IEEE-USA

Professional Guideline Series:

Intellectual Property and the Employee Engineer

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Prepared for IEEE-USA's Intellectual Property Committee

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Dedication

This work is dedicated to those engineers who help new companies expand through their personal innovation, and in doing so, help keep other engineers employed.

Intent of the Guide

A majority of IEEE members are employed in design, research or other capacities that require creativity and technical competence. The purpose of this guide is to familiarize these readers with the intellectual property issues surrounding their work, and the career implications for creative and inventive individuals. This guide is an intellectual property tutorial for *employee* engineers, and not guidance on inventing and authoring.

About the Intellectual Property Committee

The IEEE recognizes that U.S. engineers have different needs than those of our international members. Since 1975, IEEE-USA has fielded various committees concerned with the career and technology policy needs of the IEEE's U.S. members. IEEE-USA's Intellectual Property Committee (IPC) (originally the Patents Task Force) was founded in response to problems arising from the special relationship between this branch of the law and the creative work inherent in the practice of engineering in the United States.

Queries to the Intellectual Property Committee should be made through IEEE-USA, 1828 L Street, N.W., Suite 1202, Washington, DC 20036-5104. Or visit the committee's webpage at: http://www.ieeeusa.org/committees/ipc/.

About the Author

Orin E. Laney received a BSEE from the University of Maryland in 1974, and an MBA from Brigham Young University in 1980. In his many years of experience as an employed engineer and as a business founder and employer, Laney has encountered intellectual property situations from both perspectives. A member and former chair of IEEE-USA's Intellectual Property Committee, he has written many articles for the IEEE and other publications, and lectured extensively on intellectual property, the engineering profession and entrepreneurship.

A Brief Primer on Intellectual Property

In the most general sense, *intellectual property* refers to intangible or incorporeal property, such as detailed knowledge of a manufacturing process, a really good story embodied in a novel, or a trade name. Although the abstract concept of intellectual property embraces many forms, the law restricts itself to commercially important categories, of which there are four legislatively defined areas—namely patents, copyrights, trademarks, and trade secrets. Each area has its own universe of terminology and case law. The law includes mechanisms for these types of property to be protected, sold and inherited, much as for real property. Because there is no physical property to possess, what may be purchased or inherited is title to and a legal right to exclude others from exploiting the intellectual property. For instance, patent infringement is analogous to trespass on real estate.

In the United States, Federal authority over intellectual property is established by Article 1, Section 8 of the U.S Constitution. Consistent interpretation by the courts has made one point abundantly clear: in the United States, the granting of a patent or copyright has no basis in any theory of moral rights. The actual approach is a rational tradeoff between the desire of the nation at large for books, song, inventions, etc., and the unwillingness of authors, composers and inventors to provide them for free. Congress can implement any legally consistent compromise it deems adequate to reconcile such objectives.

Intellectual property law does not concern itself with ownership of mere thought as a general principle, therefore a consistent feature of the four legislatively defined categories is that each one requires some form of physical embodiment, demonstration to gain status as a legally protectable category. For instance, a novel must first be written or at least dictated onto an audio recording to gain copyright status—it cannot be merely a good tale carried about in the author's head. A trade secret is not just any confidential knowledge of an employer, but must be knowledge actively protected by restriction to appropriate personnel and by other demonstrable means. Trademarks must be in active commercial use to identify goods—they cannot merely be names in a file folder waiting to be registered. Patents are granted only for inventions (machines, manufactured articles, software, processes, or compositions of matter) that are described in such sufficiently concrete terms that anyone skilled in the industry could *practice* the invention with routine experimentation, not for speculation about what result an inventor could or might create.

Engineering in the Context of Intellectual Property Law

The United States achieved technological preeminence on the strength of its entrepreneurial tradition. In turn, success in technology based businesses and the ability to pioneer new industries depends heavily on the existence and fair application of intellectual property laws. Such laws provide the incentive for inventors, artists and authors to make the fruits of their efforts available to the public.

The IEEE's concern with intellectual property springs from the intimate relationship between intellectual property and the profession of engineering. Engineering embraces those technical arts that yield practical benefits for the human race, such as safe bridges, new chemical processes, better television and radio systems, and faster and quieter aircraft. Engineers are professional innovators — prolific intellectual property creators by the very nature of their profession.

Intellectual property law is associated with the value created by engineering effort. Every schematic, each piece of software code, every drawing, diagram and prototype has intellectual property rights attached upon creation. These rights are the legal essence of an engineer's output, for if an actual diskette or prototype is lost, another can always be had. But if the legal rights are lost, the diskette or prototype may be worthless — even if securely in hand.

Employers guard the economic value created by the engineering process as carefully as the output of the manufacturing process itself.

Just as manufacturing employees cannot stuff their pockets with product to keep at the end of the day, engineers are proscribed in the use of their knowledge and

creativity. They cannot, for instance, legally give confidential information to competitors. Even in the complete absence of any formal agreements between engineers and their employers, courts will generally hold that:

1) confidential information and inventions or other creations made during the course of employment as a normal part of job duties belong to the employer;
2) inventions made by the employee off the job, using the employee's own time and materials, will generally belong to the employee (absent fraud, related in-plant work of which the employee might be aware, or other special circumstances); and
3) inventions not related to work duties, but created with some nontrivial use of the employer's time, funds or materials still belong to the employee, but the employer has limited rights to exploit the invention without payment of royalties or other compensation.

