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Proprietary Aspects of Commercial Remote-Sensing Imagery

Patrick A. Salin *

I. INTRODUCTION

Remote-sensing is performed by sensors on board a satellite which is usually placed on a low polar orbit so that it may vertically scan the Earth while the Earth is revolving around its axis. Remote-sensing enables a very high altitude view of the areas which are covered and since it always follows the same path in a circular movement which is perpendicular to the rotation of the Earth, it covers the whole Earth after a few rotations.

For example, US Landsat satellites, the initiator in the field, circle the globe fourteen times a day at a 920 km circular and sun-synchronous orbit,¹ with a 200 km wide swath.² Their repeat coverage at the Equator is 18 days.³ Resolution of Landsat imagery is 30 m. (i.e. the size of the smallest object which can be identifiable on the basis of picture elements or "pixels"), within a standard image of 185 km by 170 km. The Landsat 4 and 5 series, as well as the soon-to-come Landsat 6 orbit the Earth at a somewhat lower altitude, 705 km, with similar other features.

Their main competitor, French SPOT satellites, orbit the Earth at a 830 km altitude and cover the whole Earth every 26 days at a similar

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¹ A "sun-synchronous" orbit refers to the orbital plan in which the satellite orbits the Earth. A sun-synchronous orbit ensures that the angle between the orbital plan and the direction of the sun is constant. Such orbit provides constant lighting conditions for all scenes. SPOT IMAGE documentation 1990.

² The "swath" is the path of land or sea that the satellite's optical devices can monitor on the ground.

³ EOSAT—Landsat Spacecraft Data Sheet, January 1991.

altitude. SPOT satellites have a 117 km swath which, due to a 27 swinging capacity of its sensors, allows them to cover a 950 km wide area.⁴ Their resolution is 20 m. for coloured pictures and 10 m. for black and white pictures.

Landsat and Spot have optical sensors, creating dependence on sun light in order to lighten the ground and on clouds which may stand between the Earth and the satellite, since their sensors capture microwaves emitted by objects on the surface of the Earth. A new generation of remote-sensing satellites appeared in July 1991 with the launch of ERS-1, a SAR or "synthetic aperture radar" system which grants a total autonomy in terms of sun light and enables it to function through all types of weather.

The format of the pictures is digital so that they can be processed by computer. This process is called "interpretation" and is of prime importance because raw remote-sensing data which are on a computer compatible tape consist of electronic bits which are not directly readable by the human eye. Legal considerations stem from the technical characteristics of both these raw and interpreted data.

The main fields of human activity which have directly benefitted from remote sensing activities include: land use planning, meteorology, civil aviation, environmental control, agriculture, fishing, oil drilling, journalism, military reconnaissance and verification of arms control agreements. For example, remote-sensing enabled Bolivia to modify a pipeline project, Brazil to organize the settlement of interior regions, and Pakistan to discover copper deposits. It also supplied valuable information after the Armenia earthquake of December 1988, provided the first images of the Chernobyl nuclear disaster in 1986, helped India (through its own IRS-1 satellite) to locate a 37 mile extension of a fault-line containing lead and zinc deposits, and helped locate the remains of Pan Am Flight 103 at Lockerbie in 1988. Remote sensing also currently helps to identify clear air turbulence for the benefit of air navigation and to monitor the deforestation of the Amazonian Rain Forest. Remote-sensing provided key strategic support during the recent Gulf War conflict. Recently, it was announced that Thailand uses French-produced Spot imagery to track and map clandestine opium fields in its northern provinces.⁵

⁴ SPOT IMAGE, L'orbite des satellites SPOT, 1990.

⁵ Ad Astra, Aviation Week & Space Technology and Air & Cosmos (in French), are important sources of information, among several others, which regularly report on such activities. The US Congress Office of Technology Assessment reported that Aviation Week & Space Technology published more than 22 major news stories based on remotely sensed images between 1974 and 1987. Office of Technology Assessment, Commercial Newsgathering From Space 15 n.b. (1987).

In the United States, Nasa's Office of Commercial Programs specifically funds an Earth Observations Commercialization Applications Program. Between 1987 and 1990, 20 research projects have thus received \$12 million in such funding. 12 new programs have been selected and budgeted to receive \$6 million in new research funding for the period 1991-1993. This program covers the following fields: hazardous waste detection, urban infrastructure mapping, land use changes, remote-sensing software system, real-time disaster assessment, enhanced hydrologic forecasting, oil seep surveys, geographic data bases, pipeline monitoring, Pacific fisheries data, agricultural production and wetland areas data.

A. A Legal Definition of Remote-Sensing

Prior to the adoption by the United Nations General Assembly of Resolution 41/56 which is the only text in international law which specifically deals with remote-sensing, Professor Ph. Diederiks-Verschoor had identified four definitions of remote-sensing. These definitions differ slightly in their content:⁶

a) The United States House of Representative's Committee on Science and Astronautics defined remote sensing as "the acquisition of information about specific objects or phenomena in which the information gathering device is not in intimate contact with the subject under investigation."⁷ This is a broad definition which could even include X-ray medical examinations or radar-directed shipping movements.

b) The United Nations Committee on Permanent Uses in Outer Space at its 1973 second session stated that "remote-sensing of the earth from outer space is defined as a methodology to assist in characterizing the nature and/or condition of features or phenomena on, above or below the earth's surface by means of observation and measurements from space platform . . . at present, such methods depend upon the emission and reflection of electromagnetic radiations."⁸ This is a much more functional definition which is aimed at describing a specific space operation.

c) At the Agricultural University of Wageningen in the Netherlands, S. Hempenius stated in 1978 that remote-sensing "consists of collecting data concerning objects, materials and situations on the earth by means of sensors mounted into fast-moving crafts on land, at sea, in the air and in space, and processing such data for quantification, qualification and mapping pur-

⁶ I.H. Ph. Diederiks-Verschoor, *Current Issues In Remote-Sensing*, 1984 MICHIGAN YEAR-BOOK OF INTERNATIONAL LEGAL STUDIES, 305, 306-07.

⁷ Zissis, *The Development of Remote-Sensing of Earth Resources*, in REMOTE SENSING OF EARTH RESOURCES 119, 120 (1972).

