Michigan Journal of International Law

Volume 5 | Issue 1

1984

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Remote sensing has become a common practice. "Sensing," or "teledetection," to use a more elegant expression, has been conducted since the days when airplanes and photography became established as indispensable elements in human society. Since then, remote sensing by satellite has entered the world scene and opened up vast new horizons.

The main change that has occurred since the early days of aerial reconnaissance has been the development of greatly improved technology, which has permitted human access to outer space and the use of satellites. Instruments like multiband cameras and single-channel thermal-IR line scanners have been among the standard equipment of aerial survey companies for a long time,[1] but currently operations are carried out with much more sophisticated methods including multispectral scanners, side-looking radar and microwave radiometry.[2] Satellite remote sensing (SRS) combines all these methods with modern space technology, and has become a powerful tool for monitoring and assessing the resources of the earth.[3]

Although this article will not attempt to itemize all the present and future benefits of SRS, however fascinating such an exercise might be, I will indicate some areas of conspicuous achievement. In the early 1960s, earth orbiting satellites contributed to major progress in the field of meteorology by improving the scale and accuracy of weather forecasting.[4] Satellites launched a decade later afforded improved oceanographic observation, and located icebergs and underwater obstacles which endangered shipping. Microwave photography made it possible to obtain accurate imagery, even of areas continually obscured by cloud formation.[5] In the agricultural sphere, crop inventorization has been greatly improved, because of which early detection of impending crop failures is now possible.[6] In yet another area significantly affecting life on earth, the environment, SRS affords added protection and safeguards by providing early warning of pollution of sea, land and air. It may also render invaluable services by

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enabling prompt and precise assessment of damage caused in major calamities like earthquakes, volcanic eruptions and nuclear explosions.[7] Taken together, these capabilities may allow a better and more effective utilization of the resources of the earth.

There are, broadly speaking, two principal methods of conducting remote sensing operations. One method uses what is conventionally and legally known as the airspace, and involves the use of aircraft or balloons. These operations are governed by air law. The other method uses satellites in outer space. These operations have been conducted for about twenty-five years, and have by now largely overtaken and replaced their aerial predecessors, both in size and effectiveness.[8]

In this article certain problems surrounding SRS will be addressed with particular emphasis on their legal implications. Aspects of air law as they affect remote sensing will not be discussed in any detail, nor will it be necessary to refer to the vexing problem of determining the satisfactory boundary between the airspace and outer space. This fundamental problem is still in dispute and under constant review, both in scholarly circles and in the United Nations;[9] and the world community may consider itself fortunate that the issue has not prevented a number of important international agreements on space law from being adopted. The status of SRS in the regimes created by these agreements will be the focus of this article.

ATTEMPTS AT A LEGAL DEFINITION OF SRS

With these introductory remarks as a point of departure it is now appropriate to distinguish the so-called "space segment" of SRS operations from the "ground segment."[10] Space segment functions include the collecting, recording and transmitting to earth of data concerning the earth's surface. In the ground segment, the reception, conversion, interpretation and distribution of the data takes place. It is this last function, distribution, which causes controversy and has become a major point at issue among the nations of the world.[11] This issue will be discussed at length below.

There have been various attempts to find a suitable legal definition of SRS. Four definitions that have been suggested are:

1. "Remote sensing is 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;"[12]
2. "[R]emote 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 measurement from space platforms. Spe-

cifically, at present, such methods depend upon the emission and reflection of electromagnetic radiation;"[13]

3. "Remote sensing refers to the detection and analysis of resources on earth by sensors carried by aircraft and spacecraft;"[14]
4. Remote sensing consists of collecting data concerning objects, materials and situations on the earth by means of sensors mounted into fast-moving craft on land, at sea, in the air and in space, *and* processing such data for quantification, qualification and mapping purposes.[15]

Comparing these definitions, we note that the first formula is couched in such broad terms that it not only accommodates remote sensing conducted from aircraft, but also may include x-ray examinations or radar-directed shipping movements. The second definition is clearly more functional, and aimed at describing space operations. The wording of the third definition perhaps has the advantage of being very concise, but its value seems to depend too much on the interpretation of the word "sensors." The fourth suggestion, again, is more functional, but mainly remarkable in the way it embraces, in so many words, the functions of monitoring and data-processing. But whatever the merits of these attempts, the essential element they share is their agreement that remote sensing involves the absence of any actual physical contact with the object under surveillance. Also, most scholars will be prepared to regard monitoring and data-processing as an integral part of SRS functioning.

