 Stat. 250 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n55 Pub. L. No. 104-13, 109 Stat. 163 (codified as amended at *44 U.S.C. § § 3501-*3520 (1994 & Supp. IV 1998)).

n56 *17 U.S.C. § 105* (1994).

n57 *See id.*

n58 *Id.*

n59 The tradition of prohibiting copyright of government works began with § 8 of the Copyright Act of 1909. Section 8 stated in part, "No copyright shall subsist . . . in any publication of the United States Government, or any reprint, in whole or part . . . ." *17 U.S.C. § 8* (1909) *repealed and replaced with* Copyright Act of 1976, § 105, 90 Stat. 2541 (codified at *17 U.S.C. § 105* (1994)).

n60 H.R. Rep. No. 94-1476, at 59 (1976), *reprinted in* 1976 U.S.C.C.A.N. 5659, 5673.

n61 *See 17 U.S.C. § 105* (1994).

n62 *See id.*

n63 *33 U.S. 591 (1834).*

n64 *Id. at 668.*

n65 *Id. at 661.*

n66 *Id. at 663-64.*

n67 *128 U.S. 244 (1888).*

n68 *See id. at 253; accord Callaghan v. Myers, 128 U.S. 617, 647 (1988).* The holdings in these cases more precisely identify what parts of the reporters work are or are not copyrightable.

n69 *Banks, 128 U.S. at 253* (citations omitted).

n70 *See* discussion *supra* Part III.A.

n71 *See Banks v. Manchester, 128 U.S. 244, 253 (1888).*

n72 *91 F. 129 (6th Cir. 1898).*

n73 *Id. at 130.*

n74 *Id. at 137.*

n75 *Id.*

n76 Georgia *ex rel. General Assembly of Ga. v. Harrison Co., 548 F. Supp. 110, 114 (N.D. Ga. 1982), vacated as moot, 559 F. Supp. 37 (N.D. Ga. 1983).*

n77 *See Building Officials and Code Adm'rs Int'l, Inc. v. Code Tech., Inc., 628 F.2d 730, 731, 207 U.S.P.Q. (BNA) 81, 82 (1st Cir. 1980).*

n78 *Id. at 734, 207 U.S.P.Q. at 85.*

n79 *Id. at 736.*

n80 *Id. at 732.*

n81 *591 F. Supp. 726, 221 U.S.P.Q. (BNA) 827 (N.D. Ill. 1983).*

n82 *637 F. Supp. 262, 227 U.S.P.Q. (BNA) 486 (N.D. Cal. 1985).*

n83 *44 F.3d 61, 33 U.S.P.Q.2d (BNA) 1183 (2d Cir. 1994).*

n84 *121 F.3d 516, 43 U.S.P.Q.2d (BNA) 1611 (9th Cir. 1997), cert. denied, 119 S. Ct. 40 (1998).*

n85 *Rand McNally, 591 F. Supp. at 734, 221 U.S.P.Q. at 839.*

n86 *See id.*

n87 *See id. at 736, 221 U.S.P.Q. at 841.*

n88 *Del Madera, 637 F. Supp. at 262, 227 U.S.P.Q. at 486.*

n89 *See id. at 264, 227 U.S.P.Q. at 488.*

n90 *See CCC Information Services, Inc. v. Maclean Hunter Market Reports, Inc., 44 F.3d 61, 73, 33 U.S.P.Q.2d (BNA) 1183, 1195.*

n91 *See id.*

n92 *See id. at 74, 33 U.S.P.Q.2d at 1196.*

n93 *See id.*

n94 *See Practice Management Information Corp. v. American Medical Ass'n, 121 F.3d 516, 517-18, 43 U.S.P.Q.2d (BNA) 1611, 1612.*

n95 *See id.*

n96 *See id.*

n97 *See id.*

n98 *See id.*

n99 *See id. at 521, 43 U.S.P.Q.2d at 1615.*

n100 *See id.*

n101 *See id.*

n102 *See 17 U.S.C. § 105* (1994).

n103 *See id.*

n104 *See* discussion *supra* Part III.B.

n105 *766 F.2d 728 (2d Cir. 1985)*

n106 *See id. at 731.*

n107 *See id.*

n108 Act of June 25, 1984, ch. 257 § 5, N.Y. Laws (not officially codified).

n109 *See Legi-Tech, 766 F.2d at 731.*

n110 *See id. at 735.*

n111 *See id.*

n112 *Id.*

n113 *Id. at 736.*

n114 *Id.*

n115 Being motivated by profit should not be confused with being motivated by cost. To be motivated by cost means that government typically worries about what things cost and paying for them, not about what the return on investment might be. Also, government control is powerful; perhaps that is the reason, in *Legi-Tech,* that New York was unwilling to permit use by the information service at any price.

n116 *See Legi-Tech, 766 F.2d at 736.*

n117 *See id. at 735.*

n118 *Id.*

n119 *542 F.2d 1116 (9th Cir. 1976).*

n120 *See id. at 1118.*

n121 *See id. at 1120.*

n122 *See id.*

n123 *Id.*

n124 *See id. at 1119.* The National Technical Information Service provides government works resulting from research and development at a variety of government agencies.

