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## AN ANALYSIS OF ISSUES ARISING FROM THE COMMERCIALIZATION OF REMOTE SENSING ACTIVITIES

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### ABSTRACT

The pursuit of space technology in remote sensing has expanded itself from the confinements of the government bodies to private players in recent years, not only because of the large amount of capital necessary to fund space programmes but also due to the ever widening scope of its applications. Therefore, the commercialization calls for a certain protection of commercial interests in order to provide incentives for further developments in that direction. This paper, thereby, shall attempt to demonstrate that copyright protection of enhanced remote sensing data is vital and will serve the divergent needs of both industrialized and developing nations. The paper will carve an argument in favour of a space IPR regime, wherein rules can be improved while concepts can balance various competing interests, thereby establishing perspective of such efforts to forge international space cooperation among various legal and economic systems. The paper discusses the existing legal mechanisms and their limitations in remote sensing market, with a comparative assessment of copyright provisions in various space-faring nations. Further, the paper elaborates on the Indian IPR perspectives and proves that that legal provisions in India are not yet specific enough to provide protection to its highly active remote sensing programme. Finally the paper concludes that protection of commercial remote sensing end-products is not adequately achieved through available legal international instruments, and argues that an international cooperation is essential in making an effort to this end.

### FULL TEXT

#### INTRODUCTION

Space activities today have come a long way from the days of being reconnaissance tools they were originally meant to be. Today they are all set to take the world by storm. One of the fundamental aspects of space activities is

remote sensing\* - sensing of the earth's surface from space.

Remote sensing is the use of satellite imagery from space for applications on

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\* The term 'remote sensing' refers to a variety of information-gathering activities undertaken from space such as satellite photography, infrared, laser, and radar imaging, and the gathering of electronic intelligence. (Reynolds, 1992).

Earth. The government first used remote sensing for land management, environmental monitoring, and urban planning.\* Remote sensing technology has led from advanced applications involving meteorology, hydrology, cartography, and reconnaissance, to more consumer-oriented applications such as insurance claims adjustment, marketing, real estate, and farming. Remote sensing sales and services alone are expected to grow to a \$2 billion market by the next century.

The imagery yielded by remote sensing satellites has traditionally been of great strategic importance, as they have the potential to be used in military and intelligence activities. Until a decade ago, high resolution satellite imagery was purely the domain of the most powerful and technologically advanced nations in the world. However, rapid developments in remote sensing technology have now put previously privileged information within easy reach of every person with access to the Internet. Now that commercial remote sensing programmes are operational in most of the space-faring nations, the continued existence of the technology depends upon how well the private sector can market satellite data. We thus need to assess the importance of strong copyright regime in the area of remote sensing.

#### THE COMMERCIALIZATION OF SPACE ACTIVITIES

The unlimited applications of remote sensing make it an extremely valuable tool with the potential of solving many of the problems which face humankind as it

enters the twenty-first century. Although a predominant role was played by states during the initial stages of remote sensing, recent remote sensing activities within a commercial framework undertaken by various countries show particular interest in the protection of intellectual property rights resulting from remote sensing activities. This is because of the large amount of capital necessary to fund space programmes and partly due to the exploratory nature of these programmes. States exercised virtual monopoly over space activities in those early stages. The participation of private enterprises in these activities was limited to that of industrial partners as manufacturers of rockets or satellites for exclusive government use and under a government license. Gradually, these private companies showed a strong interest and increased participation in space ventures. At present, the private sector is a primary actor in commercial remote sensing activities (Leo et. al., 1999).

Commercialization in this sense means that remote sensing data would be available to the public under ordinary rules of supply and demand, with profit as an end for the private operator. The commercialization of remote sensing data must be considered as an irreversible, though only a recent characteristic, of space activities throughout the world. It appears to be a logical consequence of the Open Skies Policy adopted by the US. This position enables states to widely disseminate data obtained by satellites except data of military relevance.<sup>†</sup>

\* See Jonathan Ball, *Satellite Remote Sensing*, at (visited Jan. 22, 1997) <<http://www.doc.gov/oasc/rmtsens.html>>.

<sup>†</sup> Nan Ball, et al., *Space Manufacturing and Processing* (visited Jan. 22, 1997) <<http://www.doc.gov/oasc/spcmfg.html>> (quoting

Many developments are taking place in most countries, which at the same time raise a number of questions both nationally and internationally. This is because commercialization calls for a certain protection of commercial interests in order to provide incentives for further developments in that direction. Remote sensing from space is not an exception. It is obvious, therefore, that countries which have developed a remote sensing capability and which have free market economies are determined to protect IPR resulting from remote sensing activities. In fact, as the United States entered the process of commercializing its remote sensing capability via a phased transition to the private sector, these commercial institutions were offered a certain degree of protection of their business interests through the insurance of proprietary rights connected with data acquired from remote sensing activities.