These well established principles of common law are called *shop rights*. The legal doctrine of shop rights reached its greatest expression during the industrial revolution of the 19th century. Today, few attorneys consider common law to be adequate for the needs of modern technology-based corporations. For instance, no common law barrier exists against an employee creating job-related inventions at home during nonworking hours—without use of the employer's confidential information, time, materials, or funds, and selling them to the highest bidder.

Pre-Invention Assignment Agreements

Technology-based industries dependent upon creative employees explicitly substitute private agreements tailored for individual business needs in place of the general and loose controls of common law. The private agreement will expressly provide for assignment of inventions (or other intellectual property) to the corporation. Because it will be signed at the commencement of employment, before any work is performed, such invention clauses are known as *pre-invention assignment agreements*. Acceptance of such agreements is a nearly universal requirement of employment for engineers, research scientists and others hired primarily to design, create, invent, or discover.

The generic term, *pre-invention assignment agreement,* is an increasingly inadequate description of the scope of employment agreements. Many agreements now recognize that other forms of engineering endeavors are often as valuable as hardware design, and claim all forms of intellectual property, especially software. Keep this in mind while reading this guide.

Often, we see the word *invention* and think *patent.* But the word *invention,* as used in a pre-assignment agreement is a legal term with wider reach. The subject matter covered by this term is far more than the special case of patentable inventions, for it includes essentially all creative output, including the unpatentable, mundane and trivial. Even a total lack of patentable subject matter has no effect on the scope and validity of an employer's claim.

Although the scope of a pre-invention assignment agreement certainly includes patents and patentable creations, the basic purpose is to ensure that all intellectual property generated in the course of the company's business is clearly understood to belong to the company, and to provide legal recourse when the terms of the agreement are breached.

Implications of Agreement Terms

The right and duty of employers to obtain adequate protection is indisputable. However, it is imperative for employee engineers to understand the scope and implications of the covenants they agree to. The importance runs deeper than the ordinary duty of any citizen to understand documents they are asked to sign. An employment contract is not like an appliance warranty — it defines the terms of your livelihood. In most states, the only constraints on what an agreement can attempt to claim are the outer boundaries of what courts are willing to enforce.

One-sided, overreaching agreements might never be an issue for a hypothetical engineer who never leaves an employer to work elsewhere and is never creative outside of working hours. As a group, however, engineers enjoy high job mobility. They are prolific starters of new businesses, often have hobbies related to their field, and some moonlight and consult on the side. Their technical orientation sometimes fosters a disdain for legal formalities, leading many to forget the contents, and even the location of the documents signed when starting employment.

Experience has demonstrated that unquestioning acceptance of assignment agreements is a trap for the unwary. Innovative employees will do well to remember that their pre-invention assignment agreement may require that:

(1) all inventions or discoveries, patentable or not, and whether related to the employee's job responsibilities or not, be promptly disclosed in writing to the corporate counsel;

(2) the company shall be the sole arbiter of whether said invention or discovery falls within the scope of the agreement; and

(3) the employee must assist in securing any intellectual property rights without additional compensation, even beyond the termination of employment. Some agreements include a "trailing clause" that continues to claim job related inventions for a period after the end of employment.

Tremendous variations between assignment agreements exist. But two broad philosophies are generally in use. The *Massachusetts Model* is so called because it is prevalent in the northeastern United States. It was developed toward the end of the industrial revolution as a response to shop rights. Agreements written on this model tend to imply that the intellectual life of the employee is company property. Clearly, the terms of an overreaching assignment agreement can impact heavily on an individual when a former employer challenges the rights to his work. The agreement can be a tool to quash new competitors or prevent you from taking a job with a competitor.

The Legislative Response

Big companies sometime grow from little companies, and little companies are often started by individuals who leave big companies. This cycle of innovation and renewal is fundamental to a healthy market economy. To foster this cycle, individuals require the same protections for non-work-related intellectual property that employers enjoy for work-related creations. In 1977, Minnesota formalized this concept with a law limiting the enforceable terms of pre-invention assignment agreements. The *Minnesota Model* adopts the philosophy that while the employer should enjoy protection, it should not come at the expense of today's employee to become tomorrow's new employer.

The State of California followed in 1980, by implementing protection for its famous entrepreneurial culture. As of this writing Utah, Washington, North Carolina, Kansas, Delaware, and Illinois have also promoted new business formation by means of similar laws (see Appendix B). Significantly, these states have achieved the benefits of these laws without discernable adverse effects upon employers. However, these laws create a potential administrative nuisance for businesses with employees in multiple states. The United States is virtually the only industrialized nation that has not implemented a uniform pre-invention assignment agreement policy at the national level.

Employment Strategies for the Creative Individual

The state laws limiting pre-invention assignment agreements are not in and of themselves sufficient protection for engineers working in those states, and are, of course, no help at all for those working elsewhere. Although truly overreaching terms in employment agreements are of questionable enforceability in the courts, few individuals have the temperament and resources to overturn or resist an unfair claim through litigation. The fundamental defense of any engineer against poorly drafted or ill-considered employment agreements is to not sign them. Beyond that—even when an engineer is already bound by an overreaching agreement, other defenses can be brought into play.