THE STATUS OF SRS UNDER CURRENT SPACE LAW

What place does SRS occupy under present day space law? For an answer to this question we must examine the origins of space law, and review events occurring at the United Nations from the late 1950s to the present. The serious implications of SRS, especially in the military sphere, were quickly recognized by the U.N. On December 12, 1959, the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) was established by the General Assembly.[16] To assist the Committee in carrying out its mandate, two commissions were formed from among its members, the Scientific and Technical Subcommittee and the Legal Subcommittee.[17] It is the latter which, in due course, became the leading center for discussions and preparatory work aimed at establishing a legal order for human activities in outer space. In 1971, a special working group was set up to help the Legal Subcommittee deal with problems posed by SRS.[18]

The COPUOS Legal Subcommittee can look back on its achievements with much satisfaction. It has been instrumental in clearing the way for

the adoption of a number of important international agreements on space law, three of which are especially important:[19] the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, (the "Outer Space Treaty") which became effective on October 10, 1967;[20] the Convention of the International Liability for Damage Caused by Space Objects, effective on March 29, 1972;[21] and the Convention on Registration of Objects Launched into Outer Space, effective on September 15, 1976.[22]

The Outer Space Treaty contains the main principles of space law to be observed in all space activities, including SRS. These principles can be summarized in five rules: (1) exploration and use of outer space must be carried out for the benefit and in the interests of all countries;[23] (2) there must be free access to outer space and free exploration and use by all states;[24] (3) national appropriation by claims of sovereignty, occupation, use or otherwise is explicitly banned;[25] (4) states are internationally liable for damage caused by objects launched into outer space;[26] and (5) registration of space objects carries with it jurisdiction and control for the state of registration over objects and personnel while in outer space; the ownership of space objects is not affected by their presence in outer space.[27]

Although SRS was already practiced on a considerable scale when COPUOS started its deliberations, and certainly by the time the Outer Space Treaty was concluded in 1967, none of the space law conventions cited above contain any reference to remote sensing. Article 1 of the Outer Space Treaty, however, does provide the guiding principle to be observed in any activities involving the use of outer space: these activities "shall be for the benefit of and in the interest of all nations."[28]

A convincing case can be made for the assertion that most SRS operations connected with the space segment, such as the installation and guidance of a satellite, involve the use of outer space as contemplated in space law, and are therefore subject to the provisions of the space conventions. However, although SRS is an activity involving the use of outer space, it is a space operation with a strong earth-oriented component. Its end product (*i.e.*, data) is presently collected and processed on earth, and destined to be distributed and used on earth. Sensing, data processing and distribution are essential elements in the SRS process if the whole operation is to achieve its ultimate benefical goal, but because these activities are performed on earth they are strongly connected with the state and the regions where they are carried out. It would be difficult, in these circumstances, to deny these states the exercise of sovereignty with regard to such operations.

Considering the strength of this sovereignty argument against the principle of unrestricted sensing or detecting, the assertion of the principle of state sovereignty cannot be dismissed lightly. It has been a fundamental

tenet of international law for hundreds of years that state sovereignty carries with it full powers of jurisdiction and control over all resources on its territory and its territorial waters.[29] The principle of sovereignty was made the cornerstone of air law in the "Chicago Convention" of 1944, where it is proclaimed that a state has sovereign rights over the airspace above its territory.[30]

In the light of these facts it is not surprising that voices have been raised contesting the legality of sensing operations, regarding them as intrusions into an area of state sovereignty. Some nations argued that SRS could not be carried out lawfully unless prior consent had been obtained from the "sensed" states.[31]

