Legal Ramifications of Intellectual Property

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The dissemination of federally funded scientific and technical information (STI) is an important function of all federal agencies. Because of its value, STI can be protected as intellectual property. Under this protection, constraints, controls, and exclusivity may be imposed on the use, reproduction, disclosure, and further dissemination of the information. While protection as intellectual property has always been possible and has been applied to some degree, government policies have changed drastically in recent years to encourage, if not actually require, more intellectual property rights protection of federally funded research and development (R&D) activities. This article discusses some of the reasons behind these changes and the effect of the changes on the more traditional approaches to the dissemination of federally funded STI; it includes predictions as to what may occur in the future.

THE DISSEMINATION CULTURE

The widespread dissemination of the results of R&D activities is an important function of many federal agencies and is authorized, if not actually mandated, in the organic statutes of many agencies. For example, section 203(a)(3) of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2473(a)(3)) directs NASA to "provide for the widest practicable and appropriate dissemination of its activities and the results thereof." The dissemination of STI is also influenced by the Freedom of Information Act (FOIA), which has been interpreted and applied to include such information within its ambit.[1] The rationale behind these dissemination statutes and their implementing policies and procedures stems from a combination of an historical openness-in-government society; an educational philosophy based on a free exchange of ideas, particularly in relation to basic and applied

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research; and straightforward populist attitudes to the effect that if the public pays for it, then the public owns it. In addition, many federal agencies, in carrying out their missions and program objectives, have developed strong relationships with their user constituencies to ensure that the results of research activities of mutual and beneficial interests are freely and openly exchanged.

Thus, an extensive infrastructure has evolved within the federal government for the documentation, reporting, evaluation, cataloging, and dissemination of scientific and technical information generated by, or under the support of, federal laboratories. Detailed descriptions of this infrastructure have appeared in this journal and elsewhere. For the purpose of this article, it is sufficient to note that the source of the scientific and technical information that is entered into this infrastructure may be a contractor or grantee whose R&D activities are funded by the federal government or a civil service employee conducting R&D activities in the course of her or his official duties. Consequently, the STI involved is the result of federal funding and therefore, if the free and open dissemination culture were carried to the limit, would automatically be placed in the public domain.

However, national priorities and policies with respect to the dissemination of federally funded STI from either source are in a state of flux and are changing at an accelerated pace in the direction of preventing (or delaying) certain categories of STI from being placed in the public domain. The reasons for the changes are derived largely from the reality, or perception, of the declining capabilities of the United States in international competition—and more specifically from an assessment that, although the United States has been and probably still is the world leader in basic and applied research, it is falling behind its serious international competitors in the practical application of research results to the actual products and processes necessary to compete in world markets. Since more than 50 percent of the R&D activity conducted in this country is federally funded, it is not surprising that funding policies should be modified to increase the potential for applying the research results to practical products and processes in an effort to increase our ability to compete internationally. In this context, it is important to note that the changes occurring are not to prevent the transfer of federally funded STI to the U.S. private sector or to unduly inhibit dissemination within the United States, but to limit or channel such transfer in a manner that will provide greater benefit to the U.S. economy in the face of accelerating foreign competition for high-technology markets. Also, these changes have been directed to the transfer of detailed technical information that may be applied to practical products and processes having commercial potential. The overall philosophy concerning the dissemination of basic scientific information funded by the federal government has not changed. While the ends of the spectrum may be readily identified, there is a band in the middle where the distinction between basic scientific information and detailed technical design information is not clear. There is, however, a point at which some STI may be considered "technology" or a "resource" suitable for transfer and application to practical products and processes of economic value in international competitive markets; as such it can be protected as intellectual property as an incentive for private investment in the transfer process. When this occurs, the technology may be subject to restrictions on further dissemination, reproduction, and use that are at odds with the more traditional open and free dissemination policies and practices. Consequently, there is an increasing need to integrate the government's policies and practices for the dissemination of its scientific and technical information with the technology transfer process in this changing environment.