Following are various strategies for dealing with intellectual property assignment agreements. Although written primarily for engineers in private industry, others such as applicants for faculty positions, graduate students seeking research or teaching assistantships, and government employees can find application as well. Independent consultants should understand the points made and adapt them to each consulting situation. The following six steps assume that you are looking for a job. In truth, you should have started preparing to take a new job even before you *accepted* the job you are about to leave!

Step One: Getting an Offer

As always, the first step is to find a job that appeals to you by the usual sequence of search, interview and offer. Step one is not complete until a written offer of employment is in hand. Verbal offers are notoriously subject to changes of heart, initial sincerity notwithstanding. Refusal to put an offer in written form could be an indication of insincerity or lack of authority.

Without a provable offer, your status remains that of any other non-employee. You can reach an agreement informally in principle, and work out the details later—but remember the legal maxim: *verbal contracts aren't worth the paper they are printed on.*

Translation: if it isn't written, it isn't an offer. *Written* can include handwritten, as long as a corporate officer of sufficient authority signs the offer.

Step Two: Inspecting the Offer

Once a bona fide offer of employment is in hand, request a complete set of the documents that you will need to sign when you begin employment. If the company automatically provides them with the written offer, it's a good sign—though in some instances not all of the documents are provided. Do not accept the offer before receiving and reading the documents, or else make your acceptance conditional. Make the request for documents to the personnel department, not to your prospective supervisor, who does not handle these forms anyway.

The most cogent numerous reasons for this step are:

(1) A written offer of salary, benefits and position is only half of the total offer, namely what the company promises to you. The missing half is what you promise to the company, as specified in the pre-invention assignment agreement and other documents. It is the total offer that you should consider and then accept or decline.

(2) The willingness of a company to show you these documents up front says a lot about the atmosphere you will encounter there. The mentality displayed in handling this fairly trivial request may be indicative of what you should routinely expect if in their employ.

(3) Outright refusal to allow you to inspect the agreement prior to acceptance of the offer is unacceptable, unethical, morally indefensible, and legally challengeable.

In rare instances, a company may refuse to disclose the documents before you are an employee on the grounds that at least some of the contents are company proprietary information. In this case, you should insist on inspecting the documents, but accommodate the company by either signing a nondisclosure agreement before reading, or by reading the confidential documents on company premises.

Policy handbooks also constitute part of the agreement, even if you don't read or sign them. Some companies give an employee handbook to each employee, while others use large and unwieldy binders distributed mostly to management and available for employee inspection upon request. Typical contents cover the obvious, such as prohibition of criminal activities on company premises. The versions mostly reserved for management typically include details about such issues as sick leave and accounting practices. Most companies that pay active attention to their policies choose to provide prospective employees with copies of all appropriate documents at the time of an offer, regardless of a prospective employee's interest or lack thereof.

Step Three: When the Agreement is Unacceptable

If you cannot accept the job as offered, you have an opportunity to explain your rejection of employment as a complaint about the offered terms. You obtained the forms from the personnel department, but offer rejections or complaints should be directed to the engineering department, where they will be most understood and appreciated.

If you want the job, but cannot accept the agreement, nothing ventured means nothing gained. Some circumstances dictate that negotiated modifications are the alternative to refusing the job. Most employers are willing to listen to legitimate concerns, and it may be that the company will respond with a willingness to change the agreement. If the agreement is the largest single objection, this point is your opportunity to negotiate better terms prior to accepting the offer. However, keep in mind that personnel employees lack authority to change documents, are sometimes paralyzed by lack of precedent, and might be unwilling to approach an officer of sufficient authority.

In such an instance, you can mark up the agreement yourself, and submit it before accepting the offer, or as part of your acceptance. If the company now responds, make sure that you negotiate with an officer with the authority to approve your modifications. Responses from those lacking sufficient authority are merely advisory (though the advice may be good). Continued silence is problematic. You can interpret as tacit approval. As such, it creates a presumptive right to use the altered agreement. Inaction due to confusion or continuing paralysis is an internal company matter beyond your control.

If the company files a signed, altered agreement in your folder without comment, they have accepted the altered terms. However, that filing doesn't mean that the employer cannot later require you to sign a new agreement, as a condition of continued employment. Modifications to the original agreement that are not negotiated openly and fairly are unlikely to be incorporated into the new agreement. It is cleaner, wiser, and certainly more professional to either accept or reject the company agreement as offered. Or negotiate openly and up front—so that both sides formally approve any alterations.

Agreements (contracts) offered under circumstances that make it difficult or impossible to refuse acceptance are termed *contracts of adhesion*. Such contracts are generally enforceable to the extent that they are reasonable. However, bear in mind that the ambiguous word *reasonable* is a loaded term in legal discussions. An employee who unilaterally and without notice modifies an agreement may bear the burden to explain the need to do so, especially when all other signers of the unmodified agreement apparently did not have similar need.

By the same token, it is not a sufficient defense for a company that waits to disclose their agreement until the day you start work, to point out that pre-invention assignment agreements are common, or that a new employee should expect them as a matter of course. The point is that agreements vary. The potential presence of overbearing or unusual terms creates the need for prior inspection, and a need for modifications to accommodate individual circumstances.

Step Four: When You Choose to Accept the Offer

If all is in order and the terms are acceptable, feel free to accept the job. However, if you take the job, you have a professional obligation to understand the agreement terms and live up to them. Now is the time to pre-inspect the documents.