This view highlights a significant conflict between rules of air law and space law which may be illustrated by the following example. If aircraft reconnaissance, which is a form of remote sensing, is carried out above the territory of a foreign state without the latter's consent, it would clearly be unlawful under the fundamental principle of state sovereignty. It could be opposed by the sensed state and upheld in court, and in some situations retaliatory measures might be permissible or condoned.[32] Under space law, with its new and still mysterious dimensions, totally different basic concepts have found both general acceptance and formal expression, most notably in the Outer Space Treaty. Here, all claims of sovereignty have been banned in explicit terms; in addition, all states are to have free access to outer space, and access is to be used in accordance with international law "for the benefit and in the interests of all countries."[33]

But although some nations are arguing that prior consent to SRS should be obtained, such protestations have never adversely affected operational progress. Every state in the world has been "sensed" long ago, and violent opposition at the present stage would no longer carry enough conviction to support a strong legal case or have much dissuasive value.

The state sovereignty argument has been more successfully used to challenge the uncontrolled dissemination of SRS data and information, and it is clear that the guiding principles of space law cannot be applied here indiscriminately. But as significant interests of individual states are at stake in obtaining indispensable SRS information, and as these interests clash with the assertion of state sovereignty, it is not surprising that ways have been sought to overcome this conflict. For example, some nations have argued that freedom of information (and therefore freedom of dissemination of SRS data) should be considered an unassialable human right.[34] On a more practical level, bilateral agreements between the "sensor" state and other states have been concluded. Another method, which would perhaps provide more equitable distribution of information, would be to conclude a multilateral agreement. Proposals to this effect have already been made, and UNCOPUOS has once more played a prominent

role in resolving the difficulties facing this solution. Both the bilateral approach and the multilateral approach are particularly valuable methods of dealing with the problems facing SRS, and I will describe them in detail.

The Bilateral Approach

As an illustration of the bilateral approach, the LANDSAT agreements may be the best example.[35] These are agreements concluded between the United States National Aeronautics and Space Administration (NASA) and a number of countries including Argentina, Australia, Brazil, Canada, India, Italy, Japan, and Sweden.[36] The agreements require that these countries build, at their own expense, ground stations for the acquisition and processing of SRS data.[37] NASA's authority to enter into these agreements derives from the NASA Act of 1958, which provides "that activities in space should be devoted to peaceful purposes for the benefit of all mankind,"[38] while Section 205 of that Act empowers NASA to engage in "a program of international cooperation in work done pursuant to this Act, and in the peaceful application of the results thereof."[39] In addition to the requirement that each country pay for its own share in the project, it is also agreed under LANDSAT arrangements that data obtained from experiments are made available to the international scientific community. Countries without LANDSAT facilities but within range of the ground stations will also be provided with information.[40]

A very important feature of the LANDSAT agreements has been stated in the following provisions:

> It is understood that the (government agency) and the other government agencies participating in the program will pursue a LANDSAT open-data policy comparable to that of NASA and other U.S. agencies participating in the program, particularly with respect to the public availability data. The (government agency) will thus ensure unrestricted public availability of the earth resources satellite data at a fair and reasonable charge.
>
> Catalogue listings of LANDSAT data processed by the (geographic location) station as well as ground station tape recorder logs will be provided to NASA on a monthly basis.
>
> . . . The (government agency) and NASA may each release general information to the public regarding the conduct of their own portion of the project as desired and, insofar as participation of the other agency is concerned, after suitable coordination.[41]

These passages clearly reflect the open-data policy sought by NASA, a policy which is in conformity with the traditional attitude in the United States towards public information.[42] Care has also been taken that in

carrying out the agreements no guiding principles or other rules of space law are violated or ignored.

In a world-wide context, UNCOPUOS, while continually stressing the need for maximum cooperation with the United Nations, the Specialized Agencies, and the UN Regional Commissions, has repeatedly expressed satisfaction with the result of the LANDSAT arrangements.[43] Nonetheless, the Scientific and Technical Committee has suggested that the possibility of establishing a global center, complementary to the regional centers, should be studied in the interest of "dissemination of all data and information to all countries on an equal and non-discriminatory basis."[44]

Multilateral Approaches

As stated above, when the United Nations General Assembly was faced with the growing challenge posed by SRS, it requested that the Scientific and Technical Subcommittee of UNCOPUOS in 1970 set up the Special Working Group on remote sensing.[45] The Working Group's mandate, subsequently sanctioned by the General Assembly, was formulated as follows:

> the objective will be to promote the optimum utilization of this space application including the monitoring of the total earth environment for the benefit of individual States and the international community, taking into account, as may be relevant, the sovereign rights of States and the provisions of the Treaty of Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.[46]

After the Working Group had submitted a Report[47] pinpointing the principle factors to be taken into account in any further actions, the General Assembly in 1974 called upon the Legal Subcommittee to address the question. Its purpose was to investigate "the legal implications of remote sensing of the earth from space, taking into account the various views of States expressed on the subject, including proposals for draft international instruments."[48]

In 1976, the Working Group was asked to formulate principles on the basis of common elements in a number of draft proposals.[49] These proposals had been submitted by Argentina, Brazil, France, the Soviet Union, and the United States, some of them in the form of joint proposals.[50] Principles were drafted and thoroughly scrutinized.[51] Opinions remained divided, however, on the central question of whether sovereign rights did or did not extend to SRS information on national resources.

Although in 1978 some further progress was made, no consensus could

be reached on the sensitive issues of sovereign rights and free access to SRS data and information.[52] In conformity with its proposal, which did not mention sovereignty,[53] the United States constantly argued the principle of free access to data and information, whereas most other nations continued to argue the theory of sovereign rights.[54] Since 1978 there has been little change, and to date no consensus has been reached.[55]

Events in the Working Group may well have presaged a trend that was soon to become apparent in other forums: the mounting influence of developing countries and the pressure of their combined weight in international affairs. This was manifest in the Second UN Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE), which was convened in Vienna in August 1982.[56] The first UNISPACE Conference had met in 1968, and in view of the rapid progress in space exploration and technology in the intervening years, the General Assembly considered that there was a need to reassess the methods of achieving maximum benefit for all concerned.[57] COPUOS also played an important role here. As a focal point for discussions and action in all matters regarding outer space, it had been called upon to make all preparations for the Second UNISPACE meeting.[58]

The Second UNISPACE CONFERENCE

This Conference, called by the General Assembly at the recommendation of UNCOPUOS, reflected the growing involvement of all nations, both developed and developing, in outer space activities.[59] Decisions taken at the conference dealt with matters of technical cooperation, United Nations activities and the promotion of peace. A consensus was achieved on a recommendation to guide the fast-growing use of space technology,[60] and it was also agreed to establish a UN space information directory which would channel sources of information and data services to inquiring states via data banks.[61] In addition to these general directives, the conference also issued more specific recommendations, notably on SRS.[62]

Prominent among the views expressed at the conference were those of the group of developing nations,[63] the so-called "Group of 77." Not only was their stand forceful in its concern about the arms race in outer space, and about the implications of Direct Television Broadcasting,[64] but it is obvious from the Conference Report that their influence was also noticeable with regard to SRS. The developing countries noted in the Report that a situation might arise where data are not available to the sensed state while being available to another country for commercial and other forms of exploitation. An international agreement on the principles governing SRS was therefore urged, and this was followed by a recommendation that current discussions of this matter in UNCOPUOS should be completed expeditiously. The "Group of 77" also insisted on having timely and

non-discriminatory access to the primary date concerning their territories acquired through SRS.[65]

Other findings in the Report were that greater attention should be paid by countries developing and operating space segments to the complementarity and compatibility of their data systems with those of other satellite systems.[66] In this manner redundant experiments could be avoided, and costly changes of existing ground equipment would be minimized.[67] In addition, the long-term availability of satellite data and the broadest possible use with existing facilities should be guaranteed.[68]

The Report stated that the long-term future of SRS lies in its utilization for the management of renewable resources and the monitoring of the environment.[69] This potential is still far from realized, partly due to the time-lag between the acquisition of data and its availability to the user.[70] It is pointed out that effective application requires rapid, preferably direct, access by countries to the data concerning their territories.[71] Furthermore, the Report encouraged the use of inexpensive, simple ground equipment.[72] Since most countries would be unable to afford sophisticated, expensive ground reception and data-processing facilities, it was suggested that close cooperation between the national agencies and regional facilities be contemplated, possibly in conjunction with a system of distribution of the processed data to simple, inexpensive user terminals.[73]

