various locations where procurement personnel work. Some version of the training might also be included in the initial training received by new procurement personnel.

The training should include, as a minimum, some coverage of:

a. How to deal with software/data rights acquisitions in an RFP, including some focus on adequate specification of what is being requested.

b. What software is, and how technical documentation, data rights and software tools apply to it.

c. Why life cycle concerns are important to software acquisition.

d. Why maintenance and enhancement concerns are important to the system/software being acquired.

e. How technical documentation, data rights, software tools, and life cycle concerns affect the ability to maintain and enhance system software.

f. How to understand and apply the procurement regulations relating to software/data rights acquisitions.

g. What flexibility and discretion is afforded contracting personnel under the relevant regulations.

2. Provide for greater standardization in RFP's. Such standardization should include a focus on:

a. A clearer specification of what is being requested.

b. Incorporating some mechanism whereby maintenance/enhancement concerns will be recognized and dealt with at the RFP stage of a procurement.

3. Develop a feedback mechanism whereby procurement personnel will be made aware of maintenance/enhancement problems which arise as a result of inadequate system support.

# 4. Reusability and Other Derivative Works Problems Involving Software

There has been considerable interest in recent years within the Department of Defense about promoting "reusability" of software. For a variety of reasons, discussed briefly below, software reuse is an attractive idea. However, DoD personnel seem troubled by a range of problems with attempting to implement reusability projects. Among the more serious of these problems is how DoD might make appropriate licensing arrangements with private firms so as to promote reuse of software. It is not yet clear that software reuse will be able to live up to the promise that some of its promoters have held out for it.

It is, of course, important to understand that software "reuse" is a term that refers to a wide variety of things, including large software programs composed largely of modules of standard code that can be combined to produce specific application programs, programs that are built upon and incorporate all or part of pre-existing programs, programs that were developed in conjunction with one government project that are furnished on a "GFI" (government furnished information) basis to subsequent contractors for use in subsequent projects, and even reuse of software designs or algorithms when writing new application software. There is a lively controversy within DoD over which model of reuse is the "best" or "most appropriate" model from a technical standpoint. We do not have the technical expertise to assess the merits of the claims made for or against the various models of reuse. Although different models of reuse may present different technological challenges, each has a common legal denominator. Each may be an instance of a "derivative works" right problem under the copyright law.

Copyright law gives the owner of a copyrighted piece of software the exclusive right to control the preparation of "derivative works" from the original work. Copyright law defines "derivative work" in a broad fashion; it is a work based upon another work. [59] sec. 101. Although there is as yet little case law to flesh out the meaning of the derivative works right in the software context, it is conceivable -- perhaps even likely -- that all models of software reuse discussed above may create derivative works problems unless the reuser is the same person as the owner of the original copyrighted software.

Unfortunately, it is not just software reuse that seems to raise derivative works problems for the government. Modification and enhancement of software also are instances of creating derivative works. Translating code from one computer language to another, revising code so that it can be executed on different hardware or so that it can generate code to be executed on different kinds of hardware, and perhaps even all forms of computer-generated works may be within the meaning of the "derivative works" right under the copyright law.

DoD's acquisition regulations are not currently structured so as to facilitate licensing arrangements that will promote reuse of software or harmoniously deal with other forms of the derivative works problems. DoD lawyers seem inexperienced with software technology and with the in-

tricacies of the copyright law as it affects the many different types of derivative works of software with which DoD must deal. To understand how the derivative works right may limit the government's rights as to software, this Chapter will first discuss reuse and then the other forms of derivative works with which DoD must be concerned.

## 4.1 Reusability of Software - The Pros and the Cons

Reuse of software is an attractive idea. For one thing, if software was reused, there would likely be more standardization of software and software components, which would seem a promising step toward solving some of the current problems with supportability and maintainability of software raised in Chapter 2. Greater consistency and reliability in software would also seem to be potential benefits of reusability. Reusability also holds out some promise of saving considerable amounts of money, or at least of allowing DoD to get more or better software for the same money. It was widely believed by DoD personnel to whom we spoke that DoD was paying time and time again for development of the same software or software components. It was widely believed that software costs would be reduced if software, or at least certain common functions in software, were able to be routinely reused. Also, reuse would seem to promise reduced software development time. If one can use this standard input-output routine and that filter and this standard whatever, and put one's programming effort into providing the "glue" with which to put the standard components together, or into making certain necessary enhancements to some components, surely that should reduce the time it takes to develop software. Perhaps this would also free up software engineers to tackle more difficult software development problems.

Given these (and other) prospective advantages of reusability of software, it is no wonder that DoD personnel are seriously interested in promoting reusability and no wonder that DoD has invested considerable sums in reusability projects. Yet, some initial experiences in reusability have revealed a considerable number of problems with the concept, some of which pertain to the feasibility of making appropriate licensing arrangements if software is reused.

### 4.1.1 The Debate over "GFI" Software

Among the many current "reuse" issues being debated within DoD is whether it is appropriate to provide software developed by one contractor to a second contractor on a "government furnished information" (GFI) basis (which would require the second firm to use the first firm's software). It is our understanding that the Navy and the Air Force have different views on this issue. The Navy is more favorably disposed to this practice than is the Air Force. Air Force people to whom we spoke regarded the problems likely to arise if this kind of software reuse was attempted to be so many and so serious as to outweigh the potential benefits. Without attempting to take a stand on the merits of either position or to promote this model of reuse over others, it seems worthwhile to detail the controversy to illustrate the more general problem of how to make appropriate arrangements for reuse.

Here is the Air Force's argument: suppose one decides to require reuse of radar software

developed by company A in a contract for another radar system to be developed by company B. Doing so will constrain choices about other elements of the radar system, such as what computer and operating system company B can use. These constraints, in turn, may limit other choices. Company B may well think that these constraints will inhibit its development of a superior system. Moreover, unless the two radar systems are intended to serve precisely the same function in precisely the same way, reusability requirements can lead to trouble. It is common knowledge that many adjustments in software (to add a new capability, to modify a function, even to fix a bug) can create unforeseen problems with the unmodified portions of the software, some of which may show up immediately, some of which may show up down the line. Documentation about the software obtained from A and given to B may either be inadequate or incomprehensible to B, which may further increase the risk of unintended ill effects when making the necessary modifications for the second radar system. Reuse may also mean using "old" technology instead of new and better technology. Perhaps even more significant than these problems with reusability is the practical problem of giving company B a handy scapegoat whenever there are problems with the second radar system: it will always be said to be the fault of the GFIed software.

Yet the Navy seems willing to accept these risks and has taken to evaluating bids for certain new systems based on the percentage of software reuse the bidders are willing to commit to making, and are requiring use of certain software on a GFI basis in subsequent projects.

Creating structural incentives for the contractors to reuse either their own or other software would seem to be a promising short term strategy for the Defense Department. It might also be beneficial to do follow up studies of Navy reuse projects. Perhaps the Navy approach will be proven more viable than Air Force personnel seem currently to believe.

### 4.1.2 Ownership Issues and the Derivative Works Problem with Reuse

There seemed to be considerable consensus among DoD personnel to whom we spoke that unless the government owned or had unlimited rights in software to be reused, reuse would be difficult to impossible to achieve. Although company A in the radar example above might be willing to license company B's use of its proprietary software, the government can not count on company A's cooperation, because company A may prefer to have the follow-on contract. Even if company A was willing to license reuse, it could be expected to charge B a rather hefty sum for the privilege of reuse, which might mean that the ultimate cost savings to the government from reuse would be minimal to nonexistent. And even if company A gets the follow-on contract and reuses its own software, that may only reduce the time required for development, not necessarily the cost (at least not by much since company A might be a low bidder only by comparison with the bids of others who would have to develop the software from scratch). As with competitive maintenance, reusability of software is made more difficult when proprietary software is involved.

Even if the government has paid for the development of the software intended for reuse and expects to get unlimited rights in the software, there may be a problem with actually getting unlimited rights; if the development firm decides to take a copyright in the software, the govern-

ment may be reduced to having a governmental purpose license in it (See Chapter 1). The government's ability to authorize other firms to reuse this software, for purposes other than the governmental project (i.e., for any potential commercial spinoffs) may be seriously jeopardized by the restrictions of the governmental purpose license (See Chapter 7). The government will also have the same problems getting adequate documentation from company A to give to company B for software reuse purposes as it does in getting the documentation for maintenance/enhancement purposes (See Chapter 2).

In addition to the idea of reusing specific software from one project to another (as in the radar example), there is growing interest in broader scale reusability projects, such as creating programs consisting of thousands of modules of code, different combinations of which can be formed to produce different software. Some programs of this sort have already been developed. Some are proprietary. Some have been prepared by government engineers and programmers.

It is clear that if the baseline program is proprietary, then modules of it will also be proprietary. Use of such a proprietary base program to create application software consisting of some of the base program's modules would seem to create a proprietary derivative work. Certainly if the base program is copyrighted, it would seem that the user would need the copyright owner's permission to create such derivative works. This permission might be limited or withheld. For example, the owner of the base program might limit use to creation of certain kinds of application software, or may make the right to this sort of reuse contingent upon payment of additional royalties (besides whatever fee one paid to obtain access to the base program). If one wished to use two or more proprietary base programs owned by different companies to create new software with modules from each, one might need each company's explicit permission. Some companies might object to incorporation of modules from another system. It is difficult to imagine how to deal with all the many conflicting proprietary claims and the many claims for additional royalties every time each standard module is used. (Think of how many pieces of software have the same basic I/O routine). This set of complexities has led many in the government to doubt the advisability of making use of proprietary reuse programs of this sort.

### 4.1.3 Incentive Problems with Broad Rights to Reuse in the Government

These concerns about reusability of proprietary software has led many to insist that the government must own the software or have unlimited rights to make software reuse feasible at all.

Some in DoD, though, worry about the quality of large scale reuse programs developed either internally at DoD or by private companies for the government. Although DoD does, in fact, develop a lot of software in-house, that is not its main mission or the thing that it does best. The quality of software produced by the government may not be as high as that produced by a top-notch software development firm. And private firms may lack incentives to develop outstanding reusability programs for the government, that is, programs in which the government would have unlimited rights and for which the government would have to pay no further royalty, no matter how much reuse was made of its modules. (This, of course, is precisely what many government people want: to buy one excellent program and not have to pay again each time a

new program is created through its use.) A firm that developed a "perfect" program of this sort would, in essence, put itself out of business after its first sale to the government, for if the government had unlimited rights, the government could give the reusable code away to anyone and everyone if it so chose. Even a follow-on contract for maintenance might be of limited interest to the developer of reusable modules.

If, however, the firm could be sure it could have a substantial commercial market for the reuse program without fear of government "giveaways," or if the firm could collect a royalty upon reuse of its components, then theoretically it would have a strong incentive to create an excellent set of modules so that its modules would be used instead of those of another firm. (Of course, it is important to remember that in the real world there is a big difference between creating incentives for excellence and the actual creation of an excellent product.)

### 4.1.4 Problems Associated with Configuration Management or Libraries for Reusable Software

Several DoD personnel with whom we spoke about reusability of software expressed doubts about the feasibility of efficient and cost-effective software reusability, given the substantial costs associated with managing the large volume of data needed to keep track of all the software components the government might want to reuse. This challenge is by no means peculiar to the DoD. Reuse of software requires an elaborate library or cataloguing system, whereby both the government and subsequent software developers can be made aware of and have access to software which can be reused. While the development of such an accessing system does present some challenge, it may not be insurmountable. [1]

## 4.2 Other Derivative Work Problems

Software is now considered to be copyrightable subject matter. Although not all software is copyrighted, much of it is. Many firms that claim copyright protection for their software also claim trade secret protection for the same software. Copyright owners have the exclusive right to prepare, or authorize preparation of, derivative works. [59] sec. 106 (2). The derivative works right can give rise to a number of different types of problems in addition to those already discussed in Section 4.1, each of which is discussed below.

### 4.2.1 Maintenance and Enhancement of Software

Because another chapter has been devoted to this topic, this section will do no more than reiterate that when the government maintains or enhances software, in each instance it may be creating a derivative work which, unless authorized, might infringe any copyright held in the software by a private firm (except for the fixing of a "bug" that had rendered the software inoperable, which would be privileged under section 117 of the copyright law.) Because of the broad definition accorded the concept of a derivative work, it is conceivable that even maintenance efforts might fall with its scope.

Fortunately, the government, through the standard data rights clause, always has modification rights in any software acquired under the DoD FAR SUPP. But as pointed out in Chapter 2 above, the government does not, as a matter of course, have the right to sublicense its modification rights to others. To sublicense the modification right in copyrighted trade secret software without the software owner's permission creates the risk of injunctive relief being entered against the government. (See Chapter 9.)

Who owns what rights in modified or enhanced software can be an extremely complicated question because of a copyright rule that limits or negates copyright protection for any derivative work made without the copyright owner's full authorization. [59] sec. 103 (a). Because the present procurement regulations seem to give the government authority to prepare derivative works of copyrighted software developed at public expense only for government purposes, the rights of the firm that made the modifications to make use of the modifications, even on its own copy of the same software, may be limited by the copyright rule. (See Chapters 1 and 7.)

### 4.2.2 Duty Not to Create Similar Derivative Software of Privately Funded Software

The government clearly has the right to modify the software in which it has obtained rights, to maintain it and to add a new capability needed to make the software better able to do the thing it was acquired to do. It is, however, a different question whether the government has the right to create another piece of derivative software, such as the translation of a program originally written in JOVIAL to one written in Ada, without the permission of the owner of a copyright in the original software. Indeed, the DoD FAR SUPP contains a policy statement indicating that proprietary software documentation will not be used to create other similar software. [61] sec. 27.404-1(e).

### 4.2.3 Authority to Create Derivative Software if Publicly Funded

If the government has funded the development of software, it usually expects to have unlimited rights in the software. If the government has unlimited rights in software, an argument can be made that it has the right to create or authorize creation of derivative software. However, strictly speaking, the definition of unlimited rights refers to "use," "copy," and "disclose" as the rights the government has, which could give rise to an argument that creating a derivative work is not within the scope of unlimited rights. The copyright statute could be cited to support this strict construction because of its separation of "copying" and "creating of derivative works" [59] sec. 106. Some clarification of the government's right to create derivative works in the definition of "unlimited rights" might be wise.

Also, as Chapter 1 has indicated, the government's payment of the development costs of software does not necessarily mean that it has truly "unlimited" rights in the software. The developer of such software has the right under the present regulations to take a copyright in it, with a license back to the government to use it for governmental purposes. This would seem to mean that the government's authority to authorize others to prepare derivative works is thereby limited. As Chapter 7 indicates, this may mean that the original contractor would probably be able to prevent any contractor who prepared a derivative work for the government from marketing the derivative work commercially.

### 4.2.4 Reuse of Software Designs

The government may sometimes want to reuse the design of a piece of copyrighted software in another software project. The question is whether the government needs to worry about copyright interests in such a case. Recent copyright precedents have suggested that reuse of software designs may infringe the copyright (e.g., Whelan Associates, Inc. v. Jaslow Dental Labs, Inc. [50]) finding infringement of dental laboratory software copyright based on structural similarities between programs). There are some copyright scholars who would argue that reuse of software designs involves reuse of ideas, methods, processes, and discoveries of the software which do not infringe the copyright law under 17 U.S.C. sec. 102(b) [59] but as yet the issue is unsettled. It again creates a potential for liability against the government if care is not taken in licensing arrangements with respect to the original software.

### 4.2.5 Government Rights in Contractor-Prepared Derivative Programs

A problem discussed at some length in Chapter 7 is what rights the government should have in subsequently developed derivative software made from software prepared for and funded by the government. The government will sometimes want to claim rights in these derivatives, even though there may be no contractual obligation requiring the contractor to give the government a copy. Copyright law would not seem to give the government rights in the derivative software unless the government had an ownership interest in the original copyright.

### 4.2.6 Programs Produced Through Use of Other Programs

As noted above, there would seem to be copyright problems if modules of proprietary software were "reused" by combining them together to create a new piece of application software because a derivative work would seem to have been created. In such a case, portions of identical code would be included in the new work. A copyright owner in the baseline program would, therefore, seem under the copyright law to be the owner of intellectual property rights in the new application software. Arguments might be made that this should not be an infringing derivative work since it is the very purpose of the base program to produce application software, however the question is a close one, and if it matters to DoD what the answer is, making appropriate contractual arrangements to allocate ownership would seem wise.

An even closer and potentially more troublesome question is whether the owners of copyrights in software tools (or other types of software capable of being used to create new software) have any claim to rights in programs produced through use of their proprietary programs. The definition of derivative work under the copyright law is sufficiently vague that it is conceivable that a court might find software generated through use of other software to be a derivative work. In such an instance, the code would not be identical, but the second piece of code would be "derived" from the first.

It is conceivable that a contractor might attempt, pursuant to a software license, to claim rights in software developed by the government through use of the contractor's software. We have heard

of two instances of such claims in the commercial marketplace: one in which the producer of a compiler claimed rights to royalties in compiled code, the other in which the producer of an operating system claimed rights to prevent sales of programs developed through use of the operating system to entities other than the operating system's owner. It may be this idea will catch on more widely over time. DoD might want to consider putting a provision in the procurement regulations to the effect that the government shall own rights in the software produced through use of other software, just to be on the safe side.

# 5. Government Ownership of Copyrights

When DoD wants to take a direct ownership interest in a work prepared for it by a private contractor, the DoD FAR SUPP directs that the "special works" clause found at DoD FAR SUPP ( [61] sec. 52.227-7020) be used in the development contract ( [61] sec. 27.405). The clause in effect claims a direct copyright for the government under the copyright "work made for hire" doctrine. We understand that this "special works" clause has been used in a number of DoD software development contracts. Indeed, it appears that a deviation would be required to attempt take a copyright interest in any other manner.

There are two problems with use of the special works clause for this purpose, one, that software is not one of the categories of specially commissioned works that qualifies for "work made for hire" rules, and second, that the copyright law specifically prohibits the government from taking direct ownership rights in copyrighted works ( [59] sec. 105). The legislative history of this section reflects that Congress considered the issue of copyright ownership of works prepared for the government by contractors and decided that while agencies could decide that contractors could be permitted to retain copyrights, the government could not get direct copyright ownership in works prepared for it. ( [6] at 59.)

Copyright law permits the government to own copyrights only by assignment, bequest, and the like. Taking a copyright as if the work was "made for hire" is not the same as taking a copyright by assignment or bequest. What the DoD "special works" clause will be effective in doing is precluding the contractor from claiming any ownership rights in the software. If the Defense Department wishes to obtain a copyright interest in software, it would be well-advised to adopt a strategy similar to that adopted by NASA and that proposed under the new FAR.

## 5.1 Assignment of Copyrights: The NASA and FAR Approaches

NASA lawyers with whom we spoke questioned the validity of the DoD approach to taking copyrights, and offered their strategy as an alternative possibility. The NASA strategy attempts to take advantage of the explicit exception contained within Section 105 which allows the government to hold a copyright transferred to it by assignment. When NASA wants a copyright interest in software, it inserts a special works clause in the development contract which requires the contractor to obtain a copyright registration for the work (such as software) and then to assign the copyright to NASA ( [64] secs. 1827.473-3 and 1852.227-77).

The recently proposed FAR has a somewhat more complicated approach to the "special works" problem than does the NASA policy. Under the allocation of rights provision of the FAR special works clause, the government claims four things: (1) unlimited rights in all data (which includes software and technical data) delivered under the contract and in all data first produced in performance of the contract (2) the right to limit the contractor's exercise of claims to copyright data first

produced in performance of the contract, (3) the right to obtain an assignment of copyright in such data, and (4) the right to limit the release and use of certain data by the contractor (See [66] Sec. 52.227-17(b)()(1)).

One of the two key features of the FAR special works clause is the explicit agreement it demands from the contractor not to assert a claim of copyright in any data first produced under the contract without the written permission of the contract officer ( [66] sec. 52.227.17(c)). The second key feature is the power given to the contract officer to direct the contractor to claim copyright in such data and assign the copyright to the government or its designated assignee. (Id.) A further interesting feature of the FAR clause is the limitations it puts on the contractor's own use of data first produced under the government contract. The contractor under the special works clause agrees not to use the data for purposes other than performance of the contract and not to release, reproduce, distribute, or publish the data without the written permission of the contract officer.

If ownership and control of certain software is what the Defense Department thinks it needs, the Department would be well-advised to pursue a strategy similar to that reflected in the new FAR.

## 5.2 The Implications of Owning a Copyright

There are two differences in the nature of the copyright protection afforded to those who take copyrights by assignment and those who own copyrights directly. A copyright obtained through assignment can be taken back by the author after a period of 35 years ( [59] sec. 203(a)(3)). This provision was meant to protect improvident artists who might have signed away their rights "for a song" before the value of their product had been recognized. Thus, the government might obtain less than the full-term of copyright protection (generally, 75 years) which would be available if it could take a copyright directly. Still, a more limited form of intellectual property protection is certainly preferable to a form of protection which may be unenforceable; and, at any rate, 35 years is generally a more than sufficient length of protection due to the typically rapid obsolescence of software.

Secondly, to make an assignment of a copyright effective against a third party, it must be recorded in the Copyright Office. Without recording, the assignment to the government might have to yield to a subsequent assignment to a purchaser in good faith ( [59] sec. 205(e)). In addition, proper recordation of the transfer of copyright is a prerequisite to the ability to bring an infringement action ( [59] sec. 205(d)). It would thus be important for the government to take this step and see that the assignment is recorded with the Copyright Office.

## 5.3 A Need for Legislative Reform?

It is interesting to note that the U.S. Government is permitted to take patent rights directly, but not copyrights. Congress appears to have two principal reasons for prohibiting copyright protection for "works of the United States Government." If the Defense Department regards being able to take direct copyright interests in software as sufficiently important to seek special dispensation

from Congress, these two reasons can be turned around and used to construct a rationale for a software exception to the general rule against copyright ownership.

### 5.3.1 The Double Subsidy Argument

One concern evident in the legislative history of Section 105 was that the public would, in effect, be paying a double subsidy for the work if the government were permitted to obtain copyright protection in works produced at public expense --- first in the form of tax dollars spent to develop the work, and then in the form of the higher prices which would be generated by the commercial advantage of copyright protection.

This rationale for the Section 105 prohibition does not explain why Congress decided to treat government ownership of copyrights and patents differently. The same double subsidy concerns would seem to exist for patentable works produced at public expense. In either case, the public is paying twice if forced to 1) support the development of the work with tax dollars, and 2) then pay a higher price for access to the work due to the commercial advantage generated by a particular form of intellectual property protection. Perhaps, therefore, the double subsidy argument does not seem to have been Congress' primary concern.

One can turn the double subsidy concern around by pointing out that there may sometimes be a strong need for the government to have a copyright to accomplish its objectives for software produced at public expense. It may sometimes need the power to control uses that other firms, including the contractor that originally produced the software, may make of the software, and may, in particular, need to be able to control the preparation of derivative works. To insure that the government will not have to pay again for the privilege of exercising such control, allowing the government to own the intellectual property interest may be important. If private industry is to be permitted always to retain ownership interests in software developed at public expense, the result will likely be greater expenditure of funds by the government and by the public at large -- that is, a greater subsidization by the public -- a result which runs counter to the policies underlying Section 105 of the Copyright Act. The government could use such an argument in an effort to bring about legislative reform of the Copyright Act so as to provide a software exception from the Section 105 prohibition.

### 5.3.2 The Free Flow of Information Argument

The other major reason for the prohibition against government ownership of copyrights explains why there is a differential treatment as to patents and copyrights. The legislative history of Section 105 and its predecessor Section 8 of the previous Copyright Act speak of an intent to place "all works of the United States Government, published or unpublished, in the public domain," and of the need to have works "freely available" ( [6] pp 58). Indeed, the most cited case dealing with the prohibition against copyright for government works (Public Affairs Associates, Inc. v. Rickover [42]) looked primarily to such free flow of information concerns in determining the scope of this prohibition. As the court stated in Rickover ( [42] pp 268) the prohibition against the U.S. Government securing copyright protection for works developed at public expense "is designed to

achieve in a democracy that depends upon accurate public knowledge the broadest publicity for matters of government." The concerns expressed in the Rickover case relate to censorship and freedom of information. These concerns provide a justification for prohibiting government acquisition of copyright protection for works developed at public expense, and are also consistent with the differential treatment accorded patentability of inventions developed at public expense (in which case concerns over free flow of information and the potential for censorship would not be as pronounced).

Software would seem to fit more appropriately within the rationale for allowing exclusive rights protection in the area of inventions than for precluding such rights for the government in the area of copyrightable subject matter. Software would not seem to raise the same kinds of "free flow of information" and "right of the public to know" concerns which underlie the differential treatment accorded "works of the United States Government" of a traditional copyrightable sort as opposed to works which involve patentable subject matter.

Software is a tool for performing a job; it is a commercial item, not a communicative one (at least not in the censorship/free flow of information sense of that term). The commercial realities of the software industry make it highly desirable for the government be able to protect its interests in this area. The issue is not one of censorship, but one of rational use of public funds. The public benefit from a "free flow" of the "information" contained in software seems less strong than in the case of books and articles. Given that the public is likely to pay more---in the form of higher expenditure of tax dollars---for this dubious privilege, the rationale for treating software the same as other copyrighted works seems weak.

The policies of the Section 105 prohibition against copyright protection for "works of the United States Government" simply do not fit in the case of software developed at public expense, and actually seem to be undermined by such an application of this provision.

## 5.4 Conclusion

There do seem to be some circumstances in which government ownership of rights in software would be desirable. Strict application of the copyright law does not provide adequate intellectual property protection for software developed at public expense. A protection scheme more akin to that provided under the patent laws may be needed to adequately protect the government's legitimate interests in software developed at government expense. At the very least, an exception from the Section 105 prohibition against copyright could be argued for on these grounds.

# 6. Problems Arising from the Government Trademark Rights as Regards Software

In recent years the Defense Department has been acquiring, maintaining, and enforcing trademark rights in words used in connection with software (among them, in "Ada"). We have not had an opportunity to see the government's trademark registration certificate or to thoroughly investigate the trademark questions discussed below. However, because "Ada" and other similar trademarks seem to be important to the government and because interviews with DoD personnel seemed to reveal some misconceptions about trademark issues (and about the perils of not being careful about use of trademarks) it seemed that these concerns needed to be raised. They seem deserving of further study.

## 6.1 What Kind of Mark Does the Government Own?

A question which we put to several government people who seemed knowledgeable about the "Ada" trademark was what kind of a mark it is: a trademark or a certification mark? There are important differences between the two, and some important limitations on rights depending on what kind of mark it is. The government people to whom the we spoke seemed not to know what kind of mark "Ada" was.

### 6.1.1 What a Trademark Is

A trademark is a word, picture, or symbol which a manufacturer or seller of goods adopts and affixes to his products in order to identify that manufacturer or seller's goods and distinguish them from others' goods ( [63] sec. 1127). ("Kellogg's," for instance, is a trademark for cereal products, which the mark's owner stamps on the box to allow consumers to discern that this box of cereal was made by Kellogg, and not by another cereal manufacturer.) Trademark law is aimed at protecting consumers from being confused, not at protecting the valuable property right the owner of the mark may have or thinks he has in the mark. To serve a trademark function, a word or other symbol cannot be a functional part of the product, and it has to signify to consumers from whom the goods come, not what kind of goods they are.

### 6.1.2 What a Certification Mark Is

Trademarks can only be owned by persons who manufacture or distribute goods bearing that particular mark. By contrast, the owner of a certification mark is prohibited from being either a manufacturer or distributor of goods for which certification is sought. Unlike a trademark, a certification mark does not signify the source of goods; it signifies only that certain goods have met a certain standard. A certification mark, then, is a mark used upon or in connection with the products of one or more persons other than the owner of the certification mark which certifies one or more of the following: regional or other origin, material, mode of manufacture, quality, accuracy, or other characteristics of the products ( [63] sec. 1127.)

To obtain rights to a certification mark, one must register the mark with a federal agency and set forth the criteria an applicant must satisfy to be certified to use the mark. The certification mark owner is obligated to apply the standards in a non-discriminatory fashion to those who seek certification. A certification mark is subject to cancellation or to a challenge to its validity in infringement litigation if:

> (1) the owner of it has not controlled or is unable legitimately to control use of the mark,
>
> (2) has started reproducing or marketing any goods to which the certification mark is applied,
>
> (3) has permitted use of the certification mark for other than certification purposes, or
>
> (4) has discriminatorily refused to certify or continue to certify the product of any person who meets the standards which the mark certifies ( [63] sec. 1064(e)).

A certification mark will also be subject to cancellation if it is (or has become) a generic or common descriptive name for a kind of product ( [63] sec. 1064(c)). Even having an "incontestable" mark will not preclude cancellations on these grounds ( [63] sec 1065).

The important -- if obvious -- point here is that either one has a trademark or one has a certification mark. One cannot have both, at least not as to the same or similar kind of goods ( [7] sec. 19:32). While "Good Housekeeping" is a trademark as to a magazine and a certification mark as to various household goods, there is a large gap between these two things. Where the gap is narrower or non-existent, certification marks may be invalid if similar to a preexisting trade mark already owned by the applicant. (See In Re Florida Citrus Company [32]). And if one has a certification mark, one cannot at the same time be the producer or distributor of goods of the same kind.