National regulation remains central when international implications have to be examined because international space law does not provide for the protection of private rights and even less for the protection of intellectual property rights in particular.

#### REQUIREMENTS FOR AN IPR REGIME IN SPACE

Now that commercial remote sensing programmes are operational in most of the space-faring nations, the continued existence of the technology depends upon how well the private sector can market satellite data. An understanding of the application of intellectual property rights to remote sensing data requires an

understanding of the difference between enhanced and unenhanced data. Unenhanced data, or raw data, is obtained directly from the satellite, and primarily consists of digital information or photographs. Enhanced data, in contrast, is the result of human or electronic analysis of the raw data.

Copyright protection is unavailable to unenhanced data because the very nature of a copyright is to give exclusive rights to the copyright owner. The policy of non-discriminatory access would be undermined by private operators attempting to exact royalties or licensing fees from users of raw data. Because of the value addition in enhanced data, intellectual property rights in enhanced data are necessary to increase the number of data enhancement firms and thereby increase the market for raw data (Richard, 1990).

The full potential of remote sensing could not be reached with a governmentally owned and operated remote sensing programme. Commercialisation was thus necessary for the further development of this technology. Now that commercialisation is in place, marketing of such data needs to be maximised. For this purpose, intellectual property rights in enhanced data are necessary to increase the number of data enhancement firms and thereby increase the market for raw data.

International copyright protection for enhanced data is necessary to induce firms to enter the data enhancement industry. Even a small data enhancement firm must invest significant capital in software, equipment, and trained personnel before it can begin operation. Copyright laws will protect this

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investment and, by making processed data more valuable, will provide an incentive for firms to enter the market. Without the economic rents created by copyright, it is unlikely that enough firms will produce sufficient enhanced data to make commercialisation worthwhile. This is because the data enhancement industry will constitute the market for raw data necessary to realise a profit.

Competition from foreign remote sensing systems provides another reason why legal protection of enhanced data is necessary. Many countries operate commercial remote sensing systems, and some of these, such as the French SPOT system and the European Space Agency's ERS-1 (both commercialised systems), compete with U.S.A.'s LANDSAT for international as well as domestic data markets. A significant feature of international intellectual property rights is that these rights shall protect competition among all entities producing enhanced data worldwide. Without copyright protection, an individual or entity could pirate enhanced data produced by someone else and legitimately pass it off as its own. There would be no mechanism to prevent such an entity from distorting the data to obtain financial or political benefits. Therefore, the nature of a commercial remote sensing programme mandates copyright protection for enhanced data. Such copyright protection will benefit producers of enhanced data worldwide due to the existence of multilateral copyright agreements (Richard, 1990).

Although representatives from developing nations have expressed concern regarding the legal protection of processed data, it is conceivable that in the near future their views will change.

This will occur upon the realisation that the benefits of copyright (widespread availability and low prices for unenhanced data) will outweigh the disadvantages (decreased availability of processed data). As developing nations become capable of processing data themselves, they may also accept copyright due to the fact that it will protect their own processed data from theft and misappropriation by entities which might use the information to exploit the developing nations' resources. These considerations, combined with the protection of international space agreements, clearly demonstrate that copyright protection of enhanced remote sensing data will serve the divergent needs of both industrialised and developing nations (Richard, 1990).

#### OVERVIEW AND LIMITATIONS OF EXISTING SPACE LAWS WITH RESPECT TO REMOTE SENSING

The limited applicability of copyright to remote sensing data and the differing needs of developed and developing nations combine to create possibilities of potential abuses of intellectual property rights. A number of international agreements try to negate such possibilities by attempting to both define and limit the rights and duties of producers and consumers of remote sensing data, but fail in their efforts.

#### The Outer Space Treaty (1967)

The 1967 Outer Space Treaty codified certain basic principles of space law first articulated by the UNCOPUOS in the General Assembly Resolution of 1962, the "Declaration of Legal Principles Governing the Activities of States in the

Exploration and Use of Outer Space”.\* Several of these principles have significance for remote sensing activities.

Article I of the Treaty establishes the right of all states to explore and use outer space, the moon, and celestial bodies for the benefit and in the interests of all countries, without discrimination and regardless of the stage of development of any country. Article II prohibits the appropriation of outer space, in the name of sovereignty, by any country. Today, there is widespread agreement that the twin principles of freedom and non-appropriation have acquired the status of customary international law.<sup>†</sup> The international law regarding the acquisition of remote sensing information incorporates the Article I principle of non-discriminatory access to space.