n125 *See id. at 1118 n.4.*

n126 *See id. at 1118 n.1.*

n127 *See id. at 1118 n.4.* The agency frequently negotiated exchanges with other institutions, including foreign institutions, for services or data instead of the $ 50,000 fee for the MEDLARS database.

n128 Pub. L. No. 104-231, 110 Stat. 3048 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n129 *See id.; See also* Electronic Freedom of Information Act Amendments of 1996, Pub. L. No. 104-231, 110 Stat. 3048; H.R. REP. NO. 104-795 (1996), *reprinted in* 1996 U.S.C.C.A.N. 3448.

n130 H.R. REP. NO. 104-795, at 20 (1996), *reprinted in* 1996 U.S.C.C.A.N. 3448, 3463.

n131 *Congress Passes Bill Requiring Release of Public Data in Electronic Form*, WEST'S LEGAL NEWS, Sept. 25, 1996, *available in 1996 WL 538438.*

n132 *33 U.S. 591, 661 (1834).*

n133 *Schnapper v. Foley, 471 F. Supp. 426, 428, 202 U.S.P.Q. (BNA) 699, 701 (D.D.C. 1979), aff'd, Schnapper v. Foley, 667 F.2d 102, 212 U.S.P.Q. (BNA) 235 (D.C. Cir. 1981)* (approving copyright claimed by contractor and assigned to government for films created under contract with United States government).

n134 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 6.

n135 *See id.* at 6-7.

n136 Stevenson-Wydler Technology Innovation Act of 1980, Pub. L. No. 96-480, 94 Stat. 2311 (1980) (codified as amended at *15 U.S.C. § § 3701*-3717 (1994 & Supp. IV 1998)). This act was adopted by Congress to promote technological innovation and provide for exclusive use of inventions made in government laboratories for a reasonable compensation to the United States Government. *See, e.g., 15 U.S.C. § 3710* (1994).

n137 *See* 94 Stat. at 2311-12.

n138 Federal Technology Transfer Act of 1986, Pub. L. No. 99-502, 100 Stat. 1785 (codified as amended at *15 U.S.C. § § 3701*-3714 (1994 & Supp. IV 1998)).

n139 *See 15 U.S.C. § 3710c*(a)(A)(iii)(III) (1994).

n140 *See* Federal Technology Transfer Act of 1986, Pub. L. No. 99-502, § 12, 100 Stat. 1785 (codified as amended at *15 U.S.C. § § 3701*-3714 (1994 & Supp. IV 1998)).

n141 *Id.*

n142 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 6.

n143 *See id.*

n144 *See id.* at 6-7.

n145 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 6.

n146 The federal government may not claim copyright in government works. However, it may retain copyrights assigned to it. Thus, the government, through its contract officers, may require government contractors to claim copyright and assign the copyright to the government. *See, e.g.* 48 C.F.R. § 1827.404(e) (1997).

n147 *See generally Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 6.

n148 *See Legislation: New Bill Would Extend Copyright to Federally Produced Software*, 41 PAT. TRADEMARK & COPYRIGHT J. (BNA) 265, 265 (Jan. 24, 1991).

n149 H.R. 191, 102d Cong. (1991).

n150 *See id.* Representative Morella was not the only person to submit legislation permitting copyright of computer programs. On February 5, 1991, Senator Johnston introduced Senate Bill S. 343, cosponsored by Senators Wallop, Ford, Domenici, Bingaman and Craig. In its original form, S. 343 contained language similar to that of the Technology Transfer Improvement Act of 1991. S. 343, 102d Cong. (1991).

n151 *See* 137 CONG. REC. E208-02, E208 (daily ed. Jan. 17, 1991) (statement of Rep. Morella); *see also Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148 at 265.

n152 *See* 137 CONG. REC. E208-02, E208 (daily ed. Jan. 17, 1991) (statement of Rep. Morella); *see also Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148, at 265.

n153 *See* H.R. 191.

n154 *See id.* § 2; *see also Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148, at 265.

n155 *See id.* § 3; *see also Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148, at 265. Representative Morella's provision for sharing royalties with government employees was modeled on the provision in the Stevenson-Wydler Technology Innovation Act of 1980 as modified by the Technology Transfer Act of 1986. Technology Transfer Act of 1986, Pub. L. No. 99-502, 100 Stat. 1785, at 1792 (codified as amended at *15 U.S.C. § § 3701*-3714 (1994 & Supp. IV 1998)).

n156 *See Legislation: House Panel Clears Amended Bill on Copyright for Government Software*, 43 PAT. TRADEMARK & COPYRIGHT J. (BNA) 27, 27 (Nov. 14, 1991).

n157 *See id.* at 27-28.

n158 *Compare* S. 1581, 102d Cong. (1991) *with* H.R. 191, 102d Cong. (1991); *see also Legislation: Information Groups Oppose Bill to Give Government Copyrights on Software*, 44 PAT. TRADEMARK & COPYRIGHT J. (BNA) 305 (July 30, 1992).