### 6.1.3 What is "Ada"?

The government has established rigorous standards that must be met before a compiler can be certified as an "Ada compiler." It seems reasonable, therefore, to assume that the kind of mark government must have in "Ada" is a certification mark for use in connection with compiler programs. If this assumption is correct, then, in accordance with the principles set forth in the previous subsection, it is clear that the government, in order to maintain the certification mark, must not take ownership rights in any software using the mark. It must police use of the mark by non-certified parties. It must make sure that the mark is not used for other than certification purposes. And it must not deny certification to qualified parties. If "Ada" is intended to be a certification mark for things other than compiler programs, the government should make sure its registration for "Ada" is broad enough to cover these other things and the government must develop standards and guidelines for other such "Ada" products.

## 6.2 Who Owns the Ada Trademarks?

"Ada" is most often advertised as "a registered trademark of the U.S. government" or as "a registered trademark of the U.S. Department of Defense." (The AJPO Guidelines the government has issued for use of the Ada trademark are of the latter type.) When we asked DoD people about the potential problem of the government owning programs that might be within the range of its certification, thereby endangering any certification mark it might have, the response was that it is really the Ada Joint Program Office (AJPO) that owns the Ada mark.

However, the government itself widely touts the Ada mark as being owned by the government or DoD. Because of this, it is conceivable that a court would find an overlap of ownership. Furthermore, because a court would be unlikely to enforce a certification mark owned by one division (or even a subsidiary) of a company that certified the products of another, it is not clear that even if AJPO is found to be the legal owner, it is separate enough from another unit of DoD for the certification mark to stand. At any rate, it would seem prudent, if this is to be DoD's defense, to start touting Ada as being owned by the AJPO, or to make sure DoD never takes ownership in any Ada software as a protective measure.

## 6.3 What is the Scope of the Mark in "Ada"?

Just because the government might properly own a certification mark in Ada as to compilers, that doesn't necessarily mean it owns rights in Ada across the board, or even as to anything relating to software. The point is not an obvious one, and may run counter to what common sense might suggest, but the way trademark theory runs, when someone acquires rights in a mark, he only has the right to use that mark in connection with sale of the particular goods publicly distributed with use of the mark. Someone else is free to use the same mark in connection with the sale of another kind of goods. The reason is that consumers won't be confused if they see the same mark on different kinds of goods. (If you see the word "Tiffany's" on a can of tobacco, you won't think the famous jeweler made it.)

### 6.3.1 Is "Ada" Generic?

The Guidelines written by the AJPO about use of the trademark Ada state (at sec. 1(b)):

> It is fundamented [sic] important that the Ada trademark [sic] not become a generic name for a class of programming languages; and that it be well understood that the Ada trademark refers to one programming language, created by DoD, whose purity is maintained through a rigorous language control mechanism.

Unfortunately, there may not be anything the government can do to prevent Ada from being found to be a generic term for the computer programming language as to which it is commonly used. The trademark law tests genericness based on what the ordinary person would think the term referred to, not what the owner of the mark thinks. The primary significance of "Ada" would seem to be as a particular language, rather than as signifying DoD as the source of some product. If it is, the term would seem to be generic to that extent.

Ada is less likely to be found generic as to computer programs (or compilers). To the extent that the DoD wants to assert trademark-type rights to "Ada" in conjunction with computer programs, it may (if careful) be able to maintain some control over the term.

### 6.3.2 The Scope of the Government's Rights in "Ada" as to Compilers

Assuming that DoD owns a valid certification mark in Ada as to compilers that meet its rigorous set of prescribed standards, DoD not only can authorize those who meet the standards to advertise their products as "certified as Ada compilers," it must police the market to insure that others are not marketing uncertified products as if they were certified. But this duty can be overzealously enforced. Owning a certification mark in Ada does not necessarily mean the government has a right to prevent anyone who has produced a compiler that is capable of compiling Ada source code into machine code from making reference to "Ada" in promotional materials for the program. DoD would have a right to control who can promote their products as "certified as an Ada compiler." However, this does not mean that DoD can stop someone from saying "this program compiles Ada." There is such a thing as a fair use defense to trademark infringement actions. Under 15 U.S.C. sec. 1115(b)(4) [63] persons are entitled to use words that other people claim as marks if they do so in good faith and in order to accurately describe their product. The latter comment above would appear to fall within the fair use defense.

### 6.3.3 The Scope of the Government's Rights in "Ada" as to Other Programs

From perusing the AJPO Guidelines for the use of Ada, it appears that DoD is claiming rights to control use of the term "Ada" in conjunction with programs other than compilers. However, these guidelines only set forth standards that must be met by compilers. If the government wishes to certify other kinds of programs, it would need to have and publish standards for those other things. And, of course, the government's mark as to other programs would also be subject to a fair use defense.

### 6.3.4 The Scope of the Government's Rights as to References to "Ada" in Publications

Many trademark owners whose marks are endangered because of widespread usage of the term in a generic way (Xerox, Kleenex, and plexiglass come to mind) have undertaken a policy to protect the source significance of the mark by highlighting its trademark significance. This may include, in the mark owner's own promotional materials, use of a "TM" or "(R)" or "brand" placed next to the endangered mark; it may also include the mark owner's request (or even demand) to others who might make reference to the mark, that they acknowledge the mark as a trademark in some way (e.g., use of "TM" next to the word). A trademark owner does not, however, have a legally enforceable right to insist on reference to the mark as a mark in connection with written materials (other than advertisements). The only thing that invades a trademark owner's rights is use of the mark by a competitor or near competitor in a way that would confuse consumers. Reference to a mark in a book or article does not fall into that category. That isn't to say that DoD

should not encourage others to respect their rights in "Ada," but it is to say one should be careful to understand the limits the law of trademarks places on an owner's rights.

## 6.4 Conclusion

We would caution DoD to be careful about its use and its authorization of other's use of the term "Ada" for other than certification purposes. Recall that this is one of the grounds for cancellation of a mark.

What DoD is attempting to do in promoting Ada as a standard programming language and in developing high standards for certifying programs written in and for that language are laudable aims. We would hope these aims are realized and only wish to caution about the care that must be employed in using trademark law to achieve them. We would not want to see the Department's own lack of experience with trademarks become the basis for undermining the achievement of these worthy goals.

# 7. A Hypothetical Illustration of Software Licensing Problems under the Existing Regulations

The Defense Department has recently undertaken the funding of some ambitious software engineering projects. It therefore seems worthwhile to examine a set of licensing problems and questions that are likely to arise in connection with such projects. Many of the problems which will be discussed in this chapter have been discussed in previous chapters in a more abstract way. This chapter presents a hypothetical situation which may provide a useful illustration of how these abstract problems might evidence themselves in a concrete instance.

Although the discussion below is hypothetical, it is important to understand that any ambitious software project of the sort presented here could raise similar problems. To solve these problems now, before they erupt into litigation, would seem desirable.

## 7.1 The Hypothetical Situation

For purposes of this illustration, assume that the DoD has made a major funding commitment with a contractor (Contractor A) for the development of an extremely sophisticated software system (We'll call it Z System). The primary objectives of the Z System contract are as follows:

(1) the development of a standard set of software development tools that the government could use for the purpose of generating code for military purposes;

(2) dissemination of this standard tool set to the defense contractor community for the purpose of use in military projects;

(3) excellence in the tool set so that the industry would want to use the tool set rather than having to be required to use it;

(4) creation of many derivative works, most obviously "rehosts" (rewriting the Z System so that it will operate on different host machines) and "retargets" (altering the Z System so that it will produce code that will run on different machines), all of which would be widely available to the government and to industry;

(5) creation of commercial spinoffs by those who might rehost or retarget (which hopefully would give those firms some incentive to create a good product for the government); and

(6) control over exports of the standard tool set.

To get this project underway, the DoD might let a contract to Contractor A to develop the Z System to run on one particular "host" computer and to produce code which would run on another particular "target" machine. It might well be understood that the first version of the Z System would serve as a model for future developments of rehosts and retargets, and that the original would not itself be as widely used to generate code as the derivatives because it, for example, might have been written to run on a mainframe, whereas most of the uses would be for microcomputers. Assume also that a large sum of money, somewhere in the range of $20 million, has been paid to Contractor A for the Z System product, a version of which has been delivered.

The question the government needs to know is: What is the extent of the government's rights in the Z System.

## 7.2 Government Takes Unlimited Rights, or Does it?

In most software development contracts, DoD will have used the standard data rights clause ( [61] sec. 52.227-7013). Assuming this was done in the contract with Contractor A for the Z System, the government's normal expectation would be that since public funding would subsidize the development costs, the government would have unlimited rights.

Now suppose for purposes of this hypothetical, that to the surprise and dismay of the DoD, the Z System software and documentation is delivered to DoD with Contractor A's copyright notice affixed to it. None of the DoD procurement personnel who let the Z system contract may have noticed the part of the standard data rights clause that permits contractors to retain copyright interests in all works delivered to the government (except those delivered as "special works.")

The reader should recall that the effect of the contractor's copyrighting a work paid for by the government seems to be that the government will get a license to copy and use the work for governmental purposes. Because the clause was ambiguous and was drafted by DoD, a court would likely find the copyright retention clause to limit the extent of the government's rights. That this might perturb the expectations of DoD's procurement personnel who thought that the government would have unlimited rights is unfortunate, but not contractor A's problem.

If DoD decided to attempt to purchase the copyright from Contractor A, Contractor A would most likely realize that the government was in a poor bargaining position and would take advantage of the situation by offering to sell the copyright for what the DoD would consider to be an outrageous sum.

## 7.3 Rehosts, Retargets, and Enhancements of the Z System

It is important to understand how the cutback from unlimited rights to governmental purpose rights might limit the government's power to achieve its objectives for Z system. The clearest example of a likely source of friction would arise in the creation of derivative software. We have assumed that the government always intended to authorize rehosts and retargets to be made of the Z System and that Contractor A would not be the sole source for all these derivative works. Contractor A, in this hypothetical, would likely not contest the government's right to distribute the Z System for the purpose of having rehosts and retargets prepared for it.

But what Contractor A may wish to contest is the right of the government to make certain kinds of deals to get rehosts and retargets made for them. Further, Contractor A may well claim rights in derivative works of the Z System done by other firms. If firms developing the derivatives attempt either to distribute the Z System or derivative works of the Z System for commercial purposes, Contractor A might challenge their rights to do so. The government itself might be concerned about what, if any, rights it might have in rehosts or retargets done by Contractor A for entities other than the DoD. These problems are explored in detail below.

### 7.3.1 Retargeting or Rehosting

Suppose that DoD announced the availability of the Z System for rehost and retarget purposes if a firm could meet certain minimal conditions (e.g., having a certain kind of computer). The DoD might hope to get rehosts and retargets of the Z System to be made at minimal or no additional cost to the government. If the Z System had considerable commercial potential, the DoD might hope that this would serve as an incentive for firms to do rehosts or retargets for the government at minimal cost. The DoD would realize that incentives would be enhanced if the firms were able to retain exclusive commercial rights to their version of the Z System.

Suppose that a computer company (Contractor B) offered to create a version of the Z System for Contractor B machines at no charge to the government on condition that Contractor B would retain all commercial rights to their version of Z. (Contractor B might think that commercial sales of its computers would be enhanced by being able to offer its version of the Z System along with the machine. Sales of Contractor B's machines to DoD might, of course, also be enhanced.) Contractor B might ask the DoD for assurances that Contractor B could do this without any liability to A. The question is whether DoD can give Contractor B this reassurance on the theory that it is a legitimate governmental purpose to get a free retarget, and therefore within the government's rights vis-a-vis Contractor A. What happens if Contractor A expresses objection to this kind of deal, as seems likely, arguing that its copyright in the Z System gives Contractor A the right to control all commercial distributions of the derivative works of its copyrighted work, the Z System?

Preparing derivative works is one of the exclusive rights of the copyright owner ( [59] sec. 106(2)). The copyright statute defines "derivative work" as follows ( [59] sec. 101):

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

Both a rehosting and retargeting of the Z System would seem to fit this definition.

Common sense might suggest that if Contractor B created a retarget for the government and the creation of the retarget was within the scope of the government's license, Contractor B could take a copyright in the retarget (assuming that the government would once again use the standard data rights clause in its contractual arrangement with Contractor B). However, under the copyright statute, it is not clear that Contractor B is entitled to a copyright, or that its copyright would entitle Contractor B to make commercial distribution of the derivative work. This is because Contractor A's permission to the government to authorize the making of derivative works seems, in this hypothetical, to be limited to governmental purposes. Contractor A might claim that the terms of the government's deal and Contractor B's commercial intent exceed the scope of this license. It is a general rule of copyright law that if one exceeds the scope of license permission, an infringement of the copyright has occurred (e.g., Gilliam v. American Broad-

casting Co. [30]). Also, copyright protection in a derivative work will not attach to the extent that it unlawfully incorporates another author's copyrighted material ( [59] sec. 103(a)). If the government (instead of Contractor A) owned the Z System copyright, it could authorize Contractor B to copyright Contractor B's derivative work. Not owning the copyright, the government can't grant to Contractor B a larger license than the government's arrangement with Contractor A permits. Because of this, it would not be clear that Contractor B could copyright the retarget and distribute it commercially. As a matter of copyright law, Contractor A would seem to have a legal right to control commercial distributions of the Contractor B version of the Z System, although as subsection 7.3.5 within indicates, Contractor A may not itself have any rights to use or sell Contractor B's version of the Z System.

### 7.3.2 Giving Away Z System Code for Commercial Distribution

Now suppose that DoD is also in the process of letting a second contract for some enhancements to the Z System (Z System-2). (Suppose also that Contractor A will not be a contender for this contract.) As a result of the problems DoD may have had with Contractor A over the original Z System, assume that DoD's contract personnel for Z-2 try very hard to structure their contractual arrangements with the new contractor so as to avoid those problems. One way to attempt this might be to try to get government ownership of the Z-2. (The problems with this approach be discussed below in Section 7.5) Suppose also that part of the RFP authorizes the winner of the Z-2 contract to distribute the machine-readable version of Contractor A's Z System to all of its commercial customers. (The RFP might forbid the winner from selling Contractor A's version of the Z System code but might purport to allow it to distribute the Z System code to commercial customers free from the obligation to get Contractor A's permission and free from any obligation to pay royalties to Contractor A.) To the extent that the Z-2 would be a derivative work of the Z System, the RFP might also give permission to the winning offer or to sell or license the derivative Z System to its commercial customers free from any obligations toward Contractor A.

The interesting question is, of course, whether the government has the legal right to authorize commercial distributions of the Z System code or to authorize commercial distributions of a derivative work of the Z System program without Contractor A's (i.e., the original copyright owner's) permission. This, of course, leads back to the question of what the scope of the government's rights are under the standard data rights clause.

### 7.3.3 Balancing The Government's and Contractor A's Interests

The government might argue that it does have the legal right to do these things because it is an appropriate governmental purpose to have rehosts, retargets, and/or enhancements of the Z System made at the least cost to the government, and for those rehosts, etc. to be widely available, and Contractor A always knew that widespread dissemination of derivative works was intended.

Contractor A's response might well be that under the copyright law, it has rights over distributions of its product to commercial customers and over distributions of derivative products to commercial

customers, which rights the government cannot abrogate simply because it wants to. Contractor A might well argue that it is not a legitimate governmental purpose to authorize commercial distributions of its work, in part because such distributions are not directly in fulfillment of any governmental mission and in part because it undercuts Contractor A's market for the Z System (a market which, according to our hypothetical, the government agreed to leave to Contractor A). Contractor A might admit that widespread dissemination of the Z System derivatives was expected, but might argue that it would be glad to license commercial marketing of those derivatives but that it never intended to leave itself with no commercial market. Contractor A might point out that the government knows that there is a very limited commercial market for the original Z System which runs on a particular mainframe and prepares code for another computer. Contractor A might also argue that the government is under a duty of good faith not to destroy or undermine the commercial market for its Z System.

How a court of law would decide these matters is somewhat hard to predict. It is not, however, a clear winner for the government, or for those whom the government might wish to authorize to make rehosts, retargets and enhancements.

### 7.3.4 What Rights the Government Has to Contractor A's Derivative Products

Now suppose that Contractor A made a deal with Contractor C to prepare a version of the Z System which would operate on a specific microprocessor. An important question which DoD should then ask is: What if any rights the government would have in derivative works prepared by Contractor A for others? If the government had a copyright in the Z System, or if the government had unlimited rights in it and unlimited rights meant having ownership or an ownership interest, then it would seem the government would have some rights as regards these other versions of the Z System. If the government had unlimited rights (rather than a license for governmental purposes) in the Z System, the government might have an argument that it has inchoate rights in the enhancements, even though it has no right to possession. (See Chapter 1 for a discussion of the problem of unlimited rights in non-deliverables.) Since it would appear that under this hypothetical the government may only have a license for governmental purposes, unless the government made contractual arrangements with Contractor A to obtain rights in all derivative products prepared by Contractor A, the answer would seem to be that it would have no rights to these derivative products.

### 7.3.5 Rights to Exclude and Rights to Use

To say that if the government had the copyright for the Z System, it would have some "rights" as against Contractor A when Contractor A prepared enhanced versions of the Z System for entities other than DoD is <u>not</u> to say that the government would own a copyright in the enhanced Z System or would even have a right to use copy, or disclose the enhanced Z System (unless, of course, by contract the government had obtained such rights).

As Chapter 1 has shown, intellectual property law tends to define ownership rights in terms of having power to <u>exclude</u> others from using the thing which is claimed as property. A copyright

would give the government the right to prevent Contractor A from preparing, copying, or distributing unauthorized derivative works (such as an enhanced Z System). The copyright might also give the government the right to challenge any copyright Contractor A might claim in an enhanced Z System (recall that copyright protection is not afforded to unauthorized derivative works). But negative power is not the same as positive power. That is, the power to prevent Contractor A from making or selling an unauthorized enhancement would not entail a corresponding power on the part of the government to employ the enhancement for itself (i.e., to use, disclose, copy, or do anything else with it).

### 7.3.6 DoD's Rights to Control Contractor A's Arrangements with Other Government Agencies

In this hypothetical, it has been assumed that DoD obtained a license to copy and use the Z System for governmental purposes. This license would not seem to be restricted to the DoD, but would seem to cover all federal agencies. It is an interesting question whether Contractor A has the right to sell the Z System to another governmental agency, given that the DoD's license would seem to mean that all governmental agencies are already entitled to use it without charge.

Suppose, for example, Contractor A sells rights to the Z System to a NASA facility, at some specified charge, and even agrees to do some enhancements for NASA. The DoD might wonder whether Contractor A has a right to do this and whether DoD will be able to get unlimited (or at least license) rights to any enhancements that NASA might fund.

As to the former question, it would be somewhat dependent on the terms of the original contract, but assuming that there is no clause explicitly precluding sales to other governmental agencies, it is hard to see on what basis DoD could argue that Contractor A has no rights to sell to NASA as part of its commercial market if NASA wants to buy. As to the latter question, DoD would seem to have no greater rights to obtain from Contractor A the derivative works it prepared for another government agency than as to derivative works prepared for private companies. Perhaps, however, the DoD could obtain the enhancements directly from NASA in such a circumstance.

## 7.4 Giving Out the Z System to Industry for Other Than Rehost/Retarget Purposes

If DoD has only been releasing the Z System to software defense industry firms for the purposes of having rehosts or retargets made for the government to enable the government to fulfill its governmental missions, this would seem to be within the scope of a "governmental purpose" license. But suppose the DoD decided instead to give out the Z System to the software defense industry for use by the firms to produce code for the government. Would that be a valid governmental purpose within the government's license or would this be an encroachment on the commercial market rights of Contractor A under its copyright? It is a close question. If the sole use that could be made of the Z System by industry was in performance of government contracts, that would seem to be within the scope of the government's license. Simply to distribute the Z

System code (or any improved version of it) to defense industry because the government thought it best for the industry to have a good set of standard tools would seem to be stretching "governmental purpose" further than the government's right would clearly extend.

## 7.5 Taking a Copyright in a Derivative of the Z System as a Way to Avoid Problems

Returning to the hypothetical Z-2 contract, assume that DoD seeks to avoid the problems it had with Contractor A by putting a "special works" clause in the RFP for the Z System-2, by which the DoD hoped to take a direct copyright interest in Z-2. For reasons explained in Chapter 5, the efficacy of the present special works clause to obtain ownership rights for the government is questionable because of the copyright law's preclusion of direct government ownership of copyrights. A special works clause more like NASA's might, however, be effective in getting a lawful copyright assignment to DoD. Unfortunately, a deviation may be required for DoD to use a clause other than the special works clause to achieve this purpose.

The idea of taking the copyright is a good one because, if executed properly, a copyright will give the government rights to control the making and distribution of derivative works. Had the government owned the copyright in the Z System, Contractor A's version of the Z System for Contractor C would be a derivative work in which the government would have rights; then it would be Contractor A's copyright in the derivative work that would be in jeopardy if Contractor A had not obtained authorization from the government to prepare derivatives.

Owning a copyright is a good idea, but it has its costs, not the least of which is enforcing the copyright. Unless the government grants to rehost or retarget companies exclusive licenses to the government's copyrighted works, the government will have to be made a party to any lawsuit between the rehost/retarget firm and one of its customers over actions by the customer in contravention of the rehost/retarget firm's rights under the copyright license. (See 3 Nimmer on Copyright sec. 12.02 [9].) Also, being the owner may make the government a warrantor of the software unless adequate disclaimers have been made.

Some DoD people might think that they would be able to free themselves from obligations to Contractor A once they had gotten the Z System rehosted and took a copyright in Z-2 or Z-3. Such an assumption would be questionable. Contractor A would still be the owner of a copyright in the Z System of which the rehost would be a derivative work. The government's power to have derivatives made probably only extends to having them done for government purposes. Because the government's power will be limited by the terms of its license with Contractor A it does not become free of that constraint simply by getting more rights to a later version. An analogy may help. If you get the permission of someone who has translated a book from French to German to use his German translation to do a translation into English, that doesn't mean that you don't need the French author's permission as well. Copyright permissions must have a clean trail back to the source. If you don't get it, it's like a little tooth decay under a filling. The tooth goes on rotting instead of being cured.

In other words, the DoD may never be free from obligations to Contractor A so long as its copyrighted Z System is the basis for the derivative programs.

## 7.6 What about Patents?

On the assumption that software is not patentable and that software algorithms are not patentable, let's suppose that the Z System contract says nothing about allocation of patent rights. Although there are certainly cases which say that software and algorithms are not patentable and other cases which say that transformation of matter from one physical state to another is required for patenting a process that may be implemented in software, it is fair to say that patent law as regards software is in a state of flux. One important recent case upheld a brokerage firm's patent of a data processing process implemented in software (Paine, Webber, Jackson and Curtis v. Merrill, Lynch, Pierce, Fenner and Smith, [40]). This case could presage a wave of non-manufacturing process patents for software. The government should simply be aware of this because although patent ownership by a private firm on software in which the government had a copyright would not necessarily hurt the government in terms of its own use of the software, it may hinder the government's right to license commercial distributions of the copyrighted software by other firms whom the government might license to use the software. Commercial distributions might require getting permission from the patentee as well as from the government.

## 7.7 What about Trademarks?

As indicated in Chapter 6, the government is more frequently taking ownership (or at least staking out rights to) to trademarks in software development contracts. Assume a DoD RFP for some system such as Z system or Z System-2 claims government ownership of a trademark for the system. There is nothing wrong with the government trying to get and enforce trademark rights so long as it is careful about what it is doing. As Chapter 6 points out, trademarks can be very tricky; certification marks in particular are subject to cancellation if one begins owning what is being certified. Because of this, guidance through a standard regulation about taking trademark rights would seem to be advisable.

## 7.8 What about Warranties?

Now suppose a DoD RFP is issued for a software system such as a Z System-2 which disclaims any warranties for the Z System code that will be "GFI"ed to the winning bidder. (Some government people seem to think it unnecessary to disclaim warranties, arguing that everyone knows that the government never warrants anything.) The Z-2 Contract, we'll assume, is is otherwise silent about warranties. As Chapter 11 explains, there is some chance that implied warranties of merchantability or fitness for a particular purpose may attach to software; and taking the copyright may entail taking some responsibility for warranties. Because of this, the government should be careful about making sure that in any distribution of the Z System code (or a derivative) to any commercial customer of the winning bidder, the government's liability for warranties in <u>that</u> code (as well as in the original Z System) be adequately disclaimed.

## 7.9 Controlling Export of the Z System by a Contractor

Another potential problem regarding ambitious software projects has to do with controlling exports of it. The DoD might be very upset to find out that a Contractor A had licensed to export a system, such as the Z System, developed for DoD to a foreign firm.

The problem seems to be that there are presently two independent approaches for getting an export license, one handled by the Commerce Department under the Export Administration Act ( [62] sec 2401 et seq.) and one handled by the State Department under the Arms Export Control Act ( [56] sec 2751 et seq.). We have been told that the former agency tends to be somewhat more generous in granting licenses, being more concerned about balance of trade than security matters (although acquiring such a license is still a rather complicated, onerous process). The latter agency tends to be even more cautious about granting licenses, and maintains a list of arms-related items which cannot be exported. Even with caution, however, mistakes can be made.

Apart from the export regulations, it would not seem that the government would have the power -- absent a contractual commitment not to export without permission -- to prevent a contractor's export of a system, such as Z System, developed for DoD because the standard data rights clause is silent about rights to control exports. Had the government taken a copyright in the system, it might have a power to prevent exports because exports are a kind of distribution and copyright law would give the government the right to exclude Contractor A from distributing the code unless of course the government had granted a broad license to distribute the code to the contractor.

## 7.10 Conclusion

As this chapter has illustrated, software contracts raise a host of difficult problems which current regulations do not adequately address. To avoid these problems through better planning would be preferable to experiencing them again and again.

## 8. Subcontractor Flowdown Problems

A reason "subcontractor flowdown" seems to have been so often raised by DoD personnel as a software licensing problem is that much software intended for governmental use is developed at the subcontractor level. One of the DoD persons whom we interviewed estimated that two-thirds of the mission critical computer resources (MCCR) software prepared for DoD was developed by subcontractors. Since data rights and other important aspects of the government's rights as regards software will depend at least in part on the arrangements made between the prime and its subcontractors, it is not surprising that problems have arisen when the arrangement negotiated between the government and the prime differed from the arrangement between the prime and its subcontractor (or even between a first tier subcontractor and a second tier subcontractor). Although other kinds of problems are possible, government lawyers tend to be concerned by situations in which the prime makes an agreement with the subcontractor to obtain lesser rights than the government believes it needs and had bargained for from the prime. The examples we were given of "subcontractor flowdown" software licensing problems were of this sort.

What all subcontractor flowdown problems have in common is the question of whether the government will be able to enforce its contractual rights in the software as against the subcontractor, or will be able only to sue (or gain concessions from) the prime for its failure to deliver what the government bargained for. Because such situations can include second and third tier subcontractors, and so on, the questions raised can become quite complex and difficult to sort through. One project might include several subcontractors; it might also include various items and components, each with varying restrictions on the government's right to use.

Although some of DoD's lawyers strongly believe that the government will always be able to get the rights it bargained for and insist that there are no subcontractor flowdown problems, others have expressed a belief that the subcontractor may not be held to an arrangement made by the government to which the subcontractor has not consented. In the real world, the government may tell prime contractors that their failure to get the rights they are bound to deliver to the government is their (the prime's) problem which they have to solve (hopefully by getting the rights the government wants), but primes may realize that their failure to get the level of rights the government wants is, in reality, the government's problem.

For reasons discussed below, this author thinks that the government may sometimes be able to get the expected level of rights from the subcontractor despite inclusion of a contrary clause, and sometimes not. The matter seems largely to turn on whether inclusion of a clause is mandatory or discretionary.

## 8.1 Mandatory Clause

### 8.1.1 Subcontract Silence

The strongest argument for awarding the government an entitlement to the same rights in subcontractor-produced software (or technical data) as it had arranged for with the prime is when the subcontract is silent as to the issue and the issue pertains to something addressed in a clause that is mandatory in government software acquisition contracts, for example, the standard data rights clause. The same policy considerations that prompted the court in G.L. Christian & Associates v. United States [29] to read a mandatory "termination at the convenience of the government" clause into a government contract would seem to apply as to subcontract arrangements. Subcontractors will surely know that the software they are developing is being developed for the government. They would probably be held to have constructive notice that DoD regulations require inclusion of the standard data rights clause in software development contracts unless a deviation is granted ( [61] sec. 27.404-2(b)(2)) and that the standard clause requires primes to flow government requirements down ( [61] sec. 52.227-7013(g)(1)). Regulations such as these have the force and effect of law (Caha v. United States [22]). From a policy standpoint, the effectiveness of the regulations in creating a system in which the government will know what rights it has in everything it buys would be seriously undermined if subcontractors were allowed to avoid mandatory clause flowdowns without making a special showing of need for a deviation. The regulations define, in many respects, what minimum rights the government must have. Unless a deviation is obtained, the government would seem to have the right to expect that this set of minimum requirements would be met.