Remote sensing as defined by the Principles is legal under Article IV which prohibits military activity in space. Article VI of the 1967 Treaty requires states that are parties to the Treaty to “bear international responsibility for national activities in outer space ... whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty” thus recognising that commercial entities as well as governments are covered by the treaty’s provisions. However, Article VIII of the 1967 Outer Space Treaty provides for

\* G.A.Res.1962, 18 GAOR (Supp. No. 15) at 15, U.N. Doc. A/5515 (Dec 13, 1963).

<sup>†</sup> Dept. For Disarmament Affairs, “The Implications of Establishing an International Satellite Monitoring Agency” at 52, U.N. Doc. A/AC.206/14 (Disarmament Study Series No. 9 1983); as quoted in *infra* n. vii

the retention of jurisdiction and control by the State of Registry over its space objects and personnel while in outer space. Thus, such a State is offered the possibility of extending its national law to space activities performed in outer space. Therefore, it will depend solely on the action of the individual state whether it will act to protect the intellectual property interests of its nationals and others in relation to space activities (Twibell, 1997). This in itself can create numerous problems since the private law systems, including private international law of the different countries are far from equal. The Principles, anyhow, endorse the promotion of international cooperation and assistance (Feder, 1991).

#### Principles Relating to Remote Sensing of Earth from Space (1986)

The United Nations addressed remote sensing when it adopted a resolution entitled Principles Relating to Remote Sensing of Earth from Outer Space.<sup>‡</sup> It took seventeen years to develop the Principles, finally passed by the General Assembly in 1986. The Principles resulted from a process of compromise necessary to remedy the differences between the position of the developing world and that of the space powers, particularly the United States (Christol, 1988). The major stumbling block to agreement was the divergence in opinion on the extent to which sovereignty principles should give a state an inherent right to control sensed data of its territory in a manner similar to rights regarding control of natural resources

<sup>‡</sup> G.A. Res. 41/65 Annex, “Principles Relating to Remote Sensing of the Earth from Outer Space”, (Principle I(b)), U.N. Doc. A/41/751 (1986).

located in a sovereign territory. The developing nations wanted to require prior consent before any nation's territory could be sensed, whereas the space powers wanted an 'open skies' rule under which consent would not be required (Feder, 1991). By recognising each country's sovereignty over its own wealth and resources (Principle IV), this agreement attempts to prevent an entity from using information about a sensed state to exploit the state's resources. The Principles encourage states conducting remote sensing to provide data sharing, opportunities for participation, and technical assistance to other states (Principles V-VIII). They also require states gaining information about environmental damage or natural disasters to inform any nation which might be in danger (Principles IX-X.). Like the Outer Space Treaty, the Principles apply to non-governmental entities as well (Principle XIV).

It is apparent that the principles represent a contractarian approach to remote sensing activities. Many commentators view the Principles as having no significant limiting effect on remote sensing activities, thus failing to circumscribe present practice in any important way (Hayward, 1990; Myers, 1987). At best, the resolution is "an attempt to apply modest legal safeguards to the conduct of remote sensing which some states feel, if left unregulated, might adversely affect their national interests." (Hayward, 1990; Myers, 1987). At worst, the debate surrounding the Principles resulted in little more than a reaffirmation of the broad ideals embodied in the major space treaties (De Saussure, 1989).

#### The Berne Convention (1971)

The Berne Convention is believed to provide the protection necessary to meet the needs of a commercial remote sensing industry. This agreement consists of two principal components. The first is the main body of the agreement which details and defines the functions and operation of international copyright protection for protected works. The second component of the Berne Convention is the appendix, which provides special mechanisms for developing nations to gain access to copyrighted material. This section is especially relevant to remote sensing data which may significantly benefit developing countries.

Remote sensing imagery is part of the general scope of Article 2 of the Berne Convention. At a minimum, the Convention covers the first imagery product after the bits transmitted by the satellite have been converted into a readable photograph, which raises the question of the protection of raw data. In order to help copyright protection be effective, the Berne Convention provides that works must be "fixed in some material form,"\* and national laws may not renege on their obligation to participate in such protection. Only news information is not covered by these

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\* Excerpts from Art. 2, Berne Convention (1971): "... (2) It shall, however, be a matter for legislation in the countries of the Union to prescribe that works in general or any specified categories of works shall not be protected unless they have been fixed in some material form...". Convention for the Protection of Literary and Artistic Works, Sept. 9, 1886, 12 MARTENS NOUVEAU RECUEIL (ser. 2) 173, revised Nov. 13, 1908, 1 L.N.T.S. 218; June 2, 1928, 123 L.N.T.S. 233; June 26, 1948, 331 L.N.T.S. 217; July 14, 1967, 828 U.N.T.S. 221; July 24, 1971 at 227; as quoted in *infra* n. xxiii.