When you show up on the first day, you can have the forms ready and completed more thoroughly than would otherwise be possible. Specifically, pay attention to any invitation to list prior inventions for purposes of exclusion from agreement coverage. Here, you are able to protect your personal intellectual property with a prepared list of

excluded inventions. Read the agreement carefully for language that may attempt to limit your rights in subject matter that is not included on your list. If no list is solicited, you still have the right to include one in your file.

Failure to mention an invention on the list does not by itself limit your rights, if other proof of prior conception is available, such as a date of publication, provable disclosure to others (such as your patent counsel), dated notes kept in ink, date on a patent application, etc. Remember however, that disclosure to a party not involved in the development of the invention can be a bar to all foreign patents.

A submitted list is your most important opportunity for declaring subject matter that you consider your own. Unless there are valid reasons for keeping an excludable idea off the list (a duty of confidentiality owed to someone else, for instance), it should be mentioned irrespective of any amount of other proof. Label your list *Inventions Excluded as Conceived Prior to Employment*.

While you should list everything applicable, with a reach commensurate with the company's own use of the word *invention*, pay special attention to things that you might pursue on the side, and especially things that you might eventually use as a basis for generating income. Though hard to predict, give yourself the benefit of the doubt while you have the chance.

The most you owe is a list with each entry sufficient to tag a given idea without actually disclosing details. Do not include any inventions or creations that have already been assigned (for instance to a previous employer), because they are not your personal intellectual property. Mentioning their existence could be a breach of confidentiality. Your list can easily be longer than will fit on the form. In this case, prepare it separately, and put *see attached list* in the space on the form. Keep a copy of your list for your own files. Also, make sure the list bears your name, in case it becomes separated. Don't sign and date anything at home. Wait until everything is signed on company premises.

Step Five: During Employment

Step five is optional. If, during employment, you feel the stirring of an idea that just won't wait, and you feel that you are entitled to the rights, you can either work on it at home in possible violation of your agreement, or you can disclose it to your employer. Remember: In all instances, accord yourself the same care for your personal intellectual property that you owe to the company for theirs. When you must invoke step five it's a good time to review the terms of your agreement. You may even consider the advice of legal counsel.

Where a contemplated invention will clearly belong to the company, one approach to retaining rights is to request modification of your employment agreement. For instance, in a state without a law limiting agreements, your private agreement can still incorporate the terms of a suitable state law by reference. Some employees are in a better position to request modifications after they have some tenure in company, and have proven their value to the organization.

If the agreement itself cannot be modified, it's still possible to request a waiver for a specific invention. Even submitted inventions that are clearly the property of the employer might be given back.

In many instances, an employee cannot discern whether an employee can claim a contemplated invention. But, you need reasonable certainty regarding claimability to

make an informed decision about committing personal time and funds to develop an idea. Employer-claimable ideas become company property — notwithstanding exclusive use of personal resources for development. Also, ideas that might have remained personal property still belong to the company, if company resources are used in development. You can expect only nonclaimable ideas, developed entirely with personal resources, to remain employee property. Yet, many companies offer no guarantees of reimbursement for personal resources used to develop a creation that they later claim unless they agree to it in advance.

One option is to contact corporate counsel and ask whether the general subject area of a proposed invention falls within the interests of the corporation. If an employee determines that the subject matter is claimable, any invention in that area should be disclosed as required by the employment agreement — and upon approval — developed using company time and funds. If the idea is claimed but no activity results, then corporate counsel may be casting too wide a net with regard to the company's active plans. In this instance, the employee can still ask for a waiver or return of rights, as previously discussed.

You have a common law duty of loyalty to your employer that includes disclosure of creations related to your employment duties. The employer has a reciprocal duty of good faith and fair dealing. Even if you have reasonable doubts about your employer's intent, you are still bound to the ethical requirement of loyalty — including candor and honesty — in meeting your agreement terms. However, such doubts do increase the level of vigilance required for protecting your personal intellectual property.

For instance, if corporate counsel refuse to provide guidance on subject matter claimability, it doesn't automatically mean that the company will be unfair. If the company claims all inventions, whether business related or not, there is no incentive to provide this information anyway. However, refusal in a state with limitations on claimable inventions sends a signal that the definition of *company interests* might be contingent upon the inventions potential.

A harsh, but necessary corollary that cannot be overstated is: proceed with caution if you attempt to sell an idea to your employer. Such wariness does not depend upon whether you conceived the idea, applied for, or even received a patent or copyright before taking the job. If it applies to the business of the company that has you on their payroll, the company may presume the idea is theirs.

Including the idea on your list of exclusions when you began employment is an important defense, but the bottom line is that the normal course of employment trades paychecks for ideas. Attempts to go outside this relationship breaches this conceptual arrangement, and does it with parties holding an unusual amount of power over you. Seek the advice and early involvement of an independent intellectual property attorney where such an arrangement is pursued. Remember that corporate counsel is likely the only employee trained in the niceties of property ownership, and is working for the company — not you.

Needless to say, trying to sell any idea to your employer's competitor is even more problematic. In the instance that an employee maintains secondary employment (i.e. works multiple jobs) the same principles apply. A second paycheck and a second pre-invention assignment agreement is a sale of ideas elsewhere. Secondary employment should not be with a competitor unless all parties agree. The best choice of side job will have no direct relationship to the primary employer's business.

Personal projects commonly require workday hours, because that is when suppliers and other merchants are open for business. To avoid shop-right claims or worse, avoid using work facilities for personal projects that you want to retain the rights to. Personal time off is one solution, as is an off-premises lunch hour — but it's often a poor one, considering that personal time during business hours is a scarce resource and not often available spontaneously.