⁸ Draft Report of the Working Group on Remote Sensing of the Earth by Satellites on the Work of Its Second Session, U.N. COPUOS, U.N. Doc. A/AC. 105/C.1/WG.4/L.4 at 2 (1973).

poses."⁹ This is a functional definition that also embraces the functions of monitoring and of data-processing.

d) At UNISPACE 1982, it was stated that remote-sensing "refers to the detection and analysis of resources on earth by sensors carried by aircraft and spacecraft."¹⁰ This is a concise definition which seems to place its value upon the use of 'sensors'.

A fifth definition was added in 1986, when the United Nations General Assembly adopted Resolution 41/65 which laid down fifteen Principles Relating to Remote-Sensing of the Earth from Space.¹¹ According to this document, remote-sensing means "the sensing of the Earth's surface from space by making use of the properties of electromagnetic waves emitted, reflected or diffracted by the sensed objects, for the purpose of improving natural resources management, land use and the protection of the environment." It also identifies remote-sensing activities as "the operation of remote-sensing space systems, primary data collection and storage stations, and activities in processing, interpreting and disseminating the processed data."¹²

These five definitions encompass a broad range of activities. However, we need to focus on the essence of what remote-sensing is in order to assess the proprietary aspects of the imagery which is generated by this activity. Two observations may be made about the identification of what legally remote-sensing is:

—Remote-sensing concerns earth observation with the absence of any physical contact with the object under surveillance and from an altitude which is deemed to belong to outer space; it is not earth observation from air.

—Remote-sensing also includes the monitoring, processing, storing, value-adding and disseminating of data as being integral parts of the whole remote-sensing process.

B. Remote-Sensing is of Interest for Businesses

Following the Land Remote-Sensing Commercialization Act of 1984¹³ also called Landsat Act of 1984, the signature of contract NA-84-DSC-00125 on September 27, 1985 officially started the implementation of the commercialization policy of remote-sensing by the US government. This contract was signed by the US Department of Commerce and

⁹ S. Hempenius, Inaugural speech at the Agricultural University of Wageningen, Netherlands (March 1978).

¹⁰ This information was contained in a pamphlet on the Second U.N. Conference on the Exploration and Peaceful Uses of Outer Space, held from Aug. 9-21, 1982 at Vienna. *Press Release OS/V/57*, U.N. Dept. of Public Info, at 3 (Aug. 21, 1982).

¹¹ G.A. Res. 65, U.N. COPUOS, 41st Sess., Supp. No. 53, at 115, U.N. Doc. A/41/53 (1986).

¹² *Id.* at 116.

¹³ H.R. 5155, 98th Cong., 2d Sess. (1984).

EOSAT (Earth Observation Satellite Company), an affiliate of RCA and Hughes Aircraft which had been awarded the management of Landsat 6 imagery for commercial purposes. EOSAT is allowed to handle the dissemination of Landsat imagery to all sorts of clients over the world, alone or in conjunction with foreign space agencies or ground stations which have contracted with EOSAT, NOAA or NASA for the reception of Landsat data. As soon as satellite data is converted into readable pictures, it is then fairly easy to duplicate such pictures and transform them, just like any other kind of aerial picture. The same dynamic applies to SPOT IMAGE which serves similar purposes as those of EOSAT, in the dissemination of SPOT satellites pictures.

C. Proprietary Aspects Related to Remote-Sensing Imagery

End-product imagery is produced by remote-sensing satellites, i.e. electronics signals, or bits, received by the ground station, while pictures reproduction, representation and enhancement are produced by distributors, by value-added firms, or by any other third party. This type of proprietary right has immediate important consequences in terms of commercial developments since it frames the conditions within which the end-product will directly or indirectly generate sale revenues, in both volume and allocation. Various types of protection clauses are included in all recent bilateral MOUs signed since the beginning of the commercialization era of remote-sensing imagery by the five agencies which have been operating in the western world, alone or with a commercial partner. These agencies are full or partial government bodies and belong to four space powers: the USA (NASA/NOAA/EOSAT), France (CNES/SPOT IMAGE), Japan (NASDA), Canada (CSA/RSI) and to a regional entity, Europe (ESA). They have signed agreements or memorandum of agreements (MOUs)¹⁴ with their foreign partners which manage the receiving ground-stations, most of the time the local government space or remote-sensing agency.

This remote-sensing imagery copyright issue will be addressed in two parts: First, the specific aspects of remote-sensing imagery will be assessed in terms of international protection as compared to other space activities having a literary or intellectual content, with a direct and immediate commercial impact. Second, the specific copyright provisions of several bilateral agreements will be scrutinized in a comparative approach and the merits of each of them will be assessed against those of the others. The terms "pictures" and "signals" will be used indistinct-

¹⁴ There is a slight difference between an "agreement" and a "memorandum of agreement" or MOU. The latter is less formal in its domestic approval procedure.

tively in order to identify the same physical elements, i.e. the bits or information elements transmitted by the satellite towards relay stations, either in outer space or on the ground in foreign countries.

D. Outer Space or Terrestrial Proprietary Rights?

Proprietary aspects attached to data flows directed to a relay station in outer space, also identified as a Tracking Data Relay Satellite System (TDRSS), will not be dealt with since only one country, the United States (and possibly the former Soviet Union), has and can afford such costly equipment.

However, one single comment should suffice to weigh the potential importance of this item in the future. It is quite clear that such TDRSS provides the best and easiest way for the owner state or organization to ensure an autonomous operating protocol, since it allows for the collection of sensed information free from any allegiance to earth ground stations which are usually located on foreign territories, opening the way to potential frictions with sensed countries.¹⁵ Therefore, a TDRSS provides an easy by-pass to potential proprietary claims that foreign states operating relay ground stations may have on sensed data, its strength being directly proportional to the *de facto* disappearance of the "prior access" principle with the 1986 U.N. Declaration on Remote-Sensing.¹⁶ This last principle was asserted for some time in the mid-seventies by developing countries as a consequence of the sovereignty principle which these countries attempted to have extended to information obtained about their territories, but with a not so clear impact as far as the 1986 Declaration is concerned.¹⁷

The standard situation is of concern here, whereby flows of data transit through ground-stations located on territories which are foreign to the national state of the satellite operator or commercial manager, in reference to Landsat, SPOT, MOS-1, ERS-1 and Radarsat.