Technology Transfer Considerations

The process of technology transfer has been, from its inception, a process that is often praised in the abstract, frequently encouraged by actual conduct, and sometimes mandated by statute, executive order, or regulation. Its purpose and the government's role are often misunderstood. This has resulted in two divergent philosophies regarding technology transfer, sometimes referred to as technology transfer "plus," and technology transfer "minus." The former focuses on making federally funded technology available to the private sector for commercial use; the latter is directed to restricting availability under the export control laws and regulations or for national security reasons. We address here some of the issues involved in the relationship of intellectual property rights to technology transfer "plus."

While the term technology transfer still has no universally accepted definition, it is generally understood by its practitioners and advocates (or even detractors) to mean the process of making the results of federally funded R&D activities available for the beneficial use of a specific user constituency, to solve a specific problem by any recipient, or to produce some practical and marketable commercial product or process. Beyond this broad meaning, most operative definitions are limited in terms of the general effect of the transfer (i.e., detrimental to national security, useful in international competition or in furtherance of agency mission objectives, or having the potential for secondary or "spinoff" application); the specific purpose of the transfer (i.e., for the beneficial use of a particular user constituency, to solve a specifically identified problem, or to improve an existing product or process); or by the transfer mechanism.

It is the consideration of the transfer mechanism, in the context of the type of technology involved and the purpose of the transfer, that has had the greatest effect on federal agency policies, procedures, and practices relating to the acquisition, evaluation, and dissemination of STI. While the transfer mechanisms may be multifaceted and overlapping, typical among them are formal publication and distribution programs; informal contacts and exchanges between agency personnel and specific user groups; formally structured cooperative research and development activities; and the allocation, protection, and licensing of intellectual property rights.[2] The changes that have occurred during the last decade to address international competitiveness issues have resulted in definite shifts in the direction of greater emphasis on cooperative R&D activities, and on the protection and licensing of intellectual property rights. At the same time there has been somewhat less emphasis on the more traditional publication and dissemination mechanisms. In any event, the increased emphasis on cooperative R&D, coupled with greater protection and licensing of intellectual property rights, if not understood and coordinated, could in some instances be in conflict with the established and traditional agency policies, procedures, and practices under formal publication and distribution programs. It could also inhibit some of the informal contacts between agency personnel and specific user groups.

This need not be so; if the interrelations of all transfer mechanisms are better appreciated and coordinated, all transfer mechanisms can coexist and can mutually foster beneficial use of federally funded technology by the U.S. private sector, while at the same time not inhibit the dissemination of the results of basic or applied research. Coordination and flexibility are key elements, since selectivity, timing, feedback, and mutually agreed-upon actions can avoid conflicts between cooperative research and development activities or the protection of intellectual property rights on one hand, and an agency's more traditional policies and procedures for the publication of STI on the other.

The Intellectual Property Nexus

Two laws (including rather significant amendments) enacted during the past decade and an Executive Order directly relating to them have been primarily responsible for the shift in emphasis to cooperative R&D activities, as well as to the allocation, protection, and licensing of intellectual property rights as important technology transfer mechanisms.

The first law is Chapter 18 of Title 35, United States Code, enacted as Public Law (P.L.) 96–517 in 1980. It is commonly known as the Bayh-Dole Act. The second is Chapter 63 of Title 15, United States Code, enacted as P.L. 96–480, also in 1980. It is commonly known as the Stevenson-Wydler Technology Innovation Act of 1980, or simply the Stevenson-Wydler Act. The Stevenson-Wydler Act was amended in several significant ways by the Federal Technology Transfer Act of 1986 (P.L. 99–502), now usually referred to as the Technology Transfer Act.