provisions.\* The extent to which automatic protection is afforded to the author is determined by the Convention in association with the country where protection is sought. The amount of protection which is granted to a foreign work is based on the principle of national treatment which essentially states that the protection afforded in country A to works created in country B, (both countries A and B being parties to the convention), is as ample as that provided by country A to works created on its territory. In a parallel manner, for countries which are not members of those conventions and which are not deemed to be granting national treatment in the meaning of the Berne Convention, one may expect the worse in terms of copyright infringement. However, a specific reference could be made in the bilateral agreement to local legislation with the effect of extending protection to data received by the local ground station. This amounts to a de facto national treatment.

Finally, authors have the right to authorize "the reproduction of their works,"<sup>†</sup> but this should not harm their

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\* Excerpts from Art. 2, Berne Convention (1971): "... (6) The works mentioned in this Article shall enjoy protection in all countries of the Union. This protection shall operate for the benefit of the author and his successors in title. ... (8) The protection of this Convention shall not apply to news of the day or to miscellaneous facts having the character of mere items of press information." Convention for the Protection of Literary and Artistic Works, at 227; as quoted in *infra* n. xxiii.

† Excerpts from Art. 9, Berne Convention: "(1) Authors of literary and artistic works protected by this Convention shall have the exclusive right of authorizing the reproduction of these works, in any manner or form ... (2) ... provided that such reproduction does not conflict with a normal exploitation of the work

own interest. Quite obviously, the 38 articles and the appendix of the Berne Convention are mostly geared towards works of the everyday life: remote sensing imagery cannot be protected on the basis of the provisions of this Convention (Salin, 1992).

### The Universal Copyright Convention (1971)

The UCC contains some complementary points. The visual aspect of the copyright is taken care of with the appearance of the (C) special logo with the name of the beneficiary.<sup>‡</sup> Therefore, end-product imagery may affix a visible indication of the copyright, its owner and the date of first use on each imagery item. Under UCC regulation, the duration of the copyright equals the author's lifetime plus an extra twenty-five years. This duration is shorter than that provided under the Berne Convention which provides that the protection lasts for fifty years after the author's death. The other provisions of the UCC do not differ substantially from those of the Berne Convention and are mostly devoted to standard works of a literary or artistic nature. It is generally recognised that the Berne Convention

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and does not unreasonably prejudice the legitimate interests of the author ...." Convention for the Protection of Literary and Artistic Works, 63 U.K.T.S. at 31 (1990); as quoted in *infra* n. xxiii.

‡ Excerpts from Art. III of the Universal Copyright Convention: "1.... [F]rom the time of the first publication all the copies of the work published with the authority of the author or other copyright proprietor [must] bear the symbol (C) accompanied by the name of the copyright proprietor and the year of first publication placed in such a manner and location as to give reasonable notice of claim of copyright ...". July 24, 1971, 6 U.S.T. 2731, 2734, 216 U.N.T.S. 133, 136; as quoted in Salin (1992).

provides a higher standard of copyright protection than the UCC (Stewart, 1983). As a matter of fact, the UCC itself provides that if a nation is a member of both conventions, the terms of the Berne Convention will govern, and if a nation is a member of the Berne Convention, it cannot withdraw and become only a member of the UCC. If it tries to do so, it will lose both memberships (Article 2).

### ASSESSMENT OF THE LAWS

In fact, the core of the copyright recognition problem for remote sensing imagery lies around the nature of raw data. WIPO identifies four conditions which must be fulfilled so that a work may be eligible for protection (Murphy et al., 1988): 1) The work must be unique and original, not the copy of some other work. Beyond any doubt, remote sensing raw data is unique and original. 2) The work must be presented on some material support. In that respect, remote sensing looks like a live television report. In practice, it seems that the protection of such a transmission is not challengeable, but the difficulty arises from the fact that there is no simultaneous public broadcasting. It must then be paralleled to a television report which is recorded in advance for future public broadcast. 3) The work must be authored by somebody. In this vein, a provision of the Berne Convention provides for a collective authorship\*, which may be what remote sensing imagery is about, since authorship derives from the work of an observation machine. 4) The work

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\* Excerpt from Article 7b from the Berne Convention: "The provisions of the preceding Article (Art. 7: "Term of Protection") shall also apply in the case of a work of joint authorship ..."; as quoted in Salin.

must be creative, which supposes the particular intervention of a human being.