n159 137 CONG. REC. S11216-03, S11224 (daily ed. July 29, 1991) (statement of Sen. Rockefeller).

n160 H.R. 5231, 102d Cong. (1992); *see also Legislation: House Passes Tech Transfer Bill with Government Software Copyright Section*, 44 PAT, TRADEMARK & COPYRIGHT J. (BNA) 606, 606 (Oct. 8, 1992).

n161 *See* S. 1330, 102d Cong. (1992).

n162 *See Legislation: Federally Produced Software Could be Copyrighted Under New Bill*, 45 PAT, TRADEMARK & COPYRIGHT J. (BNA) 245, 245 (Jan. 28, 1993).

n163 *See* H.R. 523, 103d Cong. (1993); *see also Legislation: Federally Produced Software Could be Copyrighted Under New Bill, supra* note 162 at 245.

n164 *See Legislation: Federally Produced Software Could be Copyrighted Under New Bill, supra* note 162 at 245.

n165 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness*, 102d Cong. (1991); *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291-92.

n166 *See Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n167 *See id.*

n168 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n169 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and*

Competitiveness, supra note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291-92.

n170 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n171 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n172 *See id.*

n173 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n174 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n175 *Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148, at 265.

n176 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech., and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291. The goal of incentivizing federal employees to think beyond their immediate needs yields technology that solves more than the agency problem. It solves similar problems faced by other groups working in the same industry. The incentives may result in computer programs that satisfy not only the agency's requirement, but the broader industry problem. *See id.*

n177 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. & Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291.

n178 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n179 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n180 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and*

Tech., 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n181 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n182 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n183 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n184 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n185 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n186 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291.

n187 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n188 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n189 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 291.

n190 *See Legislation: New Bill Would Extend Copyright to Federally Produced Software, supra* note 148 at 265.

n191 *See* H.R. REP. NO. 104-795, pt. 1, at 7 (1996), *reprinted in* 1996 U.S.C.C.A.N. 3448, 3450.

n192 Pub. L. No. 89-487, 80 Stat. 250 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n193 Pub. L. No. 94-409, 90 Stat. 1241 (1976) (codified as amended at *5 U.S.C. § 552b* (1994 & Supp. IV 1998)).

n194 Pub. L. No. 104-231, 110 Stat. 3048 (codified as amended at *5 U.S.C. § 552* (1994 & Supp. IV 1998)).

n195 *See* discussion *supra* Part IV.B.1.

n196 *See Copyright Protection for Computer Software to Enhance Technology Transfer, 1991: Hearings on H.R. 191 Before the Subcomm. on Tech. and Competitiveness, supra* note 163; *see also Legislation: House Panel Witnesses Endorse Copyright for Government Software, supra* note 8, at 292.

n197 *See Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n198 *See id.*

n199 Martin Marietta merged with Lockheed to become Lockheed Martin. *See Brenda Murray, Aerospace Giants Set to Announce Merger, MARIETTA DAILY J., Mar. 15, 1995, 1995 WL 8255558.*

n200 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n201 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n202 *See generally* 48 C.F.R. § § 27.409, 52.227-14 (1999).

n203 *See id.*

n204 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n205 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n206 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n207 *See Copyright Protection for Intellectual Property to Enhance Technology Transfer, 1990: Hearings on H.R. 191 Before the Subcomm. on Science, Research and Tech.*, 101st Cong. (1990); *see also Legislation: House Panel Considers Copyright Protection for Federal Software, supra* note 1, at 7.

n208 *See* S. 1537, 103d Cong. (1993).

n209 *See* 139 CONG. REC. S13262-04, S13283 (daily ed. Oct. 7, 1993) (statement of Sen. Rockefeller).

n210 Stevenson-Wydler Technology Innovation Act of 1980, Pub. L. No. 96-480, 94 Stat. 2311 (1980) (codified as amended at *15 U.S.C. § § 3701*-3717 (1994 & Supp. IV 1998)).

n211 Bayh-Dole Act, Pub. L. No. 96-517, 94 Stat. 3019 (1980) (codified as amended at *35 U.S.C. § § 200*-211 (1994 & Supp. IV 1998)).

n212 *See* 139 CONG. REC. S13262-04, S13283 (daily ed. Oct. 7, 1993) (statement of Sen. Rockefeller).

n213 *See id.*

n214 *See 15 U.S.C. § 3710a* (1994).

n215 *See id.*

n216 *See id.*

n217 *See 35 U.S.C. § 210* (1994 & Supp. IV 1998).

n218 *See* 139 CONG. REC. S13262-04, S13283 (daily ed. Oct. 7, 1993) (statement of Sen. Rockefeller).

n219 *See id.*

n220 *Id.*

n221 *See id.*

n222 *See id.*

n223 *See id.*

n224 *See id.*

n225 *Legi-Tech, Inc. v. Keiper, 766 F.2d 728 (2d Cir. 1985).*

n226 *SDC Dev. Corp. v. Mathews, 542 F.2d 1116 (9th Cir. 1976).*

n227 *See* discussion *supra* Part III.B.