A last preliminary comment is to be done in relation to the fact that only the international legal dimension of those proprietary rights will be dealt with. The national legal dimension of the problem will be left aside.

¹⁵ Jeff Kingwell, *Data Satellites and Remote-Sensing*, SPACE POLICY, May 1988, at 103, 107.

¹⁶ *Id.*

¹⁷ Stephen Gorove, *The U.N. Principles on Remote-Sensing*, in LIBER AMICORUM HONOURING NICOLAS MATEESCO MATTE, 112 (G.R. Baccelli ed., 1989).

II. INTERNATIONAL LEGAL PROTECTION OF COMMERCIAL REMOTE-SENSING HARD-COPY IMAGERY

A. A Distinction Between "Copyright" and "Droit d'auteur"

Copyright is an Anglo-Saxon concept which, in essence, may be looked at as a negative notion, defined as an exclusive property right of limited duration. "It is simply the right to prevent the copying of physical material and its object is to protect the owner of the copyright against any reproduction of that material which he has not authorized."¹⁸ Copyright has mostly an economic value and stands as a creature of statute which, as a consequence, has three statutory limitations:

- (1) a limited duration, beyond which the work falls into the public domain;
- (2) some uses of protected work are free, which are called "fair use";
- (3) the owner of the right may not be given an absolute right but only a right to equitable remuneration for each use, which is named as a "compulsory license."¹⁹

"Droit d'Auteur" is a Continental European concept of natural and individualistic essence and may be viewed as positive. The protected right stems from the act of personal creation. There is an intellectual property which conveys an absolute right which, in theory, cannot be restricted. Major proponents of this vision have accepted a 50 years duration. This intellectual right is of a moral nature. The author is looked at as the weaker party, so that "droit d'auteur" is aimed at protecting the creator of the work.

In practice and throughout a one hundred year international codification process, the differences between the Copyright and the "Droit d'auteur" systems have narrowed so that both systems largely overlap. A merging process of both systems took place with the simultaneous revision in 1971 of the Berne Convention ("droit d'auteur" countries) and of the Universal Copyright Convention (copyright countries), each convention being open for the signatures of member parties of the other convention. Of interest for satellite broadcasting and to a large extent for commercial remote-sensing are: 1) the Berne Convention, first signed in 1886 and amended several times until 1971 (Convention for the Protection of Literary and Artistic Works),²⁰ 2) the Universal Copyright Convention, first signed in 1952 and amended in 1971,²¹ 3) the Rome

¹⁸ Stephen M. Stewart, *INTERNATIONAL COPYRIGHT AND NEIGHBOURING RIGHTS* 7-8 (1983).

¹⁹ *Id.* at 71.

²⁰ 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.

²¹ Universal Copyright Convention, Sept. 6, 1952, 6 *U.S.T.* 2731, 216 *U.N.T.S.* 133 (entered into force Sept. 16, 1955), revised July 24, 1971, 25 *U.S.T.* 1341, 943 *U.N.T.S.O.*

Convention, signed in 1961 (International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations),²² and, 4) the Satellite Convention, signed in Brussels in 1974 (Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite).²³

Without discussing these conventions in detail, it is possible to highlight the main legal provisions relevant to remote-sensing organizations which intend to commercialize their end-product imagery. However, it should be noted that none of these conventions directly cover the matter of remote-sensing imagery. For the sake of simplicity, the expression "copyright" will be used hereunder covering notions of "copyright", "droit d'auteur", and "droit moral" (moral right) when they appear in the convention provisions under study.

B. Main Clauses of Current Copyright Conventions which Apply to Commercial Remote-Sensing

1. *The Berne Convention (1971)*

There is no doubt that remote-sensing imagery is part of the general scope of Article 2 of the Berne Convention.²⁴ 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. It has been reported that this question was first envisioned when the Jodrell Bank Observatory received video signals transmitted by Luna 9 and published them afterwards without authorization by the owner of the satellite and with a possible infringement of his copyright on the pictures. The question was never answered which may confirm that, if there was indeed a copyright infringement, the scientific nature of the publication has justified it. As a matter of fact, the absence of copyright clauses in NASA agreements with foreign space agencies was a permanent feature of the early Landsat experiments.²⁵

²² International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations, Oct. 26, 1961, 496 U.N.T.S. 43 (entered into force May 16, 1964).

²³ Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite, May 21, 1974, 13 I.L.M. 1444 (entered into force Aug. 25, 1979).

²⁴ Excerpts from Art. 2 of the Berne Convention (1971): "(1) The expression "literary and artistic works" shall include . . . photographic works to which are assimilated works expressed by a process analogous to photography . . . illustrations, maps, plans, sketches and three-dimensional works relative to geography, topography, architecture or science . . ." Convention for the Protection of Literary and Artistic Works, *supra* note 20, at 227.

²⁵ For a study of the evolution of the content and of the structure of these agreements, see Patrick A. Salin, "Landsat Contracts Signed by US Agencies with Foreign Ground-Stations: Com-

In order to have a copyright protection be effective, the Berne Convention provides that works must be "fixed in some material form,"²⁶ and national laws may not renege on their obligation to participate in such protection. Only news information is not covered by these provisions.²⁷ Incidentally, the Mediasat project of the late eighties²⁸ would have had to cope with this Article 2-8 provision of the Berne Convention which specifically withdraws that type of satellite transmitted data from the scope of the copyright protection.²⁹

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.³⁰ 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

mercial Remote-Sensing from NASA Scientific Experiments to EOSAT Private Endeavours," ZEITSCHRIFT FÜR LUFT-UND WELTRAUMRECHT, June 1992, at 165-175.

²⁶ 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, *supra* note 20, at 227.

²⁷ 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, *supra* note 20, at 227.

²⁸ Mediasat was a media business consortium envisioned in the late eighties which planned newsgathering from space by dedicating a remote-sensing satellite to that purpose in order to supply critical information. Commercial viability of the project has never been demonstrated. For more information on this venture, see Richard DalBello, *Gathering News From Space*, Ray A. Williamson, *Space Policy*, Nov. 1987, at 298. See also U.S. Congress Office of Technology Assessment, *Commercial Newsgathering From Space—A Technical Memorandum*, OTA-TM-ISC-40 (Washington, D.C.: U.S. Gov't Printing Office, May 1987).

