

AN INDUSTRY PERSPECTIVE ON SPACE-RELATED IPR

by Bradford Lee SMITH

Société de Services de Propriété Industrielle

Paris- France

Abstract

Intellectual Property Rights (IPR) are an insurance for high-risk industrial investments in technology. Obtention and use of IPR in space fields is problematic because of uncertainties about applicable legal framework, especially nationality and territoriality, both for obtaining and for enforcing IPR for space activities. This is not conducive to private investment, in particular for large sums typical of space endeavors.

Space industry is thus hampered because of limits on R&D funding and the spectre of third party infringement proceedings. Legal certainty is prerequisite for any full scale exploitation of extra-terrestrial industrial opportunities. Until now, only ad hoc solutions have been advanced : US Space Bill, Inter-Governmental Agreement (IGA) for space station Alpha, US case law (Hughes Aircraft Co. vs. X), and doctrine based on maritime law. Existing patent law has no firm basis for territorial extensions to extra-terrestrial activities on orbit and beyond.

Legal and practical uncertainties abound in enforcement of IPR : 1) applicable law, because of its territorial nature ; and 2) how to discover and prove infringement to recover damages.

Copyright © 1995 by Bradford L. Smith. Published by the American Institute of Aeronautics and Astronautics, Inc., with permission. Released to IAFVAIAA to publish in all forms.

Bradford Smith is a Patent Attorney in the Department des Brevets, SOSPI, Alcatel Alsthom group, Paris, France.

Industry needs legal certainty arising from applicable, internationally harmonised space-specific legislation. Patchwork territoriality thwarts legal certainty.

Legal certainty is necessary to attract private investments and to assess infringement liability. A workable enforcement mechanism is also required, free from territorial considerations. We need an international legislation, with an international enforcement body, such as an international board of arbitration or court. This is a gigantic undertaking, but more likely than harmonising disparate national laws. Nationalist tendencies may subsist but uniform legislation must undoubtedly be proposed rapidly on a global level.

Historical Elements

Space activities have their historical roots in national, captive markets governed by specific public procurement practices. Current main industry players almost all have grown out of defence-related industries ; national champions nurtured primarily by fat defence contracts of the cold war era. This history has contributed to traditions which continue today, in spite of leaner budgets.

Important for considering the use of IPR in space related industries is the fact that a significant majority portion of the industry has been (and remains) essentially not for profit, for example infrastructure, scientific endeavors, and most non-recurring development efforts. This means that applicable pricing is most often approximately at cost, or slightly above-- or even below cost in many instances.

Historically launch services and contracting have been subject to similar considerations, with little consensus on actual costs of launch. This situation has somewhat evolved with the emergence of commercial launch services, but accusations of market-skewing government subventions still continue to be heard among the major players on the commercial launch market.

A further consideration is the fairly widespread use of the principle of "juste retour" as applied in procurement practices by treaty organisations and multinational agencies. Even in the case of procurement by national agencies, similarly arbitrary contract awards have frequently been used to "distribute the wealth" among two or more national players. This is once again a tradition from cold-war defense funding of the "military-industrial complex".

Historically, during the cold war period for example, competition in space activities was much stronger between nations than between individual firms. Because the major players were in general traditional national champions the non-recurring development costs have typically been heavily subsidized. Therefore, real costs of major realisations in the space sector are still difficult to determine. This results in distortions to fair application of calls for tender and an open bidding process.

First commercial applications in telecommunications via satellite emerged by offer of satellite capacity by treaty organisations to their non-commercial signatories, which then resold that capacity, generally to state monopoly telecommunications operators.

The above remarks contribute to an overall impression that the rules of a free market economy have not been applied to most activities in the space sector. In fact, they still do not presently apply to the lion's share of space-related activities, and thus cannot play their normal corrective role in the economic competition between space industry players.

New Era

The space industry has evolved into a business sector which is slowly adopting a more orthodox behavior. Commercial contracts are awarded on tender, ranging from launch services to satellite procurement. Deregulation of telecommunications is being undertaken around the world, allowing private entities to offer telecoms services. Some such services are being offered via privately owned satellites. Telecommunications satellites are becoming a market commodity, serving private, national or regional entities, many of whom do not have a self-sufficient space industry capability.

This has led to the dawn of commercial competition between firms for supply of each of the component systems of a satellite, up to the entire satellite or even an entire turnkey satellite telecommunications system.

Competition between space industry players is somewhat complicated however by a sort of "fishbowl" promiscuity. Due to a fairly limited number of programs and players, competitors on one program will be partners on another, customers or main contractors on another, subcontractors on still another, in every imaginable combination.