Don't discuss outside projects with your manager — time spent with you is considered use of a company resource. In some cases, events as trivial as running a few pages through an office copier has resulted in upholding an employer's claim. The basic approach is to be knowledgeable, but discreet.

Maintain parity with your company regarding intellectual property protection. It is a matter of applying the same principles of confidentiality to your personal intellectual property that the employer specifies for theirs. Always conduct yourself with the proper respect for the terms of your employment agreement.

Step Six: Leaving Your Job

Finally, step six applies to the task of leaving for new employment.

Rather than leaving your office for someone else to clear out (and possibly scrutinize) on your final day, it is better to quietly remove anything related to personal projects beforehand. Leave a clean desk and complete files on quitting day. Make sure that company material stays put — including customer lists, cost data and other proprietary information. It may be best to hand off sensitive company materials to colleagues a day or more in advance, so you leave little or nothing confidential in your desk.

A former employer cannot claim certain things — for instance, normal growth in your profession. Every engineer is expected to continuously learn during the course of employment. The fact that you learned a generic skill while working for one employer is no bar to using it for others. However, proprietary applications of your knowledge for a former employer must remain confidential.

An employer can't force you to keep working for them, nor can a former employer prevent you from earning a living. While it is normal that a soon-to-be past employer will not like you leaving to work for a competitor, it is difficult to argue that you must abandon the very skills that make you valuable. Even so, circumstances do arise where the courts temporarily deny a competitor access to the talents of a particular worker.

If you leave for consulting, you may find that your former employer is a willing client. Be sure that there are no conflicts of interest with other client assignments. Don't solicit other employees before leaving, and be circumspect about hiring former colleagues or using them as consultants for job-related projects. For both tax and intellectual property reasons, avoid any further identification as a company employee. For instance, checks issued to you should no longer have your old employee or tax withholding numbers, and should be issued as a supplier payment, rather than through the payroll process.

If you intend to become a competitor to your former employer, you may do well to move away. Your former employer will be less likely to pick on a new competitor several cities or a state away as opposed to a former employee who is still calling old colleagues for advice and meeting them for lunch.

Although these six steps outline strategies for specific periods in the relationship between creative employee engineers and their employers, the overriding philosophy to keep in mind is one of mutual respect between the various parties, attention to rights and obligations in both directions, and the benefits for both employees and employers of an atmosphere where creativity can thrive both on and off the job.

Appendix A: Anatomy of a Pre-invention Assignment Agreement

The proper place to begin learning the language of assignment agreements is with your own. Find and read the copy given to you when you took your job. If you can't find it, get a copy from the personnel department. Sometimes it is a separate document, but often it is a clause or set of clauses in a general employment agreement. The generic term *pre-invention assignment agreement* is likely not found in it, but if it refers to inventions, copyrights or intellectual property and was signed when you commenced work, then that is what it is.

The most fundamental clause in any pre-invention assignment agreement is the assignment itself. The scope can be narrow, perhaps naming the areas of subject matter that are claimable, or it can be virtually unlimited. An example of the latter is:

"The employee agrees:

> (a) that all inventions and improvements made, developed, perfected, devised, or conceived by the Employee either solely or in collaboration with others during the Employee's employment by [corporate name], whether or not during regular working hours, relating to the business, developments, products, or activities of [corporate name], or its subsidiaries, shall be and are the sole and absolute property of [corporate name]; and to disclose promptly in writing to [division name]'s Legal Department or to such other person as [corporate name] may designate, such inventions and improvements;".

An example which is both more benign and more comprehensive is:

"In consideration of my employment by [corporate name] and of the salary or wages paid to me, I agree:

> (a) to disclose and assign to the Company as its exclusive property, all inventions and technical or business innovations developed or conceived by me solely or jointly with others during the period of my employment, (1) that are along the lines of the business, work or investigations of the Company or its affiliates to which my employment relates or as to which I may receive information due to my employment, or (2) that result from or are suggested by any work which I may do for the Company or (3) that are otherwise made through the use of Company time, facilities, or materials."

This wording at least acknowledges that an employee can engage in independent creativity not related to job responsibilities or confidential information. Sometimes, though, similar work at the other end of the building, or even at far-flung subsidiaries, of which the employee may be totally unaware can create a presumption that the employee might know about it. It also refers to the quid pro quo — something given for something received — at the heart of every employment agreement.

The clause which typically follows the assignment requires the employee to assist the company in securing the rights to the disclosed matter:

> "(b) At the request and expense of [corporate name], to make, execute and deliver any and all application papers, assignments or instruments, and to perform or cause to be performed such other lawful acts as [corporate name] may deem desirable or necessary in making or prosecuting applications, domestic or foreign, for patents and reissues and extensions thereof, and to assist and cooperate (without expense to him) with [corporate name] or its representatives in any controversy or legal proceedings relating to said inventions and improvements or the patents which may be procured thereon."

As a second example:

> "(b) to execute all necessary papers and otherwise provide proper assistance (at the Company's expense), during and subsequent to my employment, to enable the Company to obtain for itself or its nominees, patents, copyrights, or other legal protection for such inventions in any and all countries."

The second example is explicit that the duty to assist extends beyond employment. The same is also the case for the first example, because no limitation on time was specified. The open-ended wording of the first example may be obvious to an attorney, but can prove a trap for the layperson.