On the whole, obviously, there is currently no adequate and efficient protection of remote sensing data in international law. In the wake of the various copyright conventions, one may think that there is a need for a specific convention, which may be a necessary step if the trend towards the commercialisation of remote sensing is to be maintained in order to let private organisations be attracted by substantial profits to be made from the use of raw data. There are observers who clearly state that the Berne Convention itself is an "inadequate mechanism" for new technologies (Motyka, 1990), including remote sensing imagery.

### COMPARATIVE ASSESSMENT OF THE ACTUAL COPYRIGHT PROVISIONS IN VARIOUS COUNTRIES

We have the LANDSAT, SPOT, MOS-1, ERS-1 AND RADARSAT programmes in the countries of the United States of America, France, Japan, European Union and Canada respectively. Even though these copyright provisions were created at approximately the same period, in the late 1980s, it is possible to distinguish provisions which aim at protecting the satellite operator from uncontrolled dissemination of data through the intermediary of the contract partner (i.e. the agency in charge of the foreign local ground-station), and from possible external abuses beyond the will of the foreign local partner. It is also of interest to analyse how these copyright provisions are translated in the market at the client level through a plain sales contract (Salin, 1992). All these



contracts are recent in their making, having been signed by the five space agencies of the five countries which have already been named, with their foreign partners between 1989 and 1991. There are three broad heads of copyright provisions in the contracts where the first one holds a paramount importance.

### General Restrictions to Raw Data Ownership Transfer

General restrictions are the first line of protection that all satellite operators have set with their partner. However, important differences already appear at this minimal stage. In the case of LANDSAT, EOSAT does not mention the word "copyright" but asks for the station to "design and implement a data protection plan" to be submitted and approved by EOSAT.\* In other words, protection is a matter to be designed on a case by case basis and one way of doing so is to ask the other partner to submit his/her own views and ask him/her to implement those views with tangible measures. In the case of the Japanese satellite MOS-1, NASDA only faintly mentions a copyright. It specifies that "intellectual property rights ... are and will remain the property of NASDA," adding that the local agency "will refrain from registering or attempting to register any intellectual or industrial property rights, including, without limitation, copyright or patent rights."<sup>†</sup> A restriction could hardly be more general and vague. NASDA also recognizes that the local agency may have property rights on "analyzed

information ... depending on the level of processing, analysis or interpretation which has been applied" (Article 8.2). No more precision is provided for in this respect. For the European satellite ERS-1, ESA explicitly asserts that the contract partner "acknowledges the copyright of ESA ... under the terms of this agreement and under the legislation and conventions concerning copyright." Details are then provided regarding how to let the "(C) ESA, year" logo appear on all ERS-1 data, as well as the "ERS-1-R" trademark logo, irrespective of its degree of analysis or its form (Arts. 11.1, 11.2). The local authority may also add its own (C) logo depending on its own contribution to the analysed information. The effectiveness of such a clause is doubtful because the conventions this agreement refers to are not specific enough with regard to the specific situations of remote sensing raw data. For RADARSAT, CSA simply says that "all copyright and ownership rights for SAR data will be vested or reserved solely in or to CSA, the other party having rights of use as described in this MoU to the extent permitted by the laws of the Parties."<sup>‡</sup> This restriction is general, very much like the NASDA one, and it specifically refers to the laws of the other party. The SPOT contract is by far the most complete of the five agreements. The CNES copyright is asserted right away and it is specified that a clear mention of that copyright, with the "(C), CNES, year" logo must appear on all data and derivative works and products. The "SPOT-R-year"

\* Landsat Data Downlink Agreement, Art. IV, Sec. D., signed by EOSAT; as quoted in Salin.

† Arrangement Between NASDA and a Foreign Partner for the Direct Reception and Distribution of MOS-1 Data, Art. 8.1; as quoted in Salin.

‡ Memorandum of Understanding Concerning the Radarsat Project, Art. 12.4, signed by CSA. See also International Memorandum of Understanding, Art. 12.4, signed by CSA with NASA and NOAA which co-manage the Radarsat project; as quoted in Salin.

trademark logo must also be affixed to all pertinent documents. Interestingly, such copyright and trademark may co-appear with the one of the local authority in charge of the supervision of the contract, in case derivative works are developed by such authority.\*

#### PROBLEMS WITH AN EXHAUSTIVE IPR STRATEGY IMPLEMENTATION

Another aspect of IPR in space activities refers to inventions and trademarks, including data and products. It should be observed that the US, Canada, and the Philippines are the only countries in the world which apply a first-to-invent system, the rest of the world applying the first-to-file system to prove first inventorship, resulting in the right to protection.