The customers of the space-related industries are also somewhat atypical. Because of the large investments required, and also because of regulatory hurdles for orbital slots, frequency allocations and the like, customers of the space industry are still mostly government affiliated agencies, or multi-governmental treaty organisations. Procurement policy continues to rely on political will, where free market competitive mechanisms don't apply.

From an industry analyst's point of view, some of the contracting policies of the major agencies and treaty organisations further undermine the competitive mechanisms of a free market economy. The implications of this statement will be explained in greater detail in a later paragraph.

Prospective Developments

Some trends in the development of space activities are easy to predict without a crystal ball. Such trends will impact the needs for applicable IPR as will become apparent in the following paragraphs.

We will see increasing international cooperation in space activities, to the point where national borders no longer separate the different players. There will also be increasing global competition for supplying hardware and services, further eroding geopolitical frontiers as applicable to different components of space business.

Former government activities will be increasingly spun off into the commercial sector, as can already be seen in different fields such as launch services, weather forecasting, remote sensing, telecoms, localisation (GPS), and eventually, perhaps even space-based manufacturing.

At the same time, privatisation and commercialisation of activities of treaty organisations is gathering speed. Privatisation of entities or of specific projects is foreseen for example for Inmarsat, Intelsat, Comsat, Eutelsat, ...

An explosion of new applications will also fuel the market expansion, for example Direct TV Broadcast by Satellite (DBS), mobile communications, GPS, direct radio broadcast, multimedia, etc.

Last but not least, future industrial activities in outer space are actively being pursued in the planning stages : Space station Alpha (formerly Freedom), lunar mining operations, solar energy orbital platforms, Mars exploration and exploitation, etc.

All of these factors shall lead to increased awareness of the need for IPR in outer space. More and more investment will be required to realise all of these plans, and much of the financing will be required to come from the private sector. Such private investment will be motivated by hopes of financial gains, which can only be ensured in a favorable competitive environment. This is where IPR becomes a competitive weapon.

Industry Expectations from IPR

Once again, a historical perspective can shed some light on the present situation. Thinking habits of space industry players come from the historical roots of the terrestrial practices of earth-bound industry. In the present environment, space players are still surrounded on all sides by terrestrial practice. And most space IPR practitioners have started their own trade with terrestrial practice.

In addition to identified past and present contributions to industry expectations, I think it is safe to say that there are many expectations which come from simply unfounded hopes, or plain old "wishful thinking".

So what about the content of industry expectations ? A partial list must include at least the following main expectations; whether justified or not.

Industry and practitioners alike cite the alleged "protection" of R&D investment. This may mean simply the recovery of the R&D investment, or, on the other hand, may be extended to include the future fruits of such an investment. Visionaries and optimists may go so far as to speak of ensuring not only the autonomy, but also the very survival of the enterprise as something which can and should be protected by acquisition of IPR.

A more justified expectation is that IPR should confer a competitive advantage, either to win contracts or to otherwise exclude competitors from using a cost-saving innovation or an improved technical solution.

Further commercial and marketing advantages are also often cited by industrial firms and the inventors themselves. For example, the overall image of the firm is enhanced by IPR generated within the firm. Or that granted patents and even pending patents constitute a proof of competence in the "field" which upon closer examination, may be revealed to be only casually related to the filed patent or to the invention itself.

Perhaps the most realistic expectation one could have is the

usefulness of IPR in a defensive mode--- against third party attacks on the basis of third party rights. Having a well-garnished patent portfolio can be useful in coming to a friendly agreement when approached by a hostile third party, if it can be argued that the third party is also a potential infringer, or that he could benefit from accepting a cross-license instead of continuing with litigation.

Problems for IPR in Outer Space

One major problem already mentioned is the difficulty in obtaining enforcement of IPR in space applications, this difficulty arising for numerous reasons. A major problem is that the territorial nature of IPR legislation leads to territoriality of jurisdiction for infringement proceedings, with the practical result that enforcement will almost always be pursued in foreign courts under foreign legislation. An exception is possible if the jurisdiction for litigation proceedings happens to be that of the patent owner, but this is quite unlikely on the average (unless the owner happens to be American).

A second major difficulty is that of discovery and proof of alleged infringement. On orbit, infringement is understandably difficult to detect. On the other hand, at contractor's sites or at launch sites, secrecy reigns (a throwback to the cold war) and infringement goes undetected on the ground as well.

Finally, it must be mentioned again that existing patent law is intended at the outset to apply only within a national territory. However it is now seen that unilateral extensions of sovereignty may open possibilities of infringement of national laws on orbit, thus leading to increased exposure to infringement liability risks.