Although both examples of this clause promise that the company will bear the incidental expenses, neither example offers additional compensation for labor required beyond employment. During employment, time spent assisting the corporation is just another job responsibility. Beyond employment with the corporation, uncompensated labor can become a considerable burden. Simple copyright matters may be trivial, but cases exist where complicated patent matters have forced former employees to work free for ten hours or more per week for months. IEEE-USA's Intellectual Property Committee recommends that compensation for former employees be provided at an hourly or daily rate not less than the equivalent of what the former employee received from the employer during employment.

Another common clause is an agreement to keep records:

> "...to make and maintain for the Company adequate and current written records of all such inventions and innovations…." The employer may interpret this clause as requiring you to keep notebook detailing all work.

The agreement typically includes a confidentiality clause:

> "To regard and preserve as confidential all information pertaining to [company name]'s business or that may be obtained by the Employee from specifications, drawings, blue prints, reproductions, and other sources, and not to publish or disclose either during the term of employment or subsequent thereto, without the written approval of [company name] such or any other confidential information obtained by the Employee while in the employment of [company name]."

A more comprehensive, yet fairer wording is found in this example:

> "Upon termination of my employment to deliver to the Company promptly all written and other materials which are of a secret or confidential nature relating to the business of the Company or its affiliates;
>
> not to use, publish or otherwise disclose (except as my Company duties may require), either during or subsequent to my employment, any secret or confidential information or data of the Company or any information or data of others which the Company is obligated to maintain in confidence; and

not to disclose or utilize in my work with the Company any secret or confidential information of others (including any prior employers), or any inventions or innovations of my own which are not included within the scope of this agreement."

Having disposed of these matters, some agreements add incentive clauses. For instance:

"to pay the employee a cash award of fifty dollars upon execution of the employee of application for United States Letters Patent upon such execution or improvement, together with an assignment to [company name]."

The dollar amount in this example is explained by the age of the agreement. Many agreements with low dollar amounts were written in the economic and technical boom following the Second World War. In 1951, fifty dollars could cover a monthly mortgage payment. Today, fifty dollars is likely less than the company's cost to write the check. It is also often less than minimum wage for the time spent by the employee to disclose the invention and assist in securing the rights. More current agreements may offer amounts ranging from the low hundreds of dollars to $25,000 or more.

Many companies do not offer financial incentives on the theory that more rapid promotions or larger pay increases will accrue to productive employees. This strategy also avoids resolution of the often difficult problem of determining the contribution of any given improvement to the company.

An example of a royalty sharing clause is:

"To pay to the employee for each of the employee's inventions additional compensation consisting of a percentage of any income derived by [company name] from any sale of rights in such invention or part thereof, or from any royalties which [company name] may collect from licenses to others, except the sale or license of any invention or part thereof for use outside the United States, on a sliding scale, as follows:

of the first $1000 or part thereof..... 30%

of the next $1000 or part thereof..... 25%

of any further sums in excess of $2000... 20%"

Again, these dollar breakpoints represent an incentive for an earlier generation. In the context of contemporary economics, the employee is essentially always at 20% for any meaningful revenue stream. The clause suffers in other ways. The additional compensation is only for licenses or sales agreements with other companies, not governments, and only within the United States. Restriction to domestic sales is increasingly parochial as the world market matures.

The existence of license agreements depends very much upon the intent of management to make such agreements: inventions and improvements often remain captive within a company to protect a competitive position. The schedule is also inverted with respect to industries where royalty arrangements are created by negotiation. Book publishers usually begin with small or no royalties and increase the rate as up front costs are recovered, rather than reducing it after an initial generosity."

The agreement continues:

> "It is further understood and agreed that [company name] may sell such invention or improvements, or license the manufacture thereof for such price or royalty as [company name] shall in its sole judgement and discretion shall determine, or if [company name] elects to do so, grant royalty free licenses for the use of such invention, or waive future royalties for a definite or indefinite period of time on any license theretofore issued, and that the employee shall have no claim or claims against [company name] except to receive the percentages above set forth of such amounts as [company name] shall collect through sale or licenses of such inventions or improvements."

The employee should assume that any decision to collect or not collect royalties and fees is strictly a business decision that includes the cost of providing the employee's share. Many license contracts use cross licensing or other terms to avoid the trouble of accounting for and collecting payments. Thus, the promised benefits may prove illusory. If a share of royalty or licensing revenue is important to you, and you are offered such a clause, it may be useful to inquire how many employees have received such payments within the last decade, and to get some idea of the amounts involved.

A final type of clause, common in the aerospace and defense communities is:

> "The employee understands that [company name] has assumed and will continue to assume certain obligations with respect to inventions and patents under or by virtue of its contracts with the government of the United States and other customers, and employee agrees that any rights under this agreement are subject and subordinate to any obligations [company name] has assumed or may assume in the future in its contracts with the United States Government and other customers."

Appendix B: State Laws on Pre-invention Assignment Agreements

The following is a paraphrase of elements found in the various state statutes. While the existing laws have many similarities, each state phrases these principles in their own way, will not include every provision, and may include details and nuances not mentioned here. The intent of this appendix is general understanding, therefore the reader should consult the text of the applicable statute, with the assistance of counsel as may be required, for understanding specific cases.