²⁹ See Luc Frieden, *Newsgathering by Satellites: A New Challenge to International and National Law at the Dawn of the Twenty-First Century*, 25 STAN. J. INT'L L. 103 (1988). See also Robert P. Merges & Glenn H. Reynolds, *News Media Satellites and the First Amendment: A Case Study in the Treatment of New Technologies*, 3 HIGH TECH. L. J. 1 (1988).

³⁰ Excerpts from Art. 5, Berne Convention: "(1) Authors shall enjoy, in respect of works for which they are protected under this Convention, in countries of the Union other than the country of origin, the rights which their respective laws do now or may hereafter grant to their nationals, as well as the rights specially granted by this Convention.

(2) The enjoyment and the exercise of these rights shall not be subject to any formality . . . the extent of protection, as well as the means of redress afforded to the author to protect his rights, shall be governed exclusively by the laws of the country where protection is claimed . . .". Convention for the Protection of Literary and Artistic Works, 63 U.K.T.S. 29 (1990).

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,"³¹ but this should not harm their 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.

2. *The Universal Copyright Convention (1971)*

The Universal Copyright Convention (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.³² 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 recognized that the Berne Convention provides a higher standard of copyright protection than the UCC.³³ 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

³¹ 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 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).

³² 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.

³³ See Stewart, *supra* note 18.

member of the UCC. If it tries to do so, it will lose both memberships.³⁴

3. *The Rome Convention (1961), the Phonogram Convention (1971)
and the Satellite Convention (1974)*

These conventions are of little or no interest to remote-sensing imagery protection since they are exclusively designed for the protection of the radio and satellite broadcasting of literary and artistic works. They also imply a public reception and distribution of sounds or of images which have been fixed on some material support or of their performance.³⁵

However, from a purely doctrinal point of view, one may express several comments on a few of these convention provisions which may have a potential application to the specific case of remote-sensing imagery.³⁶ National legislatures may reduce the extent of the copyright to that of a compulsory license: "the author's permission is no longer required and the broadcaster's only duty is to ensure that the author receives remuneration customarily regarded as "equitable", . . . "equity" is the sole possible criterion for determining remuneration in the absence of balanced contractual discussions."³⁷

Then, how far may a remote-sensing imagery products licensor go in terms of prescribing the rights and duties of the licensee as well as his remuneration? Such potential restriction to the ability of the satellite operator to regulate the actions of its distributors, as applied to remote-sensing by means of a specific convention, may contradict with some established practices which go far beyond.

³⁴ Excerpts from Art. XVII of the Universal Copyright Convention: "1. This Convention shall not in any way affect the provisions of the Berne Convention . . . or membership in the Union created by that Convention.

2. In application of the foregoing paragraph, a declaration has been annexed to the present Article. This declaration is an integral part of this Convention for the States bound by the Berne convention The signature of this Convention by such States shall also constitute signature of the said declaration, and ratification, acceptance or accession by such States shall include the declaration, as well as this Convention." *Supra* note 32, at 6 U.S.T. 2744, 216 U.N.T.S. at 148.

Excerpts from Appendix declaration relating to article XVII: "a) [W]orks which, according to the Berne Convention, have as their country of origin a country which has withdrawn from the Berne Union after January 1, 1951, shall not be protected by the Universal Copyright Convention in the countries of the Berne Union." *Id.* at 6 U.S.T. 2746, 216 U.N.T.S. at 150.

³⁵ Excerpts from Art. 3 of the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organisations:

"b): "phonogram" means any exclusively aural fixation of sounds of a performance or of other sounds; . . .

f): "broadcasting" means the transmission by wireless means for public reception of sounds or of images and sounds; . . ." Oct. 26, 1961, 496 U.N.T.S. 43, 46.

³⁶ André Kerever, *Satellite Broadcasting and Copyright*, 24 COPYRIGHT BULLETIN 6 (1990).

³⁷ *Id.* at 6-7.

There is no doubt about the fact that "any operation whereby . . . works are made available to the public constitutes an act of communication to the public, of public performance or of broadcasting. It therefore matters little whether the broadcaster uses a direct broadcasting satellite (DBS) or a fixed satellite system (FSS) if the signals are actually available to the public in both cases."³⁸

Applying Kerever's reasoning to remote-sensing imagery, when this imagery is made available to the public, it may automatically fall into the category of public broadcasting, which means that it could be within the scope of the 1974 Brussels Satellite Convention. However, Kerever adds further that "copyright obligations depend solely on whether there has or has not been communication to the public, and not on the lawfulness of the conditions of public access from the standpoint of public telecommunication law."³⁹

Such a position, i.e. whether there has been communication to the public, has been supported by the European Commission on Human Rights in Strasbourg, France.⁴⁰ The Strasbourg Commission ruled that "the nature of the message transmitted by the signal, combined with the encoding or non-encoding of the signal determined whether it was intended for the public." Even though the jurisdiction of the Strasbourg Commission is restricted to human rights, its opinion is interesting to be noted.

The gap is easily bridged in the case of remote-sensing, since the bits which compose the message on the Computer Compatible Tape (CCT) request a very special processing by the receiver before it is made accessible to the public; since this process is a *de facto* encoding, it is not aimed at the public. Therefore, one may directly question the validity of any kind of copyright on remote-sensing raw data from the position of the most recent copyright conventions. But as soon as this raw data is converted into visually accessible information, one may consider this a copyrightable work. But such work would then have to be rendered accessible

³⁸ *Id.* at 9.

³⁹ *Id.*

⁴⁰ *Autronic AG v. Switzerland*, 8 March 1988. In this case, a national postal authority had refused a company the right to install dish antennas capable of picking up programs transmitted by the FSS (Fixed Service Satellite)-classified Soviet telecommunication satellite Gorizont. The authority cited the FSS classification as grounds for its claim that, under Article 22 of the ITU Convention and Article 23 of its Regulations, these programs were subject to secrecy of correspondence and postal authorities were bound to prevent them from being made accessible to the public. The company maintained that the encoded television program carried signals that were normally accessible to the public and that freedom of reception was therefore guaranteed under Article 10 of the European Convention of Human Rights. The Commission decided in favour of the company. *Cited in Kerever, supra* note 36, at 9-10.

to the public. This, however, is not the case in Canada, where such information is stored and archived at the Gatineau or Prince Albert CCRS ground station, two government sites which are not currently open to the public. It is beyond that point, when data is ready to be stored and by the same token is ready to be sold, that a copyright may become necessary and justifiable.