### 8.1.2 Contradictory Clauses

Suppose the prime is unable to persuade a subcontractor to allow the government to modify the software and agrees to inclusion of a clause that precludes modification. Regardless of whether the standard data rights clause is included or excluded, would the government have the right to modify the software? The issue is important because commercial licensing arrangements typically do not allow the licensee to make modifications or enhancements. Subcontractors for software may be quite insistent that the software not be modified, especially if the software is to be warranted.

As Chapter 2 above indicated, some contract officers seem to believe the government would not have the right to modify software if the prime had negotiated the right away. Other government lawyers to whom we spoke believed that the government would still have the right to modify the software notwithstanding the contrary agreement. One lawyer cited Technical Development Corp. v. United States [46] in support of this theory. Certainly, the policy considerations which support the Christian doctrine and its application in subcontractor contexts would seem to be useful to the government when confronted with a clause in contradiction to the government's standard set of rights. A deviation is always available if a special case can be made for limiting the government's rights in particular instances. In the absence of a deviation, the government

would seem entitled to the benefit of the minimum rights guaranteed under the standard data rights clause. Contract officers, acting outside of their authority, cannot bind the government [47].

### 8.1.3 Partial Contradiction

Suppose instead that a software producer was required to deliver three pieces of software to a prime for the government and was willing to let two of the pieces of software be modified, but not the third. Suppose further that the subcontractor realized that the standard data rights clause was incorporated by reference in the subcontract and expected and intended for that clause to apply as to the two pieces of software, but negotiated with the prime for a special clause precluding modification of the third. A court applying general contract law would probably try to interpret the seemingly conflicting clauses in a way that would reconcile the conflict (e.g., City of Columbia, Mo. v. Paul N. Howard Co. [27]). One way to reconcile the conflict would be to say that the standard clause applies to the first two and the "no modification" clause to the third. General contract law might also tend to favor subsequent and more specific expressions of the parties' intent when construing conflicting clauses (e.g., Matter of Antuna [36]). This too might seem to favor giving effect to the "no modification" clause.

On the other hand, when one is talking about a mandatory clause, that is, a clause that is required by regulation and that is itself a regulation, a strong argument can be made that it should apply notwithstanding the arguments that favor the subcontractor. Government contract law, after all, is somewhat different from general contract law.

### 8.1.4 Subcontract Clause Resolving an Ambiguity in the Mandatory Clause

Suppose that a subcontractor agrees to develop a piece of software at public expense. Assume that he realizes that there is an ambiguity in the standard data rights clause as to the extent of the government's rights in such software -- unlimited rights or a license for governmental purposes (See Chapter 1) -- and decides that in the subcontract, he is going to resolve the ambiguity by putting a clause in the contract giving himself the copyright, giving to the prime a license to use the software for governmental purposes and permission to sublicense the government for the same, and defining "governmental purposes" to exclude "giveaways" to industry.

The subcontractor's argument for enforcement of his rights as against the government is much stronger here than in the previous hypotheticals. Although an agency is ordinarily entitled to interpret its own regulations, courts will not always accept later developed interpretations of regulations that would defeat the reasonable expectations of those who have produced and delivered a product in reliance on a particular, reasonable interpretation of the regulations. A potential subcontractor might need to be able to assess the extent of his commercial market for the software to decide whether and on what terms to bid. If resolving the ambiguity will aid in his planning and will encourage him to bid, why not allow the subcontractor his supplement? After all, the government had ample opportunity to define its rights and its terms in advance of the subcontract, and failed to do so.

## 8.2 Discretionary or Special Clauses

There are many clauses in government contracts that are not mandatory. Some are standard discretionary clauses, such as the special works clause [61] sec. 52.227-7020). Some are specially drafted for particular contracts, for example, clauses defining the scope of warranty rights in software. If a prime contractor has promised the government to obtain certain rights under a discretionary clause (e.g., to obtain a copyright for the government or to obtain strong warranties), and the prime is either unable or neglects to get a commitment for such right from a subcontractor, it seems unlikely that the government could enforce against the subcontractor the rights it had expected the prime to get for it. We were told of a number of examples of this kind of problem. We were given to understand that these situations tended to be resolved through negotiation, the prime typically conceding its neglect and offering some penance, but without the subcontractor giving in further. This was perceived by DoD lawyers to be a serious problem, particularly as to software licensing. The difficulty for a contract officer in finding time to closely supervise data rights provisions in subcontracts was often cited as a contributing cause of this problem. Closer supervision of the terms of subcontracts would, however, seem to be the best way to resolve this set of problems.

# 9. Limitations on Governmental Action: Injunctions and Related Problems

Most software intended for commercial distribution is held as a trade secret by the producer. Although the government has statutory authority to infringe patents and copyrights ( [53] sec. 1498) it does not have similar authorization to appropriate trade secrets against the owner's wishes. Indeed, there is a criminal statute ( [69] sec. 1905) that penalizes any federal employee who discloses confidential information claimed as a company's trade secret without authorization. Some DoD lawyers are worried about the risk in litigation with a software producer over trade secret software of an injunction issuing against governmental use of the software.

This is a risk that the government has not previously had to confront as to systems acquired from contractors because hardware, if protected by a form of intellectual property law, would generally be protected only by patents, which the government could infringe. Trade secrets generally cannot reside in hardware since reverse engineering of the hardware would readily reveal any such "secrets." Because software is now often protected by copyright and trade secret law, a new situation has arisen. As the discussion below indicates, there is good reason to be concerned about this potential, although there are some situations (described below) in which the government might be able to avoid the issuance of an injunction.

An additional basis for concern about injunctive relief has been expressed because of a series of recent federal court decisions which have suggested that injunctive relief may be available to prevent the government from releasing material in which it claims unlimited rights but which is claimed as a trade secret by its producer. This danger was thought by several DoD lawyers to be particularly acute in disputes with subcontractors because until recently there has been no formal procedure under the Contracts Dispute Act for handling controversies about data rights as between a subcontractor and the government. Some thought that the Contract Disputes Act should be amended to eliminate this risk. One provision of the 1985 DoD Authorization Act may partially address this problem.

## 9.1 Limitations of 28 U.S.C. sec. 1498

If the government uses or manufactures a patented invention or copies or distributes a copyrighted work without the owner's permission, section 1498 of Title 28 of the U.S. Code says that the exclusive remedy of the patentee or copyright owner is an action for damages in the Claims Court . This statute effectively prevents injunctive relief from being entered against the government for patent or copyright infringements (e.g., Pitcairn v. United States [41]). One of the reasons that this shield from injunctions is available as to copyrights and patents, but not trade secrets, is that if one infringes a patent or copyright, the patent or copyright will survive the infringement, whereas an appropriation of the trade secret can utterly destroy the trade secret, as for example, when the government distributes trade secret information about a spare part for competitive reprocurement purposes. An injunction is the only thing that can prevent the loss of the trade secret. Because of this, it seems unlikely Congress would amend this statute to grant the government broad discretion to appropriate trade secrets.

### 9.1.1 Forcing an Election of Copyright

Software is copyrightable subject matter (Apple Computer, Inc. v. Franklin Computer Corp. [19]). Because software is copyrightable and because copyright protection attaches to original works of authorship from the time of their creation ( [59] sec. 302(a)), some government lawyers have thought that the government would be able to use section 1498 as a shield against an injunction in any software dispute.

It is an intriguing theory, but there are some problems with it. There does not seem to be a precedent that would support the theory that an infringer can force the owner of an unpublished work to opt into the copyright system and forego trade secret protection just so that the infringer can avoid an injunction. Indeed, the Supreme Court decision in Kewanee Oil Co. v. Bicron Corp. [34] indicates that a company has the right to choose whether to rely on trade secret protection instead of seeking a patent. Presumably, the Court would hold similarly as to copyrights.

The theory would also seem to prove too much. If right, it would mean the government could release any or all technical data it possessed, regardless of its restrictive legends, because virtually all of the things that qualify as "technical data" would also qualify as "original works of authorship" under the copyright law. It would not be just as to software that this theory would apply. There would be, then, no company trade secret which the government could not give away. It is unlikely that courts would be willing to permit this construction of the reach of section 1498.

### 9.1.2 Simultaneous Copyright and Trade Secret Protection in Software

The present standard data rights clause permits developers of software for the government to retain copyrights in the software ( [61] sec. 52.227-7013(c)(1)). For reasons discussed in Chapter 1, there may be an incentive for a software producer to claim a copyright in the software because this action may have the effect of cutting back on the extent of the government's rights, giving them a license to the software for governmental purposes rather than giving them unlimited rights. Some privately developed software may also be delivered to the government with copyright notices.

Some government lawyers have argued that whenever software is delivered with any indication of an intent to claim copyright protection, that means that section 1498 can be invoked to avoid an injunction. This theory is more plausible than the previously discussed theory, but it too seems to rely on an election of protection theory that may not hold water. That is, the theory boils down to the idea that if someone claims a copyright in something, he cannot claim it as a trade secret at the same time. However, simultaneous copyright and trade secret protection has been finding acceptance in the courts (see e.g., Warrington Assoc. v. Real Time Engineering Systems, Inc. [48]) in which the court held that even if computer software is mass marketed, as long as there is an agreement not to disclose by the purchaser, trade secrecy as well as copyright protection can be maintained.) And many software producers rely on both. The DoD standard data rights clause does not, either explicitly or implicitly, seem to require any election.

On the other hand, DoD FAR SUPP sec. 27.404-1(d) [61] does say that "[p]atented or copyrighted computer software will not be subject to any agreement prohibiting the government from infringing a patent or copyright." The likely response to this by a software producer who claims simultaneous copyright and trade secret protection in software is: "If you can infringe my copyright without violating any of my trade secret rights, that's OK; I'll take my claim for damages to Claims Court; but if you threaten my trade secret in any way, I will sue you for injunctive relief."

### 9.1.3 The "Essence of the Claim" Test

This hypothetical response of the hypothetical software producer suggests a refinement of the theory discussed in the previous subsection which might produce a shield against injunctions in some instances: If the "essence" of the claim against the government is not on a trade secret, but relates to an infringement of the copyright, section 1498 may shield the government from injunctive relief despite the claim of simultaneous copyright/trade secret protection. For example, if some Air Force officer had made a second copy of some software to give to one of his co-workers, the "essence" of the owner's claim would seem to be damages for copying, based on an infringement of the copyright, which would allow the government to invoke section 1498. If instead the government decided to give out a company's trade secret source code to the defense contractor community, the essence of the owner's claim would be on the trade secret, and thus injunctive relief might be awarded.

### 9.1.4 NASA's Approach to Simultaneous Protection

If a firm sells NASA rights to software and the program is delivered with a copyright notice and without any legend saying it is unpublished, NASA considers the software to be published copyrighted material [64]. If the software is a published copyrighted work, then the ideas it contains are in the public domain and can no longer be claimed as trade secrets. NASA also considers mass-marketed software as published software. This treatment of software by NASA is an important way to claim the benefits of section 1498 by eliminating possible trade secret claims and forcing copyright infringement claims where injunctions are not permitted. However, this procedure does not eliminate the threat of injunctions if the company delivers the software with a notice that it is unpublished. DoD might want to consider adopting regulations similar to NASA's in this respect.

### 9.1.5 National Security Grounds for Avoiding Injunctive Relief

Several of the government lawyers to whom we spoke about this issue believed that the government would never be enjoined from any use, duplication, or disclosure of software because even if section 1498 did not preclude an injunction, national security considerations could be cited to persuade a court to decline issuing an injunction, even though it might have power to do so. It is indeed hard to imagine a court ordering the F-16 fleet grounded because some software producer has a dispute over his rights in software aboard these planes, but national security considerations may not always win the day, especially where the software is being used by the government in much the same way as a commercial customer might use it (e.g., word processing).

### 9.1.6 Taking Trade Secret Software by Eminent Domain

Trade secrets have been held to be property which is protected by the Fifth Amendment of the Constitution. This Amendment prohibits the government from taking private property without due process of law or without just compensation (Ruckelshaus v. Monsanto [44]). It appears unlikely that the Defense Department can exercise the power of eminent domain to take trade secrets without some explicit authorization from Congress (see e.g., United States v. North American Co. [39], indicating the need for Congressional authorization to effect a valid taking under the government's eminent domain powers).

Section 1498 impliedly authorizes the DoD to take patents and copyrights for public use (Leesona Corp. v. U.S. [35]). The court in that case declared that when the government infringes a patent, it has "taken" a patent license under an eminent domain theory based on the implied power of Section 1498.

It is not clear that this same analysis could be applied to a taking of software which is protected as a trade secret. There does not appear to be any law that, either expressly or impliedly, would grant the government broad power to take trade secrets whenever the DoD feels it is necessary. Although regulations which are promulgated by the heads of departments have the force and effect of law (Caha v. United States [22]) it seems doubtful that DoD could grant itself the power to "take" trade secrets. From the present interpretation of the law, this power probably requires some type of legislative authority from Congress.

### 9.1.7 Liability of Government Employees for Unauthorized Disclosures of Trade Secrets

If a government employee discloses trade secret or confidential information of a private firm without authorization, that employee may be prosecuted by the government under the criminal provision of the Trade Secrets Act [69]. The Trade Secrets Act does not create a private right of action which would allow the private firm to sue the government to enjoin any disclosure in violation of the statute (Chrysler v. Brown [26]) but the statute has been construed to provide a standard by which to judge the legality of proposed agency disclosures. One court has construed it to create a federal law right of non-disclosure (Chevron Chemical Co. v. Costle [25]).

### 9.1.8 Injunctions Against Particular Government Employees

Another important question is whether a government employee might be enjoined against use of certain software in the course of his employment, even if the government itself could not be enjoined. An example was given of a lab director who was asked to sign a restrictive license agreement with a software company. This license agreement was not made part of the contract which was signed by the contracting officer and did not contain the minimum rights required in software contracts. If the lab director had violated the agreement, the company could not sue the government because the lab director, who was not a contracting officer, had no authority to bind the government to such an agreement (see e.g., Utah Power & Light Co. v. United States

[47] where the Supreme Court ruled that the United States is not bound by any agreements entered into by its officers which are not permitted by law.) It is possible that an injunction might issue against the particular lab director's continued use of the software in a way that violated the agreement. That, of course, would not preclude moving the employee to a different location and having the software used by a new lab director who would not be bound by the agreement.

## 9.2 Limitations of the Contract Disputes and Tucker Acts in Disputes Over Proprietary Rights

At one time, the government could argue that any dispute over the extent of its data rights as to any piece of technical data or software deliverable under a contract was a dispute under the contract that could be shunted into the Contract Disputes Act or Tucker Act frameworks. This would preclude the issuance of injunctive relief (e.g., International Engineering Co. v. Richardson [32]). Since the Supreme Court decision in (Chrysler v. Brown [26]), discussed briefly below, a new avenue has opened up for litigating data rights claims against the government, one which seems to permit injunctions to issue. Contractors concerned about the government's impending release of proprietary data may look to this promising new avenue. Government lawyers are rightly concerned about this development.

### 9.2.1 The Relevant Cases

It was the Supreme Court's decision in Chrysler v. Brown [26] that opened up this new door to injunctive relief against the government in cases involving proprietary data. Chrysler had sued under the Administrative Procedure Act for an injunction to prevent the Defense Logistics Agency from releasing data about Chrysler's affirmative action plan to persons making a request for it under the Freedom of Information Act. The Supreme Court held that DLA's decision to release the data was "agency action" reviewable under the APA by a person who had suffered a legal wrong or had been adversely affected thereby ( [54] sec. 702). The APA does not preclude injunctive relief against the government.

Three years later, in Megapulse v. Lewis, [37] a contractor who opposed the government's release of its technical data for competitive reprocurement purposes sued for injunctive relief under Section 702 of the APA in reliance on Chrysler. The contractor claimed that the government had only limited rights in the data; the government claimed unlimited rights in it. The lower court refused to issue an injunction because of the earlier International Engineering decision. Megapulse argued to the Court of Appeals that Chrysler v. Brown had effectively overruled that earlier case, and that an APA action was now available when an agency decided to release proprietary data. The Court of Appeals agreed with Megapulse and ruled that injunctive relief was possible. The court stated that not all decisions by a contract officer would be reviewable under the APA. Actions against the government that were in essence "contract" claims would still have to be pursued under the Tucker Act, but the court did not accept the government's argument that a suit over proprietary data rights was essentially a contract claim. It was the government, not the contractor, who was relying on the contract. Although the Court of Appeals did not order

an injunction to issue, it directed the lower court to "grant such non-monetary relief as it finds appropriate." The Megapulse decision has many government lawyers worried.

The Megapulse decision has been cited approvingly in other cases including B.K. Instrument, Inc. v. United States, [21]; Williams International Corp. v. Lehman ( [51]; and Spectrum Leasing Corp. v. United States [45]. Between these cases the Supreme Court decided another case which some DoD lawyers have thought to be somewhat helpful to the government's argument that Megapulse should be overruled. That case is Monsanto Corp. v. Ruckelshaus [44]. Monsanto complained of the EPA's decision (under an authorizing statute) to release valuable information about Monsanto's pesticides to Monsanto's competitors. Monsanto argued that this was a taking of property without just compensation in violation of the Fifth Amendment to the Constitution. As to one of the three time periods involved, the Supreme Court found that there may have been a "taking" of the trade secret through a decision to release the data, which would require just compensation to be awarded to Monsanto. However, the Supreme Court held that equitable relief was not available to enjoin the taking of the trade secret for a public use which was duly authorized by law; a Tucker Act claim of monetary damages would be the only remedy available.

The Williams International case discusses the implications of Monsanto on the viability of Megapulse. Williams International involved a subcontractor who was complaining of the Navy's decision to remove restrictive legends on its drawings submitted to the prime contractor who in turn submitted them to the Navy. In Williams International, the government relied on Monsanto for the proposition that injunctive relief was unavailable in any case where the government "took" a trade secret. The government argued that Megapulse had implicitly been overruled by the Supreme Court in Monsanto.. The court in Williams International disagreed. Although deciding in favor of the government on the merits of the controversy, the court found that Megapulse had not been overruled by Monsanto. A difference the court found significant between the Megapulse and Monsanto situations was that in Monsanto there had been specific legislative authorization for the agency's release of data such as Monsanto's. Congress therefore had intended to exercise its eminent domain powers if necessary to achieve the release, whereas there was no similar authorization as to the subcontractor's data in Williams International.

### 9.2.2 Application to Subcontractors and Primes

Another reason the court in Williams International decided that an injunction could issue against the government in a data rights dispute of that sort was that the subcontractors were unable to directly bring suit against the government under the Tucker Act or make use of the Contract Disputes Act because there was no privity of contract between them and the Navy. The applicable regulations do not provide a mechanism by which subcontractors can use the internal appeals process for contract disputes with primes. [66] 44.203(c) and 52.233-1, Disputes.)

The DoD Authorization Act of 1985 [52] may provide some additional buffer against injunctive relief in at least some future disputes between the government and subcontractors over proprietary rights in material delivered under contract. Section 1216 of that Act, now embodied in [57] sec. 2321(e) states:

> If a claim pertaining to the validity of the asserted [proprietary] restriction is submitted in writing to a contracting officer by a contractor or subcontractor at any tier, such claim shall be considered a claim within the meaning of the Contract Disputes Act of 1978...

There are several limitations of this provision which merit attention. For one thing, it appears that this provision will apply only as to solicitations issued by DoD after October 19, 1985, and thus will not affect many current contracts. Secondly, when one looks at the whole of section 2321 (of which this provision is a part) it is clear that by its terms it applies only to technical data, and not to software. Thirdly, a reading of the whole of section 2321 raises a question of the reach of subsection (e). That is, it would appear that the section envisions a formal challenge procedure as to restrictive legends on technical data when contract officers and contractors (quite notably, it adds subcontractors) are in disagreement when the material is delivered. The subsection says if a contractor or subcontractor submits a claim as to the validity of the restriction within this formal challenge mechanism, that claim will be under the Contracts Dispute Act. That subsection does not say that all claims concerning the validity of restrictions on data delivered under contract are by their nature, contract claims that must be handled exclusively under the Contracts Dispute Act. If instead of following the formal challenge procedure under section 2321, the government simply decided to lift the restriction for competitive reprocurement (or other) purposes, subsection (e) might not provide protection. Thus, while this provision may help the government construct an additional defense against injunctions in some instances, it does not appear to provide a complete and certain shield against injunctions in all software rights disputes.

Similarly, the proposed subpart 27.4 of the FAR [66] provides at sec. 52.227-24(i) that a contract officer may deal directly with a subcontractor at any tier over issues related to restrictive markings. This provision states explicitly, however, that it neither creates nor implies privity of contract between the government and the subcontractor. This provision would not appear to help, and may even work against any efforts by the government to bring such a dispute within the ambit of the Contract Disputes Act. It thus appears that unless the Megapulse and Williams International decisions are overruled, DoD will still have to worry about injunctions issuing in software disputes.

# 10. Problems Associated with CAD/CAM Programs

CAD/CAM (computer aided design/computer aided manufacturing) programs are likely to produce some of the most complex and hotly contested software licensing questions for DoD over the next few years. The current acquisition regulations are not set up to facilitate acquisition of these important tools. This Chapter discusses the set of concerns DoD personnel raised about CAD/CAM programs in the course of our interviews.

## 10.1 What CAD/CAM Programs Are and Why They Are Important

The CAD aspect of a CAD/CAM program is, as the name implies, a tool which aids in the design of a product. The CAD provides an electronic display, a blue print if you will, on which to make design additions and alterations. This display is complete with measurements and specifications relevant to the design process. The CAM aspect of a CAD/CAM allows one to carry this process a step further. With the CAM, one can transmit the design, through telephone lines for example, to be received at another location. More importantly, the CAM is capable of causing equipment at the remote location to "tool up" and begin producing the item which has been designed and transmitted. Hence, this is the manufacturing aspect of a CAD/CAM program. A CAD/CAM program can be used in the design and manufacture of components, or the whole of a product. Further, CAD programs are being used increasingly often in the development of software. A CAD/CAM program can thus be a powerful tool in the development and growth of new technologies.

There are various CAD/CAM programs currently available, and these programs are not necessarily derivative of one another. In order to access and modify a product or component designed with the aid of a CAD/CAM program, be it for maintenance or enhancement purposes, we understand that one must use the very same CAD/CAM program that was originally used in the design and manufacture of that component or product. It seems that contractors on many DoD projects are making use of CAD/CAM programs. Our understanding is that different CAD/CAM programs are being used in those projects. Whether or how much they may be derivative of one another is not clear.

CAD/CAM programs have significant commercial value to the contractors who have developed these programs. This technology, which is still in an early state of development, promises to have a major impact on the high technology field as it is further developed and commercially exploited. In all likelihood, CAD/CAM programs will be among the most commercially lucrative of technological innovations of the near future. Increased use of such programs in the design and manufacture of new technology seems certain. In other words, CAD/CAM programs are valuable commercial items that can be expected to be widely used in large scale manufacturing of new technologies.

Due to the commercial value of CAD/CAM programs, most contractors would prefer not to provide such programs - that is, certainly not the source code and the technical documentation

and often not even the executable code -- to the government. Contractors seem to be concerned that providing the CAD/CAM to the government might endanger the commercial value of the program. Our information is that some of these contractors may, however, be willing to supply the government with an access code through which the government will be able to gain remote access to the firm's CAD/CAM system for a particular component or product on an "as needed" basis. Further, our information is that these contractors may even be willing to allow the government to make a printout of a particular component design that may appear on the terminal screen.

Such an access arrangement would, however, raise some important questions and concerns. The primary question is whether such limited electronic access to CAD/CAM programs used in the development of products the government is using would be sufficient to meet the maintenance and enhancement needs of the government for that product.

## 10.2 Access to the Original CAD/CAM Program Needed

Because of the substantial commercial value of such programs, contractors are constantly changing --- improving and refining --- the CAD/CAM programs which they have developed, so as to make those programs even more valuable. The life cycle of components used by DoD is very often as long as 20 years. Clearly, software industry people cannot be expected to keep their CAD/CAM programs the same for the life cycle of components. Indeed, our understanding is that some CAD/CAM programs are changed almost daily.

An arrangement allowing access to a CAD/CAM program for maintenance/enhancement would present some clear dangers for the government. Under such an arrangement, it would be the contractor which controlled the program, and it would be the contractor which would be in a position to determine whether the program would be changed. For the CAD/CAM program to be adequate for the government's maintenance and enhancement needs, the government would need an explicit agreement that the original CAD/CAM program would remain available to it.

## 10.3 The Need for Irrevocable Access

Another critical consideration regarding access arrangements for DoD would be: what assurance will the government have that its access to the CAD/CAM would not be cut off? For example, what happens if the government has a dispute with the vendor and, in retaliation, the vendor changes the access code to the CAD/CAM, thereby cutting off the government's access to the program. The control of access to the CAD/CAM program remains with the vendor in this type of accessing arrangement. The government would, at the least, want to get a contractual agreement from the vendor that access to the CAD/CAM, whether through change of the access code or otherwise, could not be terminated. Escrowing the CAD/CAM program with a neutral third-party might be another way to protect the government's interests.

## 10.4 Treatment of Electronic Access under the Regulations

Electronic access to CAD/CAM is in some ways inferior to, or at least different than, physical possession of the program and/or technical data. Most obviously, access to technical data via a CRT provides only a temporary image of the data---electronic pulses on a screen. This raises various difficult questions. How would such access be handled under the procurement regulations: as software or as technical data? The CAD/CAM program would clearly be software, but without delivery it cannot be classified as software by the government for the government would not, in this situation, have physically received the actual software. An electronic image does not, on the other hand, seem to fit the definition of technical data, but a printout of the image and/or information would seem to fit the definition of technical data ( [61] sec. 227.401, regarding the definition of technical data: "The data may be graphic or pictorial delineations in media such as ... computer printouts").

If the government only gets access to CAD/CAM, what is it getting? Should electronic access be treated as software or as technical data? How should printouts of the electronic image be treated? How would the applicable procurement regulations be applied? Are the FAR and FAR SUPP flexible enough to deal with a new situation such as software which is part of the manufacturing process? The answers to these questions do not spring readily from the existing regulations and DoD policy in this area.

What some contractors are reportedly offering in the way of access to a CAD/CAM appears to be a limited license for maintenance purposes; it is clearly less than restricted rights. Do the regulations permit the government to enter into this kind of arrangement? It is not clear what rights the government would be required to obtain in CAD/CAM under the procurement regulations, nor is it clear what data rights attach to the electronic image or to the printout of CRT images.

An arrangement of this sort might have an adverse impact on any plans DoD has with regard to competitive reprocurement. Government personnel are concerned about whether the government would have the right to show another contractor the printout for purposes of spare parts procurement or maintenance/enhancement of the product designed with the aid of the CAD/CAM program. Some have also wondered about the effect of the Maintenance Clause (Section 1-202) of the DoD Authorization Act which seems to require that DoD acquire sufficient rights to maintain software: would electronic access to the CAD/CAM program meet the mandate of this legislation?

Each of these questions would require further study before policy recommendations regarding CAD/CAM programs would be possible. Until some policy regarding CAD/CAM programs is developed, it seems likely that government personnel will be in a quandary as to how to react when confronted with a data rights question involving a CAD/CAM.

## 10.5 Ability of DoD Personnel to Make Use of Electronic Access Material

Another difficult question is whether the government can effectively make use of on-screen technical data for maintenance/enhancement purposes. Some to whom we have spoken have doubted that government personnel have the "know-how" to make appropriate use of CAD/CAM programs and technical data they may contain. CAD/CAM programs tend not to be very "user-friendly." Not being able to find material they need, or even realizing it is accessible via the electronic access to the CAD/CAM creates a real-world problem for government personnel. A contract with the CAD/CAM purveyor to supply training or "know how" on an as needed basis might answer some of these problems.

We understand that the Air Force has begun to encourage the delivery of technical data via electronic media. At least some Air Force policy makers seem to feel that electronically accessible technical data is preferable to data delivered in more traditional paper form. Electronic data allows for easier storage, and over time, as electronic media are increasingly used for such data, it will hopefully become easier for personnel to use.

## 10.6 Conclusion

CAD/CAM programs are a valuable technology that DoD should encourage, even if industry may only be willing to provide access to the CAD/CAM, not a physical copy. As long as the government has assurances that its access to the original CAD/CAM program will not be cut off, electronic access to CAD/CAM may actually provide some benefits over physical delivery of technical data. At any rate, the government should think through its policy in this area and determine what type of arrangement, consistent with regulatory requirements, will protect its interests in access to CAD/CAM.

# 11. Problems Arising from Software's Hybrid Nature: of Warranties and Other Matters

Software in its machine-readable form has some characteristics of hardware and some characteristics of technical data. This hybrid character of software has led to some confusion within the Department of Defense about the manner in which software should be acquired and maintained after acquisition: should it be treated like hardware, or like technical data, or differently from both? The hybrid character of software also has a bearing on other questions, such as whether implied warranties may attach to it.

## 11.1 The Hybrid Character of Software

### 11.1.1 Hardware and Software

Software is like hardware in that it causes machines to do things. Software is in fact merely a replacement for hardware components that could otherwise perform the same function. Software is embedded in hardware and part of an overall hardware system. Like hardware, software can often serve as a tool for creating other items. Like hardware, software needs maintenance work from time to time to operate properly.