The Bayh-Dole Act ensured that contractors and grantees that are small business firms or nonprofit organizations shall have the first option to acquire exclusive commercial patent rights to inventions made in the performance of federally funded contracts and grants. It also provided to all agencies clear authority to license for royalties, on an exclusive, partially exclusive, or nonexclusive basis, patents on inventions they own. An important feature is that it eliminated any bias in favor of nonexclusive licensing over partially exclusive or exclusive licensing that previously existed in many agencies. The purpose in both cases was to increase the opportunity for commercial use of federally funded technology. While exclusivity may enhance commercialization and royalty income, it also presupposes valid, enforceable patents. This in turn has created a greater need for close coordination between the patent process and an agency's dissemination and publication procedures to ensure that premature disclosure will not prejudice the patent rights of either the contractor or the agency.

The Stevenson-Wydler Act of 1980 established the first positive requirements and infrastructure for government technology transfer activities. Its legislative history acknowledged, and in some instances the act itself adopted, some of the features of NASA's Technology Utilization Program. These requirements and infrastructure, however, focused primarily on the identification, documentation, acquisition, and subsequent dissemination through publication (or by placing in the public domain) new technology developed by federal laboratories or their contractors. This was sometimes referred to, particularly by critics, as a passive transfer mechanism. There was little, if any, consideration of intellectual property rights that may be associated with technology, of any need for the exclusivity possible under such rights, or of the prospect of an agency entering into cooperative arrangements with the private sector to achieve technology transfer. In other words, there was no recognition of the synergism that could exist between the original Stevenson-Wydler Act and the possible exclusivity under the Bayh-Dole Act, even though both were enacted in the same year. Consequently, the Stevenson-Wydler Act was amended by the Technology Transfer Act to provide for more active transfer mechanisms by authorizing and encouraging cooperative activities and by producing a stronger link with intellectual property rights and the exclusivity provided thereby.

An important feature of the Technology Transfer Act was that it gave agencies clear authority to enter into cooperative research and development agreements with the private sector. This included the ability to permit the private sector to acquire exclusive commercial rights to inventions made under such agreements, including inventions made by federal employees.

NASA had preexisting authority under sections 203(c)(5) and (6) of the Space Act to enter into substantially the same types of agreements as those authorized by the Technology Transfer Act. However, the enactment of the Technology Transfer Act produced greater visibility for, and interest in, such agreements. As a result, an increasing number of such agreements have been implemented or are under consideration, granting greater patent exclusivity to the private participant to thereby make it more important that the premature publication of the resulting STI does not prejudice such exclusivity.

Another feature of the Technology Transfer Act that had a significant effect on in-house R&D activities at federal laboratories is a requirement that whenever an agency receives any royalties or other income from the licensing of an invention, at least 15 percent must be shared with the employee inventor. Also, agencies have the authority to use the remaining income to support additional licensing and technology transfer activities. This includes all inventions made at federal laboratories, not only those made under a cooperative research and development agreement. This change is extremely important. Previously any such royalty income had to be deposited in the general receipts of the U.S. Treasury and not shared with the inventor nor used by that laboratory. As a result, the number of inventions reported to NASA and other agencies has increased noticeably. Most reported increases range from 20 to 30 percent. This in turn has produced increasing pressure to obtain patents on, and to actively pursue royalty-sharing licenses for, these reported inventions. Also, of course, greater precautions are necessary to ensure that premature publication will not subvert the opportunity to patent, license, and obtain royalty income.

The Executive Branch also took steps to strengthen the ties between intellectual property rights and the technology transfer process by issuing Executive Order 12591, signed by the President on April 18, 1987. For example, section 1(a) requires agencies to take the steps that may be needed, including delegations of authority, to enter into the Cooperative Research and Development Agreements (CRDAs) authorized by the Technology Transfer Act of 1986. It was clear that the Executive Branch did not intend to leave this authority unimplemented.

Also, section 1(b)(4) of the Executive Order requires agencies to ensure, consistent with the Presidential Memorandum on Government Patent Policy of May 18, 1983, that contractors and grantees that are not small business firms or nonprofit organizations shall also be afforded first option to acquire exclusive commercial rights to inventions made in the performance of federally funded contracts and grants. Rights to inventions made under NASA contracts with other than small business firms and nonprofit organizations still remain subject to section 305 of the Space Act, which requires NASA to acquire title to such inventions unless waived under the NASA Patent Waiver Regulations (37 CFR 1245.1). These Waiver Regulations have been greatly liberalized to comply with the spirit and intent of the Presidential Memorandum and section 1(b)(4) of the Executive Order. Thus NASA has been able to adjust its statutory requirements to afford greater patent exclusivity for technology it funds, in order to be consistent with the changing environment in this area.