Remote-sensing simplifies the debate regarding the applicable law and the existence of an exclusive copyright in the context of regular uplink and downlink satellite transmissions. The simplification arises from the technical fact that remote-sensing is generated by some kind of work done only in outer space which, in terms of international telecommunication, corresponds to a unilateral downlink transmission emanating from a satellite which remains the total responsibility of the state of registration having granted an operational license to a closely controlled operating agency. But on the terrestrial segment of the whole operation—the marketing of the data—the operating agency is free to impose the law and the legal provisions of its choice when contracting with foreign ground stations.

In fact, the core of the copyright recognition problem for remote-sensing imagery lies around the nature of raw data. The World Intellectual Property Organization (WIPO) identifies four conditions which must be fulfilled so that a work may be eligible for protection:⁴¹ 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,⁴² which may be what remote-sensing imagery is about, since authorship derives from the work of an observation machine. 4) The work must be creative, which supposes the particular intervention of a human being. For regular remote-sensing or regular earth observation like the Meteosat system, one may argue that there is

⁴¹ Marie F. Murphy & Rene Oosterlinck, *Protection des Données et des Inventions dans L'Espace in DROIT DE L'ESPACE* 279 (Jacqueline Duthiel de la Rochere ed., 1988).

⁴² 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 . . ." *Supra* note 31, at 31.

no human intervention, but only well programmed sophisticated equipment. But one may also argue that there is human intervention when the two steerable sensors of SPOT satellites are programmed according to client requests, or also when EOSAT, or Radarsat starting in 1994, ask their clients to specify what portion of the Earth surface the satellite sensor must be programmed for transmission.

However, national laws which must inevitably be updated in order to abide with international copyright conventions do not seem to consider raw data as being original and of a creative nature.⁴³ The operating agencies may then protect their raw data by referring to the International Telecommunication Convention (ITC) which specifically makes it illegal to acquire signals when it is not duly authorized by the transmitting organization.⁴⁴ They may also use specific encoding systems—and change them periodically—in order to make their satellite signals inaccessible for non-informed third parties.

Another way to look at the protection of raw data as soon as it is archived—i.e. as soon as it is received by the licensed ground station and stored in computer facilities—is under its database dimension as soon as it is archived. But one may argue that it is fairly late, since a pirate ground station may already have funnelled the information in its own computer facilities. Once it has been stored anywhere in the form of computerized archive, it is no longer a remote-sensing raw data copyright, but a plain database copyright for which a solution must be found with existing international conventions. This question does not seem easier to solve.⁴⁵

As an exemple, it appears that the remote-sensing operator who intends to have its archived raw information database copyrighted in the U.S. not as a database *per se*, but as a mere compilation of literary works⁴⁶ would face two types of hurdles: 1) Registration difficulties, be-

⁴³ See Murphy & Oosterlinck, *supra* note 41, “[I]t seems that in most countries, raw data are not considered as if they were creative works and therefore cannot be protected under the droit d’auteur rules . . .” (translation Salin).

⁴⁴ International Telecommunication Convention, Nov. 6, 1982, 33 U.K.T.S. 1, 13-14 (1985). Excerpt from Article 23 on Establishment, Operation and Protection of Telecommunication Channels and Installations:

“ . . .

2. So far as possible, these channels and installations must be operated by the methods and procedures which practical operating experience has shown to be the best . . .

3. Members shall safeguard these channels and installations within their jurisdiction.

4. Unless other conditions are laid down by special arrangements, each Member shall take such steps as may be necessary to ensure maintenance of those sections of international telecommunication circuits within its control.”

⁴⁵ Laurent Faugérolas, *L’ACCÈS INTERNATIONAL À DES BANQUES DE DONNÉES* (1989).

⁴⁶ A compilation is “formed by the collection and assembling of preexisting materials or of data

cause US copyright law forces as many registrations as there are updates: "it allows for a single registration to apply to any database updates or revisions over a three-month period."⁴⁷ In other words, registration of an electronic database which is continually changing may become unmanageable, and 2) Publication difficulties (through dissemination), because "under US copyright law, what constitutes publication of a database is not entirely clear," even according to the Copyright Office.⁴⁸

Yet, with the Berne Convention the problem is not easier. Since computer programs and databases were not much developed at the time of the revision of the Berne Convention, the convention refers to protection defined by domestic law. By extrapolation, this may be extended to any work of new technology, including a downlink stream of remote-sensing raw data. However, "much confusion exists as to how the current text of the Berne Convention should be interpreted with respect to these works of new technology."⁴⁹ And as if such confusion was not sufficient, it is estimated that where a party to the Berne Convention violates its obligation, the Convention's enforcement mechanisms are fairly weak,⁵⁰ being left to each country's goodwill in the matter.⁵¹

A last resort for the protection of raw data lies with provisions which may be similar to those of the U.S. Land Remote-Sensing Act⁵² of 1984 and its sections 601-a and 603.⁵³ In other words this is a non-dis-

that are selected, co-ordinated, or arranged in such a way that the resulting work as a whole constitutes an original work of authorship." 17 U.S.C. sec. 101 (1988).

⁴⁷ Carol A. Motyka, *Effects of U.S. Adherence to the Berne Convention*, 16 RUTGERS COMPUTER & TECH. L. J. 195, 212 (1990).

⁴⁸ *Id.* at 213. "It is unclear whether on-line availability with or without printers for the user constitutes publication of the work under copyright law." The decision of publication is made by the copyright owner. *Id.* at 213 n. 204, citing Copyright Registration for Automated Databases, Copyright Office Circular 65(1987), reprinted in COPYRIGHT L. REP. (CCH) 15,054.

⁴⁹ See Motyka, *supra* note 47, at 214.

⁵⁰ Excerpt from Article 16 of the Berne Convention:

"(1) Infringing copies of a work shall be liable to seizure in any country of the Union where the work enjoys legal protection.

(2) The provisions of the preceding paragraph shall also apply to reproductions coming from a country where the work is not protected, or has ceased to be protected.

(3) The seizure shall take place in accordance with the legislation of each country."