Software is unlike hardware, however, in a great many ways. Software is, for example, easy and cheap to replicate as compared with hardware. Once the first copy has been produced, software can be almost endlessly replicated at almost no cost regardless of how complex the code is. One of the consequences of this is that the government tends to think that additional copies of software ought to be deliverable at a very low cost, whereas industry, which is concerned about recouping its research and development costs and about "piracy" of its product which the firm may be helpless to prevent, and which regards the sale of software as the sale of a production facility (as if one bought a General Motors factory when one bought a truck produced by GM), regards additional sales at higher price levels to be necessary to make the software business viable. A second consequence of this low-cost replicability is that the software industry, for the most part, tends to make its products available only on a highly restrictive licensing basis, rather than selling copies outright.

Another important difference between software and hardware is that software may be wholly subject to a lengthy lawful monopoly (i.e., a copyright) as well as being held as a trade secret, whereas hardware may be subject to a much shorter monopoly (i.e., a patent) and most often cannot be held as a trade secret since it generally can be reverse engineered. Moreover, quite often hardware is either not patented at all or only subject to partial patent protection. A high standard of inventiveness is required for patent, while copyright requires only the most minimal originality. Hardware, unlike software, cannot be copyrighted at all. The bottom line of all of this is that it will be <u>much</u> harder to get competition as to software reprocurements and maintenance than as to hardware because of the stronger intellectual property protection afforded to the whole

of a piece of software (e.g., control over making derivative work) as compared with the whole of a piece of hardware. This means that it is even easier to get into a "sole source" arrangement as to software than as to hardware. Because the government is becoming ever more dependent on software, this has to be a serious concern.

Moreover, because software engineering is still in early stages of development, it is generally more difficult to specify how software (as compared with hardware) should be developed for particular functions and to estimate the costs and development schedule for it. Software is also virtually "invisible" as compared with hardware, which means that it is more difficult to detect if someone delivers very similar or nearly identical software on a second development contract. And "invisibility" means that it may be more difficult, as a general matter, to detect defects in software or to know how to fix them once the defect is known. Again, because software engineering is a developing art, software is likely to contain a lot of undetected defects that will need to be corrected while in the user's possession. Unlike hardware, software is readily changeable; new capabilities can be added without substantial additional plant or material costs. All it takes is labor. All of this tends to make software maintenance and enhancement a much bigger part of software life cycle planning than is the case with hardware.

### 11.1.2 Software and Technical Data

Software and technical data are similar in being recorded information. They are also alike in that both are often held as trade secrets and licensed under restrictive conditions, rather than being sold in the marketplace. Loss of the secrets may undermine or destroy the firm's commercial advantage. Both are also capable of being claimed as unpublished copyright material. Both involve modest production costs in themselves once the technology they embody has been developed. Both are difficult to price with any precision. Because the material costs are low (i.e, what it costs to do a drawing on paper, what it costs to make a second copy of software), the government often thinks the price ought to be low. Because it is the valuable technology that they embody that the firm wants to protect and exploit, industry tends to price them high. With both, sometimes crucial information necessary for maintenance or enhancement of the item to which they pertain may not be readily apparent from examination of the paper or disk; rather it may be stored away in the memory of some engineer who designed it. Ongoing service contracts are sometimes necessary to be able to gain access to that expertise.

Where software differs from technical data is in being an "end item" in itself. Software is a product that will perform machine functions, whereas technical data is merely information about a product. As an end item, software will more likely be a product with a commercial market whereas technical data will often not be sold or licensed to anyone but the government. When altered, software will perform differently, as compared with technical data which will simply reflect a new configuration. Software also requires an environment of equipment and other software to be effective.

### 11.1.3 The Implications of Software's Hybrid Nature

We wish that we could provide clear guidance as to the acquisition and maintenance implications of the differences between software and hardware and between software and technical data. Many persons in DoD whom we interviewed were deeply puzzled about this subject and regarded solving this puzzle as crucial to making better decisions about DoD's software acquisition policies. The discussion of the two previous subsections reflects the factors that fueled the puzzlement of those to whom we spoke. It does seem that software is sufficiently different from hardware and technical data that software cannot be acquired or managed as if it was hardware, or as if it was simply technical data.

## 11.2 Implied Warranties for Software

Although there are a great many questions which the hybrid nature of software raises, we will only dwell on one that was frequently raised in the interviews we had with DoD personnel: whether, in the absence of any contractual provision as to warranties, there might be any implied warranties -- of merchantability or of fitness for a particular purpose -- that might attach to software delivered to the government. The reason this is a "hybrid nature" question is that the answer to the question seems to turn largely on whether software is more properly characterized as a "good" or as a "service". Implied warranties do not attach to services; they may apply to goods.

Hardware -- computers, airplanes and hammers -- is clearly "goods". Technical data is clearly not "goods," but may be reflective of a service. Preparing software is a service. Maintaining software is a service. But how is software to be characterized when produced?

Although there is no definitive answer to this question, the modern trend seems to be to treat software as a "good" (e.g., Carl Beasly Ford, Inc. v. Burroughs Corp. [23], and [2]). This makes sense given that software performs machine-like functions just as hardware does. The fact that software manufacturers so often disclaim all implied warranties might indicate their acceptance of a strong likelihood that software products will be treated as "goods" for warranty purposes.

A second hurdle that must be overcome to impose implied warranty liability on a software manufacturer is establishing that the transaction is of a sort that qualifies. Outright sales of goods are clearly transactions that will give rise to implied warranty responsibilities; leases and licenses are less clearly covered. Since much software is currently licensed rather than sold, this might seem to cut against the argument for implying warranty protection. However, it is becoming more common to apply U.C.C. [71] principles to lease and licensing transactions (e.g., Chatlos Systems, Inc. v. National Cash Register Corp. [24] and Westmont Tractor Co. v. Viking Exploration, Inc., [49]). So this too may be a surmountable obstacle.

Thirdly, there is a question of whether implied warranties may attach to software sold to the government. Sales to the government are governed by federal contract law, not state contract law, such as the Uniform Commercial Code [71]. It appears that when there are no specific

federal laws which contradict the provisions of the U.C.C., courts have increasingly applied U.C.C. principles as a statement of the modern law of contracts to be used in federal contract cases as well (United States v. Conrad Publishing Co. [28]). Implied warranty liability under U.C.C. principles has been imposed in prior government contract cases (see e.g., Appeals of Reeves Soundcraft Corp. [18] in which the Armed Services Board of Contract Appeals upheld the government's right to refuse to accept a delivery of magnetic tape claiming the tape did not meet the standards set by the parties to the contract. An implied warranty was found, applying principles of the U.C.C. and the Uniform Sales Act as guides to federal law in the area of implied warranties). It would surely not seem reasonable that the government be accorded less warranty protection than any other commercial customers of a seller. Under the U.C.C., implied warranties of merchantability automatically arise in every transaction involving a merchant-seller ( [71] sec. 2-314) (unless appropriately disclaimed) and an implied warranty of fitness for a particular purpose will be enforceable if the seller has reason to know of the buyer's particular purpose for the software and that the buyer is relying on the seller's expertise in choosing or designing the correct software (see [71] sec. 2-315). Therefore, if the software doesn't perform correctly and there is not an explicit disclaimer of implied warranty protection, there would seem to be some basis for a government claim of implied warranties as to software delivered to it, although in many cases there may be a disclaimer.

And finally, software can be reused. The reuse of software further complicates the warranty situation in that the reused modules will often be subject to separate and distinct warranty provisions in themselves. The effect of the reuse on the warranty which applies to the module, and the effect of the reuse on the ultimate product are difficult questions which add to the lack of clarity as to this issue.

# 12. Problems Arising from New Chip Protection Law

Congress recently passed the Semiconductor Chip Protection Act of 1984 [67] which created a new form of intellectual property law to protect semiconductor chip designs. This law resembles patent law in certain ways and copyright law in certain ways. It also contains some new and unique features which are found in neither copyright nor patent law. The federal procurement regulations have not yet been amended to take this new law into account. Because much software that the government buys is delivered on semiconductors and because chips are so intimately related to computer systems acquisitions of which software is a part, several DoD persons were concerned about how this new law should be treated under the FAR or DoD FAR SUPP.

Because ignorance of what the law provides and having no policy about the law means that the DoD may be more likely to get into trouble over the issue, it would seem worthwhile to understand the law and make a policy about it.

## 12.1 An Overview of the Semiconductor Chip Protection Act

Under the chip protection law [67], persons who create "original" mask works for semiconductor chips have been given the exclusive right to control the creation of chips embodying that design, as well as the importation and distribution of chips embodying that design. (The standard of originality is said in the legislative history to be of the same minimal sort as is true in copyright.) To obtain ten years of protection for this design, the mask work's owner must apply to the Copyright Office for a certificate of registration within two years of the first commercial exploitation of the chip design. Chips embodying a protected design may (but need not) display a symbol of this protection (an "M" and the name of the owner). The same set of remedies have been provided to mask work owners as to copyright owners. A right to reverse engineer chip designs is specifically provided in the Chip Protection Act.

The legislative history of the chip protection law makes clear that any programs that are embedded on a ROM do not fall within the scope of this law. Such programs may, of course, be protected under the copyright law, and/or possibly be maintained as a trade secret. The chip protection law governs only as to the design of the circuitry, not the information stored on it. That is, it is the non-program aspects which are protected under the chip law.

## 12.2 Circumstances In Which It Might Matter to DoD What the Chip Law Provides

### 12.2.1 Government Funded Development of Mask Works/Chip Designs

We have not spoken with anyone in the Defense Department who is directly involved in government funding of chip designs. We are aware of the VHSICs program and we have reason to believe that some government funding of chip designs is ongoing. Because of this, some formal DoD policy on ownership and the extent of rights in chip designs would seem to be appropriate.

### 12.2.2 How DoD Might Obtain Ownership of the Mask Work

Like the copyright law, there is a provision in the chip law that mask works created by the United States government can not be protected under the chip law. Again like the copyright law, the chip law provides that the United States government is not precluded from receiving or holding exclusive rights to mask works by assignment, bequest or the like. Because of the similarity in the wording of the copyright and chip law provisions, it would seem to make sense for the government to require, if it wanted to own the chip design, the developing firm to get a mask work certificate and to assign it to the government rather than to try to use an approach similar to that reflected in the DoD special works clause. (See Chapter 5.)

### 12.2.3 How DoD Might Obtain Other Rights to the Mask Work

If the government wants to allow the chip designer whose work it might be funding to retain ownership of the mask work and wants to obtain unlimited rights or other license rights to use, disclose or duplicate the chip design, the DoD FAR SUPP would have to be amended. The standard data rights clause presently in place refers only to technical data and software. The government may also want to give itself the right to distribute the protected chips, if the definition of unlimited rights is not certain to include it.

Chip designs are not typically held as trade secrets once the chip has been sold into the marketplace because "publication" of the chip prevents the design from being held as a trade secret. This makes the proprietary rights provisions of the standard data rights clause inappropriate for use in a contract involving acquiring rights in chip designs. Technical data about the process of manufacturing the chips however, might still present the same acquisition concerns as are associated with other technical data.

### 12.2.4 Government Purchase of Infringing Chips

(a) Purchase for Government Use Only

Persons (including the government) who buy "pirate" chips or who buy equipment which contains "pirate" chips for their own use will not be liable under the chip law to the person who owns the mask right in the chips. This means that in the ordinary case where the government might buy equipment for its use (and its use alone) the government will not be liable to the chip manufacturer if one of its contractors has used "pirate" chips in performance of a contract to develop the equipment. It is irrelevant whether or not the government knows that the contractor was using

infringing chips. The only time the government could get into trouble by purchasing equipment with infringing chips for use by government employees would be if the government had induced or knowingly caused its contractor to violate one of the exclusive rights of the mask work owner.

(b) Purchase for Redistribution

If the government buys "pirate" chips or equipment containing "pirate" chips and the government intends to distribute these items to another entity (such as to GFE it or to make a foreign military sale) and the government did not know that infringing chips were used, it will incur no liability until it learns that infringing chips were used. After receiving notice, the government would have to pay the mask work owner a reasonable royalty on any chips it distributed (i.e., sold, leased, licensed, exchanged, etc.) thereafter. What a reasonable royalty is may be decided by the parties or in litigation. A failure to negotiate about the reasonable royalty will subject the formerly innocent user to the full range of remedies available against outright infringers.

Because there may well be occasions in which the government will want to distribute chips or equipment with chips in it, perhaps the government should revise DoD FAR SUPP to require the contractor to warrant that no infringing chips were used and to indemnify the government for any liability.

It is probably worth emphasizing as a separate matter that a copyright in a piece of software is not affected in any way by the chip law.

### 12.2.5 Manufacture of Chips

Before the government started to manufacture chips which contained a protected chip design, authorization from the owner of the chip mask would be needed. Manufacture without such authorization would be an infringement of the proprietary rights of the owner of the mask.

### 12.2.6 Possibility of an Injunction

If the government violated the rights of the chip mask owner through manufacture of a chip without authorization or in some other way, and the owner of the mask sued, 28 U.S.C. Sec. 1498 [53] would not protect the government against the issuance of an injunction to stop the use of the mask. Sec. 1498 only eliminates the possibility of an injunction against the government for patent or copyright infringement (see Chapter 9) and has not been extended to apply to infringements of a chip mask.

# 13. A Proposed Approach to Solving DoD's Software Licensing Problems

Having raised so many software licensing problems in the course of this report, we feel some responsibility to suggest at least an approach that DoD might employ to solving the myriad problems it has with the acquisition and maintenance of software. Unfortunately, there is no quick and easy way to solve all of DoD's software licensing problems. There are too many different types of problems, stemming from too many different causes. There is also too much money at stake for any "quick fix" solution to work. The situation is made more difficult by the strained relationship which currently exists between industry and government with regard to software/data rights issues.

That does not mean, however, that none of DoD's software licensing problems can be resolved quickly or easily; nor does it mean that most of of its problems are unsolvable. Removing the inconsistencies from the existing procurement regulations described in Chapter 1 would, for example, require no more than some minor alterations to those regulations. Improved personnel policies and training programs could alleviate other difficulties DoD is experiencing. And, although some other of DoD's software licensing problems may be more resistant to solution than others, there may well be ways of approaching even the major problems that would be more constructive than other approaches which might be taken.

The crucial point is that not all of DoD's software licensing problems can, or should be treated in the same way. There are certain problems which DoD has more control over than it does others. In allocating resources, we would suggest that DoD place a greater emphasis on those problems which are more readily within its control, and, therefore, could be more easily resolved. There are also some software licensing problems that are by their nature more amenable to change than others. Again, in allocating the time and resources of DoD personnel to addressing software licensing problems, we would advise that DoD attempt to focus its limited resources on those problems which are most likely to be impacted by such an effort.

## 13.1 What DoD Has Most Control Over

### 13.1.1 How DoD Treats Its Personnel

How DoD trains, works, and rewards its contracting personnel is an important factor bearing on its software licensing problems and also a factor over which DoD has considerable control. As Chapter 3 has indicated, the DoD contracting personnel to whom we spoke feel they could benefit from additional training about software, its life cycle management, and data rights. Probably the biggest "return" per dollar spent on solutions could be obtained by improving initial training about these matters, and by having periodic update training.

Once on the job and trained, procurement personnel should also have manageable workloads,

accessible and knowledgeable supervisors, and they should be paid reasonably. In other words, they should be accorded working conditions that are not seriously disproportionate to those of their counterparts in private industry. Good procurement regulations don't help unless you have experienced, well-trained, and dedicated people performing the acquisition work. Good people can work around problems with the procurement regulations. If, on the other hand, DoD continues to lose its best people to industry due to low employee morale, inadequate job preparation, undesirable working conditions, low pay and so on, then it will probably also continue to fare badly in its dealings with industry in the area of software/data rights procurement.

### 13.1.2 Encouraging Employees to Specialize in the Software/Data Rights Area

As has been illustrated throughout this report, the acquisition of software, data rights and other computer related technology is one of the more complex and specialized areas with which DoD personnel become involved (see Chapter 3). Consequently, it would be beneficial to DoD to have some personnel who are sufficiently specialized in this area that they would be adept with the intricacies and subtle nuances of software technology. It is also difficult, if not impossible, for a legal generalist to acquire sufficient knowledge of intellectual property and software/data rights issues to be able to perform well in negotiations or legal conflicts with industry people, many of whom are specialized in those particular areas. In particular, DoD would probably benefit significantly if it encouraged more of its attorneys to specialize in the intellectual property area, with some of these focusing their efforts on software/data rights issues.

### 13.1.3 Internal Communications

The DoD might also do well to devote more of its resources to finding strategies which would improve internal communications within DoD, and within and among the services and defense related industries. Better feedback mechanisms, whereby individuals are informed not only of problems which arise in the course of software/data rights acquisition, but also of approaches which seem to work well, are needed. In addition, communication as to what software/data rights resources are already available within the Department would be useful. Our research uncovered situations in which the same software or data rights had been purchased on more than one occasion because of the lack of any mechanism whereby the availability of the software or data rights could have been communicated to others within the Department. Some form of library or cataloguing system might even be advisable as a means of encouraging that DoD take advantage of the reusability of certain software, and of communicating that DoD already possesses certain data rights and there is no reason, therefore, to purchase them again. These are matters which it is certainly well within the control of DoD to address.

### 13.1.4 DoD - Industry Communications

In the course of preparing this report, we spoke with many individuals, from both government and industry, who play some role in the software/data rights procurement process. We noted that representatives of both industry and government are quick to acknowledge that there currently

exist many problems in this area. Those same individuals tend to point an accusing finger at the other side as the culprit responsible for these problems. Industry people say, "the government is asking for too much, and they are not willing to pay for it." The government people say, "we need those software tools, or data, or rights to meet our needs", or "the regulations, or this policy, or that clause requires us to get all of that whether we need it or not, so you have to give it to us." Unfortunately, industry has become somewhat distrustful about what government people say, and the government people sometimes feel the same way about industry people.

The reality of today is that many firms on the "cutting edge" of software technology can survive without doing business with the government. The DoD needs the latest technology in order to maintain a strong defense and military capability. Thus, it seems clear that in many cases, DoD needs industry more than industry needs DoD. Given this situation, it seems incumbent upon DoD to make some effort to open up and improve the strained lines of communication between it and private industry.

Many of the industry people we spoke with indicated that they would welcome the opportunity to sit down and discuss software/data rights procurement issues with DoD people in an effort to resolve their differences. Indeed, some of these individuals told us that in their view the most useful role the SEI could play would be to provide a forum wherein industry and government people could meet to discuss software/data rights issues in an objective, rational manner. These people, however, also expressed a lack of optimism over the prospect that such productive communication would in fact occur, citing incidents such as DoD's sudden withdrawal from the Rights in Data Technical Working Group (RTDWG) [13] (a study which DoD had itself initiated), and the imposition of the Air Force's "Orr Clause".

Our conclusion is that industry people are willing to meet with DoD in an effort to resolve differences which exist. It is clearly within the power and control of DoD to pursue such communications, and would likely be one of the most beneficial steps DoD could take toward resolving many of its software licensing problems.

## 13.2 What DoD Has Some Control Over

### 13.2.1 DoD's Own Acquisition Regulations

The DoD also has considerable control over its own procurement regulations in the areas of software and data rights (the DoD FAR Supplement). This control is tempered somewhat by the limitations imposed by the FAR and relevant legislation, as well as by the process required of DoD to adopt new regulations, and the opportunity of industry to contest newly proposed regulations before they become effective. Nonetheless, there is much DoD could do toward adopting regulations which are more simplified, uniform, and clear.

Through revision of its own acquisition regulations, the DoD could, for example, resolve issues such as government ownership of copyright by adopting an assignment approach, and concerns

regarding trademark rights in words such as Ada by properly registering the mark and complying with the requirements as discussed in Chapter 6. Further, it would be relatively easy for the DoD to address any issues related to the need for a derivative works right by making some adjustments to its definition of "unlimited rights".

As has been noted throughout this report, the DoD acquisition regulations are in need of some revision so as to make them more consistent with the realities of modern commercial practice as well as the precepts of intellectual property law. A clearer, more succinct delineation of the various rights packages available, and of the situations to which they apply, would be a substantial improvement. The regulations could be shaped so as to allow the DoD to more easily enter escrowing and long term maintenance agreements where necessary and appropriate in order to secure documentation, tools, CAD/CAM programs and the like which would otherwise remain unavailable to the DoD. In general, the software/data rights regulations could be revised so as to better reflect the economic realities of the software industry as well as a better appreciation of software technology. It is time to stop treating software and its documentation similar to the way DoD treats technical data. The economics of the software industry are simply too different from the economics of the technical data situation for the legal rules to be the same. The policy reflected in the newly proposed FAR Subpart 27.4 [66] would provide DoD a good starting point toward devising such a regulatory policy statement. A further advantage of addressing DoD's software licensing problems through regulations is that such changes could be made without resort to legislative or litigation activities.

### 13.2.2 DoD Policies With Respect to RFPs and Procurement Practices

DoD could also do much to improve its own internal policies as to the preparation of RFPs, and other aspects of DoD procurement practices. The Department could take steps toward greater standardization, and increased emphasis on maintenance/enhancement issues at an early stage of the procurement process (as was discussed in Chapters 2 and 3). Moreover, this is an area in which DoD has substantial control since it would not be limited by the notice and comment requirements which would accompany the adoption of new regulations.

### 13.2.3 Legislative Reforms and Court Action

The DoD could use its powerful lobbying abilities to seek legislative changes if it thought this necessary to improve its position in the software/data rights procurement area. Areas of focus might include the changes to the Contract Disputes Act to shunt all data rights disputes into this framework so that injunctive relief would be unavailable to contractors in software disputes (see Chapter 9) or the Copyright Act to get software exempted from the Section 105 preclusion against direct government ownership of copyrights (see Chapter 5). Similarly, the government could target certain areas for emphasis by its legal staff. Test cases could be sought in an effort to put forward legal theories which DoD feels are important. Resources could be focused in these areas in an effort to maximize the chances that DoD would prevail as to these legal theories.

## 13.3 What DoD Has Less Direct Control Over

As has been discussed throughout this report, there are some areas over which DoD has little direct control, and little likelihood of making a direct impact regardless of the amount of resources expended. The areas in which it seems less likely that DoD would be successful in bringing about direct changes include:

(1) Getting competition in maintenance of proprietary software (see Chapter 2).

(2) Obtaining software tools in which a private firm holds a proprietary right (see Chapter 2 ).

(3) Obtaining CAD/CAM programs from private firms (see Chapter 10.)

The rights the government has been asking for in this regard are too valuable to industry to be given up easily. A more productive approach might be to develop a mechanism whereby DoD could more easily enter escrowing and long term maintenance agreements providing for controlled access to such items. Indeed, such an approach might actually be beneficial to the DoD in that under such an arrangement DoD would not only have access to needed documentation, code, tools and the like, but would also avoid having to trouble itself with storage, cataloguing and internal access concerns.

Further, through such a method, DoD could have greater access to improvements in the technology and/or means of maintaining and enhancing that technology, and, significantly, would not be endangering any implied warranties which might otherwise be jeopardized if DoD maintained or modified software organically or through competitive reprocurement. If DoD persists in asserting that it must have ever greater rights in software, software tools, CAD/CAMs, and software documentation, it may find it has "shot itself in the foot". Industry response is likely to be to withdraw from doing business with DoD or to only sell DoD "old" technology.

Finally, it should be noted that the challenge of trying to find an appropriate way to acquire and maintain software is not one unique to the DoD. The unique nature of software -- part "writing," part" machine" -- has caused substantial confusion about its proper treatment in many areas of the law. Properly conceptualizing software and fashioning a set of legal rules to deal with it is extremely difficult; it requires a deep understanding of the economics of the software industry and of the realities of the development of software technology.

One of the things that makes this already difficult task yet more difficult is that the economic and technological aspects of the software industry are not static, but rather are rapidly evolving. Software development has long been a very labor-intensive activity; it is now becoming a more capital intensive industry, especially with the development of powerful software development tools and environments. There would be some advantage to DoD in encouraging this shift to a more capital intensive production process, especially in terms of improvement of development productivity. To encourage this shift, DoD must, however, abandon the quasi-technical data orientation of its current software acquisition policy.

Because of the DoD's position as a world leader in supporting the development and use of software technology, DoD has had the misfortune of confronting a great many software problems before they have rippled through other parts of the national economy. Unquestionably, this creates some difficulties for DoD, and places the DoD in the position of dealing with challenges that are often without precedent, a difficult task indeed. On the other hand, this situation gives the DoD a unique opportunity to influence the direction of the software industry in the future. By addressing the many challenges placed on its doorstep by the software industry, the DoD can claim a strategic position on the leading edge of the development of software technology.

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# APPENDIX A

## Selected Sections of the Copyright Law

### Section 101 - Definitions

As used in this title, the following terms and their variant forms mean the following:

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

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

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

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

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

A "compilation" is a work formed by the collection and assembling of reexisting materials or of data that are selected, coordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship. The term "compilation" includes collective works.

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

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

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

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

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

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

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

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

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

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

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

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

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

"Phonorecords" are material objects in which sounds, other than those accompanying a motion picture or other audiovisual work, are fixed by any method now known or later developed, and from which the sounds can be perceived, reproduced, or otherwise communicated, either directly or with the aid of a machine or device. The term "phonerecords" includes the material object in which the sounds are first fixed.

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

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

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

To perform or display a work "publicly" means:

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

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

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

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

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

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

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

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

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

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

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

A "work made for hire" is:

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

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

**Section 102 - Subject Matter of Copyright: In General**

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

(1) literary works;
(2) musical works, including any accompanying words;
(3) dramatic works, including any accompanying music;
(4) pantomimes and choreographic works;
(5) pictorial, graphic, and sculptural works;
(6) motion pictures and other audiovisual works; and
(7) sound recordings.

(b) In no case does copyright protection for an original work of authorship extend to any

idea, procedure, process, system, method of operation, concept, principle, or discovery, regardless of the form in which it is described, explained, illustrated, or embodied in such work.

**Section 103 - Subject Matter of Copyright: Compilations and Derivative Works**

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

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

**Section 104 - Subject Matter of Copyright: National Origin**

(a) **Unpublished Works.** The works specified by sections 102 and 103, while unpublished, are subject to protection under this title without regard to the nationality or domicile of the author.

**(b) Published Works.** The works specified by section 102 and 103, when published, are subject to protection under this title if -

(1) on the date of first publication, one or more of the authors is a national or domiciliary of the United States, or is a national, domiciliary, or sovereign authority of a foreign nation that is a party to a copyright treaty to which the United States is also a party, or is a stateless person, wherever the person may be domiciled, or

(2) the work is first published in the United States or in a foreign nation that, on the date of first publication, is a party to the Universal Copyright Convention; or

(3) the work is first published by the United Nations or any of its specialized agencies, or by the Organization of American States; or

(4) the work comes within the scope of a Presidential proclamation. Whenever the President finds that a particular foreign nation extends, to works by authors who are nationals or domiciliaries of the United States or to works that are first published in the United States, copyright protection on substantially the same basis as that on which the foreign nation extends protection to works of its own nationals and domiciliaries and works first published in that nation, the President may by proclamation extend protection under this title to works of which one or more of the authors is, on the date of first publication, a national, domiciliary, or sovereign authority of that nation, or which was first published in that nation. The President may revise, suspend, or revoke any such proclamation or impose any conditions or limitations on protection under a proclamation.

**Section 105 - Subject Matter of Copyright: United States Government Works**

Copyright protection under this title is not available for any work of the United States Government, but the United States Government is not precluded from receiving and holding copyrights transferred to it by assignment, bequest, or otherwise.

**Section 106 - Exclusive Rights in Copyrighted Works**

Subject to section 107 through 118, the owner of copyright under this title has the exclusive rights to do and to authorize any of the following:

(1) to reproduce the copyrighted work in copies or phonorecords;

(2) to prepare derivative works based upon the copyrighted work;

(3) to distribute copies or phonorecords of the copyrighted work to the public by sale or other transfer of ownership, or by rental, lease, or

(4) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and motion pictures and other audiovisual works, to perform the copyrighted work publicly; and

(5) in the case of literary, musical, dramatic, and choreographic works, pantomimes, and pictorial, graphic, or sculptural works, including the individual images of a motion picture or other audiovisual work, to display the copyrighted work publicly.

**Section 107 - Limitations on Exclusive Rights: Fair Use**

Notwithstanding the provisions of section 106, the fair use of a copyrighted work, including such use by reproduction in copies or phonorecords or by any other means specified by that section, for purposes such as criticism, comment, news reporting, teaching (including multiple copies for classroom use), scholarship, or research, is not an infringement of copyright. In determining whether the use made of a work in any particular case is a fair use the factors to be considered shall include -

(1) the purpose and character of the use, including whether such use is of a commercial nature or is for nonprofit educational purposes;

(2) the nature of the copyrighted work;

(3) the amount nd substantiality of the portion used in relation to the copyrighted work as a whole; and

(4) the effect of the use upon the potential market for or value of the copyrighted work.