Another important aspect of the Executive Order is section 1(b)(5), which requires agencies to implement, as expeditiously as possible, royalty-sharing programs for inventions they license. It is clear here also that the Executive Branch did not intend to leave this authority unimplemented. NASA implemented its royalty-sharing program in NASA Management Instruction (NMI) 3450.2B. Under this NMI the first $2,000 received annually

from each license, as well as 20 percent of any royalties over $2,000, is paid to the inventors. The NMI also emphasizes the need for prompt reporting of inventions and assigns responsibilities to all those involved in the patent licensing and royalty distribution process. Since valid, enforceable patents must be acquired in order to have a "product" that can be licensed to create such royalty income, the ramifications of the requirement to establish a royalty-sharing program are clear and have been borne out by increased invention reporting, patent, and licensing activities, as previously mentioned.

Finally, section 1(b)(6) of Executive Order 12591 requires agencies to cooperate in developing, pursuant to guidelines to be provided by the Office of Federal Procurement Policy, regulations that will enable contractors and grantees to retain rights to computer software, engineering drawings, and other technical data "generated" in the performance of federally funded contracts and grants. The important point to note is that the technical data generated under contract are those data which, under present policies and practices, agencies normally require to be unrestricted and enter into their publication and dissemination infrastructure. Affording a contractor "rights" to such data will result in some degree of exclusivity under intellectual property law, of a type and to an extent yet to be determined. Whether such data can or should be entered into an agency's dissemination infrastructure for limited or restricted distribution is an issue that must be addressed once the extent and type of such exclusivity has been determined. Ultimately, implementation will be made by revisions to section 27.4 of the Federal Acquisition Regulation, and intense interagency activities are now in process to achieve that implementation.

SOME PRACTICAL EFFECTS ON AN AGENCY'S PUBLICATION AND DISSEMINATION ACTIVITIES

There are three basic forms of intellectual property rights protection that may affect an agency's policies and procedures relating to the publication or dissemination of the results of R&D activities: patent rights, copyrights, and trade secret (or the equivalent) rights. In general, and at the risk of oversimplification, a patent provides for the exclusive right to make, use, or sell the end-item product or process described and claimed in the patent. Copyright protects the specific expression or manifestation of the copyrighted "work" (but not the ideas or concepts that may be embodied therein) and provides for the exclusive right to perform certain acts in relation to the work, such as the reproduction, distribution, performance, or display of the work. In both cases, once certain legal requirements and formalities have been met to protect the right, the informational content or the ideas or concepts described or disclosed in the patent or the copyrighted works are publicly available; however, unlicensed individuals cannot make, use, or sell the patented product or process, or reproduce, distribute, perform, or display the copyrighted work for personal or economic gain.

The situation is markedly different for trade secret protection: for such protection to be established and maintained, the information divulging the trade secret must be held in confidence. While absolute secrecy is not necessary, the information must be subject to some safeguards against unauthorized disclosure and use, and any recipients of the information must be subject to legally binding nondisclosure agreements or commitments. The following is a discussion of the relationship between the publication and dissemina-

tion of technology and these three forms of intellectual property rights protection, as well as the effect of increased government emphasis on intellectual property rights on agencies' publication and dissemination policies.[3]

Patent Rights

Once a patent application has been filed in either the United States or a foreign patent office, information disclosing the invention (technical reports, journal articles, and the like) may be published or disseminated. However, the premature publication of information disclosing an invention may preclude obtaining a patent on that invention. Since, as a general rule, patents have no extraterritorial effect, the national laws of each country in which a patent is to be obtained must be checked to determine what may constitute premature publication in regard to the specificity of the information published in describing the invention, as well as to the timing of the publication in relation to the date a patent is applied for. In the United States there is a 1-year grace period between the publication date and the application date of a patent. In many foreign countries a patent must be applied for before any publication takes place. The degree of specificity in a publication that will bar a patent is often a highly subjective judgment call.