Further recommendations by UNISPACE included:

1) A suggestion that UN organizations like FAO, UNESCO, UNDP, and UNEP should strengthen their programs which encourage dialogues between members about their requirements, and also encourage consultations between potential users and designers and producers.[74]

2) A study should be undertaken to assess the need for, and the viability of, a world-wide SRS system.[75]

3) Close cooperation is required in the establishment of regional or international centers, so that developing countries can derive the maximum benefit at the lowest possible cost. Before embarking upon such ventures, existing telecommunication links should be thoroughly examined to see whether these would be adequate for the purpose.[76]

4) As a final point, the Report stresses that access to meteorological data obtained from SRS are now free and should continue to be so, in the interest of developing countries whose national prosperity, especially in agriculture, has already become dependent on SRS services for weather forecasting.[77]

To sum up the Conference Report, it evidences a strongly increased emphasis on the interests of the developing world in acquiring an equitable share in SRS benefits. It is to be expected that this will not be without effect on further UNCOPUOS actions. Indeed, we may expect new initiatives there, focused on finding the proper legal framework.

In writing this article I have been guided mainly by my concern for the proper channelling of the enormous potential of SRS and to show the legal obstacles standing in the way of achieving this aim. But remote sensing is such a multi-faceted activity that no more than a rough sketch of its scope, ramifications and legal implications could be given. Future articles will explore these issues in greater depth.

NOTES

1 Bourély, *Europe and Remote Sensing,* in LEGAL IMPLICATIONS OF REMOTE SENSING FROM OUTER SPACE 47 (N.Matte and H. DeSaussure eds. 1976) [hereinafter cited as LEGAL IMPLICATIONS].

2 *Id.; see also,* Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space [UNISPACE 82], U.N. Doc. A/Conf. 101/10, at 24-27, 41 (1982) [hereinafter cited as UNISPACE Report].

3 *See, e.g.,* C. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 722-23 (1982); DeSaussure, *Remote Sensing of Satellite: What Future for an International Regime?,* 71 AM. J. INT'L. L. 707, 707-08 (1977); Morley, *Remote Sensing Satellites–What Do They Actually Measure and How Sensitive Is the Information,* in LEGAL IMPLICATIONS, *supra* note 1, at 13, 14-17.

4 *See, e.g.,* CHRISTOL, *supra* note 3, at 725.

5 *See, e.g.,* UNISPACE Report, *supra* note 2, at 41.

6 *See, e.g.* Morley, *supra* note 3, at 14; *see also* Luney and Dill, *Uses, Potentialities, and Needs in Agriculture and Forestry,* in REMOTE SENSING (1970) (report of the Committee on Remote Sensing for Agricultural Purposes).

7 *See, e.g.,* UNISPACE Report, *supra* note 2, at 42; CHRISTOL, *supra* note 3, at 722-23. *See generally* Report on the United Nations Regional Seminar on the Use of Satellite Technology for Disaster Applications, U.N. Doc. A/AC.105/228 (1978) (discusses use of SRS for disaster early warning and risk assessment).

8 *See generally,* UNISPACE Report, *supra* note 2, at 23-27 (review of past and anticipated future developments in SRS); CHRISTOL, *supra* note 3, at 722, 726 (historical information about remote sensing by satellite).

9 *See, e.g.,* The Question of the Definition and/or the Delimitation of Outer Space, U.N. Doc. A/AC.105/C.2/7 (1970), *discussed further in* U.N. Doc. A/AC.105/C.2/SR.279-81 (1977); S. LAY & H. TAUBENFELD, THE LAW RELATING TO ACTIVITIES OF MAN IN SPACE 39-48 (1970); F. SCHICK, WHO RULES THE SKIES 17-20 (1961); Kopal, *The Question of Defining Outer Space,* 8 J. SPACE L. 154 (1980); Qizhi, *The Problem of Definition and Delimitation of Outer Space,* 10 J. SPACE L. 157 (1982); Soraghan, *Reconnaissance Satellites: Legal Characterization and Possible Utilization for Peacekeeping,* 13 McGILL L.J. 458, 460 (1967); Note, *Legal Aspects of Reconnaissance in Airspace and Outer Space,* 61 COLUM. L.REV. 1074, 1083-1085 (1961).