The first item of business in each statute is the basic exception to what an employer can claim:

> "Any provision in an employment agreement which provides that the employee shall assign or offer to assign any rights in an invention shall not apply to an invention that the employee developed entirely on his own time without using the employer's equipment, supplies, facility, or trade secret information."

This fundamental protection is immediately followed by these caveats to ensure fairness to the employer:

> "...except for inventions that relate to the employer's business, or actual or demonstrably anticipated research or development, or result from work performed by the employee for the employer."

Simply limiting the enforceability of agreements does not prevent an employer from proffering unenforceable terms. That is the next task:

> "An employer may not require a provision of an employment agreement made unenforceable under this section as a condition of employment or continued employment."

The lack of penalties for breach of this clause means that it has value primarily as a defense for the employee.

Companies grow and change, enter new business areas, merge with other companies, and otherwise encounter circumstances that require a new or changed assignment agreement:

> "An employer may require his employees to agree to an agreement enforceable under this section as a condition of employment or of continued employment."

Circumstances where the employer gives employees an afternoon or a few days to return a signed agreement are not satisfactory. A requirement for a new or changed preinvention assignment agreement potentially becomes a decision over whether to remain with the employer. The IPC recommends that the employer grant an acceptance period of reasonable length for employees to find other employment. It should at least be commensurate with the period allowed outside recruits for acceptance of an offer.

Ordinary citizens are not expected to know the law in full detail. Thus, disclosure of the statute is often required:

> "The employer must, at the time the agreement is made, provide a written notification to the employee that the agreement does not apply to inventions falling under the exceptions created by this section."

While disclosure of the law is laudable, the ideal time for notification is at disclosure of the assignment agreement, rather than at the time of signature. A common form of notification is to simply provide a copy of the statute.

Next, a statement of responsibility:

> "The employee shall bear the burden of proof in establishing that an invention qualifies under this section."

This statement sets the basic terms of an employee's legal strategy in a dispute. The company is presumed to possess the rights, unless the exceptions created by the statute are demonstrated to apply. The State of Washington adds a further burden:

> "Even though the employee meets the burden of proving the conditions specified in this section, the employee shall disclose, at the time of employment or thereafter, all inventions being developed by the employee, for the purpose of determining employer and employee rights in an invention."

While the duty to disclose even personal creations during employment is ordinary, this trailing clause has ***no time limit***. Outside of Washington State, trailing clauses are left to the discretion of the drafter of the agreement and can be altered or negotiated. Privately drafted trailing clauses (and they are not that common), are for periods typically ranging from six months to two years, *not* an employee's remaining career.

Given that most confidential knowledge from a former employer rapidly becomes stale, indefinite trailing clauses are a classic example of law that creates such a burden in its literal observance that it is virtually designed to be ignored. Yet it still serves as a trap for the unwary.

Illinois includes a statement of what most courts would hold:

> "This act shall not preempt existing common law applicable to any shop rights of employers with respect to employees who have not signed an employment agreement."

Another statement of the obvious is found in Utah law:

> "This act shall not apply to any right, intellectual property, or invention that is required by law or by contract between the employer and the United States Government or its agencies, or a state or local government to be assigned or licensed to the United States."

This statement is legally obvious because federal law preempts state law. Another such statement is:

> "This act shall not apply to an agreement between and employee and his employer which is not an employment agreement."

While these paraphrased clauses are not an exhaustive sum of the provisions of the various states, they are the main ones. The following references are for those interested in the actual statutes. As of this writing, the extant state laws limiting pre-invention assignment agreements are:

California CA Labor 2870 - 2872

Delaware 19 Del.C. s 805

Illinois 765 I.L.C.S. 1060/2

Kansas K.S.A. 44-130

Minnesota M.S.A. 181.78

North Carolina G.S. s 66-57.1

Washington RCWA 49.44.140, 150

Utah UT ST s 34-39-3

Current and additional information may be found at the IEEE-USA Intellectual Property Committee web site (http://ieeeusa.org/committees/IPC/index.html).

Appendix C: Types of Intellectual Property

Patents

When engineers use the word *patent*, they usually mean a *utility patent*, since this category is the most germane to engineering. A *utility patent* is a government grant of the right to exclude others from making, using, selling, or offering to sell an invention of a process, apparatus or composition of matter. There are also design patents, which protect shapes, decorative embellishments and ornamental features. A third category is plant patents, which protect asexually reproduced botanic creations, such as new varieties of flowers or crops.

As part of the tradeoff between the needs of inventors and those of the public, one of the requirements for a patent is that it contain a sufficiently clear description of the invention, so that others skilled in the field of the invention can understand and apply it. Once issued, the contents of the patent are in the public domain (not the patent rights). The legislative intent is to grant to the inventor a limited monopoly right to exclude others from making or selling the instances of the invention, yet enable others to understand and obsolete or improve the invention, hopefully in the form of more patents. By this means, the progress of the technical arts is made as rapid as possible. A secondary benefit for society is that the accumulation of patents serves both as a technology library and documentation of the history of technology.

By law, a patent issues in the name of the actual inventor(s). A joint inventor must actually conceive and contribute some element that is covered in the claims. A technician or other individual who works on the invention under the direction of the inventor(s) is not a joint inventor unless they make an independent contribution. Nor can anyone legally be included as a joint inventor merely as a matter of courtesy or recognition.