Because of international convention, many countries, including the United States, will recognize the filing date in another country that is a member of such convention if a patent application is filed in the second country within 1 year of the first. Thus, if worldwide patent protection is to be obtained, a patent application must first be filed in a convention country prior to any publication or public disclosure of information disclosing the invention.[4] If this rule is not followed, then the laws of each country in which patent protection is to be sought must be reviewed and a judgment made in each case as to whether a patent can be obtained. This process can be very time-consuming and risky because the matter may not be conclusively put to rest until a court ruling is made after protracted litigation. The same rule applies if only U.S. patent protection is sought, except that filing for the patent application must be within 1 year of any publication or public disclosure of information disclosing the invention, rather than prior to any subactivities. Accordingly, a decision on foreign filing should be made as soon as possible in order to ascertain whether the 1-year grace period is available. If these rules are not followed, the patent may be barred or declared invalid in one or more countries, resulting in the loss of royalty income. Thus coordination between the publication procedures and the patent filing process of an agency becomes very important. Doubt should be resolved by obtaining patent review and delaying publication until either patent protection is obtained or a decision is made not to file for a patent.

One complicating factor in delaying publication is the Freedom of Information Act, which could force unrestricted public release of information disclosing an invention.[5] However, in anticipation that that act could require premature release, the Bayh-Dole Act gave federal agencies the authority to withhold from public disclosure (including release under FOIA) information disclosing an invention for a reasonable time for patent applications to be filed.[6] This applies to inventions by government employees as well as to those by contractors and grantees; in either case this authority may be invoked so as not to force premature release of information disclosing an invention to a third party in response to a request made under FOIA. Again, coordination between the FOIA release process and the patent filing process of an agency is necessary to ensure that this authority is properly utilized.

In addition to the possibility of release under FOIA, the information involved may often be contained in scientific and technical reports prepared by contractors or by federal employees that an agency itself intends to publish or disseminate. In this event, care must be taken to ensure that the agency does not publish the reports prematurely so as to compromise patent rights. Government policies in this regard place the responsibility on the contractor submitting the report or the federal employee preparing the report to notify cognizant agency personnel that the report contains information disclosing an invention so that the agency may take appropriate steps to withhold the report from publication for an agreed-upon period.[7] When the agency is notified, the report will be withheld for at least 6 months, with flexibility for reasonable extensions. As an example of how this may be implemented, NASA procedures for entering scientific and technical reports into its dissemination process provide an opportunity to identify reports that may contain information disclosing an invention as a matter of course.[8] The report is withheld from publication for at least 6 months when the submitter notifies NASA and a reasonable extension may be needed to file a patent application. Regulations dealing with the policies and procedures for inventions made under a contract or grant also caution of the need to notify NASA that a report contains information disclosing an invention so that it can be withheld from publication.[9] Similarly NASA's management instruction dealing with such inventions informs the employees of the need to report an invention promptly and to take the necessary steps to time the publication of these reports so as not to prejudice patent rights.[10]

Copyrights

Under present law, works created by a federal employee cannot be copyrighted. However, copyright may be established for works created under a contract or grant unless prohibited in the contract or grant. Current government policy is to permit a contractor or grantee to establish claim to copyright for works produced when doing so is an incentive for distribution or dissemination of the work by the contractor or grantee and such permission is not in conflict with an agency's dissemination or distribution policies and procedures or not otherwise inconsistent with the government's purpose for having the work prepared.[11] The permission-granting procedures, as well as the specific contract terms and conditions implementing the right to establish claim to copyright, are set forth in the applicable data rights regulations for contracts and grants. For contracts, specific instructions and clauses are set forth in subpart 27.4 of the Federal Acquisition Regulation for the civilian agencies and in the Department of Defense Supplement thereto for contracts entered into by the Department of Defense (DOD).