10 Bourély, *supra* note 1, at 44.

11 *See e.g.,* Hosenball, *Free Acquisition and Dissemination of Data Through Remote Sensing,* in LEGAL IMPLICATIONS, *supra* note 1, at 105, 110. *Compare* Robinson, *For a Worldwide Utilization and Dissemination of Data Acquired Through Remote Sensing,* in LEGAL IMPLICATIONS, *supra* note 1, at 113, *with* Zhukov, *Problems of Legal Regulation of Using Information Concerning Remote Sensing of the Earth from Space,* in LEGAL IMPLICATIONS, *supra* note 1, at 125.

12 *See* Zissis, *The Development of Remote Sensing of Earth Resources,* in REMOTE SENSING OF EARTH RESOURCES 119, 120 (1972) (prepared for the thirteenth panel meeting of the U.S. House of Representatives' Committee on Science and Astronautics).

13 U.N. Committee on the Peaceful Uses of Outer Space [UNCOPUOS], Draft Report of

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

14 U.N. Department of Public Information, Press Release OS/V/57, at 3 (Aug. 21, 1982) (concerning the Second UN Conference on the Exploration and Peaceful Uses of Outer Space [UNISPACE 82] held at Vienna, Aug. 9-21, 1982).

15 Inaugural speech by S. Hempenius, Teledetectie: hoe ver en hoe fijn, Agricultural University of Wageningen (Neth.) at 3 (1978) (translated from Dutch text).

16 G.A. Res. 1472, U.N. Doc. A/RES/1472 (XIV) (1959); Report of the Ad Hoc Committee on the Peaceful Uses of Outer Space, 14 GAOR (856th plen. mtg.) at 752, U.N. Doc. A/PV.856 (1959); *see also* 14 GAOR Annexes (Agenda Item 25) at 1-30 (documents collected therein); CHRISTOL *supra* note 3, at 12-20 (history of UNCOPUOS).

17 UNCOPUOS, Verbatim Record of the Ninth Meeting, U.N. Doc. A/AC.105/PV.9, at 3 (1962).

18 UNCOPUOS, Report of the Scientific and Technical Subcommittee of the Work of Its Eighth Session, U.N. Doc. A/AC.105/95, at 4 (1971).

19 *See generally* 1-4 MANUAL ON SPACE LAW (N. Jasentuliyana & R. Lee eds. 1979-81) (treaty texts with commentary and bibliography).

20 *Done* Jan. 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6347, 610 U.N.T.S. 205 [hereinafter cited as Outer Space Treaty]. *See generally* CHRISTOL, *supra* note 3, at 12-58 (annotated discussion of Outer Space Treaty).

21 *Done* Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762 [hereinafter cited as Liability Convention]. *See generally* CHRISTOL, *supra* note 3, at 59-128 (annotated discussion of Liability Convention).

22 *Done* Jan. 14, 1975, 28 U.S.T. 695, T.I.A.S. No. 8480 [hereinafter cited as Registration Convention]. *See generally* CHRISTOL, *supra* note 3, at 213-245 (annotated discussion of Registration Convention).

23 Outer Space Treaty, *supra* note 20, at art. I.

24 *Id.*

25 *Id.* at art.II.

26 *Id.* at art.VI; Liability Convention, *supra* note 21.

27 Outer Space Treaty, *supra* note 20, at art.VIII; Registration Convention, *supra* note 22.

28 Outer Space Treaty, *supra* note 20, at art. I.

29 *See, e.g.*, J. BRIERLY, THE LAW OF NATIONS 7-16, 45-49, 162-221 (H. Waldock 6th ed. 1963).

30 Convention on International Civil Aviation, Dec. 7, 1944, art. III, 61 Stat. 1180, T.I.A.S. No. 1591, 3 Bevans 944, 15 U.N.T.S. 295 [hereinafter cited as Chicago Convention].

31 *See, e.g.*, U.N. Doc. A/C.1/1047 (1974) (draft articles proposed by Argentina and Brazil to prohibit remoting sensing of one nation's natural resources by another without prior consent).