**Section 108 - Limitations on Exclusive Rights: Reproduction by Libraries and Archives**

(a) Notwithstanding the provisions of section 106, it is not an infringement of copyright for a library or archives, or any of its employees acting within the scope of their employment, to reproduce no more than one copy or phonorecord of a work, or to distribute such copy or phonorecord, under the conditions specified by this section, if -

(1) the reproduction or distribution is made without any purpose of direct or indirect commercial advantage;

(2) the collections of the library or archives are (i) open to the public, or (ii) available not only to researches affiliated with the library or archives or with the institution of which it is a part, but also to other persons doing research in a specialized field; and

(3) the reproduction or distribution of the work includes a notice of copyright.

(b) The rights or reproduction and distribution under this section apply to a copy or phonorecord of an unpublished work duplicated in .....

**Section 117 - Limitations on Exclusive Rights: Computer Programs**

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

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

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

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

**Section 118 - Scope of Exclusive Rights: Use of Certain Works in Connection with Noncommercial Broadcasting**

(a) The exclusive rights provided by section 106 shall, with respect to the works specified by subsection (b) and the activities specified by subsection (d), be subject to the conditions and limitations prescribed by this section.

(b) Not later than thirty days after the Copyright Royalty Tribunal has been constituted in accordance with section 802, the Chairman of the Tribunal shall cause notice to be published in the Federal Register of the initiation of proceedings for the purpose of determining reasonable terms and rates of royalty payments for the activities specified in subsection (d) with respect to published nondramatic musical works and published pictorial, graphic, and sculptural works ...

## CHAPTER 2. - COPYRIGHT OWNERSHIP AND TRANSFER

### Section 201 - Ownership of Copyright

(a) **Initial Ownership.** Copyright in a work protected under this title vests initially in the author or authors of the work. The authors of a joint work are co-owners of copyright in the work.

(b) **Works Made for Hire.** In the case of a work made for hire, the employer or other person for whom the work was prepared is considered the author for purposes of this title and, unless the parties have expressly agreed otherwise in a written instrument signed by them, owns all of the rights comprised in the copyright.

(c) **Contributions to Collective Works.** Copyright in each separate contribution to a collective work is distinct from copyright in the collective work as a whole, and vests initially in the author of the contribution. In the absence of an express transfer of the copyright or of any rights under it, the owner of copyright in the collective work is presumed to have acquired only the privilee of reproducing and distributing the contribution as part of that particular collective work, any revision of that collective work, and any later collective work in the same series.

(d) **Transfer of ownership.**

(1) The ownership of a copyright may be transferred in whole or in part by any means of conveyance or by operation of law, and may be bequeathed by will or pass as personal property by the applicable laws of intestate succession.

(2) Any of the exclusive rights comprised in a copyright, including any subdivision of any of the rights specified by section 106, may be transferred as provided by clause (1) and owned separately. The owner of any particular exclusive right is entitled, to the extent of that right, to all of the protection and remedies accorded to the copyright owner by this title.

(e) **Involuntary Transfer.**

When an individual author's ownership of a copyright, or of any of the exclusive rights

under a copyright, has not previously been transferred voluntarily by that individual author, no action by any governmental body or other official or organization purporting to seize, expropriate, transfer, or exercise rights of ownership with respect to the copyright, or any of the exclusive rights under a copyright, shall be given effect under this title except as provided under Title 11 [relating to bankruptcy].

## APPENDIX B

## DoD Procurement Regulations

27.403 Acquisition of Rights in Technical Data.

27.403-1 Background.

(a) Government's Interest in Technical Data. The Government has extensive needs for many kinds of technical data. Its needs may well exceed those of private commercial customers. For defense purposes, millions of separate equipment and supply items, ranging from standard to unique types, must be acquired, operated, and maintained, often at points remote from the source of supply. Functions requiring varied kinds of technical data include training of personnel, overhaul and repair, cataloging, standardization, inspection and quality control, packaging, and logistics operations. Technical data resulting from research and development contracts must be obtained, organized and disseminated to many different users. Finally, the Government must make technical data widely available in the form of contract specifications in order to obtain competition among its suppliers, and thus further economy in Government procurement.

(b) Contractor's Interest in Technical Data. Commercial organizations have a valid economic interest in technical data pertaining to items, components, or processes which they have developed at their own expense. Such technical data is often closely held because its disclosure to competitors could jeopardize the competitive advantage it was developed to provide. Public disclosure of such technical data can cause serious economic hardship to the originating company.

(c) The Balancing of Interests.

(1) It is apparent that there is no necessary correlation between the Government's need for technical data and its contractors' economic interest therein. However, in balancing the Government's requirements for technical data against the contractor's interest in protecting his technical data, it should be recognized that there may be a considerable identity of interest. This is particularly true in the case of innovative contractors who can best be encouraged to develop at private expense items of military usefulness where their rights in such items are scrupulously protected.

(2) It is equally important that the Government foster successful contractual relationships and encourage a ready flow of data essential to Government needs by confining its acquisitions of technical data to cases of actual need. Certainly the Government must not be barred from bargaining and contracting to obtain such technical data as it needs, even though that technical data may normally not be disclosed in commercial practice. Moreover, when the Government pays for research and development work which produces new knowledge, products, or processes, it has an obligation to foster technological progress through wide dissemination of the new and useful information derived from such work and where practicable to provide competitive opportunities for supplying the new products and utilizing the new processes.

(3) At the same time, acquiring, maintaining, storing, retrieving, and distributing technical data in the vast quantities generated by modern technology is costly and burdensome for the Government. For this reason alone, it would be necessary to control closely the extent and nature of technical data procurement. Such control is also necessary to insure Government respect for its contractors' economic interest in technical data relating to their privately developed items. The policies and procedures of this subsection are framed in the light of these considerations.

27.403-2 Policy.

(a) General.

(1) It is the policy of the Department of Defense to acquire only such technical data rights as are essential to meet Government needs.

(2) In deciding whether to acquire technical data for future acquisitions so that all such acquisitions can be made on a competitive basis tc the maximum practicable extent, the provisions of this section shall govern.

(b) Unlimited Rights Technical Data. Technical data in the following categories shall be acquired with unlimited rights.

(1) Technical data resulting directly from performance of experimental, developmental, or research work which was specified as an element of performance in a Government contract or subcontract;

(2) Technical data necessary to enable others to manufacture end-items, components and modifications, or to enable them tc perform processes, when the end-items, components, modifications or processes have been, or are being, developed under Government contracts or subcontracts in which experimental, developmental or research work was specified as an element of contract performance, except technical data pertaining to items, components or processes developed at private expense;

(3) Technical data prepared or required to be delivered under any Government contract or subcontract and constituting corrections or changes to Government-furnished data.

(4) Technical data pertaining to end-items, components or processes, prepared or required to be delivered under any Government contract or subcontract, for the purpose of identifying sources, size, configuration, mating and attachment characteristics, functional characteristics and performance requirements ("form, fit and function" data, e.g., specification control drawings, catalog sheets, envelope drawings, etc.);

(5) Manuals or instructional materials prepared or required to be delivered under a Government contract or subcontract for installation, operation, maintenance or training purposes; and

(6) Technical data which is in the public domain or has been or is normally released cr disclosed by the contractor or subcontractor without restriction on further disclosure. "In the public domain" means available to the public without copyright or other restriction of any kind.

(c) Limited Rights Technical Data.

(1) Except as provided in paragraph () above, unpublished technical data pertaining to items, components or processes developed at private expense will be acquired with limited rights, provided that the data is identified as limited rights data in accordance with subparagraph (b)(2) of the clause at 52.227-7013, Rights in Technical Data and Computer Software. Unpublished, as applied to technical data and computer software documentation, means that which has not been released to the public nor been furnished to others without restriction on further use or disclosure.

(2) It should be clearly understood that the above statement of policy is a recital of rights to be acquired in technical data. Neither the foregoing statement of technical data rights policy, nor its implementing subparagraphs (b)(l) and (2) of the clause at 52.227-7013, Rights in Technical Data and Computer Software, establishes technical data requirements for a particular contract. It should also be noted that technical data pertaining to items, components or processes developed at private expense may be called for, required, or otherwise furnished under subparagraphs (b)(l), (3), (4), (5), and (6) above and, as such, it will be acquired with unlimited rights. Contract clauses and the schedule establish the form and type of technical data to be furnished; the categories into which such technical data fall, determine the rights to be obtained by the Government to use or publish such technical data.

(d) Predetermination of Rights in Technical Data.

(l)(i) When the Government needs technical data with unlimited rights, any data which the offeror intends to deliver with limited rights pursuant to paragraph (c) above should be identified prior to contract award, if feasible, and an agreement with respect thereto shall be incorporated in the contract. This procedure is called predetermination of rights in technical data.

(ii) The procedure may be initiated by the contracting officer or an offeror during the negotiation of a negotiated contract. In order to be productive, the procedure should apply only to that technical data for which rights may practicably be identified. Although the agreement may also cover technical data to be delivered with unlimited rights, in no case shall the procedure be used to require the contractor to furnish, with unlimited rights, technical data which he is entitled to furnish with limited rights under the policy in paragraph (c) above. The contracting officer shall consult his counsel as fully as possible in determining whether to use the procedure and in connection with the various steps of the procedure.

(2) Any agreements reached shall be incorporated in the Schedule of the contract directly or by reference and shall describe specifically the technical data which may be furnished with limited rights pursuant to paragraph (c) above. The contracting officer may, however, review the technical data asserted to be limited rights data to determine whether to invoke the procedures of paragraph (f) below to negotiate to purchase unlimited rights in any of the technical data, or adopt some alternative such as to--

(i) delete or modify the requirement for the technical data in which the Government would need unlimited rights if it were ordered, or

(ii) modify the specifications so as not to require or permit the use of the item, component or process covered by the limited rights data; or

(iii) include a contractual option to acquire unlimited rights. (3) When the predetermination of rights in technical data procedure is to be used, include the provision at 52.227-7014, Predetermination of Rights in Technical Data, in the Request for Proposals.

(4) If completion of predetermination proves impracticable before award or if contractual requirements relating to design or technical data items are changed during the course of a contract, an appropriate provision shall be included in the contract, requiring the contractor to complete the identification of limited rights with respect to that technical data listed in the solicitation for which predetermination was proposed, or to identify limited rights technical data relating to the changed requirements.

(e) Subcontracts. It is the policy of the Department of Defense that prime contractors and higher-tier subcontractors shall not use their power to award subcontracts as economic leverage to acquire rights in the technical data of their subcontractors for themselves. Accordingly, a subcontractor who would have the right pursuant to paragraph (c) above to furnish technical data with limited rights, may furnish such limited rights data directly to the Government rather than through the prime contractor.

(f) Specific Acquisition of Unlimited Rights in Technical Data.

(1) Notwithstanding paragraph (c) above or any other provision of this subsection the Government may acquire unlimited rights in any limited rights technical data by means of negotiation with an individual contractor or subcontractor, or as a part of a competition among several contractors or subcontractors. Such individual negotiation or competition may be conducted either by the Government, or upon Government request by the prime contractor or higher-tier subcontractor. Such unlimited rights in technical data shall be stated in the contract schedule as a separate item and shall be separately priced. Unlimited rights in technical data shall not be acquired under this paragraph unless it is determined after a finding upon a documented record that component, or process to which the technical data pertains;

(ii) there is no suitable item, component or process of alternate design or availability;

(iii) the item or component can be manufactured or the process performed through the use of such technical data by other competent manufacturers, without the need for additional technical data which cannot be purchased reasonably or is not readily obtained by other economic means; and

(iv) anticipated net savings in reprocurements will exceed the acquisition cost of the technical data and rights therein.

(2) The analysis and findings referred to in subparagraph (b)(l) above shall specifically identify each item, component or process and the particular technical data therefor which is to be purchased.

(3) When all technical data is to be acquired under any contract with unlimited rights in accordance with the findings of paragraph (f)

(1) above, the clause at 52.227-7015, Rights in Technical Data -- Specific Acquisition, shall be used.

(4)(i) In addition to the acquisition of unlimited rights in technical data as authorized in paragraph (f) (1) above, there will be situations when it is in the best interest of the Government to acquire from subcontractors repair parts or components by direct sale to the Government.

(ii) The clause at 52.227-7017, Rights in Technical Data -- Major System and Subsystem Contractor, may be used in contracts for major systems or major subsystems involving estimated program expenditures in excess of $50 million of RDT&E funds or in excess of $200 million of production funds. When this clause is used, any compensation the contractor requires for the right the subcontractor will have to use his limited rights, technical data shall be included in the price of the prime contract. Also, the Government shall have the right to purchase such items direct from manufacturing subcontractors without the payment, either directly of any fee or royalty to the prime contractor, or as part of the purchase price, for use of the prime contractor's technical data.

(iii) For the purpose of applying the foregoing policy, the following definitions shall be utilized: A major system is a composite of equipment, skills, and techniques capable of performing and/or supporting an operational role which required or will require research, development, test and evaluation investment or design, development, test and evaluation investment estimated in excess of $50 million or total production investment estimated in excess of $200 million. A major subsystem is a major functional part of a major system (as defined above) which is essential to operational completeness. Examples are: airframe, propulsion, armament, guidance, and communication. A major system or major subsystem contractor includes an associate contractor defined as a prime contractor to the Government for developing and/or producing subsystems, equipment, or components meeting specifications prepared by a contractor performing one or more of the functions of systems engineering for a major system (as defined above).

(g) Notice of Certain Limited Rights.

(1) Whether or not the procedure of paragraph (d) above for predetermination of rights in technical data is used, if continuing information is desired under a contract about a contractor's intention to use in the performance of the contract any item, component, or process for which technical data would be subject to limited rights in accordance with the policy of paragraph (c) above, the contractor may be required to advise the contracting officer of this fact promptly (see subparagraph 27.412(a)(2) and Alternate I to the clause at 52.227-7013, Rights in Technical Data and Computer Software). If possible, the schedule should indicate the specific areas pertaining to which limited rights data is of concern and the notice requirement should be restricted to those areas of concern.

(2) No such advice shall be required as to items, components, or processes for which notice was previously given pursuant to the predetermination procedure in the same contract, or with respect to standard commercial items which are manufactured by more than one source of supply. No contracting officer approval under this clause is necessary for the contractor to use any item, component, or process, identified pursuant to this requirement, in the performance of the contract.

(3) If the contracting officer agrees that under the policy stated in paragraph (c) above such technical data would be subject to limited rights, he may then determine whether to invoke the procedure of paragraph (f) above, to negotiate for the purchase of unlimited rights in such data or to adopt other suitable alternatives. The contract shall be amended to reflect any changes required by these procedures.

27.403-3 Procedures.

(a) Deviations. Extension of the six-month period of subparagraph 27.403-3(d)(2) below shall be processed under the authority of FAR Section 1.403. 0ther deviations to Section 27.403 and from the clauses prescribed for use herein shall be processed in accordance with the procedures in FAR Section 1-404.

(b) Establishing the Government's Rights to Use Technical Data.

All technical data specified in a contract or subcontract for delivery thereunder shall be acquired subject to the rights established in the appropriate Rights in Technical Data clauses. Except as provided in FAR Section 48.105 and in FAR Subpart 36.6 no other clauses, directives, standards, specifications or other implementation shall be included, directly or by reference, to enlarge or diminish such rights. The Government's acceptance of technical data subject to limited rights does not impair any rights in such data to which the Government is otherwise entitled or impair the Government's right to use similar or identical data acquired from other sources.

(c) Marking of Technical Data.

(1) Technical data delivered to the Government pursuant to any contract requirement shall be marked with the number of the prime contract, except as provided, in Subparagraph 27.434-2(c)(2), and the name of the contractor and any subcontractor who generated the technical data. Each piece of technical data submitted with limited rights shall also be marked with--

(i) the authorized restrictive legend,

(ii) an indication (for example, by circling, underscoring, or a note) of that portion of the piece of technical data to which the legend is applicable, and

(iii) an explanation of the indication used to identify limited rights data.

The Government shall include such identifying markings on all reproductions thereof, unless the Government cancels such markings pursuant to subparagraphs (c)(2), (d)(3), or (d)(4) below.

(2) The contractor has the responsibility to assure that no restrictive markings are placed on technical data except in accordance with the "Rights in Technical Data and Computer Software" clause at 52.227-7013. Copyright notices as specified in Title 17 United States Code, Sections 401 and 402, are not considered "restrictive markings".

When the clause at 52.227-7013, "Rights in Technical Data and Computer Software", is required by 27.412(a), the clause at 52.227-7018, "Restrictive Markings on Technical Data", shall also be included in the contract. The contractor's procedures required by this clause shall be reviewed periodically by the Contract Administration Office. In addition to the rights afforded to the Government by the clause at 52.227-7018, "Restrictive Markings on Technical Data", the following actions are available to insure proper marking of technical data:

(i) The procedures in paragraph (d), "Removal of Unauthorized Markings", of the clause at 52.227-7013, may be invoked if the contractor fails to follow procedures required by the clause at 52.227-7013, Rights in Technical Data and Computer Software, or fails to correct deficiencies within a specified time.

(ii) Failure to follow proper marking procedures may also be deemed to render technical data nonconforming and subject to FAR Section 46.102 and to withholding of payments under the "Technical Data--Withholding of Payments" clause.

(iii) When a pre-award survey is requested by the purchasing office, the quality assurance review shall include as an item of special inquiry an examination of the prospective contractor's procedures for complying with the "Restrictive Markings on Technical Data" clause.

(iv) The contractor's procedures for complying with the "Restrictive Markings on Technical Data" clause shall be reviewed when holding post-award conferences pursuant to FAR Subpart 42.

(d) Unmarked or Improperly Marked Technical Data.

(1) The Government shall have the right to require the contractor to furnish clear and convincing evidence of the propriety of any restrictive markings used by the contractor on data furnished to the Government under contract.

(2) Technical data received without a restrictive legend shall be deemed to have been furnished with unlimited rights. However, within six months after delivery of such data the contractor may request permission to place restrictive markings on such data at his own expense and the Government may so permit if the contractor--

(i) demonstrates that the omission of the restrictive marking was inadvertent,

(ii) establishes pursuant to subparagraph (d)(l) above that the use of the markings is authorized, and

(iii) relieves the Government of any liability with respect to such technical data (see Paragraph 27.403-3(a)).

(3) If technical data which the contractor is not authorized by the contract to furnish with limited rights is received with restrictive markings, the technical data shall be used with limited rights pending written inquiry to the contractor. If no response to an inquiry has been received within 60 days, or if the response fails to substantiate by clear and convincing evidence that the markings were authorized, the cognizant Government personnel shall cancel or ignore such markings, notify the contractor accordingly in writing, and thereafter may use such technical data with unlimited rights.

(V) If technical data which the contractor is authorized by the contract to furnish with limited rights is received with restrictive markings not in the form prescribed by the contract, the technical data shall be used with limited rights, and the contractor shall be required by written notice to correct the markings to conform with those specified in the contract. If the contractor fails to so correct the markings within 60 days after notice, Government personnel may correct or cancel the markings, so notify the contractor in writing, and thereafter use the technical data accordingly.

(e) Technical Data Furnished on a Restricted Basis in Support of a Proposal. When the contracting officer contemplates awarding a contract on a solicited or unsolicited proposal which was offered on a restricted basis (see FAR Section 5.413 and FAR Section 15.509), he shall ascertain whether to acquire rights to use all or part of the technical data furnished with the proposal. If such rights are desired, the contracting officer shall negotiate with the offeror in accordance with the policies set forth in this Section 27.403. If the offeror agrees to furnish the technical data under the contract, the appropriate clause at 52.227-7013, Rights in Technical Data and Computer Software, shall be inserted in the contract, and the contract shall identify the technical data to be covered by the clause as provided by Section 27.410.

(f) Delivery of Technical Data to Foreign Governments. As provided in the definition of limited rights in Section 27.401, limited rights include the right of the Government to deliver the technical data to foreign governments as the national interest of the United States may require, subject to the same limitations which the Government accepts for itself. When the Government proposes to make technical data subject to limited rights available for use by a foreign government, it will, to the maximum extent practicable, give reasonable notice thereof to the contractor or subcontractor who generated the technical data and whose name appears thereon. 27.404 Acquisition of Rights in Computer Software.

27.404-1 Policy.

(a) The Government shall have unlimited rights in:

(1) Computer software resulting directly from or generated as part of the performance of experimental, developmental, or research work specified as an element of performance in a Government contract or subcontract;

(2) Computer software required to be originated or developed under a Government contract, or generated as a necessary part of performing a contract;

(3) Computer data bases, prepared under a Government contract, consisting of--

(i) information supplied by the Government--

(ii) information in which the Government has unlimited rights, or--

(iii) information which is in the public domain;

(4) Computer software prepared or required to be delivered under this or any other Government contract or subcontract and constituting corrections or changes to Government-furnished software; or

(5) Computer software which is in the public domain or has been or is normally furnished by the contractor or subcontractor without restriction.

(b) When the Government has unlimited rights in computer software in the possession of a contractor, no payment will be made for rights of use of such software in performance of Government contracts or for the later delivery to the Government of such computer software, provided however, that the contractor shall be entitled to compensation for converting the software into the prescribed form for reproduction and delivery to the Government.

(c) It is Department of Defense policy to acquire only such rights to use, duplicate, and disclose computer software developed at private expense as are necessary to meet Government needs. Such rights should be designed to allow the Government flexibility while, at the same time, adequately preserving the rights of the contractor. Computer software developed at private expense may be purchased or leased. Restrictions may be negotiated with respect to the right of the Government to use, duplicate, or disclose computer programs or computer data bases developed at private expense. As a minimum, however, the Government shall have the rights provided in the definition of restricted rights in Section 27.401.

(d) Patented or copyrighted computer software will not be subject to any agreement prohibiting the Government from infringing a patent or copyright. Title 28, United States Code, Section 1498 provides that the Government is liable only for reasonable compensation for use of a patented invention or for infringement of copyright. However, see Section 27.711.

(e) When computer software is developed at private expense and acquired with

restricted rights, the associated computer software documentation will be acquired with limited rights to the extent provided in the definition of limited rights in Section 27.401, and will not be used for preparing the same or similar computer software.

(f) Commercial computer software and related documentation developed at private expense may be leased, or a license to use may be purchased, by the Government subject to the restrictions in subdivision (b)(3)(i) of the clause at 52.227-7013, Rights in Technical Data and Computer Software.

27.404-2 Procedures.

(a) Deviations. All requests for deviations from this Section 27.404 shall be submitted to the DAR Council in accordance with the procedures in FAR Section 1.404.

(b) General.

(1) except as provided at 52.227-7031, Data Requirements, any computer program or computer data base to be purchased under a contract shall be listed on the Contract Data Requirements List (DD Form 1423). Also, if a contract requires the conversion of data to machine-readable form, the editing or revision of existing programs, or the preparation of computer software documentation, the products of this work, if required to be delivered, shall be included on the DD Form 1423.

(2) The clause at 52.227-7013, Rights in Technical Data and Computer Software, shall be included in every contract under which computer software may be originated, developed, or delivered. That clause establishes the circumstances under which the Government secures unlimited rights in both technical data and computer software, limited rights in technical data, and restricted rights in computer software. In negotiated contracts where the clause at 52.227-7013, Rights in Technical Data and Computer Software, is required, the provision at 52.227-7019, Identification of Restricted Rights Computer Software, shall be included in the solicitation.

(3) Contracts under which computer software developed at private expense is procured or leased shall explicitly set forth the rights necessary to meet Government needs and restrictions applicable to the Government as to use, duplication and disclosure of the software. Thus, for example, such software may be needed, or the owner of such software will only sell or lease it, for specific or limited purposes such as for internal agency use, or for use in a specific activity, installation or service location. In any event, the contract must clearly define any restrictions on the right of the Government to use such computer software, but such restrictions will be acceptable only if they will permit the Government to fulfill the need for which such software is being procured. The recital of restrictions may be complete within itself or it may reference the contractor's license or other agreement setting forth restrictions. If referencing is employed, a copy of the license or agreement must be attached to the contract. The minimum rights are provided in the Rights in Technical Data and Computer Software clause at 52.227-7013, and need not be included in the recital.

(4) When computer software developed at private expense is modified or enhanced as

a necessary part of performing a contract, only that portion of the resulting product in which the original product is recognizable will be deemed to be computer software developed at private expense to which restricted rights may attach.

(5) The scope of the restrictions on or, conversely, the scope of the use which the Government is permitted to make of such software shall be taken into account in determining the reasonableness of the contract price for the computer software.

(c) Computer Software Subject to Restricted Rights.

(1) Because of the widely-varying restrictions which are likely to be encountered in the purchase or lease of computer software developed at private expense, a standard recital setting forth specific restrictions and rights suitable for all cases is not feasible. If the standard set of restrictions and rights set forth in paragraph 27.404-l(f) for commercial computer software is not appropriate, personnel are urged to consult counsel in any case in which the proposed contractor requests the Government to accept other restrictions on the use of such software.

(2) To apprise user personnel of the restrictions on use, duplication or disclosure agreed to by the Government with respect to such software sold or leased to the Government, the contractor is required to place the following legend on such software:

RESTRICTED RIGHTS LEGEND

Use, duplication or disclosure is subject to

restrictions stated in Contract No. .....

with.....(Name of Contractor).

For commercial computer software and documentation, the contract number may be omitted and replaced by "paragraph (b)(3)(B) of the Rights in Technical Data and Computer Software clause at 52.227-7013", and the contractor's address added. The Government shall include the same restrictive markings on all its reproductions of the computer software unless the Government cancels such markings pursuant to the procedures in Paragraph 27.403-3(d).

(3) A statement setting forth the restrictions imposed on the Government to use, duplicate, and disclose computer software subject to restricted rights is required to be prominently displayed in human- readable form in the computer software documentation. The reference to the Rights in Technical Data and Computer Software clause in the Restricted Rights Legend on commercial computer software and documentation satisfies this requirement.

(4) Except as provided in paragraph (b) above, computer programs, computer data bases, and computer software documentation delivered to the Government pursuant to a contract requirement must be identified with the number of the prime contract and the name of the contractor.

(5) All markings, (notice, legends, identifications, etc.) concerning restrictions on the

use, duplication, or disclosure of computer software required or authorized by the terms of the contract under which delivery is made are required to be in human-readable form that can be readily and visually perceived and, in addition may be in machine-readable form as appropriate and feasible under the circumstances. Such markings shall be affixed by the contractor to the computer software prior to delivery of the software to the Government.

(6) The human-readable markings may be applied to card decks, magnetic tape reels, or disc packs. This may be, in the case of a card deck, on a notice card even though the cards of the deck do not contain printed material; in the case of a card deck packaged in a container intended as a permanent receptacle for the cards, on the container; in the case of a tape, on the tape reel or on the surface of the leader and trailer of the tape; and in the case of a disc pack, on the hub of the disc.

(d) Unmarked or Improperly Marked Computer Software.

(1) No restrictive markings shall be placed upon computer software unless restrictions are set forth in the contract prior to delivery of the software. Copyright notices as specified in Title 17, United States Code, Sections 401 and 402 are not considered "restrictive markings". The Government may require the contractor to identify the contractual provision setting forth such restrictions before accepting computer software with restrictive markings. If computer software is received with restrictive markings, and there is a question whether it is authorized by the contract to be furnished with restricted rights, it shall be used subject to the asserted restrictions pending written inquiry to the contractor. If no response to an inquiry has been received within 60 days, or if the response fails to identify the restrictions set forth in the contract, the cognizant Government personnel shall cancel or ignore the markings, notify the contractor accordingly in writing, and thereafter use the software with unlimited rights.

(2) Computer software received without a restrictive legend shall be deemed to have been furnished with unlimited rights. However, the contractor may request permission to place restrictive markings on such software at his own expense, and the Government may so permit, if the contractor establishes that the markings are authorized by the contract and demonstrates that the omission was inadvertent. Failure of the contractor to mark such computer software prior to delivery to the Government shall relieve the Government of liability for any use, duplication or disclosure of such computer software.

(3) If computer software authorized by the contract to be furnished with restrictions is received with restrictive markings not in the form prescribed by the contract, the software should be used in accordance with the restrictions provided for in the contract and the contractor shall be required by written notice to correct the markings to conform with those specified in the contract. If the contractor fails to correct the markings within 60 days after notice, Government personnel may correct the markings, and so notify the contractor.

52.227-7013 Rights in Technical Data and Computer Software. As prescribed at 27.412(a)(1), insert the following clause:

RIGHTS IN TECHNICAL DATA AND COMPUTER SOFTWARE (MAY 1981)

(a) Definitions. "Commercial Computer Software", as used in this clause, means computer software which is used regularly for other that government purposes and is sold, licensed or leased in significant quantities to the general public at established market or catalog prices.

"Computer", as used in this clause, means a data processing device capable of accepting data, performing prescribed operations on a device that operates on discrete data by performing arithmetic and logic processes on the data, or a device that operates on analog data by performing physical processes on the data.

"Computer Data Base", as used in this clause, means a collection of data in a form capable of being processed and operated on by a computer.