Given the technical content inherent in a patent application, the U.S. Patent and Trademark Office (PTO) has its own procedure for registering individuals who wish to act on behalf of inventors seeking patents. One requirement is an adequate technical background. An undergraduate degree in engineering, physics, chemistry, or a similar technical discipline is required, or sufficient equivalent experience. Most attorneys lack this grounding in the technical arts. In fact, this area of law is one of the few where non-attorneys are allowed to practice.

Non-attorneys must pass the same qualifying examination on PTO law and practices as attorneys, and after registration are known as *patent agents*. They perform exactly the same function as patent attorneys in assisting clients to obtain patents, though they cannot bring suit for infringement or otherwise provide legal services beyond practice before the PTO. Thus, the fraternity of patent attorneys and patent agents is a small and exclusive one compared to the legal profession as a whole.

The very nature of a patent is that it is property entitling the owner to sue others for infringement. The labor and expense of doing so is left entirely to the patent owner. Some industries are sufficiently specialized that there is a scarcity of relevant literature, leaving little for the PTO to research. This lack of information makes it possible to obtain patents (not necessarily valid), even for common industry practices within that niche, and to entangle competitors in legal battles for years.

Patents can also be used as a marketing tool. A patent can add a cachet to advertising copy and imply that competitors are old hat or inferior, notwithstanding that a new idea might not be superior to an established one.

They are also used as a negotiating tool for cross-licensing agreements, which may include trade secrets and other *know how*. In some industry segments, licensing income from intellectual property can rival that derived from manufacturing.

Patents are also used as a defensive measure to disclose information without giving it away. The public disclosure created by a patent becomes prior art to any later patent application. In this instance, the patent holder might not choose to enforce the patent rights or prefer to exact only token royalties. Publication in a trade journal or company literature can produce much the same effect at lower cost. However, a patent creates a presence that an obscure journal might lack, and leaves open the possibility of improved license terms if the invention becomes established.

Finally, there are those occasional hardy individuals who labor to make money by patenting an idea and licensing or selling the rights. The difficulties and rewards are beyond the scope of this guide, but the stories of those who have traveled this route are instructive and interesting reading for others who would consider doing so.

Copyright

Copyrights were originally intended to keep publishers from copying each others' books without payment. Many commercially valuable forms of property have managed to shoehorn into this concept, so that copyright protection has been extended to motion pictures and sound recordings, computer software, paintings, architecture, and even decorative belt buckle designs. The laws have been updated to automatically extend copyright protection to new works; therefore lack of a formal copyright notice no longer implies that the work is in the public domain.

The basic concept is that some spark of creativity or originality must be present for copyright protection. For instance, a new column format for a telephone directory may be a protectable element, but the courts have held that an alphabetical list of the actual names, addresses and numbers is not. Code fragments, whose instruction content is dictated by utilitarian considerations, like speed of execution or efficiency such that any software author driven by the same goals will tend to converge on the same sequence, are also not protectable by copyright.

The other basic concept is that only the expression of an idea or function is protected, but not the idea itself. The idea of a spreadsheet is not copyrightable, although a particular choice of screen representation may be. A copyrighted schematic is no barrier to creating a new schematic directly from inspection of equipment, for the ideas embodied in the equipment are not protectable by copyright, and the new schematic is an independent creation.

Decompiling code is an obvious and often used means to discover the workings of software products. The information so gained should be abstracted before application. The use of *clean room* techniques is one formal approach to insulating *ideas* from *expression of ideas*. However, if a new work is created with nontrivial reference to a previously copyrighted one, the new work may be classified as a derivative work. Derivative works are not considered original — considerable originality may have been required and much labor expended. Such dodges as recoding a program in a different language, so that the resulting code bears no obvious resemblance to the original, has not been a barrier to successful infringement suits by the original authors.

Copyrights have long terms of protection compared to patents. The term is the life of the author, plus 50 years. In the case of works for hire (written by an employee or as a paid assignment), anonymous or pseudonym works, the term is the shorter of 100 years from creation or 75 years from publication.

Trademarks

Trademarks are the logos and stylized lettering and regular letters that businesses use as a shorthand identity to associate with their goods (trademarks), services (service marks) and business (trade names). For instance, everybody recognizes General Electric and International Business Machines just by their initials, and the NBC television network by a sequence of three tone chimes. The commercial value of these recognition aids is considerable; thus trademarks have a long history of legal protection.

A trademark can have an indefinite life, if used properly. However, a trademark can be lost if its use is abandoned for a sufficiently long period, or if it is too successful and becomes the generic name for the product or service that it represents, for instance linoleum, cellophane, aspirin, and escalator. While trademarks are often suggestive (but not descriptive) of the products they represent, the strongest are often those that are arbitrary or non-descriptive, such as Apple brand computers.

Trade dress is similar to trademarks and service marks.

Trade Secrets

Trade secrets are the only form of intellectual property that cannot be made public without losing protection. What does and does not constitute a trade secret depends very much on how the secret knowledge is treated and protected, not merely on the fact that it may not be widely known. Consequently, trade secrets may have an indefinite life, such as the carefully guarded formula for Coca Cola, or a very short life depending upon the security precautions taken by the owner.

Once made public, trade secrets cannot be recalled and are permanently lost as secrets, regardless of how the knowledge came to be public. The only recourse is to seek damages and/or criminal prosecution against those responsible, if fraud, carelessness, or malicious intent can be proven, and appropriate treatment of the knowledge as secret information can be demonstrated.





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