It is standard practice, when an agency permits a contractor or grantee to copyright works (other than computer software) produced under contract or grant, for the agency to reserve a license for government purposes. This license normally enables the agency to distribute the work to the public when such distribution is considered proper. For the civilian agencies the contractor or grantee retains exclusive commercial rights for any further reproduction or distribution of the copyrighted work. Consequently, the recipient of such a work from a civilian agency does not have, or acquire, the right to further reproduce or distribute the copyrighted work for any nongovernmental purpose. This limitation preserves the commercial exclusivity afforded the contractor. Under DOD's policies and regulations, however, both the government and the recipient can reproduce and distribute the copyrighted work

for any purpose whatsoever. Thus the copyright holder has no commercial exclusivity. This discrepancy in DOD policy and regulations may need further review in today's changing environment.

In order to put all recipients on notice as to respective rights in copyrighted works, the contractor is required to place a copyright notice, as well as a notice of government sponsorship, on works delivered to the government. When NASA enters such a work into its distribution system—which it is permitted to do under the license mentioned above—an additional notice is affixed to the work that informs the recipient that the document is copyrighted, that it may be reproduced and redistributed only for government purposes, and that all other rights (i.e, commercial rights) are reserved by the copyright owner.[12]

Trade Secrets

Another recognized and commonly used form of intellectual property protection in the private sector is trade secret protection. Such protection, however, is intrinsically different from patent or copyright protection in that it requires that the information be maintained in confidence, with any recipient of the information bound by an express or implied nondisclosure agreement. Thus, by definition, any information protected as a trade secret, or the functional equivalent, is not suitable material for, and should be excluded from, an agency's normal or routine scientific and technical information dissemination activities.

This has been a non-issue in that most agencies' scientific and technical information dissemination activities have been based on information produced at government (i.e., taxpayer) expense in an environment that presumes that such information should be obtained by the government without restriction so that it may be freely disseminated or placed in the public domain. Consequently, to the extent exclusive commercial rights have been invoked to encourage technology transfer and commercialization for government-funded technology, it has been by patent or copyright protection only. While, as discussed, such protection does require some procedural burdens and cautions and may restrict the ultimate end use of the products and processes resulting from the information, or the reproduction and redistribution of specific expressions of the information, it does not detract from the basic function of the dissemination of the results in terms of the free exchange of ideas and concepts, or even the informational content, of scientific and technical information produced or sponsored by a federal agency. In fact, such dissemination functions and patent rights and copyrights have coexisted, often in supportive relationships, in meeting the mutual objectives of technology transfer and commercialization for some time.

This environment could change, however, depending on the extent and manner in which the requirements of section 1(b)(6) of Executive Order 12591 are implemented. As previously discussed, contractors and grantees are to be afforded "rights" (yet to be defined) to engineering drawings, computer software, and other technical data generated under contract or grant. Since the Executive Order was issued at a time when patent rights and copyrights, as discussed above, were routinely available to contractors and grantees, trade secret rights, or some functional equivalent requiring confidentiality for some period of time, appear to be what was intended. Practically speaking, the commercial interests of the proprietor of any such rights can be protected only if the recipient of the information is bound by an express nondisclosure agreement, or somehow an implied understanding of confidentiality can be imposed government-wide on recipients (an approach at odds with present common law prin-

ciples). In any event, some percentage of federally funded scientific and technical information may have to be excluded from an agency's dissemination and distribution activities, or such activities will have to be significantly revised to handle distribution under nondisclosure agreements or under some as yet unspecified implied understandings of confidentiality.

At present, such considerations are directed only to STI generated under contract or grant, and not to information generated at federal laboratories by civil service employees. However, questions are also being raised in relation to cooperative research and development agreements (of the type authorized under the Technology Transfer Act) regarding the ability of an agency to agree with the private participant to maintain technical information produced under the agreement in confidence for some reasonable period, even if the information is generated by a federal employee at a federal laboratory. At present, this ability is contrary to long-standing policies and is legally questionable because of FOIA. Further legislation will be needed if confidentiality is to be afforded to such information.