"Computer Program", as used in this clause, means a series of instructions or statements in a form acceptable to a computer, designed to cause the computer to execute an operation or operations. Computer programs include operating systems, assemblers, compilers, interpreters, data management systems, utility programs, sort-merge programs, and ADPE maintenance/diagnostic programs, as well as applications programs such as payroll, inventory control, and engineering analysis programs. Computer programs may be either machine-dependent or machine-independent, and may be general-purpose in nature or designed to satisfy the requirements of a particular user.

"Computer Software", as used in this clause, means computer programs and computer data bases.

"Computer Software Documentation", as used in this clause, means technical data, including computer listings and printouts, in human- readable form which (1) documents the design or details of computer software, (2) explains the capabilities of the software, or (3) provides operating instructions for using the software to obtain desired results from a computer.

"Limited Rights"' as used in this clause, means rights to use, duplicate, or disclose technical data, in whole or in part, by or for the Government, with the express limitation that such technical data shall not, without the written permission of the party furnishing such technical data be (1) released or disclosed in whole or in part outside the Government, (2) used in whole or in part by the Government for manufacture, or in the case of computer software documentation, for preparing the same or similar computer software, or (3) used by a party other than the Government, except for:

(1) Emergency repair or overhaul work only, by or for the Government, where the item or process concerned is not otherwise reasonably available to enable timely performance of

the work; Provided, that the release or disclosure thereof outside the Government shall be made subject to a prohibition against further use, release or disclosure; or

(2) Release to a foreign government, as the interest of the United States may require, only for information or evaluation within such government or for emergency repair or overhaul work by or for such government under the conditions of (1) above.

"Restricted Rights", as used in this clause, means rights that apply only to computer software, and include, as a minimum, the right to--

(1) Use computer software with the computer for which or with which it was acquired, including use at any Government installation to which the computer may be transferred by the Government;

(2) Use computer software with a backup computer if the computer for which or with which it was acquired is inoperative;

(3) Copy computer programs for safekeeping (archives) or backup purposes; and

(4) Modify computer software, or combine it with other software, subject to the provision that those portions of the derivative software incorporating restricted rights software are subject to the same restricted rights.

In addition, restricted rights include any other specific rights not inconsistent with the minimum rights in (1)-(4) above that are listed or described in this contract or described in a license or agreement made a part of this contract.

"Technical Data", as used in this clause, means recorded information, regardless of form or characteristic, of a scientific or technical nature. It may, for example, document research, experimental, developmental or engineering work, or be usable or used to define a design or process or to procure, produce, support, maintain, or operate materiel. The data may be graphic or pictorial delineations in media such as drawings or photographs, text in specifications or related performance or design type documents, or computer printouts. Examples of technical data include research and engineering data, engineering drawings and associated lists, specifications, standards, process sheets, manuals, technical reports, catalog item identifications and related information, and computer software documentation. Technical data does not include computer software or financial, administrative, cost and pricing, and management data or other information incidental to contract administration.

Unlimited Rights', as used in this clause, means rights to use, duplicate, or disclose technical data, in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so.

(b) Government Rights.

(1) Unlimited Rights. The Government shall have unlimited rights in:

(i) technical data and computer software resulting directly from performance of experimental, developmental or research work which was specified as an element of performance in this or any other Government contract or subcontract;

(ii) computer software required to be originated or developed under a Government contract, or generated as a necessary part of performing a contract;

(iii) computer data bases, prepared under a Government contract, consisting of information supplied by the Government, information in which the Government has unlimited rights, or information which is in the public domain;

(iv) technical data necessary to enable manufacture of end-items, components, and modifications, or to enable the performance of processes, when the end-items, components, modifications or processes have been, or are being, developed under this or any other Government contract or subcontract in which experimental, developmental or research work is, or was specified as an element of contract performance, except technical data pertaining to items, components, processes, or computer software developed at private expense (but see subdivision (b)(2)(ii) below);

(v) technical data or computer software prepared or required to be delivered under this or any other Government contract or subcontract and constituting corrections or changes to Government- furnished data or computer software;

(vi) technical data pertaining to end-items; components or processes, prepared or required to be delivered under this or any other Government contract or subcontract, for the purpose of identifying sources, size, configuration, mating and attachment characteristics, functional characteristics and performance requirements ("form, fit and function" data, e.g., specification control drawings, catalog sheets, envelope drawings, etc.);

(vii) manuals or instructional materials prepared or required to be delivered under this contract or any subcontract hereunder for installation, operation, maintenance or training purposes;

(viii) technical data or computer software which is in the public domain, or has been or is normally released or disclosed by the Contractor or subcontractor without restriction on further disclosure; and

(ix) technical data or computer software listed or described in an agreement incorporated into the schedule of this contract which the parties have predetermined, on the basis of subparagraphs (i) through (viii) above, and agreed will be furnished with unlimited rights.

(2) Limited Rights. The Government shall have limited rights in:.

(i) technical data, listed or described in an agreement incorporated into the Schedule of this contract, which the parties have agreed will be furnished with limited rights; and

(ii) unpublished technical data pertaining to items, components or processes developed at private expense, and unpublished computer software documentation related to computer software that is acquired with restricted rights, other than such data as may be included in the data referred to in subdivisions (b)(l)(i), (v), (vi), (vii), and (viii) above. The word unpublished, as applied to technical data and computer software documentation, means that which has not been released to the public nor been furnished to others without restriction on further use or disclosure. For the purpose of this definition, delivery of limited rights technical data to or for the Government under a contract does not, in itself, constitute release to the public.

Limited rights shall be effective provided that only the portion or portions of each piece of data to which limited rights are to be asserted pursuant to subdivisions (2)(i) and (ii) above are identified (for example, by circling, underscoring, or a note), and that the piece of data is marked with the legend below in which is inserted:

A. the number of the prime contract under which the technical data is to be delivered,

B. the name of the Contractor and any subcontractor by whom the technical data was generated, and

C. an explanation of the method used to identify limited rights data.

LIMITED RIGHTS LEGEND

Contract No. ----------

Contractor:

Explanation of Limited Rights Data Identification Method Used

Those portions of this technical data indicated as limited rights data shall not, without the written permission of the above Contractor, be either

(A) used, released or disclosed in whole or in part outside the Government,

(B) used in whole or in part by the Government for manufacture or, in the case of computer software documentation, for preparing the same or similar computer software, or

(C) used by a party other than the Government, except for:

(1) emergency repair or overhaul work only, by or for the Government, where the item or process concerned is not otherwise reasonably available to enable timely performance of the work, Provided, that the release or disclosure hereof outside the Government shall be made subject to a prohibition against further use, release or disclosure; or

(2) release to a foreign government, as the interest of the United States may require, only for information or evaluation within such government or for emergency repair or overhaul work by or for such government under the conditions of (1) above. This legend, together with the indications of the portions of this data which are subject to such limitations shall be included on any reproduction hereof which includes any part of the portions subject to such limitations.

(3) Restricted Rights.

(i) The Government shall have restricted rights in computer software, listed or described in a license or agreement made a part of this contract, which the parties have agreed will be furnished with restricted rights, Provided, however, notwithstanding any contrary provision in any such license or agreement, the Government shall have the rights included in the definition of "restricted rights" in paragraph (a) above. Such restricted rights are of no effect unless the computer software is marked by the Contractor with the following legend:.

RESTRICTED RIGHTS LEGEND

Use, duplication or disclosure is subject to

restrictions stated In Contract No.

with (Name of Contractor)

and the related computer software documentation includes a prominent statement of the restrictions applicable to the computer software. The Contractor may not place any legend on computer software indicating restrictions on the Government's rights in such software unless the restrictions are set forth in a license or agreement made a part of this contract prior to the delivery date of the software. Failure of the Contractor to apply a restricted rights legend to such computer software shall relieve the Government of liability with respect to such unmarked software.

(ii) Notwithstanding subdivision (i) above, commercial computer software and related documentation developed at private expense and not in public domain may, if the Contractor so elects, be marked with the following Legend:

RESTRICTED RIGHTS LEGEND

Use, duplication, or disclosure of the

Government is subject to restrictions

as set forth in subdivision (b

(3)(ii) of)

the Rights in Technical Data and Computer

Software clause at 52.227-7013.

(Name of Contractor and Address)

When acquired by the Government, commercial computer software and related documentation so legended shall be subject to the following:

(A) Title to and ownership of the software and documentation shall remain with the Contractor.

(B) User of the software and documentation shall be limited to the facility for which it is acquired.

(C) The Government shall not provide or otherwise make available the software or documentation, or any portion thereof, in any form, to any third party without the prior written approval of the Contractor.

Third parties do not include prime contractors, subcontractors and agents of the Government who have the Government's permission to use the licensed software and documentation at the facility, and who have agreed to use the licensed software and documentation only in accordance with these restrictions. This provision does not limit the right of the Government to use software, documentation, or information therein, which the Government may already have or obtains without restrictions.

(D) The Government shall have the right to use the computer software and documentation with the computer for which it is acquired at any other facility to which that computer may be transferred; to use the computer software and documentation with a backup computer when the primary computer is inoperative; to copy computer programs for safekeeping (archives) or backup purposes; and to modify the software and documentation or combine it with other software, Provided, that the unmodified portions shall remain subject to these restrictions.

(E) If the Contractor, within sixty (60) days after a written request, fails to substantiate by clear and convincing evidence that computer software and documentation marked with the above Restricted Rights Legend are commercial items and were developed at private expense, or if the Contractor fails to refute evidence which is asserted by the Government as a basis that the software is in the public domain, the Government may cancel or ignore any restrictive markings on such computer software and documentation and may use them with unlimited rights. Such written requests shall be addressed to the Contractor as identified in the Restricted Rights Legend.

(4) No legend shall be marked on, nor shall any limitation or restriction on rights of use be asserted as to, any data or computer software which the Contractor has previously delivered to the Government without restriction. The limited or restricted rights provided for by this paragraph shall not impair the right of the Government to use similar or identical data or computer software acquired from other sources.

(c) Copyright.

(1) In addition to the rights granted under the provisions of paragraph (b) above, the Contractor hereby grants to the Government a nonexclusive, paid-up license throughout the world, of the scope set forth below, under any copyright owned by the Contractor, in any work of authorship prepared for or acquired by the Government under this contract, to reproduce the work in copies or phonorecords, to distribute copies or phonorecords to the public, to perform or display the work publicly, and to prepare derivative works thereof, and to have

others do so for Government purposes. With respect to technical data and computer software in which the Government has unlimited rights, the license shall be of the same scope as the rights set forth in the definition of "unlimited rights"\in paragraph (a) above. With respect to technical data in which the Government has limited rights, the scope of the license is limited to the rights set forth in the definition of "limited rights" in paragraph (a) above. With respect to computer software which the parties have agreed in accordance with subparagraph (b)(3) above will be furnished with restricted rights, the scope of the license is limited to such rights.

(2) Unless written approval of the Contracting Officer is obtained, the Contractor shall not include in technical data or computer software prepared for or acquired by the Government under this contract any works of authorship in which copyright is not owned by the Contractor without acquiring for the Government any rights necessary to perfect a copyright license of the scope specified in subparagraph (c)(l).

(3) As between the Contractor and the Government, the Contractor shall be considered the "person for whom the work was prepared for the purpose of determining authorship under Section 201(b) of Title 17, United States Code.

(4) Technical data delivered under this contract which carries a copyright notice shall also include the following statement which shall be placed thereon by the Contractor, or should the Contractor fail, by the Government:.

This material may be reproduced by or for the U.S. Government pursuant to the copyright license under the clause at 52.227-7013 (date).

(d) Removal of Unauthorized Markings. Notwithstanding any provision of this contract concerning inspection and acceptance, the Government may correct, cancel, or ignore any marking not authorized by the terms of this contract on any technical data or computer software furnished hereunder if:

(1) the Contractor fails to respond within sixty (60) days to a written inquiry by the Government concerning the propriety of the markings, or

(2) the Contractor's response fails to substantiate, within sixty (60) days after written notice, the propriety of limited rights markings by clear and convincing evidence, or of restricted rights markings by identification of the restrictions set forth in the contract.

In either case, the Government shall give written notice to the Contractor of the action taken.

(e) Relation to Patents. Nothing contained in this clause shall imply a license to the Government under any patent or be construed as affecting the scope of any license or other right otherwise granted to the Government under any patent.

(f) Limitation on Charges for Data and Computer Software. The Contractor recognizes that the Government or a foreign government with funds derived through the Military Assistance Program or otherwise through the United States Government may contract for

property or services with respect to which the vendor may be liable to the Contractor for charges for the use of technical data or computer software on account of such a contract. The Contractor further recognizes that it is the policy of the Government not to pay in connection with its contracts, or to allow to be paid in connection with contracts made with funds derived through the Military Assistance Program or otherwise through the United States Government, charges for data or computer software which the Government has a right to use and disclose to others, which is in the public domain, or which the Government has been given without restrictions upon its use and disclosure to others. This policy does not apply to reasonable reproduction, handling, mailing, and similar administrative costs incident to the furnishing of such data or computer software. In recognition of this policy, the Contractor agrees to participate in and make appropriate arrangements for the exclusion of such charges from such contracts, or for the refund of amounts received by the Contractor with respect to any such charges not so excluded.

(g) Acquisition of Data and Computer Software from Subcontractors.

(1) Whenever any technical data or computer software is to be obtained from a subcontractor under this contract, the Contractor shall use this same clause in the subcontract, without alteration, and no other clause shall be used to enlarge or diminish the Government's or the Contractor's rights in that subcontractor data or computer software which is required for the Government.

(2) Technical data required to be delivered by a subcontractor shall normally be delivered to the next-higher tier contractor. However, when there is a requirement in the prime contract for data which may be submitted with limited rights pursuant to subparagraph (b)(2) above, a subcontractor may fulfill such requirement by submitting such data directly to the Government rather than through the prime Contractor.

(3) The Contractor and higher-tier subcontractors will not use their power to award subcontracts as economic leverage to acquire rights in technical data or computer software from their subcontractors for themselves.

(End of clause)

ALTERNATE I (MAY 1981) As prescribed at 27.412(a)(2), add the following paragraph to the basic clause:

Notice of Certain Limited Rights.

(h)(l) Unless the Schedule provides otherwise, and subject to (2) below, the Contractor will promptly notify the Contracting Officer in writing of the intended use by the Contractor or a subcontractor in performance of this contract of any item, component or process for which technical data would fall within subparagraph (b)(2) above.

(2) Such notification is not required with respect to:

(i) standard commercial items which are manufactured by more than one source of supply; or

(ii) items, components or processes for which such notice was given pursuant to predetermination of rights in technical data in connection with this contract.

(3) Contracting Officer approval is not necessary under this clause for the Contractor to use the item, component or process in the performance of the contract.

ALTERNATE II (MAY 1981) As prescribed at 27.412(a)(3), add the following paragraph to the basic clause:

( ) Publication for sale. If, prior to publication for sale by the Government and within the period designated in the contract or task order, but in no event later than 24 months after delivery of such data, the Contractor publishes for sale any data

(1) designated in the contract as being subject to this paragraph and

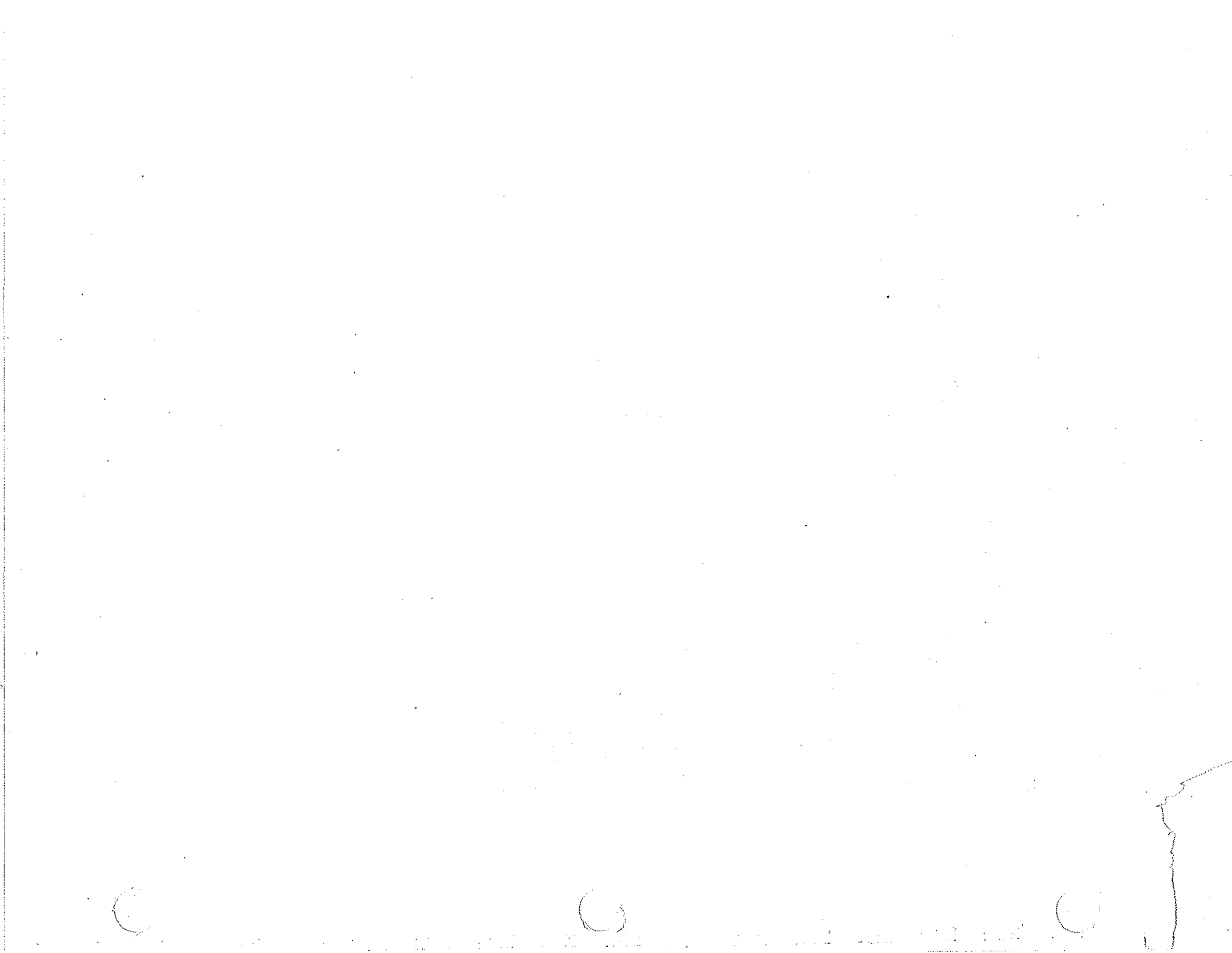
(2) delivered under this contract, and promptly notifies the Contracting Officer of these publications, the Government shall not publish such data for sale or authorize others to do so. This limitation on the Government's right to publish for sale any such data so published by the Contractor shall continue as long as the data is protected as a published work under the copyright law of the United States and is reasonably available to the public for purchase. Any such publication shall include a notice identifying this contract and recognizing the license rights of the Government under subparagraph (c)(l) of this clause. As to all such data not so published by the Contractor, this paragraph shall be of no force or effect.

## APPENDIX C

## Interviewees

### Background/Profession

| EMPLOYER | | Management Admin. | Technical | Contracting Personnel | Lawyers | TOTAL |
|---|---|---|---|---|---|---|
| | ARMY | 01 | 01 | | 04 | 06 |
| | NAVY | 11 | 06 | 02 | 08 | 27 |
| E | AIR FORCE | 09 | 14 | 15 | 09 | 47 |
| | OSD | 01 | | | 03 | 04 |
| M | DLA | | 03 | | | 03 |
| P | STARS | | 04 | | | 04 |
| L | TOTAL DoD | 22 | 28 | 17 | 24 | 91 |
| O | NASA | | | | 02 | 02 |
| Y | Industry Private Practice | 04 | 03 | | 11 | 18 |
| E | Academic Research | | 04 | | 02 | 06 |
| R | TOTAL | 26 | 35 | 17 | 39 | 117 |



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| 6c. ADDRESS (City, State and ZIP Code)<br>Carnegie-Mellon University<br>Pittsburgh, PA 15213 | 7b. ADDRESS (City, State and ZIP Code)<br>Hanscom Air Force Base<br>Hanscom, MA 01731 |
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| FIELD | GROUP | SUB. GR. | |
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This report of the Software Licensing Project of the SEI catalogues and discusses various problems with respect to DoD software procurement policy, and offers suggestions as to ways in which the DoD could improve its software acquisition and licensing methodologies. The report focuses on the software/data rights provisions of the DoD procurement regulations (DoD FAR SUPP Subpart 27.4) as they relate to the Federal Acquisition Regulations, legislation regarding federal contracting practices, intellectual property law (i.e., copyright law patent law, state trade secret law, trademark laws, etc.) and general commercial practice of the software industry. Particular attention has been given to legal issues related to maintenance and enhancement (software supportability) concerns, reusability and other software modification issues, subcontractor situations and the possibility of an injunction issuing against the government in certain situations. Issues related to significant DoD projects, such as the development of the Ada language system, are also examined. This report urges a reform of DoD policy with respect to the acquisition of software, technical data and documentation, software development tools, CAD/CAM programs and the like.

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SEI-86-TM3

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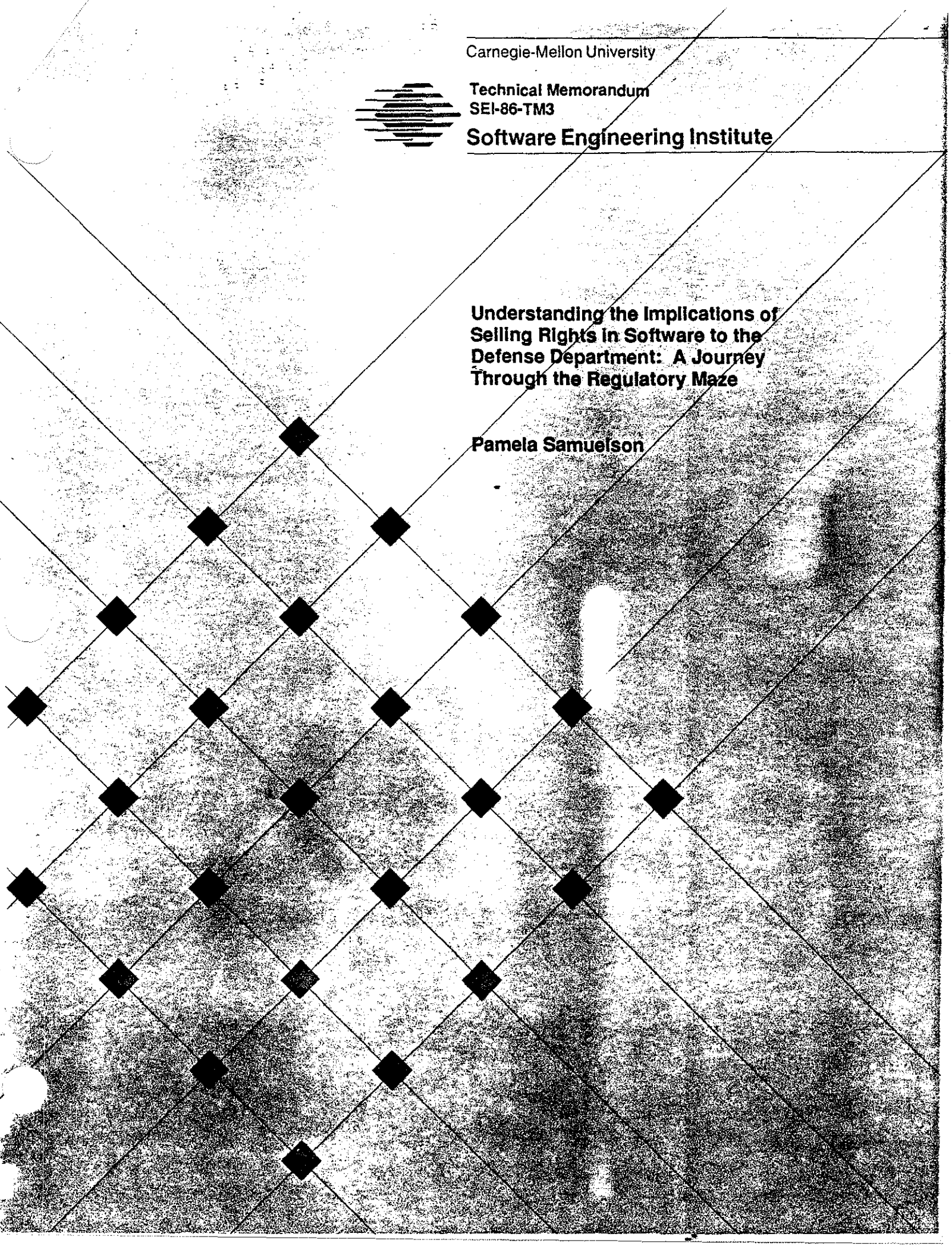
# Understanding the Implications of Selling Rights in Software to the Defense Department: A Journey Through the Regulatory Maze

Pamela Samuelson



**Technical Memorandum**
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**March 1986**

# Understanding the Implications of Selling Rights in Software to the Defense Department: A Journey Through the Regulatory Maze

*by*

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# Understanding the Implications of Selling Rights in Software to the Defense Department:

## A Journey Through the Regulatory Maze

**Pamela Samuelson**

**Abstract.** This article of the Software Licensing Project of the SEI examines problems related to DoD procurement policy as reflected in the DoD acquisition regulations (DoD FAR SUPP). This article discusses ambiguities and inconsistencies found in the acquisition regulations, and ways in which these problem areas might result in unexpected disadvantages to both the government and industry. Issues related to funding of software development, treatment of technical data and documentation, the concept of unlimited rights, the making of derivative works and other modifications of software, and the interface between DoD acquisition policy and intellectual property laws (such as copyright and trade secret law) are discussed. The article serves to catalogue potential problems that might arise under the DoD acquisition regulations.

The Defense Department has in recent years been sponsoring the development of a large number of very sophisticated software systems. Many companies are interested in exploring the possibility of participating in one or more DoD-sponsored software development projects. Small firms, in particular, may be drawn to DoD as a source of funding for large scale projects, perhaps hoping that the software developed for the military will also (at least with some modifications) have a significant commercial market. The company may think it worthwhile to take DoD funding because that will pick up the initial development costs, and then profits can be made on commercial sales.

One of the perceived drawbacks to making such a deal with the Defense Department is the "data rights" policy the Department has adopted to allocate and administer what rights the government and its contractors will have as to software acquired by the government. The DoD data rights policy is often decried as "confiscatory" by industry people, although just how and to what extent it is "confiscatory" is not well understood. Given the length and complexity of the standard data rights clause that DoD inserts in virtually all of its software acquisition contracts, it is not surprising that many industry people do not know the full implications of the clause. This article will set forth as simply and clearly as the author's capabilities permit what rights contractors are likely to have - and not have - when selling rights in software to the Defense Department. The article will also assess the potential risks of negotiating non-standard contract terms with special contractual language. Not all such special language may be enforceable for reasons set forth at some length below.

### Limits on Flexibility

There are many places one can begin this examination of the standard data rights policy. This article will begin with pointing out how little flexibility DoD's own contracting personnel seem to have under the current procurement regime. The regulations say that the standard data rights

clause is to be incorporated into every software acquisition contract into which the Defense Department enters, unless a formal "deviation" is granted owing to special circumstances. The mandatory nature of the standard data rights clause is an important limit on the ability of contracting personnel to reach agreements that contravene clear mandates of the standard clause.

This is not to say that the clause is completely inflexible. One can, for example, negotiate a special set of terms to control the government's use of privately developed software so long as the government still has the four minimum rights prescribed in the standard clause . But an agreement purporting to take away from the government one of the four standard minimum rights would be of questionable validity absent authorization for a deviation. Similarly, a specially negotiated arrangement which would give the government less than "unlimited rights" in software funded in whole or in part with federal money would be of questionable validity. If the standard data rights clause is included in a government contract (or, for that matter, a subcontract), the mandatory clause seems likely to prevail over any contradicting specially negotiated provisions if a dispute between the parties over rights arises in the future.

### Conflicts Between The Standard Clause and Special Clauses

The policy reasons that support enforcement of the standard data rights clause over a specially negotiated clause are straightforward: The Defense Department buys a tremendous volume of software (and other items). It needs a way of predicting with some certainty what minimum rights it will have in this property. The standard data rights clause is the vehicle for obtaining such assurances. It is required to be used by agency regulations; it is itself a regulation. (It is well to remember that agency regulations have the force and effect of law.) The standard clause sets forth the basic transactional rules that the government has decided are necessary to protect its interests. Because there is a way within the regulations to alter the standard data rights policy, namely the formal deviation, specially negotiated terms that contradict the standard clause might well be found ineffective when the deviation process was not used to obtain the right to an exception. This policy argument would seem to apply equally to subcontracting situations as to prime contractor situations.