32 *See, e.g.*, Wright, *Legal Aspects of the U-2 Incident*, 54 AM. J. INT'L. L. 836 (1960); Note, *supra* note 9.

33 Outer Space Treaty, *supra* note 20, at art. I.

34 See Spiegel, *Prior Consent and the United Nations Human Rights Instruments*, this volume; *See also* Robinson, *supra* note 11, at 123-24.

35 Galloway, *Remote Sensing from Outer Space: Legal Implications of Worldwide Utilization and Dissemination of Data*, in LEGAL IMPLICATIONS, *supra* note 1, at 91.

36 Mossinghoff and Fuqua, *United Nations Principles on Remote Sensing*, 8 J. SPACE L. 103 (1980).

37 Galloway, *supra* note 35, at 92-94.

38 National Aeronautics and Space Act of 1958 § 102(a), 42 U.S.C. § 2451 (1976).

39 *Id.* at § 205, 42 U.S.C. § 2475 (1976).

40 Galloway, *supra* note 35, at 94.

41 NASA, Memorandum of Understanding between the Cooperating Government Agen-

cy and the National Aeronautics and Space Administration (undated), *quoted in* Galloway, *supra* note 35, at 95.

42 Galloway, *supra* note 35, at 97.

43 *Id.* at 99-100.

44 UNCOPUOS, Report of the Scientific and Technical Subcommittee on the Work of its Twelfth Session, U.N. Doc. A/AC.105/150, at 9-10 (1975).

45 *See* U.N. Doc. A/AC.105/95, *supra* note 18.

46 UNCOPUOS, Report of the Working Group on the Remote Sensing of the Earth by Satellites on the Work of its Third Session, U.N. Doc. A/AC.105/125, at 4 (1974).

47 This report is discussed in CHRISTOL, *supra* note 3, at 720-55.

48 G.A. Res. 3234, U.N. Doc A/RES/3234 (XXIX) at 2 (1974).

49 Mossinghoff and Fuqua, *supra* note 36, at 108-10.

50 *Id.* at 108.

51 *Id.* at 109; CHRISTOL, *supra* note 3, at 735.

52 Mossinghoff and Fuqua, *supra* note 36, at 114; CHRISTOL, *supra* note 3, at 738-46.

53 U.N. Doc. A/AC.105/C.2/L.103 (1975).

54 *See, e.g.*, CHRISTOL, *supra* note 3, at 738-39.

55 *See, e.g.*, CHRISTOL, *supra* note 3, at 746-757; UNISPACE Report, *supra* note 2, at 124 para. 514.

56 *See, e.g.*, UNISPACE Report, *supra* note 2, at 111 para. 455.

57 *Id.* at 107 para. 440.

58 *Id.* at 107-10.

59 *See generally* UNISPACE Report, *supra* note 2 (proceedings of the conference); *Events of Interest*, 10 J. SPACE L. 181 (1982) (reports on UNISPACE 82).

60 UNISPACE Report, *supra* note 2, at 103-04 paras. 429-30.

61 *Id.* at 104 para. 432.

62 *Id.* at 67-68 paras. 256-72, 57 paras. 226-27.

63 *See generally* UNISPACE Report, *supra* note 2, at 122-28; Declaration of the Group of 77, U.N. Doc. A/Conf.101/5 (1982).

64 *See, e.g.*, UNISPACE Report, *supra* note 2, at 62-66.

65 *Id.* at 43 para. 174.

66 *Id.* at 66-69.

67 *Id.* at 68 para. 272.

68 *Id.* at 51 para. 205, 57 para. 225, 68 para. 272.

69 *Id.* at 41-43.

70 *Id.* at 41 para. 68.

71 *Id.*

72 *Id.*

73 *Id.*

74 *Id.* at 42-43 para. 173.

75 *Id.* at 58 para. 227.

76 *Id.* at 58 paras. 227-30; *see also id.* at 87-92 (multilateral cooperation and cooperation among developing countries), 53 para. 211 (regional cooperation on databanks and SRS), 60 para. 239 (regional training centers for technicians).

77 *Id.* at 43 para. 176.