Questions are being raised as to whether there should be additional legislation to allow computer programs and similar technology generated by federal employees to be copyrighted. The purpose, apparently, is to allow computer software and related technology to be licensed for commercial use and royalty income generated and shared by the federal employee and the laboratory in a manner similar to that for royalties generated by the licensing of patented inventions under the Technology Transfer Act. These questions have precipitated ongoing reviews by the General Accounting Office, the results of which may produce recommendations for further legislation or the need for more definitive guidelines in these unsettled areas.

COMPUTER SOFTWARE ISSUES

Computer software is unique in that information describing or expressing the software, and the software as an end-item product or process, often merge and take on the dual characteristics of both information and an operating device or working tool. Thus computer software is the most obvious example of a case in which it is necessary to distinguish between "information" to be disseminated for explanatory or descriptive purposes and "technology" to be transferred for end-item commercial use. This distinction has been diluted because government policies and practices do not necessarily distinguish among computer programs (usually in machine-readable form) that cause a computer to execute operations, descriptive design material (in human readable form) that will allow a computer program to be recreated or reconstructed, and the database that contains or stores the information the computer and its program process or operate on.

If distinctions along the foregoing lines can be developed and maintained, then "computer software," as that term is often used generically, can be treated as discussed above. For example, computer databases, to the extent they comprise a collection of information converted to computer-recognizable form for the purposes of storage, manipulation, transmission, display, and the like, should be treated no differently from the same information in more human-recognizable form. In other words, the format in which the information exists, or the media on which it may be maintained, should not require any different treatment of the information for dissemination policy, technology transfer, or intellectual property rights purposes.

On the other hand, a computer program intended to operate in or in conjunction with a computer, should be treated as an operating tool or property, and not as information, in that it is an extension of the computer or computers with which it is intended to operate. However, such programs are also valuable "technology" that as end items should be transferred for commercial use—they are not information. NASA has established a separate infrastructure, the Computer Software Management and Information Center (COSMIC), operated by the University of Georgia, to make computer programs developed by or for NASA available for commercial and governmental use by purchase, lease, or license. The programs so distributed may include supporting documentation sufficient for the program to be operated and maintained, but not the databases (i.e., the information) on which the computer programs operate.

As to intellectual property rights considerations, the foregoing discussion of patents, copyrights, and trade secrets may be applied to the various subsets of computer software as appropriate. For example, although rather difficult, time-consuming, and expensive, a patent may under appropriate circumstances be obtained for a computer program as an end-item product or process. The situation is the same as that for a patent obtained on any other end-item product or process and the descriptive material relating thereto, including cautions against premature publication.

The most convenient and commonly used protection for computer software is copyright protection. Under the copyright laws both the computer program and the descriptive documentation from which a computer program may be recreated may be copyrighted. However, as previously discussed, copyright is not presently available for works authorized by Federal employees in carrying out their official duties. Thus, copyright for federally funded computer software is available only for software generated under contract or grant, to the extent that agency policies permit. Under the Federal Acquisition Regulation for civilian agencies, when copyright is permitted, the funding agency does not, under its license for government purposes, obtain the right to disseminate the software to the public (as an agency can do for non-computer software material). This is to maximize commercial rights to the software for the contractor as an incentive to make it commercially available. Thus NASA, in recognition of the COSMIC infrastructure set up to disseminate NASA-funded software, does not normally permit a contractor to copyright computer software generated under contract. However, on a case-by-case basis a contractor may be permitted to copyright the software where there is an intent and commitment to make the software available in a commercial product line. When this mission is granted, the software is not entered into the COSMIC infrastructure.