Nevertheless, there may be some instances in which a software company and DoD contracting personnel have gone ahead and entered into special arrangements in which the standard data rights clause may be incorporated by reference and in which separate clauses contradicting part of this standard clause will also appear. The government contract officer and the industry representative may have between themselves reached an understanding that the specially negotiated language will govern. In many and perhaps most instances, the deal may go smoothly and no disputes about rights will arise. In the event of a dispute, the Defense Department might well take the position that the standard data rights clause prevails over the specially negotiated terms for the policy reasons discussed above. It may also argue the contract officer (or the prime contractor in the subcontract situation) had no authority to make special arrangements without getting a deviation. The inequity of subjecting a firm to vastly different terms than it had agreed to would probably give way to the larger policy underlying the procurement regulations. This is a potential risk for firms that sell rights in software to the government.

## Different Treatment for Software and Its Associated Documentation

There are many features of the DoD standard data rights clause that differ from standard commercial practices. One important example of this is in the different treatment accorded to machine-readable code and to software documentation. DoD defines "software" in such a way as to encompass only machine-readable code; software documentation is considered to be "technical data."

If both the machine-readable code and documentation have been developed (at least in part) at public expense, the separate classification of machine-readable code and documentation will matter very little because the government will claim the same "unlimited rights" in both. If they have instead been developed wholly at private expense, however, the machine-readable code will be subject to a tighter set of restrictions than the documentation (except if the software is an off-the-shelf commercial product).

Privately developed machine-readable code purchased by DoD must be acquired with four standard minimum "restricted rights" in the government. They are: (1) the right to use it in the computer or facility for which it was obtained, (2) the right to use it in a backup computer if the intended use computer is inoperable, (3) the right to make a backup copy of it, and (4) the right to modify it. Privately developed software documentation will typically be acquired with "limited rights" in the government which means that the government will have the rights to use, copy, and disclose it throughout the government, and in emergency repair situations, to have these same acts performed by outsiders. (The exceptions to this general rule, for commercial software and for manuals or instructional material needed for installation and training are discussed in a later section.)

It should be readily apparent that DoD's discrepant treatment of privately developed machine-readable code and its documentation is at odds with commercial practice, which tends either to treat software and documentation the same, or to treat documentation more restrictively than executable code. This is a feature of DoD's policy that warrants careful consideration by software firms supplying software and documentation to the government.

## Public vs. Private Funding of Software

Undoubtedly the most important distinction in the DoD standard data rights clause is that between "publicly funded software" and "privately developed software." The government will claim "unlimited rights" in any software and documentation developed with public funding; it will treat as "proprietary" any software developed at private expense.

The DoD takes an "all or nothing" approach in these situations. That is, no matter how much of a private firm's own money has gone into the development of a piece of software, and no matter how valuable that software or its prototype may be, if even one dollar of DoD money has gone into the software's development fund, the government will claim unlimited rights in that software and documentation. This policy is sometimes viewed by industry as particularly inequitable when

the DoD money has paid only for slight modifications to the code which were necessary to make the software suitable for government purposes. Industry has been trying for many years to alter this policy.

Indeed, recent legislation seems to call for the establishment of some form of middle ground alternative for mixed funding situations. The newly proposed Federal Acquisition Regulations (FAR) would, for example, permit the government and a contractor to make arrangements for the government to get less than unlimited rights when both supply funds for the development of software. The new FAR would also permit firms to retain "privately developed" status for software that has been slightly modified by a contractor to make it suitable for government use. This is not, however, the Defense Department's policy, as reflected in the current DoD FAR Supplement and under the proposed amendments to it.

## Unlimited Rights: What Does That Mean Vis-a-Vis Ownership?

As indicated above, the standard data rights clause provides that if DoD provides funding for any part of the development costs for software, it will claim "unlimited rights" in the software and its associated documentation. There seems to be some confusion within DoD, as well as in the industry, about what the meaning of unlimited rights is vis-a-vis an ownership interest. Many people seem to think that unlimited rights is equivalent to an ownership interest.

It appears, from a close examination of the standard data rights clause, that this assumption is not accurate. The definition of unlimited rights under the DoD clause makes no mention of an ownership interest. "Unlimited rights" is defined in the standard data rights clause to mean only the rights to use, duplicate and disclose software and its documentation in any manner and for any purpose and to have or permit others to do the same. While this is surely a very broad license, it appears that it is not an ownership interest. In intellectual property law, ownership rights are defined in terms of rights to exclude other people from doing one or more things with the property; the definition of unlimited rights confers no rights to exclude on the government. Furthermore, a close reading of the DoD procurement policy regulations reveals that when DoD wants to try to take an ownership interest in software, it should use the "special works" clause instead of the standard data rights clause.

## The Effect of Use of a Special Works Clause

The DoD special works clause purports to give to the government an ownership right and a direct copyright interest in software or other work prepared under a government contract in which this clause is used. The clause claims this direct copyright interest by claiming that the work prepared by the contractor under the clause is a "work made for hire" under the copyright law. Unfortunately, the DoD special works clause, insofar as it purports to give the government a direct copyright interest in software, may be ineffective for this purpose because it conflicts with the copyright law in two respects: (1) software is not a category of specially commissioned work that qualifies for the "work made for hire" rules, and (2) the copyright law specifically prohibits the

government from directly owning copyrights (see 17 U.S.C. Section 105). The effect of putting the DoD special works clause in a software development contract would seem to be to put the software and associated documentation in the public domain. Use of the special works clause seems to nullify the contractors right to claim ownership in the software.

### How Broad Is The Unlimited Rights License?

How broad the government's rights are when it has unlimited rights in software might seem a tritely simple question, but it's not. Some procurement personnel tend to interpret the term as if it was tautologically defined (i.e., that "unlimited rights" means "unlimited" rights.) But the DoD's own definition of the term is limited to three basic rights: the rights to use, duplicate, and disclose the software. The most glaring omission from the definition is that relating to rights to prepare derivative works. Derivative works are defined broadly by the copyright law. There is as yet little case law to provide guidance as to the scope of this concept vis-a-vis software but it would seem to include all modifications, enhancements,translations into other programming languages, and the development of additional programs using parts of the original code (i.e., reusability of software.) Although DoD might argue that a derivative works right is implicitly included in the DoD rights, it is at least conceivable that a court might find that the DoD does not obtain the right to make derivative works of copyrighted material when it has unlimited rights. DoD's argument for implicit inclusion is weakened because the newly proposed FAR does define unlimited rights to include a right to make derivatives.

If firms that have developed software with government funds retain the right to control the government's preparation of derivative software, that would certainly be an important limitation on the government's rights. It is simply unclear whether this is so.

### Contractor-Prepared Derivatives of Unlimited Rights Software

As important a question as may be the government's right to prepare derivative software, an even more important question from industry's perspective may be whether the government will have any rights-- or perhaps even unlimited rights -- in any contractor-prepared derivative software intended for the commercial market. If DoD funds have paid for development of the original software and if some part of the original software is traceable in the derivative software, some DoD personnel might argue that the government will (or should) have unlimited rights in the derivative software as well -- despite the fact that delivery of derivative software may never have been called for under any contract.

The problem of what it might mean for the government to have unlimited rights in non-deliverables is always a thorny one, but in the context of derivative software, it could cause considerable concern. How a court would resolve a dispute of this sort is difficult to predict. It might seem inequitable to the software industry for the government to claim broad rights in derivative software whose delivery they never bargained for. However, DoD might very well take the position that the government can and should exercise rights to derivative software.

## The Effect of Copyrighting Software Developed at Public Expense

The making of derivative software from software funded at public expense can also be a complicated problem if the developer of the original software has copyrighted the software (as the standard data rights clause permits) and if a different company is selected to prepare the derivative software for the government. As was pointed out above, it is not entirely clear that the government has the right to authorize the making of derivatives. For the moment, let's assume it does. That still doesn't mean that there are no limits on the government's ability to authorize the creation of derivatives. One provision of the standard data rights clause suggests that the government's rights to do various things with copyrighted software and to authorize others to do the same is limited to circumstances in which they are done for governmental purposes. The regulation is somewhat ambiguous in this respect, but it may be that the effect of a contractor's copyrighting software it has developed with government funding will be to narrow the scope of the government's rights in that software from an "any purpose" license to a "government purposes" license, that is, to contract the scope of unlimited rights.

This contraction of the government's rights may be particularly important as to the creation of derivative software, for it may permit the original developer (insofar as it may be a copyright owner) to control distribution of derivative software prepared by a second firm to anyone besides the government. That is, the first firm may not be able to prevent a second firm from preparing a derivative program for the government, but it may at least be able to prevent the second firm from copyrighting the derivative and selling it widely to commercial customers. The government cannot give to the second firm a wider set of rights than the first firm has given to the government. And if the second firm -- even with the government's permission -- exceeds the scope for the government's license, it may be enjoined from infringing the first firm's copyright, and thus be unable to bring the derivative to market.

## The Policy When Software Is Developed At Private Expense

Having now a clearer understanding of the risks and uncertainties involved when a firm accepts government funding for software development, a software firm may prefer to find some independent source of funding for the software to avoid the problems just described. The firm may think, "Well, at least if it's privately developed, I'll be able to restrict the government's use of it." To an extent, this is true; to an extent, it may not be true. In the event a contractor firm uses its own funds for software development as a way of ensuring its ability to restrict the government's rights in the software, the firm should realize that it must still follow a circuituous path through the data rights regulations to secure the restricted rights protection it may be seeking.

## Commercial Software: The Option

One of the potentially helpful provisions for industry as to privately developed "commercial software" that it may take some experience with the clause to discern is that the standard data rights clause allows contractors to opt whether to have their commercial software treated as

"commercial software" or as "other-than-commercial software." (What qualifies as "commercial software" is not clear from the regulatory definition; it seems to be interpreted to reach off-the-shelf software that has a substantial commercial distribution.)

The primary advantage of having one's software treated as "commercial software" is that its documentation will be subject to the same "restricted rights" as applies to the machine-readable code instead of being subject to the broader limited (i.e., government-wide) rights that pertain to other documentation. The primary disadvantage of opting for commercial software treatment is that there is a fixed and unnegotiable set of terms that will apply to the code and the documentation; no further terms can be negotiated. Some firms with commercial software prefer to be able to negotiate additional terms, and thus exercise the option to have commercial software treated as other-than-commercial-software.

### Other Than Commercial Software: A "Booby Trap"

The DoD standard data rights clause contemplates that when DoD acquires other-than-commercial-software that has been developed at private expense, a separate licensing agreement will be negotiated between the government and the software firm which will then be made part of the government contract. The DoD must only get the standard four minimum rights in the software.

An interesting question is: what happens if the firm fails to negotiate a separate license agreement and have the agreement made part of the government contract? A cursory reading of the standard data rights clause might suggest to an industry person that if no license agreement was entered into between the government and the contractor, the government would have no more than the four standard minimum rights in the software. However, a closer reading of the clause itself indicates that the failure to negotiate a separate license or the failure to have a separate agreement made part of the government contract may instead mean that the government will have unlimited rights in the software (that is, at least, in the machine-readable code). This may strike software industry people as unreasonable, but it is the result a close reading of the regulations seems to contemplate for those who don't negotiate a separate agreement and have it made part of the contract. It would certainly be prudent to negotiate a separate licensing agreement and have it made part of the contract if a firm wants to ensure that its privately developed software will be subject to tight restrictions.

### Other Technicalities

Similarly, the failure of the contractor to put a restrictive notice on the software or documentation, or the failure of the contractor to identify in his proposal a piece of software as to which he desires to negotiate restricted rights could result in the government's claiming unlimited rights in that software, even if the software was developed wholly with private funds. Further, even if the software and documentation was developed wholly at private expense, and even if one has been careful to comply with the technical requirements of the regulations, a software firm might be

threatened with loss of its limited (or restricted) right protection for software documentation to the extent that the documentation has been incorporated into a manual or other instructional material prepared for or required to be delivered under the government contract to assist with installation, operation, maintenance, or training. The government claims unlimited rights in all such manuals and materials. Unfortunately, virtually any piece of software documentation could arguably be construed to be within this rule, so there would seem to be within the regulation yet another potential pitfall.

## Conclusion

Given this complicated and ambiguous regulatory environment, it is understandable that a software firm that might be jealously guarding its software and documentation in order to preserve its competitive edge in the marketplace might be somewhat reluctant to do business with the Defense Department. It is a system in which the Defense Department's contracting personnel have their hands tied. Short of getting permission to grant a deviation, it would appear that contract officers have no authorization to make deals that go against clear provisions of the standard data rights clause.

The fact that a contract officer would even consider entering into special agreements as well as honoring them, despite a lack of authority to do so, serves as a testament to the goodwill and reasonableness of the many DoD personnel who want the government to get good technology, and who realize that if the standard data rights policy is always insisted upon and enforced, a lot of excellent software technology will not be made available to the government. It is unfortunate that the Defense Department's procurement regulations make the job so difficult for them, and at the same time, put at risk software firms who want to believe that the government can accommodate their needs for protection of software, and who want to make their technology available to the government on fair and reasonable terms.

Why are the Defense Department regulations so difficult to change? Well, that, as they say, is another story. Until the regulations are altered to accomodate the needs and interests of those in DoD who want access to the highest quality software technology and of those who can supply it, software vendors must be prepared to journey through a complex and sometimes frustrating regulatory maze.

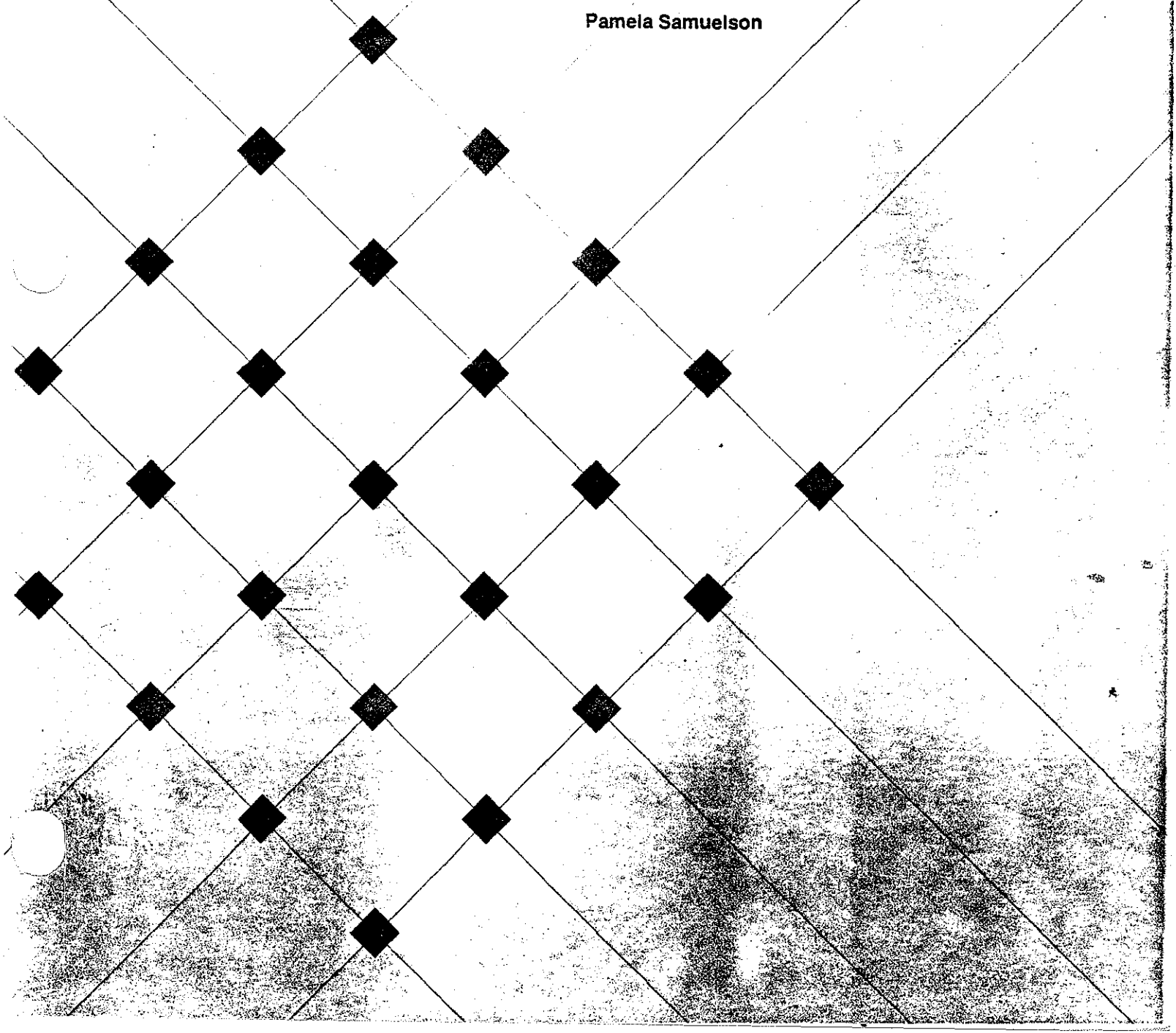
Carnegie-Mellon University

Technical Memorandum
SEI-86-TM2

Software Engineering Institute

# Comments on the Proposed Defense and Federal Acquisition Regulations

Pamela Samuelson



## Technical Memorandum

SEI-86-TM2
March 1986

# Comments on the Proposed Defense and Federal Acquisition Regulations

*by*

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This work was sponsored by the Department of Defense.

# Comments on the Proposed Defense and Federal Acquisition Regulations

**Pamela Samuelson**

**Abstract.** This paper compares and contrasts the software/data rights sections (Subpart 27.4) of the DoD procurement regulations (DoD FAR SUPP) and the Federal Acquisition Regulations (FAR). The regulations currently in force, as well as recently proposed revisions to those regulations, are examined. Criticisms are made of the DoD regulations, as well as suggestions as to how those regulations could be brought more in line with procurement related legislation, intellectual property law and general commercial practice within the software industry. Inconsistencies and ambiguities found in Subpart 27.4 of the DoD acquisition regulations are discussed at some length. A recommendation is made that the DoD adopt a regulatory policy more like that found in the FAR.

## Introduction

Until recently, there has been no substantive "data rights" policy under the FAR. Because DoD needed to have a standard policy for acquiring rights in software and technical data, DoD developed its own elaborate policy, which is currently embodied in the DoD FAR SUPP Subpart 27.4.

The Competition in Contracting Act (CICA), passed last year, required development of a substantive data rights policy for federal agency acquisitions. Both CICA and the 1985 DoD Authorization Act reflect Congress' intent that there be a uniform data rights policy for all federal agencies.

Proposed Subpart 27.4 of the FAR is the substantive data rights policy that was issued this past summer to respond to this Congressional mandate. Shortly after issuance of the newly proposed FAR data rights provisions, DoD issued a set of proposed revisions to the DoD FAR SUPP. The comment period on both sets of proposed regulations has been extended to January 9, 1986. DoD has a set of interim rules in effect at this time which are, in most respects, identical to the regulations in effect for the preceding several years.

Although said to "supplement" the FAR, the proposed DoD regulations, if adopted, would entirely supplant the FAR. Supplantation of the FAR is inconsistent with the Congressional mandate for a uniform policy for federal acquisitions. Because of this and because the proposed FAR contains a superior data rights policy, one which is more straightforward and concise, more consistent with commercial practice, and more compatible with other Congressional directives in the CICA and the 1985 DoD Authorization Act, DoD should adopt the proposed FAR rather than the proposed DoD FAR SUPP. If a few additional provisions are necessary to enable the Defense Department to carry out its special mission, DoD should, of course, be able to supplement the FAR to accomplish these objectives. Complete supplantation of the FAR is, however, neither necessary nor desirable.

## A. The Need for Clear, Concise, Comprehensible Regulations on Data Rights

One of the priorities DoD should have for its data rights regulations is having regulations which are as simple, straightforward and clear as possible. The current DoD data rights regulations fall short of this goal. The proposed FAR is a distinct improvement in this regard.

The heart of the DoD's data rights policy is the standard data rights clause. (DoD FAR SUPP sec. 52.227-7013.) The current version of the DoD standard data rights clause is very long, very complicated, poorly organized, and ambiguous in some important respects. The new FAR standard data rights clause (although not perfect) is more concise, more straightforward, better organized and less ambiguous than the DoD clause.

It should be evident why a clear, concise, comprehensible data rights regulation is important: those in the procurement community who look to the data rights regulations for guidance need to understand what that guidance is, and how it applies to the situations at hand.

The need for a clarifying revision of the standard data rights policy is made the more compelling because of the complex interrelationship of the DoD regulations and intellectual property law vis-a-vis software. Unlike the hardware systems with which DoD has a long procurement history, software systems are protected chiefly by copyright and trade secret law. Software law is currently in something of a state of flux, which of course, makes the coordination of DoD policy and intellectual property law more difficult, yet even more necessary.

### 1. Policy on Privately Developed Software

One good example of how the existing DoD regulations unnecessarily complicate data rights matters is in the provision for two kinds of restricted rights for software and yet another set of restrictions ("limited rights") for technical data, including software documentation. It is extremely difficult to understand why there are two kinds of restricted rights for software, especially given that the two sets of rights are very similar but not identical. It is also difficult to comprehend why the regulations subject software documentation (which is generally classified as "technical data") to different restrictions than machine-readable code (i.e., "software"), and why the government has a much broader set of rights as to documentation than as to machine-readable code. This doesn't seem to make sense given that in the commercial market these things are either subject to the same restrictions, or documentation is treated more restrictively than the executable code. Why one would treat commercial software documentation (which DoD allows to be treated the same as machine-readable code) differently than other software documentation is also mysterious.

The newly proposed FAR data rights provisions simplify the software data rights policy by defining "software" to include not only machine-readable code, but software documentation as well. It also provides for only one set of restricted rights to be applicable to software. Thus, the sources of confusion inherent in the more complicated DoD policy are completely avoided in the FAR.

### 2. How The Contractor's Retention of a Copyright Affects the DoD's Rights

One good example of an ambiguity in a very important substantive provision of the DoD's data right clause is the effect of a contractor's decision to claim a copyright in publicly funded software on the extent of the government's rights thereafter. Subsection (b) of the DoD standard data rights clause seems to give DoD unlimited rights in all software developed at public expense. Subsection (c) of the same clause seems to say that if the contractor retains a copyright in publicly funded software (which the contractor is entitled to do unless the "special works" clause is used):

> ...the Contractor hereby grants to the Government a nonexclusive, paid-up license throughout the world of the scope set forth below, under any copyright owned by the Contractor, in any work of authorship prepared for or acquired by the Government under this contract, to reproduce the work in copies or phonorecords, to distribute copies or phonorecords to the public, to perform or display the work publicly, and to prepare derivative works thereof, and to have others do so for Governmental purposes.

The ambiguity is further compounded by the following sentence which declares:

> With respect to technical data and computer software in which the Government has unlimited rights, the license shall be of the same scope as the rights set forth in the definition of "unlimited rights" in paragraph (a) above.

This appears to mean that the contractor's retention of a copyright won't affect the government's unlimited rights in the work. But it can't NOT affect the scope of the government's rights. A general rule of contract construction (and after all, the data rights clause is a contract clause) is that ambiguities are resolved against the drafter. If this rule was applied to the interpretation of this problem, the DoD's rights would likely be cut back from an unlimited rights license to a government purpose license when a contractor exercises his right to retain a copyright.

The new FAR policy is structured to avoid this ambiguity. In its section which delineates when the government will have unlimited rights, it explicitly says that the government will have unlimited rights in software developed at public expense unless the contractor copyrights the software in which case the government will have government purpose rights. Thus the new FAR policy avoids a serious ambiguity that lies at the heart of the DoD policy.

## B. The Need for Data Rights Regulations That Are More Compatible With Standard Commercial Practices

One of the oft repeated concerns within the defense contracting community is that the Defense Department's current data rights policy as to software is too "confiscatory" to provide meaningful incentives for software firms to offer their best and latest technologies to the government. Some companies are said to refuse to consider doing business with DoD because of the data rights policy. Although DoD certainly has a lot of money to spend on software, the commercial market is currently so large and so lucrative that many of the best software development companies are likely to choose to focus their energies on the commercial market where their proprietary interests are likely to be better protected than if they sell rights in their software to DoD.

Because of its special mission, DoD will, of course, often need to have greater rights in software (and its associated documentation) than would the ordinary commercial customer. DoD, for example, may need to be able to move the software from one locale to another in wartime or to modify the software in remote locations (such as Indonesia), without having to go back and renegotiate with the software's producer. The software industry seems to be aware that DoD needs greater rights than other customers, and seems to be willing to accept that. However, the wider the gap between the terms on which DoD and the rest of the software market are willing to do business, the more incentives to do business with DoD dwindle, and the fewer the number of firms who will choose to provide their best products to DoD. Thus, if DoD wants to have access to the best technology, DoD should adopt a data rights policy that is no more divergent from standard commercial practices than is necessary to achieve its goals. Several examples of how DoD's policies may diverge from standard commercial practice more than is necessary, and how the new FAR policy would treat these problems, are discussed below.

### 1. Different Treatment for Documentation and Machine-Readable Code

One substantial respect in which the DoD policy diverges from standard commercial practice in the software field has already been mentioned briefly above in Section A. The standard DoD policy is, in general, much more restrictive about DoD's rights as to machine-readable code (e.g., restricting use of it to one computer or one facility) than as to software documentation (e.g., allowing DoD to use, duplicate, and disclose it throughout the government). Although "commercial software" -- which seems to be interpreted as requiring that at least 55% of a company's sales be made in the off-the-shelf market -- may qualify for an exemption from the limited rights policy as to software documentation, the standard for qualifying as "commercial software" seems high and it seems that one thereby forecloses an opportunity to negotiate further about data rights. It appears that if a software company elects to have its software treated as "commercial software", it and the government may be stuck with the four standard minimum rights. As mentioned above, software firms --- particularly those who do not regularly sell their software on an off-the-shelf basis --- are generally highly protective of their software documentation, even more so than as to their executable code. Just why DoD's policy should diverge so significantly from commercial practice is hard to understand. Also, if DoD is willing to exempt documentation for "commercial software" from this policy, the software industry might wonder why it can't live with the same exemption as to other software documentation.

The new FAR policy, as mentioned above, subjects software documentation to the same set of restrictions as the machine-readable code, and thus averts this collision with commercial practice.

### 2. Slight Modifications

It is standard DoD policy to take unlimited rights in all software, the development of which was sponsored to any extent with public funds. If a software company developed a piece of software wholly at private expense, and then at the government's request made some minor modifications to it to make it suitable for the intended use by the government, the company may thereby forfeit

proprietary status for the software. If any DoD funds are used to subsidize the modifications, the government will claim unlimited rights in the software.

Many software industry firms regard this policy as inequitable, particularly in view of the fact that it was only because the government said it needed the modifications that the modifications were made. It is also different from the standard commercial practice. In contrast, the new FAR policy allows contractors to retain the "privately developed" status for their software when only minor modifications are made for the government.

### 3. Less Than Unlimited Rights in Mixed Funding Situations

As the previous subsection has indicated, DoD takes an "all or nothing" approach to the public funding versus private funding issue. For years the software industry has been urging adoption of a policy that would permit a "middle ground" as to data rights when both private and public funding are used to develop software. The industry was encouraged by that part of the 1985 DoD Authorization Act that called for DoD to reconsider its policy in mixed funding situations.

When late this past summer, DoD promulgated its proposal for revising the data rights regulations which made no policy change as to mixed funding arrangements, the software industry's disappointment was keen. The sense of disappointment was the more intense because the proposed FAR policy (which was announced about a month earlier than the new DoD policy) did contain a provision allowing the government and the contractor to negotiate for less than unlimited rights when both private and public funds were used to develop software. The FAR policy once again is less divergent from standard commercial practice than is the DoD policy.

### 4. The Test for What Is "Developed" at Public or Private Expense

Given that the extent of the government's rights in software depend entirely on whether software is developed at public or private expense, it is curious that the DoD regulations do not define what is meant by the term "developed."

One respect in which the newly proposed DoD data rights regulations differ from their predecessors was in attempting to define this important term. The DoD definition of "developed at private expense" would have required "that completed development [of the software] was accomplished without direct government payment, at a time when no government contract required performance of the development effort, and was not developed as a part of performing a government contract." "Developed" was further defined to require that the software had been not only constructed and used, but "tested so as to clearly demonstrate that it performs the objective for which it was developed."

Industry reaction to this attempted definition was strongly negative. Almost no software would qualify for private development status if such a definition was adopted. It appeared that even if private funds were used to do the development work after the government contract was entered into, the government would claim unlimited rights to it; and if the government insisted that

software be "tested", that too could give the government a "hook" with which to claim unlimited rights.

It is understandable that, in view of Congressional outrage about DoD's data rights policy, there would be some who would think the Department's interests would best be served by taking an expansive view of what "developed at private expense" should mean. But it is equally understandable that the software industry would regard the definition as "confiscatory." If adopted, it would be likely to create substantial disincentives for software firms to do business with DoD. The newly proposed FAR data rights policy is superior to the proposed DoD policy only in not defining the term.

## C. The Need For Procurement Regulations That Give DoD the Data Rights It Truly Needs

The previous section has pointed out that in a number of respects DoD's data rights regulations claim broader rights for the government than the software industry may be willing to live with. From this, the reader might get the impression that the only respect in which the author would recommend substantive changes in the regulations would be to trim back somewhat on the government's claim of rights so as to increase industry incentives to deal with DoD. That is not so. There are a number of respects in which the current DoD regulations may confer on DoD fewer rights than the government might need. How the proposed FAR deals with these issues will also be discussed below.