Examples of such extensions include the US space bill, or common law interpretations of "use" in the territory to include downlinks to the territory, or again common law interpretations of "control" to include uplinks originating from the territory. Completed with an attitude of refusal of the doctrine of temporary presence (cf. HAC vs.

X), the United States has become the world's most likely jurisdiction for infringement proceedings in outer space cases, merely because of its efforts in unilateral territorial extensions.

Meanwhile on the ground, other problems are waiting in the wings. Agencies and Treaty organisations have collected extensive IPR and options including sublicense rights, originally consented by industry to non-commercial entities. In this regard, it should first be noted that quite often the R&D has been funded by an agency or other organisation, under contractual clauses which attempt to protect or recover the agency investment, but offer little or no protection for the accompanying portion of industry investment. As for recovery of R&D costs : under contractual clauses in widespread use, often a successful patented technology will also result in the patent proprietor paying royalties to the funding agency for the use of the patent, considerably slowing the rate at which the industry investment may be recovered. Agency and similar third party R&D finding contracts also commonly reserve licensing rights with accompanying extensive sublicensing rights. This generally means that the agency will be able to use patented inventions for other uses than those foreseen by the original contract, and also that the agency can grant sublicences to the originating firm's competitors, effectively defeating the hoped-for competitive advantages.

Furthermore, this IPR under licence or option is increasingly regarded as a source of revenues for the agency or treaty organisation, to the detriment of the originating company. If and when non-commercial entities become commercial or privatised, they have a tendency to adopt a more aggressive stance for the exploitation of such IPR.

Finally, as treaty organisation signatories evolve from state chartered entities into the private sector, massive legal loopholes are opened for defeating patent protection, as numerous sublicensing

possibilities generally have already been set forth within the original founding treaty.

Another dilution of potential competitive advantage comes from the fact mentioned above, that quite often tender bids do not necessarily reflect true cost, and maybe therefore do not reflect cost savings achieved through patented technology.

In addition to the above, standardisation of patented technology may also lead to loss of monopoly through compulsory licensing.

So how about the contribution of IPR enhanced company image to commercial and marketing success? The effect should be undeniably positive, even if the magnitude of the effect is subject to speculation. However it may be argued that a similar effect may be obtained by much cheaper means. A widely filed, single patent can easily cost the owner up to several hundred thousand French Francs, whereas open publication in a refereed scientific or technical journal will be more widely read and appreciated by clients and competitors alike, costing no more than a few thousand French Francs.

Can a well garnished patent portfolio be effectively used to protect oneself from third party aggressions? This can hardly be guaranteed, once again because of lack of legal certainty and the resulting uncertainty of predictions of successful outcome of infringement proceedings. Because of the huge sums which may be earned in a successful infringement suit, attempting an attack becomes attractive enough to raise venture capital to pay legal fees of the attacking party, even if the chances of success are objectively slim. And in the US at least, lawyers working on a purely speculative basis on potentially lucrative lawsuits are far from uncommon.

Yet another subtlety of territorial-based patent law comes up when one seeks to define which acts constitute infringement. Does transfer of ownership on orbit constitute infringement? What about use on orbit of the satellite having an infringing component or subsystem aboard?

Finally, further problems are easily imagined as concerns activities which may be carried out aboard the International Space Station Alpha. What constitutes a disclosure (novelty bar) and how can this be avoided in practice? Which state may make national security claims? What provisions must be made for use of third party inventions when such use may not be reasonably avoided? Is some type of compulsory licensing scheme necessary?

Which is the Applicable Law Today?

There are three possible answers in existing legislation. The first solution is that of multilateral consensus treaties, such as those ratified under the auspices of the United Nations. This is perhaps quite satisfying for the signatories, but until now, has not given any practical consequences as concerns IPR problems in outer space.

A second type of agreement is exemplified by the Inter Governmental Agreement for the International space station Alpha. This agreement is the bare minimum necessary for building and operating the space station. It is a rather awkward agreement to put into practice, and does not even attempt to reply to broader questions as raised above. It does have the advantage of allowing work to proceed on the station, without waiting for a more elegant and complete legislation. It is not sure that difficulties will not arise in application.

What is required to improve?

First of all, and most importantly, we need legal certainty arising from appropriate, applicable legislation. It seems imperative that such legislation be conceived concomitant with international harmonisation for space use. Patchwork territoriality leads inevitably to inconsistent application and spawns legal uncertainty.