Documentation of a computer program of a nature that may allow the program to be recreated or reproduced (such as source code) is, as a practical matter, usually disseminated, in conjunction with the program it describes. Such documentation may also be subject to intellectual property protection. However, if the program is made subject to either patent or copyright protection, then the protection of the documentation will probably be no greater than that afforded the end-item program. For example, the informational content, or conceptual ideas, contained in such documentation could allow a similar (but legally distinguishable for patent or copyright purposes) program to be developed. Thus, it is often the practice in the private sector to maintain such documentation, particularly source code, in confidence as a trade secret, and this even though the end-item program may be subject to copyright or patent protection. However, for reasons previously discussed, such protection

is not now normally available for federally funded software, leaving patent or copyright protection for the end-item program the only choices. Whether or not trade-secret or some equivalent protection will be available in the future is contingent on the ultimate implementation of section 1(b)(6) of Executive Order 12591 and some of the other reviews that are being made in this area.

The Future

While there have been dramatic changes in the law and federal government policies relating to intellectual property rights and the transfer and commercial use of federally funded technology over the past decade, the environment should start to stabilize. In the main, the changes have been accommodated and adjusted to by NASA and other agencies. This has resulted in certain refinements in and a need for closer scrutiny of NASA's policies and procedures for the dissemination and distribution of STI, but no drastic restructuring of the basic approach to meet NASA's statutory obligation to provide for the widest practical and appropriate dissemination of information concerning NASA's activities and the results thereof. While there may be further changes in the process of implementing section 1(b)(6) of Executive Order 12591 or as the result of legislation that may be passed to permit certain technical data generated by federal employees at federal laboratories to be maintained in confidence for commercial purposes, or to allow computer software generated by the federal employee or contractor to be copyrighted, any prediction of what may occur, and its impact, is premature. There will be a need to balance dissemination needs and requirements with the exclusivity afforded to meet commercialization objectives. If this is done, however, there is no reason why any changes that may result cannot be accommodated as have those in the past decade. As long as there is understanding and agreement on the overall objective of transferring federally funded technology in a manner that is beneficial to the U.S. private sector in this era of escalating international competition, and there is also coordination of the transfer mechanisms involved, all transfer mechanisms can, and should, coexist, and even reinforce one another.

NOTES AND REFERENCES

1. 5 U.S.C. 552. There has always been some concern as to whether detailed technical data should be considered an "agency record," rather than a "resource" not subject to the FOIA. However, over the years case law has treated detailed technical data as agency records. The Department of Defense has obtained an exemption to such treatment (10 U.S.C. 140c) for technical data that are subject to the export control laws and regulations. Other agencies have been unsuccessful in obtaining a similar exemption. In a broader sense, the failure to differentiate between the dissemination of STI as an end process and as an integral part of an agency's R&D programs and technology transfer activities has obscured efforts to develop government policies in these areas.
2. For a more detailed discussion of various agency transfer mechanisms, see Richard L. Chapman, "The Federal Government and Technology Transfer." *Technology Transfer* (Winter, 1989).
3. An extensive discussion of the relationship between intellectual property rights and information policy may be found in a report by the U.S. Congress, Office of Technology Assessment, *Intellectual Property Rights in an Age of Electronics and Information*, OTA-CIT-302 (Washington, D.C.: U.S. Government Printing Office, April 1986).
4. The convention revising the Convention of the Union of Paris of March 20, 1883, as revised for the protection of industrial property, done at Stockholm July 14, 1967, entered into force for the United States September

5, 1970, with the exception of Articles 1 through 12, which entered into force for the United States August 25, 1973. See 21 UST 1583; 24 UST 2140; TIAS 6293, 2727.

5. Supra, note 1.
6. 35 U.S.C. 205.
7. See, for example, the Federal Acquisition Regulation at 27.305-5; and 37 CFR 401.13(c).
8. NASA Scientific and Technical Information Handbook Documentation, Approval, and Dissemination. NHB 2200.2, (February 6, 1987), pp 2-6.
9. Supra, note 7.
10. NASA Management Instruction NMI-3450.2B, (October 13, 1987).
11. This approach for works produced under contract is recognized in the legislative history for 35 U.S.C. 105 (in House Report 94-1476).
12. Supra, note 8, pp 2-9.