In fact, the policy of the US towards commercialization of a range of space activities has been focused recently on this issue. The policy of the NASA was to encourage the commercialization of technology developed through its financial resources. Efforts are now being undertaken to guarantee more proprietary rights protection for private aerospace industries as manifested through a number of joint agreements. Likewise, Section 305 of the NASA Act provides that although title to such invention rests with the government, NASA includes a broad waiver policy. It retains only a non-exclusive royalty free license for government use and the right to use it if the contractor does not develop the invention.

The International Space Station raises

relatively new issues regarding the protection of industrial property among the state and non-state participants. Nevertheless, these issues were addressed in various provisions of IGA on the Space Station. Article 16 provides for a cross-waiver of liability and Article 3(d)(4) provides that intellectual property claims do not fall within the scope of application of the Agreement. Article 21 deals explicitly with intellectual property. It defines intellectual property in its first paragraph by reference to the terminology used in Article 2 of the Convention Establishing the World Intellectual Property Organization.<sup>†</sup>

Because intellectual property rights are generally based on territoriality, their application to situations in outer space may cause problems, because outer space can not be the subject of national appropriation. Hence, paragraph 2 of Article 21 applies the fiction of territoriality over activities taking place in or on a specific space station element, the space segment where the invention was developed. Moreover, inventions in any space segment of any ESA Member State are deemed to have occurred within the territory of any European Partner State. Therefore, the territoriality concept can be applied by the state concerned, while in relation to ESA registered elements, the regulation facilitates the application of each individual nation's law on intellectual property. Such a conclusion results from the application of the principles of jurisdiction and control of the state of registry over the individual flight element.

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\* Agreement Regarding the Reception and Distribution of SPOT Data, Arts. 11, 12, 14, signed by SPOT IMAGE; as quoted in Salin.

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<sup>†</sup> See Nathan C. Goldman, *American Space Law: International & Domestic* 25 (1996)

National laws on patents differ from state to state, in that the law may be based either on filing or the fact of invention itself. In the space law context, this problem is partially answered through Article 21 of the IGA with respect to inventions made by non-nationals or non-residents by restricting the application of national laws concerning secrecy of invention. This prevents the filing of a patent application. If patent protection exists in more than one European partner state, Article 21 prohibits, through paragraph 4, recovery in more than one of those states for the same rights in such invention for infringement, which occurs in or on an ESA registered element. In paragraph 5, the European partner states are prohibited from refusing the recognition of a license in relation to patents if that patent is enforceable under the laws of any European partner state. This likewise also bars recovery for infringement in any European partner state.

### INDIAN PERSPECTIVE

The growth of Indian space programme during the past four decades has been phenomenal.\* The success, which India

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\* India entered the Nineties with the launch of more ASLV and PSLV launchers. With the launch of IRS-IB and INSAT 2A & 2B, the Indian space programme becomes fully operational through its own communication and remote-sensing satellites. The INSAT series satellites, with the capabilities to provide communications, meteorological and disaster management systems, have proved unique, as other countries have separate spacecraft for each of these functions.\* The IRS satellites have helped in the extensive mapping of our natural resources, and the voluminous data generated through these are used in a variety of fields. Even the

has achieved in the application of remote sensing, and perhaps, surpasses the efforts of even the most advanced countries. Today India has become a leader in satellite based remote sensing providing services on an end-to-end base with a series of state-of-art satellites, the necessary data reception and processing facilities and the commensurate launch capability.<sup>†</sup>

During the last two decades increasing emphasis on reducing governmental budgets worldwide has forced the world's space faring nations to reassess their civil space programs. Developing countries like India are hard pressed to allocate funds for space activities. Therefore the need for privatization of space activities deserves the maximum attention in countries like India, which need these activities even more than their richer counterparts for their national development. The space application sector witnessed tremendous developments with the active involvement of the private sector. There is a huge market to be tapped in India in the field of cable and satellite television. Recognizing the privatization and commercialization of space activities many developed nations have drafted National Space Laws for various complex facets of space activities, including a core licensing system for Private Space Activities. Thus, it is abundantly clear that even countries, which are lagging far behind India in technological advancement, have some sort of Space Law for their country, which places them ahead of India in attracting cross border investments. It is

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developed countries – including the US—have started acquiring the IRS data.

<sup>†</sup> Department of Space, Govt. of India, Annual report, 1994-95, pp/42-43, India

therefore imperative for India also to have specialized Space Legislation so as to emerge as a global destination in attracting foreign investment. India has demonstrated indigenously developed technology in space programmes, just as it has showcased matchless expertise in software. However it is disheartening to note that because of lack of an adequate legal framework India is losing many opportunities in the field of investment in space technology.