Supra note 31, at 63 U.K.T.S. 34.

⁵¹ Clayton Yeutter, U.S. Trade Representative, stated at the Senate Hearings on the Berne Convention (100th Cong., 2d Sess. 2 (1988): "[S]ome countries don't want to enforce Berne because they've discovered that piracy pays." See *supra* note 47, at 221.

⁵² Land Remote-Sensing Commercialization Act of 1984, 15 U.S.C. secs. 4201-4292 (1988).

⁵³ Excerpt from Land Remote-Sensing Commercialization Act of 1984, Pub. L. No. 98-365, Sec. 601(a), 98 Stat. 451, 463: "Sec. 601—Nondiscriminatory data availability. (a) Any unenhanced data generated by any system operator under the provisions of this Act shall be made available to all users on a nondiscriminatory basis in accordance with the requirements of this Act."

Excerpt from Land Remote-Sensing Commercialization Act of 1984, Pub. L. No. 100-147, sec. 603, 101 Stat. 876, 877 (1987): "Sec. 603—Nonreproduction - In addition to such other terms and

semination clause aimed at keeping raw data under the control of the satellite operator, thereby functioning as a *de facto* copyright towards any buyer. However, in the case of a non-contracting station which would technically be able to receive the signals, there is no protection. It has been reported that the main reason for the absence of such protection by the US lawmakers was the protection of the value-added industry against potential abuses by the satellite operators.⁵⁴ The underlying motivation was that the risk for unleashed copying is far greater with enhanced work—which is more easily covered by the international conventions—than with raw data.

Obviously, there is currently no adequate and efficient protection of remote-sensing raw data in international law. In the wake of the various copyright conventions, one may think that there is a need for such a specific convention, which may be a necessary step if the trend towards the commercialization of remote-sensing is to be maintained in order to let private organizations 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,⁵⁵ including remote-sensing imagery.

III. A COMPARATIVE ASSESSMENT OF LANDSAT, SPOT, MOS-1, ERS-1 AND RADARSAT ACTUAL COPYRIGHT PROVISIONS

Even though these copyright provisions were created at approximately the same period, in the late 1980's, 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 analyze how these copyright provisions are translated in the market at the client level through a plain sales contract. All these contracts are recent in their making, having been signed by the five space agencies which have already been introduced with their foreign partners between 1989 and 1991.

conditions as the system operator may set forth in compliance with section 601 of this Act, the system operator may require that unenhanced data not be reproduced or disseminated by any foreign or domestic purchaser.”

⁵⁴ See Murphy & Oosterlinck, *supra* note 41, at 287: “An in-depth analysis of Congress reports reveals that the reason why raw data are not legally protected comes from the fact that Congress wanted to protect value-added firms because they develop the market.”

⁵⁵ See Motyka, *supra* note 47.

A. 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, it is not surprising that 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.⁵⁶ 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, the National Aeronautic and Space Development Agency (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."⁵⁷ 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."⁵⁸ No more precision is provided for in this respect.

For the European satellite ERS-1, the European Space Agency (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."⁵⁹ 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.⁶⁰ The local authority may also add its own (C) logo depending on its own contribution to the analyzed 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, the Canadian Space Agency (CSA) simply says that "all copyright and ownership rights for SAR data will be vested or re-

⁵⁶ Landsat Data Downlink Agreement, Art. IV, Sec. D., signed by EOSAT.

⁵⁷ Arrangement Between NASDA and a Foreign Partner for the Direct Reception and Distribution of MOS-1 Data, Art. 8.1.

⁵⁸ *Id.* at Art. 8.2.

⁵⁹ Arrangement Between ESA and a Foreign Partner Concerning the Direct Reception, Archiving, Processing and Distribution of ERS-1 Data, Art. 10.2.

⁶⁰ *Id.* at Arts. 11.1, 11.2.

served 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.”⁶¹ 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 under study. 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” 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.⁶²

B. Complementary Restrictive Provisions

Complementary restrictive provisions aim at strengthening the unavoidable flaws and weaknesses of international copyright conventions. This is where the intention of contract writers shows up in their will to effectively fend off risks of uncontrollable dissemination of raw data.

The EOSAT contract contains a rather ambiguous clause stating that, “neither title to nor ownership of the Landsat data transmitted to Earth Station under this Agreement is transferred to Earth Station,” which is further explained by the statement, “EOSAT grants to Earth Station a nonexclusive license to use, copy and distribute such Data for the purpose of performing this Agreement”⁶³ This seems to equate to a right of use *as if* the station were the owner of the data, *as if* it were to market the data as the owner would do, without transferring the ownership of the data. This also is to be understood within the Data protection plan which has been mentioned in section A above. Such provisions do not ensure a real control of data dissemination by EOSAT through the whereabouts of the local station, which is not ensured of being the only one to use the data, since the license is nonexclusive. Therefore, the legal incentive to abide by EOSAT’s restriction does not look very strong.

The NASDA contract does not accompany its general restriction clause about intellectual property with any other comments. In addition,

⁶¹ 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.

⁶² Agreement Regarding the Reception and Distribution of SPOT Data, Arts. 11, 12, 14, signed by SPOT IMAGE.

⁶³ See EOSAT Agreement, *supra* note 56, at Art. IV, Sec. E.

there is only a confidentiality clause requesting that the local agency not disclose the commercial, financial, scientific and technical information pursuant to this Arrangement without written consent.⁶⁴

ESA accompanies its copyright clause with the request that the local agency provide a model sales contract including "a written undertaking" that third parties "shall not distribute or sell ERS-1 SAR data and analyzed information in their possession or copies thereof."⁶⁵ This is an attempt to control what clients do with the purchased raw data or value-added products. ESA also requests that all packagings of ERS-1 data and analyzed information be clearly marked that they are distributed by the agency "under ESA license."⁶⁶

CSA's copyright clause is straightforward. Further protection is added in an international memorandum of understanding (IMOU) signed by NASA and NOAA which co-manage the Radarsat project. In this IMOU, CSA states that the participation of "agencies or organizations outside of the Governments of the Parties" will be the subject of separate agreements with CSA, and that such participants "will agree to support all project objectives, including . . . restrictions on data distribution."⁶⁷ This is embodied in the MOU between CSA and RSI whereby RSI is instructed to keep CSA informed about any intention or activity it may undertake in relation to the value-added market. This is certainly a valuable clause when considering that SPOT IMAGE has entered the value-added market, a possibility that RSI may also consider.