### 1. Defining Unlimited Rights to Include the Right to Prepare Derivative Works

The current DoD FAR SUPP definition of unlimited rights, both in the policy and contract clause provisions of the procurement regulations is silent as to whether the DoD will have the right to prepare derivative works when it has unlimited rights in software. The current definition speaks only of rights to "use", "duplicate", and "disclose" such software. Derivative works rights are particularly important as to software because maintenance, enhancement, reuse, translation, rehosting, and retargeting are all dependent on having a derivative works right. Thus, if DoD believes that preparing derivative software is important, it would seem prudent to make explicit the DoD's claim to a derivative works right. The proposed revisions to the DoD FAR SUPP fail to rectify this problem.

The proposed FAR, by contrast, provides a more precise definition of "unlimited rights" and includes a right to make derivative works. The argument that DoD's unlimited rights includes a derivative work right despite the silence of the regulations is considerably weakened if the broader FAR definition is adopted while DoD's definition stays the same.

## 2. The Special Works Clause

When DoD wants to take a direct ownership interest in a work prepared for it by a private contractor, the DoD FAR SUPP directs that the "special works" clause be used in the development contract. The clause in effect claims a direct copyright for the government under the copyright "work made for hire" doctrine. This "special works" clause has been used in a number of DoD software development contracts. Indeed, it appears that a deviation would be required to attempt take a copyright interest in any other manner.

The problem with use of the special works clause for this purpose is that the copyright law specifically prohibits the government from taking direct ownership rights in copyrighted works. See 17 U.S.C. sec. 105. The legislative history of this section reflects that Congress considered the issue of copyright ownership of works prepared for the government by contractors and decided that while agencies could decide to permit contractors to retain copyrights, the government was not to get a direct copyright ownership in works prepared for it.

Copyright law permits the government to own copyrights only by assignment, bequest, and the like. Taking a copyright as if the work was "made for hire" is not the same as taking a copyright by assignment or bequest. What the "special works" clause will be effective in doing is precluding the contractor from claiming any ownership rights in the software. If the Defense Department wishes to obtain a copyright in software, it would be well-advised to adopt a strategy similar to that adopted by NASA and that proposed under the new FAR.

The practice at NASA when ownership and control of software is needed has been to require contractors to obtain copyright protection in the software and then to assign the copyright to NASA. Because Section 105 permits the government to own copyrights by assignment, the NASA policy seems to be consistent with the letter, if not the spirit, of Section 105.

The recently proposed FAR has a somewhat more complicated approach to the "special works" problem than does the NASA policy. Under the allocation of rights provision of the FAR special works clause, the government claims four things: (1) unlimited rights in all data (which includes software and technical data) delivered under the contract and in all data first produced in performance of the contract, (2) the right to control the contractor's exercise of claims of copyright in data first produced in performance of the contract, (3) the right to require the contractor to obtain and assign copyrights in such data, and (4) other rights to limit the contractor's right to control release and use of data developed under the contract. If ownership and control of certain software is what the Defense Department thinks it needs, the Department would be well advised to pursue a strategy similar to that reflected in the new FAR.

## 3. Four or Five Minimum Rights?

The newly proposed FAR would give the government one additional mimimum right in privately developed software over the four that the current and proposed revised DoD regulations would provide. The fifth mimimum right would give the government the right to disclose or reproduce

software for use by support contractors or subcontractors, subject only to the latter agreeing to abide by the other restrictions that bind the government in its use of the software. The failure of the DoD FAR SUPP to claim this fifth mimimum right may be interpreted as a decision to reject this right. The loss of this fifth mimimum right may impede the ability of DoD to have other firms assist in the maintenance and enhancement of its software.

### 4. Unlimited Rights in Non-Deliverables

It is standard DoD policy to claim unlimited rights for the government in all software developed with public funds, regardless of whether the software is required to be delivered under the contract or not. Disputes have occasionally arisen when a contractor has refused to deliver -- or at least refused to deliver for free -- software developed under a government contract but not deliverable under the contract. Although DoD policy permits the insertion of a deferred ordering or a deferred delivery clause, in practice this seems rarely done. The newly proposed FAR policy would make a deferred ordering clause a standard feature in government development contracts. This would greatly facilitate acquisition of non-deliverables.

## D. The Need for Defense Department Data Rights Regulations That Are Consistent with the FAR Data Rights Regulations

The 1985 DoD Authorization Act granted the Defense Department authority to issue a set of procurement regulations governing the "legitimate proprietary interest of the United States and of a contractor in technical or other data." (See 10 U.S.C. sec. 2320.) However, the grant of authority explicitly states that Congress intended that these DoD regulations should be a "a part of the single system of government-wide procurement regulations as defined in section 4(4) of the Office of Federal Procurement Policy Act." The OFPP Act, at section 4(4), also emphasizes that there shall be a single system of government procurement regulations.

Even more significant is that section's limitation on the authority of individual agencies with respect to supplementing the FAR. Supplements "shall be limited to (i) regulations essential to implement government-wide policies and procedures within the agency and (ii) additional policies required to satisfy the specific and unique needs of the agency." Thus, the pertinent statutes appear to confine the authority of agencies to adopt different policies than those contained in the FAR. To adopt a different policy, it seems that an agency must show that this policy is necessary to carry out the specific and unique needs of the agency.

Although there may be some respects in which the special mission of the Defense Department would require DoD to have a somewhat different data rights policy than other federal agencies, it seems unlikely that the DoD's data rights policy needs differ so substantially from the needs of other federal agencies that a completely different data rights policy is justified for DoD.

For DoD to have a completely different policy than the FAR would seem to run counter to the apparent Congressional intent reflected in three separate statutory provisions (the OFPP Act, the

DoD Authorization Act, and the Competition in Contracting Act). It would also seem unwise to have two different data rights policies on purely practical grounds. Intragovernmental exchanges of software (e.g., NASA to DoD), will be impeded if the application of different sets of rights and different definitions of key phrases depends on which agency let the development contract.

The inconsistency of the DoD FAR SUPP (current and proposed) with the proposed FAR data rights policy is virtually complete. The two sets of regulations do not even define terms in the same way. The DoD FAR SUPP definition of software excludes software documentation; the FAR definition includes it. The DoD FAR SUPP definition of unlimited rights makes no reference to derivative works rights or to public performance or public display rights, whereas the FAR definition includes all three.

Not only do both sets of proposed regulations appear to differ in the extent of the government's rights when software is publicly funded (the FAR's definition being by far the more generous to the government); they also differ as to the extent of the government's minimum rights when software has been developed at private expense. DoD fails to claim the fifth minimum right provided by the FAR -- that which gives the government the right to sublicense to support contractors.

A clause-by-clause analysis of the two sets of data rights regulations reveals that there is not one identical, or even nearly identical provision common to both. Thus, the DoD policy would completely supplant and not merely supplement the FAR, which is not only contrary to Congressional intent, but undesirable from a policy standpoint.

## Conclusion

The proposed FAR data rights regulations present a clearer and more concise and comprehensible regulatory scheme than either the current or proposed DoD regulations. The proposed FAR is also more compatible with standard software commercial practices and provides more incentives for industry to make their best technology available to the government than the DoD policy, while at the same time giving to the government a number of rights that even the DoD needs to fulfill its special mission. In addition, both statutory and policy reasons support having a uniform set of federal data rights regulations. For these reasons, it would be desirable for the Department of Defense to adopt a data rights policy, such as that reflected in the proposed FAR.

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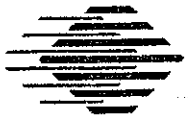

Software Engineering Institute

# Adequate Planning for Acquiring Sufficient Documentation about and Rights in Software to Permit Organic or Competitive Maintenance

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**Technical Memorandum**
**SEI-86-TM1**
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# Adequate Planning for Acquiring Sufficient Documentation about and Rights in Software to Permit Organic or Competitive Maintenance

*by*

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# Adequate Planning for Acquiring Sufficient Documentation about and Rights in Software to Permit Organic or Competitive Maintenance

**Pamela Samuelson**

**Abstract.** Both the DoD and industry have significant concerns regarding maintenance and enhancement of software. The DoD wants to be certain it will be able to maintain and enhance software, and where cost effective, to compete maintenance of software. Industry wants ensure that its proprietary interests will be adequately protected. This paper will explore possible ways in which both groups' interests might be satisfied.

## Introduction

The Department of Defense (DoD) is a major consumer of software. This software is used as a vital component of many systems ranging from those which perform relatively simple functions, such as intra-office communications and word processing, to sophisticated software which is embedded in major weapons and defense systems. The procurement of software is an ongoing rather than discrete event. This is because software must be maintained, and, as needs change, enhanced.

Maintenance and enhancement of software is often a problematic and expensive undertaking. As a result of issues arising under the copyright laws and DoD acquisition regulations, as well as other practical problems, the DoD quite often finds that it does not possess adequate documentation, software tools, and/or intellectual property rights to perform necessary maintenance and enhancement functions, either organically or through competitive reprocurement. As a result, the DoD may be left in the position of having to return to the original contractor whose possession of needed documentation and/or rights puts the contractor in a sole source position as to DoD maintenance and enhancement needs. This, of course, is a position DoD would prefer to avoid, for both economic and political reasons.

This paper explores the legal, regulatory and logistical problems related to software maintenance and enhancement. Some potential solutions for acquiring sufficient documentation and intellectual property rights to allow for organic and/or competitive reprocurement for maintenance and enhancement are offered.

## A. The Hybrid Character of Software

To begin, it is important to understand the hybrid nature of software. Software in its machine-readable form has some characteristics of hardware and some characteristics of technical data. This hybrid character has made it difficult to categorize exactly how software should be acquired, and then maintained after acquisition: should it be treated like hardware or like technical data, or as a distinct item altogether? This section is intended to explore ways in which this hybrid character may affect planning for software maintenance and enhancement.

## 1. Software/Hardware

Software is like hardware in that it causes machines to do things. Software is in fact merely a replacement for hardware components that could otherwise perform the same function. Software is often embedded in hardware and part of an overall hardware system. Like hardware, software can often serve as a tool for creating other items, including new software. And like hardware, software will require maintenance work from time to time to operate properly, although the type of maintenance which software requires, such as fixing a "bug" or making an enhancement, differs in many respects from the more traditional forms of maintenance required by hardware.

Software is unlike hardware, however, in many other ways. Software is, for example, less difficult and less expensive to replicate than is hardware. Once the first copy has been produced, software can be almost endlessly replicated at little cost regardless of how complex the code is. One of the consequences of this is that the government tends to think that additional copies of software ought to be deliverable at a very low cost, whereas industry, which is concerned about recouping its research and development costs, regards additional sales at higher price levels to be necessary to make the software industry viable. Because of the ease of replication, industry representatives often regard the sale of software as more akin to the sale of a production facility rather than the sale of a single product (as if one bought a General Motors factory when one bought a truck produced by GM). Another consequence of this low-cost replicability is that the software industry, for the most part, tends to make its products available only on a highly restrictive licensing basis, rather than selling copies outright.

Another important difference between software and hardware is that software may be subject to a very lengthy lawful monopoly period (i.e., the approximately 75 year period of a copyright) as well as being held as a trade secret, whereas hardware is likely to be subject to a much shorter monopoly (i.e., the seventeen year period of a patent) and most often cannot be held as a trade secret since reverse engineering of the hardware would likely reveal any "secrets" contained therein. Quite often, in fact, hardware is either not patented at all or only subject to partial patent protection. Patents are usually difficult to get because of the high standards of invention that must be met, whereas copyrights are relatively easy to obtain. Hardware, unlike software, cannot be copyrighted at all. Moreover, software, if copyrighted, will also be subject to strict limitations on the rights of the user to make derivative works from the software. Hardware, even if patented, is not subject to similar limitations.

The main point here is that because of the great breadth and length of the copyright monopoly on software, it will be much harder to get competition as to software reprocurements and maintenance than as to hardware. A consequence of this is that it is even easier to get "locked into" a sole source position as to software than as to hardware. Because the government is becoming ever more dependent on software, this should be a serious concern.

Also, because software engineering is a discipline which is still in the early stages of its development, it is generally more difficult to specify how software should be developed for particular functions and to estimate the costs and development schedule for it. Software is also virtually

"invisible" as compared with hardware, which means that it is more difficult to detect if someone delivers very similar or nearly identical software on a second development contract. Further "invisibility" means that it may be more difficult, as a general matter, to detect defects in software or to know how to fix them once the defect is known. Again, because software engineering is a developing art, software is likely to contain a lot of undetected defects that will need to be corrected while in the user's possession. Also, unlike hardware, software is, in general, readily changeable; new capabilities can be added without substantial additional costs. All of this tends to make software maintenance and enhancement a much more substantial part of software life cycle planning than may be the case with hardware.

### 2. Software/Technical Data

Software and technical data are similar in that both are recorded information. They are also alike in that both are often held as trade secrets, and licensed under restrictive conditions, rather than being sold in the marketplace. Loss of the secrets may undermine or destroy the firm's commercial advantage. Both are also capable of being claimed as unpublished copyright material. Both involve modest production costs in themselves once the technology they embody has been developed. Both are difficult to price with any precision.

Because the material costs are low (i.e, what it costs to do a drawing on paper, what it costs to make a second copy of software), the government often thinks the price ought to be low. Because it is the valuable technology that they embody that the firm wants to protect and exploit, industry tends to price them high. With both software and technical data, crucial information necessary for maintenance or enhancement of the item to which they pertain may not be readily apparent from examination of the paper or disk; rather it may be stored away in the memory of some engineer who designed it. Ongoing service contracts are sometimes necessary to be able to gain access to that type of expertise.

Where software differs from technical data is in being an "end item" in itself. Software is a product that will perform machine functions, whereas technical data is merely information about a product. As an end item, software will be more likely to be a product with a commercial market whereas technical data will often not be sold or licensed to anyone but the government. When altered, software will perform differently, as compared with technical data which will simply reflect a new configuration. Software also requires an environment of equipment and other software to be effective.

## B. Getting Adequate Rights and Documentation to Maintain and Enhance Software

The DoD has been experiencing some difficulty in acquiring sufficient rights in software and software documentation to enable it to maintain or enhance software, either in-house (commonly referred to as "organic maintenance") or by private firms through competitive bidding. This section discusses some of the reasons underlying these difficulties.

## 1. Getting Rights to Modify

In contrast to the beliefs of many who have addressed DoD's software procurement problems, the acquisition of the rights necessary to modify software is not a current software licensing problem of the Defense Department. While many other buyers or licensees of software are experiencing difficulty in negotiating with software firms about whether or not they or persons whom they authorize can modify software, this does not seem to be DoD's problem. The DoD procurement regulations require that in all software acquisition contracts the government must get the right to modify the software.[1] Government lawyers, on the whole, tend to think that this means that even when a contract between the government and a software contractor is silent about modification rights, the standard data rights clause will be construed by a court to be incorporated into the contract under the Christian doctrine.[2] On the other hand, though, some DoD personnel seem to believe that if prime contractors negotiate away the government's right to modify software in dealing with a subcontractor, the government would be bound by the prime's action. This may not in fact be so, although the law is uncertain in this area.

If, instead of relying on the DoD standard data rights clause, the government were to rely on the copyright law as a basis for obtaining rights to modify software, the government might have some serious difficulties. Copyright law regards a modification of copyrighted software as the creation of a "derivative work" for which one would need the permission of the copyright owner.[3] Although there is a limited right to modify software under Section 117 of the copyright law, the right is so limited as to be virtually nonexistent (1) because only "owners" of copies (and not licensees) have such rights, and (2) because modifications are only permitted to the extent they are created as an "essential step in the utilization of a computer program in conjunction with a machine." One court has interpreted this to mean that modifications are only permitted if the program won't execute as is.[4] Because copyright law currently offers such limited rights to modify software, it is important that DoD has made modification rights part of the package of minimum rights that it always gets in software.

## 2. Getting Adequate Documentation To Make Modifications

Getting adequate software documentation seems to be the major software maintenance/enhancement problem the Defense Department is currently having. Many of DoD's difficulties seem to fall within one of the following categories of problems:

(a) companies being unwilling to give their source code or other proprietary information to the government at any price or under any conditions;

(b) the need to be farsighted enough to ask for delivery of all the documentation needed to enhance or maintain a system;

(c) the need to supervise the delivery of documentation to insure that everything was delivered that should have been delivered;

(d) the need to supervise the attachment of restrictive notices to software; or

(e) difficulty in comprehending the documentation delivered because of its complexity or turgidity.

There seems to be general agreement among DoD personnel that steps need to be taken to remedy this situation. Some are hopeful that solutions can be devised that would create greater incentives for industry to voluntarily cooperate with DoD in its efforts to get better documentation for maintenance purposes. Some worry that punitive approaches could enhance already strong disincentives to cooperate with the government in this respect. The possibility of the government entering escrowing agreements whereby needed documentation is placed into escrow with the government to have access to the documentation on an as needed basis upon the meeting of some certain specified condition(s) precedent is a potential solution which holds significant promise. Such arrangements have been used with a large amount of acceptance and success within private industry.

### 3. Getting Sufficient Rights In Software And Documentation To Get Competition As To Software Maintenance And Enhancements

Whether the government can get competition in software maintenance and enhancement contracts seems largely to turn on whether the government has ownership of or unlimited rights in software and its associated documentation, or whether the government has only restricted rights as to the software and limited rights as to the documentation. If the government has ownership or unlimited rights, getting competition in software maintenance/enhancement contracts appears to be relatively easy. If instead the government has only restricted and limited rights, it seems that getting competition is very difficult. Defense Department personnel generally report little success in getting restricted rights software competitively maintained.

As the DoD regulations are presently written, while DoD virtually always has rights to modify software, it does not automatically have rights to sublicense the modification right to others. That means that getting competition as to maintenance and enhancement of restricted rights software will only be feasible if the software's owner will agree, which he need not. If he will not agree, DoD will either have to do the modifications itself or hire the original firm to do the maintenance on a sole source basis.

Because many software companies may wish to have sole source maintenance contracts with DoD, their incentives to agree to competitive maintenance arrangements are minimal. It seems that the best, and perhaps only time there may be any opportunity to get such agreements to allow competitive maintenance is during the original competition when the development contract is let. For this reason, it seems imperative that DoD personnel involved in software acquisition be as well trained and prepared as possible to recognize DoD's maintenance and enhancement needs so as to increase the probability that they will be able to secure favorable arrangements at this time when DoD's leverage is at its peak.

## C. Maintenance Needs For Things Used In Performance of Government Contracts: Software Tools and CAD/CAM Programs

Documentation is often not the only thing needed in order to maintain or enhance software. Access to software tools and/or CAD/CAM programs may also be needed to do maintenance and enhancement work. Indeed, because of the tremendous commercial value of software tools and CAD/CAM programs, as well as the usually steep development costs, it may be even more difficult to persuade industry to make these valuable items available to the government than it would be to persuade them to part with software documentation. In addition, industry may be particularly sensitive about government proposals to license competitors to make use of these valuable technologies since these items will often be a part of the companies' competitive edge in the market place.

### 1. Software Tools

Software tools are a set of programs that may be used in the production of other programs. Software tools commonly include editors, compilers, and debuggers, among other things. The application software produced by the tools could be anything from the guidance system of a missile to an inventory control program. Much of the expensive software the government buys is software which is expected to be modified over time. For example, satellite monitoring systems must be revised whenever a new satellite is launched. In order to modify application software in an optimal way --and in some cases, in order to modify it at all -- it may be desirable or necessary to have access to the software tools that were used to create the program in the first place.

Even if the government's procurement personnel have the foresight to try to bargain to obtain rights in software tools, the company may be extremely reluctant to grant anyone -- let alone the government (which is widely perceived by industry to be unable to protect commercial secrets) -- to have a copy of the software tools, or even to have access to the tools. A software producer's tools may be perceived to be the major factor in the company's competitive edge in the industry. In addition, the development of such tools often requires a substantial inventment on the part of the company, an investment which the company, understandably, expects to be able to recoup. Consequently, making such items available to the government is often a highly charged subject. Indeed, for the government to be able to make any deal to get proprietary software tools is often thought a remarkable event.

One potential approach to this problem, as was also mentioned in the discussion regarding documentation above, would be for the government to enter into an escrow agreement with the developer. An escrow arrangement could be structured so as to allow the government access to needed tools and other programs, upon the meeting of some specified condition(s) precedent, while still protecting the company's proprietary information. Moreover, such an approach would be consistent with normal commercial practices.

Another potential approach to this problem would be for non-governmental third parties to enter into licensing arrangements with the software tool producer (assuming that the company would

license anyone) on more restrictive terms than government procurement practices would allow. The government could then allow this third party licensee to do the maintenance/enhancement work. This may not be a viable solution in some instances, however, since there seems to be a strong preference, if not a clear policy, for DoD to do "organic" maintenance/enhancement work for all weapons system software and weapons related software. It also seems that many companies would not license proprietary software tools to anyone. In these cases, however, the escrow approach might still be available.

Further, it should be noted that those software tools which are made available to the government or to third party maintainers are likely to be "older", less valuable technologies. The government may often have to be content to use such older technologies if it wants to have unlimited rights in software tools. If DoD's priority is to get the best technology, using old tools doesn't seem to be desirable. If DoD's priority is to be able to do all maintenance and enhancement organically, then having rights to old tools is better than having rights in none.

### 2. CAD/CAM Programs

Increasingly, industries are using computer aided design/computer aided manufacturing (CAD/CAM) programs to design systems of many sorts, as well as to manufacture them. This seems to be especially true with regard to the aircraft industry. Because aircraft tend to be rather expensive systems and systems which require more than a modest amount of maintenance and enhancement, both as to software and hardware components, there is growing concern within the Defense Department about getting access to and rights in the CAD/CAM programs used to design the systems initially. Access to these programs may be essential to do maintenance and enhancement work for the system. The companies that have developed them may be unwilling or at least very reluctant to give the government any rights to them, or to authorize third party maintainers to have access to them because of their great commercial value, and high development costs. This, therefore, is another area where use of escrowing agreements might prove a useful way for the government to gain access to the technology necessary to fulfill its maintenance and enhancement requirements. Arrangements providing for access to such tools, rather than actual physical possession of them, are often more acceptable to industry.

## D. Other Problems With Getting Delivery of Adequately Supportable Systems

### 1. Different Interests Of Buyers and Maintainers Within the Government

There also appears to be some structural problems internal to the Defense Department that may make adequate planning for software maintenance and enhancement difficult to achieve. Major weapons or communication systems acquired by DoD may include complex software components. These systems may also require significant and complex software systems to support the major systems. If the command which purchases the system is not the command which will

use, maintain, or enhance the system, it may not be aware of the extent of software documentation that will be needed to use, enhance, or maintain the software, and it may not be as sensitive to the need for supportability of the software as the using or maintaining command might need it to be. Although there are some structural mechanisms within DoD that are intended to provide opportunities for communication about such matters, that may not always work as successfully as DoD would wish. This could be a contributing cause toward the software maintenance and enhancement problems DoD has encountered.

## 2. Sole Source Maintenance As a Habit

From procurement personnel's point of view, if a company has built a complex piece of software for DoD, and it's a good piece of software, that company will likely know that software better and will be able to maintain it better than any other company, even if the other company gets the source code. That software engineering is still in fairly primitive stages as an engineering discipline makes reliance on the original developer to do maintenance work often seem the most expedient route to take. The developing company will have a better idea of how to avoid the problems that enhancing one section of a program can so often create in another part of code. Theoretically, the developing firm will be able to do the job faster, more reliably, and more cheaply than a competitor because they won't have to be brought up to speed on it, and if it's a good piece of code, then the developing company may be thought to deserve to reap some more rewards. Besides, procurement personnel may be wont to think, we already know those guys and they do a good job for us. Quality and quickness count for something; money isn't everything. So why not deal with that company instead of having to go through a long drawn out competition process? Over time, the original developer may become more and more confident of its position as the sole source for maintenance, and may increase the price for its services accordingly. It may thus be difficult for the government to break away from sole source maintenances no matter what the cost.

If one adds to this set of already described structural disincentives to adequate planning for software maintenance and supportability the fact that procurement personnel are often not well trained about software, system lifecycles, or data rights, one can see that the structural problems internal to the Defense Department may be significant contributors to software maintenance problems. It takes considerable sophistication and experience with major systems and what it takes to support them to plan for system supportability. Adequate planning may be made additionally difficult because at the time a development contract is let, the software for the system will often not yet be in existence, but only in the preliminary planning stages, and supportability of the software system will likely not be easily plannable until after the system is more fully developed.

It is perhaps an obvious point that the structural problems internal to the Defense Department create opportunities in software maintenance and supportability contexts for industry to charge very large sums of money for work or rights that could have been purchased more cheaply had they been bargained for at the early phases of the contractual arrangement. It is often in the industry's interest to take advantage of these opportunities when they arise.

## E. Some Recommendations About Licensing Problems Relating To Maintenance and Enhancement of Software

This article has explored various problems and concerns related to the maintenance and enhancement of software acquired by DoD. The need for rights to modify, and the need for access to documentation and software development tools has been discussed at some length. While the acquisition of modification rights was found not to be a major problem for DoD, serious difficulties with respect to the acquisition of, or access to technical documentation, software tools and CAD/CAM programs was discussed. Some potential solutions to these concerns have been suggested.

The primary problem areas which have been identified herein include:

1) The need for DoD to develop arrangements whereby companies will allow it access to commercially valuable software development tools and technical documentation the contractor would not be willing to give up physical possession of, and

2) The need for DoD planning and procurement personnel to be aware of DoD's maintenance and enhancement needs as they relate to software development tools and to be alert to strengths in DoD's bargaining position in this regard prior to the actual awarding of a contract.

The following set of specific recommendations are offered for consideration as possible solutions to the maintenance and enhancement problems discussed in this article.

### 1. Getting Adequate Documentation and/or Software Development Tools

(a) Consider entering into escrow agreements whereby documentation is placed in the hands of a third party with the documentation to be released for use by the government only upon the meeting of certain specified conditions as another possible alternative to deal with maintenance and enhancement problems.

(b) Develop a better, more specific, more standardized set of specifications about what documentation must be delivered to DoD and with what rights.

(c) Decide upfront what arrangements the government wants or needs to make about who should do the maintenance or enhancement work. For reasons other than merely cost, the government may need to do the maintenance in-house. How much rights and how much data the government needs from a contractor will in large measure depend on this decision.

(d) Assess the relative costs of acquiring different levels of rights and of sole source, internal or competitive maintenance over time so that cost-effective choices can be made upfront. Recognize that sometimes sole source maintenance will be cheaper than acquiring all the rights and data needed to do the maintenance.

(e) Insist that procurement personnel involve both the using command and the maintaining

command in the supportability planning, perhaps even getting engineers from these latter commands to sign off on the system.

(f) Train procurement personnel about software life cycle needs, about data rights, and about software documentation as regards supportability needs.

## 2. Getting Sufficient Rights To Enable Competition For Maintenance

(a) Recognize that it may be difficult to impossible to compete maintenance and enhancement of software held as a trade secret by its owner. Assess, to the extent you can, what the long term maintenance needs and costs are likely to be, taking into account what cost savings may be achievable by competition. Remember that it may not be worthwhile to buy rights to compete maintenance.

(b) Recognize that DoD's only chance to get competition as to software maintenance may be when it is initially negotiating the system development contract.

(c) If DoD decides to try to compete the maintenance, it should recognize that it will need to get upfront:

(i) the ability to sublicense the software modification right or a commitment by the contractor to license another company;

(ii) the ability to sublicense its rights in documentation about the software or a commitment by the contractor to license the other company's access to the documentation;

(iii) very detailed documentation; and possibly

(iv) rights in the software tools, or a commitment from the developing firm to license a competitor's access to the tools.

(d) It may be desirable for DoD to develop a standard competitive or maintenance license provision and clause for the DoD FAR SUPP in order to alert contract officers to the need for and the appropriate manner of obtaining rights for these purposes. It seems unwise to rely on the existing definition of "license rights" to achieve this because it refers only to licensing for governmental purposes and begs the question whether competitive maintenance and enhancement are within the scope of the "governmental purpose" language.

(e) To be able to maximize the possibility of gaining agreement for competitive maintenance of proprietary software, DoD should be prepared to make arrangements :

(i) either to name who will be the third party maintainer or define what process will be used to qualify a potential third party maintainer; and

(ii) to promise the developer of the software to put the competitive maintainer under a specific set of restrictions (such as those under which the government operates as to that software).

The government might also want to consider naming the original software developer as a third party beneficiary of the agreement between the government and the third party maintainer as to restrictions on rights so that if there is abuse, the developer can directly sue the maintainer.

## Notes

[1]See DoD FAR SUPP sec. 52.227-7013(b)(3).

[2]See G.L. Christian and Assoc. v. United States, 160 Ct. Cl. 1 (1963) in which the court read a "termination for the convenience of the government" clause into a military housing contract.

[3]See 17 U.S.C. sec. 106(2).

[4]See Midway Mfg. Co. v. Strohon, 564 F. Supp. 741 (N.D.Ill. 1983).