We are also of the opinion that doctrine and case law are not sufficient, in themselves, to obtain the necessary legal certainty. We therefore need some space-

specific international legislation. Legal certainty is a necessity in order to attract private investors to finance space industry efforts in the commercial sector.

This legal certainty is also necessary to enable industry to properly assess risks of infringement liability. This may be a key element when bidding on commercial supply contracts, particularly when the buyer is a service provider, and when infringement suits may call for royalties based on operating revenues ("use" of an infringing technology) instead of only the value of the hardware provided under the supply contract.

In addition to legislation, we also must establish a workable enforcement policy and mechanism. Many present problems must be overcome for this to become a reality.

Firstly the present territoriality patchwork, which means that enforcement actions are always to be taken in foreign courts under foreign laws, with only one exception per plaintiff : when by pure chance the infringement is in his own country.

Secondly, detection of infringement is presently next to impossible with the confidentiality which reigns in the industry.

We must all, as world citizens, be particularly vigilant as concerns unilateral extensions of territorial or national sovereignty, whether they be legislative or common law arising from decisions in national courts. Note that in this respect, state law (e.g. California law, Texas law, etc.) may also apply in addition to federal law, if a dispute embraces non-patented know how or other proprietary information such as trade secrets.

In fact, the legal void may be lead to dangerous interpretations before national courts, but it is equally dangerous when a single national legislation goes about trying to establish, alone, a legal framework which extends to embrace all of its space activities as well as those of foreign nationals whose activities fulfill unilaterally dictated criteria.

Modest Recommendations

Whereas the space industry is a truly global endeavor at present, the playing field is not level for all of the global players. This is related to several problems above, plus favouritism of governments and contracting organisations towards their own national champions.

The best we could hope for in a free market economy of space-related endeavors would be to reap the (until now) illusory expectations of industry and private investors as exposed above. This would surely be limited in practice, but industry would like to be able to use IPR to protect its R&D investments, to gain competitive advantages such as marketing and commercial advantages, and to be able to continue industrial pursuits without fear of third party aggressions on IPR issues.

As exposed above, a major and necessary step towards achieving such a situation is to **establish legal certainty** for IPR issues in space-related activities. Obtention of IPR must be clarified in view of disparate territorial principles.

An even more difficult problem is that of the exercise of IPR which obviously requires special "fair" rules for space-related activities. Here, I would like to draw a distinction between two components of the problems to be solved. Questions of legislation, such as how to achieve uniformity in the obtention of IPR, would appear to involve a component which is almost exclusively logical. On the other hand, questions such as "fairness" in application and enforcement of IPR in a global context, appear to rely on ethical issues, which would call components from another sector, not relying purely on logic.

The obvious question to be resolved is that of the universality vs territoriality or nationality question. However in view of the general interest of space-related activities to mankind as a whole, as reflected in the terms of the Outer Space Treaty, we should perhaps consider at length the possibility of developing a fair scheme which strikes a balance between

the private interests which generate innovation at the expense of financial and human resources, and which hope to capitalize on those investments ; and the wider interests of the planet, perhaps through some sort of compulsory licensing scheme.

I should like to point out that the space-related industry is not the only one to face such problems of general interest to all of mankind, and perhaps we can collaborate with, or take inspiration from IPR practitioners in other fields where similar debates are raging. The biotechnology field comes immediately to mind, with its research on the human genome, attempts to patent gene fragments (by a government agency !), resulting diplomatic incidents, etc.

It would appear that some issues are just too broad to let any country decide alone what should happen, even within its own borders. And we notice once again that in general, the first move towards appropriation of as yet unclaimed territory seems to come consistently from the same part of the world !

It seems to me that there is no quick fix. The best solution might be to **establish space and its accesses (launch sites, vehicles) as a single territory with a single, uniform law**. This will always be easier than harmonising the internal national laws of the player countries. However this may be a utopic proposition, because it would then also be necessary to **establish a single, universal enforcement body** such as an international court of law or an international arbitration authority. Nationalist tendencies may take decades to overcome.

Further, in order to try to level the playing field between space industry competitors, on the one hand, and to integrate the newly privatised entities into the commercial space sector, on the other hand, the rules of terrestrial IPR and related contracts should be revised to take into account the specificities of the space activities. Everybody should be able to benefit from the knowledge and wealth generated by space activities in an equitable fashion as according to the terms of the

OSA (outer space agreements). Industry interests must balance with those of the general population. But space industry, which now requires more and more private investment, will also require a reasonable return on that investment.

As is already the long standing tradition for terrestrial activities, it becomes increasingly urgent to ensure that the space industry benefits from a workable IPR legislative framework which can guarantee of least a minimum level of security for investments and for future activity.