Finally, SPOT IMAGE again has the most elaborate provisions. It really utilizes the local agent or station as a kind of common manager of the SPOT raw data and value-added products. Evidence of such a partnership appears in the following clauses:

- * The other party, "agrees not to assert against CNES any right or claim whatsoever with respect to copyright on the Data,"⁶⁸ even if related to its own value-added contribution.
- * The contracting partner must also provide SPOT Image with a model sales contract and must ensure that all sub-licensees and customers will sign such sales contract where it says that they must comply with the terms of this agreement.
- * Raw data and value-added work delivered to a third party must include "a written undertaking that such third party shall respect CNES copyright interests and . . . shall not distribute or sell" those data or work or copies

⁶⁴ See NASDA/MOS-1 Arrangement, *supra* note 57, at Art. 9.

⁶⁵ See ESA/ERS-1 Arrangement, *supra* note 59, at Art. 11.1 (b).

⁶⁶ *Id.* at Art. 11.2 (b).

⁶⁷ See CSA Radarsat/IMOU, *supra* note 61, at Art. 12.6.

⁶⁸ See SPOT IMAGE/Spot Agreement, *supra* note 62, at Art. 11.3.

thereof.⁶⁹

* The contracting partner must make every effort to be informed "of any infringement or suspected infringement of CNES copyright interests and . . . trademarks."⁷⁰

* Should such infringements occur, both parties must consult "in order to reach an agreement concerning the measures to be taken" including "legal actions by one or both of the parties against the infringer or suspected infringer of the copyright interests or trademarks."⁷¹

* In the event of legal action with a sub-licensee, the contracting partner "will at its own cost take any action including legal proceedings" without undermining CNES' or SPOT IMAGE's ability to undertake similar actions or to subrogate the other party's rights against the infringer.

* Finally, each party agrees to join the other in such an action.

* Also of interest are clauses regarding the assignability of part or all of this agreement, as well as the granting of sub-licenses to prior written agreements from SPOT IMAGE.

Whether this much wider array of legal provisions is more efficient than the less detailed protection clauses of the other agreements remains to be tested in practice. It appears so far that SPOT's legal advisers have designed a series of converging provisions which aim at filling the giant gaps that international copyright conventions have in reference to remote-sensing raw data.

C. Actual Copyright Provisions as They Appear on Sales Contracts

The actual intention of the contract makers appears at the client level when it is incorporated into everyday sales conditions. This analysis is restricted to EOSAT and SPOT IMAGE since only those two organizations have been operational on a large scale for several years.

1. EOSAT's Sales Contracts

EOSAT signs with its clients an "Agreement for Purchase and Protection of Satellite Data." Out of the six sections and the accompanying order form, only one is relevant to this analysis, "Confidentiality of Satellite Data." One may notice that there is no mention of any copyright in any form. Satellite Data is presented as a "special, valuable and unique asset of EOSAT" and is "confidential information which is disclosed in confidence to Purchaser."⁷² This is the justification of the sale and the clause sets the framework within which the sale is performed. Ironically, it contradicts a free access data policy.

⁶⁹ *Id.* at Art. 11.6.

⁷⁰ *Id.* at Art. 11.7.

⁷¹ *Id.* at Art. 11.9.

⁷² Introduction to Section 2 of EOSAT's "Agreement for Purchase and protection of Satellite Data."

A client may "use, translate, enhance or display" the data for an "authorized purpose", which must be "related to its established activities or lines of business."⁷³ This clause allows for a transformation of raw data sold to the client as far as it is related to the authorized use. This includes free dissemination within the client's organization as long as the receivers are juridically dependent on the purchaser. Part of the clause seems hard to apply from a purely commercial point of view, stating that data should not be disclosed to a client's competitor, since EOSAT is a privately run business organization whose purpose is to make a profit and the client does not hold an exclusive licence.

A fairly weak clause has the client agree "to take appropriate action" in case of inadvertent disclosure of information. This is analogous to SPOT's stronger clause by which the foreign agency should take legal action against offenders of the non-dissemination restriction.⁷⁴ While the need for such a provision is easily understood, one may wonder about its effectiveness. A copy of the warning which appears on the data packaging is inserted in this sales agreement, in a manner very similar to most software products in North America. In essence, data is presented as a "confidential trade secret of EOSAT."⁷⁵ Again, no copyright is specifically mentioned, the data being presented as "proprietary information," but nothing is said about the owner of the information. The Agreement for Purchase goes on, expressing that infringement of this disclosure restriction constitutes "misappropriation of a trade secret" and is presented as a violation of Section 603 of the Landsat Act of 1984 and is illegal. Actually, this is the only legal effective protection that EOSAT may claim on its satellite data.

Brokerage services are also offered by EOSAT. EOSAT acts as an intermediary between a purchaser of archived satellite pictures and the ground stations (IGRS) located in 14 countries around the globe. Such sale is deemed to be performed by the IGRS itself, notwithstanding the intervention of EOSAT as an agent of the purchaser. Such intervention enables the purchaser not to disclose its identity to the local IGRS. It is interesting to note that such brokerage services were not mentioned in the sole example of MOU signed by EOSAT and a foreign agency that was analyzed earlier in this research.

As far as copyright privileges are concerned, there are no specific restrictions mentioned in this contract. One can only point out a general clause in Section 1(b) which refers to a transfer of rights from the IGRS

⁷³ See EOSAT Agreement, *supra* note 56, at sec. 2(a).

⁷⁴ *Id.* at Sec. 2.(d).

⁷⁵ Package Warning which is to be attached to satellite data media, shipments and containers.

to the purchaser.⁷⁶ One may question the meaning of such a clause. Would the purchaser benefit from a right after having purchased archived data? This leads to the conclusion that EOSAT proprietary rights on satellite data are restricted to raw data, before being archived and may confirm EOSAT's own view about the uselessness of any type of copyright clause.