To fulfil International commitments and domestic regulations of space activities, every nation state should draft a space legislation that would bring or achieve the necessary coherence between Space law, international agreements, and domestic legislations. As far as India is concerned, until now it does not have any comprehensive or specific law dealing with space activities/conflicts, unlike other countries i.e. USA, Canada, France, Germany and Australia. However, with the rapid development of activities in space and its commercialization, there is a growing need for enacting domestic space legislation. As this area involves huge amounts and high risks of public and private funds, in all probability there would be growing litigation or conflicts that cannot be solved by the existing system. Therefore, the proposed legislation should provide for Creation of National Space Agency, Licensing, and Certification of space activities, Economic Conditions of Space Activities, A Provision on Space Infrastructure, Space Safety and Space Liability, Space Insurance, International Cooperation and Protection of Intellectual Property Rights in Outer Space. This draft legislation should be a convergence of divergent regulations in order to bring a comprehensive and

harmonious space legislation that would be beneficial for India.

To now examine the types of IPR in the context of Indian remote sensing activities- we have copyright and trade secrecy. As we examine them within the framework of the domestic legislation, we can try and analyse whether they can be extended to remote sensing activities as well.

### Copyright

The Copyright Act, 1957 now stands amended by the Copyright (Amendment) Act of 1994. Copyright is important in the Indian context as they have a very strong and active remote sensing programme in place.

According to the earlier definition of "literary work" contained in Section 2(o), a literary work included computer programmes and compilations. The Copyright (Amendment) Act, 1994 now defines a literary work to specifically include a computer database within its ambit. On account of the doctrine of "independent creation" the data collected by one agency even if identical to that owned by another would not infringe copyright. There would be no infringement or violation of copyright unless there is copying of data. For copyright to subsist in a literary work, it must be original although originality simply means that the work has not been copied from elsewhere. The copyright which would so subsist includes the exclusive right to do several acts (called restricted acts) which include the right to reproduce the work in any material form, to publish the work or to communicate the work by broadcast. Under Section 17 of the Copyright Act, the first owner of a

literary work is the author of the work unless of course one of the provisions to the said section is attracted.

In the case of a satellite collecting data, there are two possibilities. Under the Copyright Act, 1957, it was difficult to establish who the author was as the data collected by a machine did not involve human intervention like the creation of other literary works. For this reason, the definition of author in relation to literary works which are computer generated has now been changed and under Section 2(d) (vi), "author" means the person who caused the work to be created. Consequently, the owner of the satellite would be the author. The second possibility arises in the case of public undertakings- the proviso to Section 17 in the form of (dd) states that in the case of a work made or first published by or under the direction or control of any public undertaking in the absence of an agreement to the contrary, the first owner of the copyright therein would be the public undertaking. Since satellites in India are all government owned and controlled, the data collected by them would be a literary work made or first published under the direction or control of a public undertaking such as ISRO. Consequently, ISRO would be the first owner of the copyright in the data so collected.

According to the ISRO viewpoint, remote sensing data is protected by copyright law and normally belongs to the satellite owners. This is an international practice which ISRO respects. The data collected by a U.S. satellite over India, for example, by the Landsat satellite is passed on to India under an agreement which specifies the fees for data access and for payment of royalties for the data

distributed to users on a commercial basis. The principles for distribution provide for non discriminatory access to users. The copyright however remains with the U.S.

### Trade Secrecy

Apart from copyright, data is also protected under the law of trade secrecy. Indian courts protect confidential know-how irrespective of contract.\* One weakness of the trade secrecy law is its difficulty in restraining third parties with whom there was neither any privacy of contract nor disclosure made. In recent years, courts in England and other jurisdictions have accepted that innocent defendants can also be restrained. In *Wheatley v. Bell*<sup>t</sup>, the court rejected the idea that an innocent defendant can be likened to a bonafide purchaser for value without notice and granted the injunction against all the defendants. Although there has been no Indian case which has extended the principle in a similar way, it is likely that this would be the approach even of the Indian courts.

Normally, in commercial transactions involving breach of confidentiality only

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\* Although it is recommended to have a confidentiality clause in an agreement, even in the absence thereof, if

a) the know-how is confidential or secret, that is, not in the public domain so to preserve the confidentiality of a technology there must be a clear intention to restrict the access of the document, and

b) it is disclosed in circumstances which gave rise to an obligation of confidence, and

c) there is actual or anticipated violation, misuse or disclosure of the said information,

the same can be restrained. These principles were reiterated by the Delhi High Court in *John Richard Brady v. Chemicals Process Equipment Pvt. Ltd* (AIR 1987 Delhi 372).

<sup>t</sup> 1984 FSF 16 at p. 22.

civil remedies are available, such as, injunctions, damages, rendition of accounts etc. However, space research being predominantly government controlled, most secrets would come within the ambit of the Indian Official Secrets Act, 1923. Section 3 of the Act lays down parameters for spying which broadly includes obtaining, collecting, publishing or communicating, recording any document or information which is likely to affect the sovereignty, integrity and security of India. This is the only legislation they have which could be applied to secrets in space technologies. However in the light of the Freedom of Information Act passed recently, even its importance has dwindled immensely.

It is clear from the preceding discussion that legal provisions in India are not yet specific enough to provide protection to its highly active remote sensing programme. Legally suitable clauses for data privacy rights are included in the agreements with buyers/partners. While they do have a Remote Sensing Data Policy in place\*, it is interesting to note that the Remote Sensing Data Policy does not address the IPR issues, as it is intended for different purpose- to assess the user's requirement, the end use, justifications etc. As regards the IPR policy, it is addressed in the agreement to be signed for obtaining remote sensing data from NRSA, Hyderabad.<sup>†</sup>

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\* See Statement in the Lok Sabha by Vasundhara Raje, Minister of State in the Department of Atomic Energy and Department of Space, on Wednesday August 8, 2001, regarding "Remote Sensing Data Policy".

<sup>†</sup> See Section 4 of NRSA Product Purchase Agreement available online at <http://www.nrsa.gov.in> (last visited November 4, 2005): "The customer acknowledges the copyrightable character of satellite data under the legislation and conventions concerning copyrights. Accordingly,

## CONCLUSION

The problem of protecting intellectual and industrial property rights in outer space endeavours will partially be addressed through the efforts of space countries towards international cooperation. The construction and full operation of the International Space Station is a step towards this end. Efforts towards international space cooperation are nothing new to the space countries. Their experience with INTELSAT, INMARSAT, EUTELSAT and ESA may become a solid foundation in the future endeavours. From this experience, rules can be improved while concepts can balance various competing interests. The perspective of such efforts to forge international space cooperation is the establishment of uniform IPR protection laws among national law systems.

The active presence of the WIPO would certainly make such effort less difficult. The presence of the WIPO assures that there would be representation of the various views and opinions of the world community not only in IPR protection but also in international space law as well. It is hoped that the presence of underdeveloped states in this international effort could stimulate and coordinate a rather relevant and developmental legal regime of IPR protection resulting from outer space endeavours.

While the importance of remote sensing cannot be disputed, the protection of commercial remote sensing end-products is not adequately achieved through available legal international instruments.

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the customer acknowledges the NRSA ownership (including ownership of copyright and intellectual property rights) of satellite data."

Protection clauses which are included in specific contracts between satellite operators or commercial managers on the one hand and either foreign ground stations or commercial and industrial final clients on the other hand are, at best, 'ad hoc' clauses which attempt to chart legitimate uses of such imagery and establish, in the most elaborate cases, conditions for a potential pursuit of the offender by both the satellite operators, the image distributors, and the foreign ground station managing agency. In the Indian context as well, there is a need for the drafting of a convention on remote sensing which would, among other things, provide for the conditions of the exercise of a specific copyright in reference to satellite imagery. The legal provisions at best support a stretch-fit exercise, stretching the available legal provisions to fit the required level of protection. India should make all efforts to capitalise on its capabilities, tying the loose ends. Other anticipated developments like the use of such information by news media organizations and possible conflicts between proprietary aspects of satellite imagery and issues of personal freedom also illustrate the need for a new international convention as a matter of urgency.

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LIST OF ACRONYMS

CNES	Centre National d'Etudes Spatiales
CSA	Canadian Space Agency
EOSAT	Earth Observation Satellite
ERS	Earth Remote-Sensing Satellite
ESA	European Space Agency
EUTELSAT	European Telecommunication Satellite
IGA	International Government Agreement
INMARSAT	International Marine/Maritime Satellite
INTELSAT	International Satellite
IPR	Intellectual Property Rights
ISRO	Indian Space Research Organisation
LANDSAT	Land Remote-Sensing Satellite
MOS	Marine/Maritime Observation Satellite
NASA	National Aeronautical and Space Agency
NASDA	National Aeronautic and Space Development Agency
NRSA	National Remote Sensing Agency
RADARSAT	Radar Satellite
SPOT	Systeme Pour Observation de la Terre
UCC	Universal Copyright Convention
UNCOPUOS	United Nations Committee On the Peaceful Uses of Outer Space
WIPO	World Intellectual Property Organization

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