2. *SPOT IMAGE's Sales Contract*

Sales conditions pertaining to the European market are obtained from the SPOT IMAGE headquarters in Toulouse, France. It is a fourteen clause document having an order form printed on its back.⁷⁷ The contract states first that the purchaser does not enjoy any exclusive right of any sort on the data that he has acquired. The "droit d'auteur" of CNES is very clearly mentioned relative to SPOT data. Commercial products sold by SPOT IMAGE are derived from those data and the purchaser may use them only for internal purposes. He may neither pass, lend nor transfer them, temporarily or permanently, to a third party, not even copies of them. Any commercialization of those products or of products which are derived therefrom is subject to prior SPOT IMAGE approval, and is the object of a specific contract. This, however, does not include reproduction of SPOT data mainly for educational or scientific purposes, provided that the CNES copyright and logo are clearly indicated on such reproductions. Finally, a sale of SPOT data does not attribute to the user any right to the data or to the company logo.

As a general comment, one may say that such conditions are more in tune with other provisions analyzed in this article. They do not appear to be very stringent since such sales are supposed to be performed on French territory. As far as the territory is concerned, these conditions may also be similar for most of the E.E.C. territory, or they should be similar beginning in 1993.

In the U.S., an Agreement on General Terms and Conditions for SPOT Data User Licenses is signed with any prospective client. Such Agreement is subject to SICORP's (SPOT IMAGE Corporation) exclusive right in the United States to license SPOT data acquired by SPOT satellites. It reasserts in its introductory paragraph that CNES holds all U.S. and worldwide copyrights covering SPOT data.

⁷⁶ "Title to all IGRS Data purchased pursuant to this agreement shall pass directly from the IGRS to Purchaser, and EOSAT shall acquire no rights or liabilities with respect to such IGRS Data except as expressly stated herein." EOSAT Brokerage Services Agreement, Sec. 1(b).

⁷⁷ SPOT IMAGE Sales Contract, "Conditions Générales de Vente," Secs. 10, 11, 11(b), 12.

Copyright considerations represent a large part of SICORP's agreement; specifically, four out of the 12 sections in the document or about half of the whole document. The bulk of these provisions is composed by section 2 which organizes the ways which the Licensee (the client, who is granted a non-exclusive license) may use the data. This section is composed of eight sub-sections identified from A to H, which successively attempt to cover the most important situations. They are organized around three basic principles:

- (1) Internal freedom. Clients are free to analyze, process, display and copy SPOT data strictly for internal purposes, as long as it does not result in any digital reproduction. One backup copy is allowed but not available to anybody. All copies must bear the CNES copyright logo.
- (2) Data is available to external identified partners. Data may be made available to outside contractors, consultants or joint-venturers only if such persons are bound in writing by the same restrictions and if they agree to return such data to the Licensee as soon as requested.
- (3) No copy is allowed unless authorized. Copy of data provided in photographic form, or transmission of data to media, or preparation of textual reports and of non-image materials based on data, or commercial reproduction, or distribution of derived products, or any kind of transfer of rights are forbidden, unless previously authorized by SICORP in writing.

Any breach of the above-mentioned, and of the other clauses of the agreement is deemed to be unlawful. A specific section is devoted to the physical appearance of the CNES copyright. It is considered to be "a material term of this contract and of all agreements entered into by Licensee" provided that such agreement has been approved by SICORP.⁷⁸ Third parties to these agreements must agree to abide with these provisions.

All these considerations confirm the general impression derived from the earlier analysis of the weaknesses of the copyright conventions as applied to the specific case of remote-sensing data. However, it is interesting to point out that, even though the U.S. has signed the Berne Convention, EOSAT does not make any reference to any copyright aspects of the data, but concentrates on the notions of confidentiality of information and of trade secret protection, whereas SPOT IMAGE attempts to strengthen the copyright notion as part of a more general contract obligation.

IV. CONCLUSION

This article has focused on specific proprietary aspects of the exploitation of earth observation imagery produced by the few operating

⁷⁸ SICORP's Agreement on General Terms and Conditions, Sec. 8.

commercial remote-sensing systems. The protection of commercial remote-sensing end-products is not adequately achieved through available legal international instruments. This lack of protection does not directly hamper the end-product itself, but it hampers the raw data from which it is derived. Raw data is the weak part, in terms of legal protection, of the whole commercial remote-sensing imagery chain which goes from the original satellite bits on their way down to the ground station, to the very sophisticated value-added products which are generated from this raw information through various value-adding processes. This may explain why there seems to be a trend towards having the satellite imagery distributor develop its own value-added products.⁷⁹

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. This looks more like a theoretical threat than an effective deterrent.

Since it is anticipated that value-added products developers will give the commercial remote-sensing industry a tremendous boost,⁸⁰ 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. Other anticipated developments also illustrate the need for a new international convention, for example, the use of such information by news media organizations and possible conflicts between proprietary aspects of satellite imagery and issues of personal freedom.⁸¹

To date, it appears that commercial remote-sensing imagery has developed primarily due to the initiatives of the few satellite operators. The

⁷⁹ This trend may have been started with SPOT IMAGE which recently introduced on the market of value-added products such items as "ready-to-use" imagery called SPOT QuadMaps, SPOT CountyViews and SPOT BasinViews, which are designed to update and replace standard US Geological Survey maps. See Lori Keeseey, *Value-Added Firms Eye Geographic Sector Growth*, SPACE NEWS, Dec. 3-9, 1990, at 8.

⁸⁰ Stephens, *Remote-Sensing: Opportunity Waiting to Happen—As More Attention is Focussed on Remote-Sensing, the Opportunity for Providing Value-added Services Increase Astronomically*, SATELLITE COMMUNICATIONS, May, 1991, at 16.

⁸¹ Robert P. Merges & Glenn H. Reynolds, *News Media Satellites and the First Amendment: A Case Study in the Treatment of New Technologies*, 18 HIGH TECH. L. J. 31 (1989). See also Luc Frieden, *Newsgathering by Satellites: A New Challenge to International and National Law at the Dawn of the Twenty-First Century*, 25 STAN. J. INT'L L. 193 (1989).

arrival of new competitors from other industrial countries and developing nations will undoubtedly stress the need to design an effective copyright system, similar to those that exist in other intellectual work-product industries, and possibly along the lines of the treatment of plain computer-transmitted images.⁸²

⁸² Benjamin R. Seecof, *Scanning Into the Future of Copyrightable Images: Computer-based Processing Poses a Present Threat*, 18 HIGH TECH. L. J. 400 (1990).