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### Practice of States and international

### organizations in registering space objects

## Practice of States and international organizations in registering space objects

### Background paper by the Secretariat

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\* A/AC.105/C.2/L.253.



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## I. Introduction

1. In its resolution 58/89 of 9 December 2003, the General Assembly endorsed the recommendation of the Committee on the Peaceful Uses of Outer Space that the Committee's Legal Subcommittee consider the practice of States and international organizations in registering space objects in accordance with the work plan adopted by the Committee.
2. The Committee also agreed that the Office for Outer Space Affairs should make a presentation on the United Nations Register of Objects Launched into Outer Space at the forty-third session of the Legal Subcommittee.
3. Following the presentation, the Legal Subcommittee requested the Office for Outer Space Affairs to prepare a background document based on the presentation in order to facilitate the work of the working group to be established by the Subcommittee at its forty-fourth session in 2005, in accordance with the work plan.
4. The present document has been prepared in response to that request and reflects information received as at 1 January 2005.

## II. Background

5. At present, the United Nations maintains two separate, yet complementary, registers on objects launched into outer space. One register is maintained with information provided by Member States in accordance with General Assembly resolution 1721 B (XVI) of 20 December 1961 and the other with information provided by parties to the Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex).
6. In its resolution 1721 B (XVI), the General Assembly called upon States launching objects into orbit or beyond to furnish information promptly to the Committee on the Peaceful Uses of Outer Space, through the Secretary-General, for the registration of launchings; and requested the Secretary-General to maintain a public registry of the information furnished in accordance with that provision.
7. Member States began to notify the Secretary-General of their launchings in 1962, in accordance with resolution 1721 B (XVI). The first notifications included all launchings since the first object was launched into outer space in 1957. The Secretary-General designated the Outer Space Affairs Division (now the Office for Outer Space Affairs) to maintain the public register (referred to as the "Resolution Register") specified by the resolution and the information furnished by States has been disseminated in a series of documents with the symbol A/AC.105/INF.--.
8. In its resolution 3235 (XXIX) of 12 November 1974, the General Assembly adopted the Convention on Registration of Objects Launched into Outer Space, which entered into force on 15 September 1976.
9. Following the entry into force of the Registration Convention, the Secretary-General, pursuant to its article III, established a register (referred to as the "Convention Register") for information furnished under the Convention and again designated the Office for Outer Space Affairs to maintain the Register. To provide full and open access to the information in the Register as required by the

Convention, a new series of documents with the symbol ST/SG/SER.E/- was established to publish information furnished by States parties to the Convention.

10. Pursuant to article X, which requires the consideration by the General Assembly of the need for revision of the Convention 10 years after its entry into force, the Secretary-General prepared a report on the application of the Convention by parties up to that date (A/AC.105/382), which was submitted to the Legal Subcommittee at its twenty-sixth session, in 1987.

11. As at 1 January 2005, there had been 45 ratifications and 4 signatures of the Registration Convention. The most recent ratification was deposited with the Secretary-General by Greece, on 27 May 2003. In addition, in accordance with article VII, two international organizations have declared their acceptance of rights and obligations under the Registration Convention: the European Space Agency (ESA) and the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT) (see annex I).

12. Pursuant to article II, 16 States parties have notified the Secretary-General of the establishment of national registries. The most recent notification was received from France in January 2004 (ST/SG/SER.E/INF.16) (see annex II).

13. The Resolution Register is still used to provide information provided by Member States that are not parties to the Registration Convention. As at 1 January 2005, it contained nearly 6,000 space objects issued in 411 documents. Since the entry into force of the Convention, Algeria, Brazil, Israel, Italy, Luxembourg, Malaysia, Nigeria, the Philippines and Turkey have provided information on their space objects pursuant to resolution 1721 B (XVI). The most recent submission was received from Nigeria in August 2004 (A/AC.105/INF.411).

14. As at 1 January 2005, the United Nations had issued 462 documents containing registration data on over 7,050 space objects in accordance with the Registration Convention. Argentina, Australia, Canada, Chile, China, the Czech Republic, France, Germany, Greece, India, Japan, Mexico, Pakistan, the Republic of Korea, the Russian Federation, Spain, Sweden, Ukraine, the United Arab Emirates, the United Kingdom of Great Britain and Northern Ireland and the United States of America have provided registration information in compliance with the Convention. In addition, ESA and EUMETSAT have also submitted information on their space objects. The most recent submission was from Germany in December 2004 (ST/SG/SER.E/462).

15. Of the 32 States and international organizations that have provided information to the United Nations, 23 are parties to the Registration Convention.

16. The present report describes the current practices of Member States and international organizations in registration of space objects in accordance with the Registration Convention.

### **III. Complementary nature of the two registers**

17. Following the entry into force of the Registration Convention in 1976, parties to that Convention began to provide information on space objects launched from that time on. In the majority of cases, parties also provide additional information

(such as the date a space object is no longer in Earth orbit) on space objects that have been registered in the original Register. It is therefore possible for a space object to be registered in accordance with resolution 1721 B (XVI), but for its change of status (i.e. re-entry into the Earth's atmosphere) to be provided in accordance with the Registration Convention.

18. In a few cases, parties to the Convention have resubmitted registration information on all or some of their space objects. Most recently, France resubmitted information on 532 space objects, encompassing all launches of its space objects since 1965 (ST/SG/SER.E/445).

19. Where information on a space object originally submitted in accordance with resolution 1721 B (XVI) has been resubmitted to the United Nations in accordance with the Registration Convention, the space object is removed from the Resolution Register and placed in the Convention Register. A notation that the space object was registered in the original Register is attached to the record of the space object.

20. While the Registration Convention specifies what information should be provided with regard to a space object, resolution 1721 B (XVI) does not. However, the categories of information provided by States under the resolution since 1976 are, in most cases, identical to the information required under the Convention.

#### **IV. Application of the articles of the Registration Convention**

21. Articles I, II and IV-VII of the Registration Convention determine the practices of States and international organizations in registering space objects.

##### **A. Article I**

22. Article I of the Registration Convention states that the term "space object" includes "component parts of a space object as well as its launch vehicle and parts thereof". Based on the registration data provided to the United Nations, registered space objects can be classified in two categories: functional space objects (such as satellites, probes, spacecraft and space station components)<sup>1</sup> and non-functional or formerly functional space objects (such as spent rocket stages and deactivated satellites).

23. Nearly 56 per cent of all space objects registered under the Registration Convention are non-functional objects. It should be noted that approximately 68 per cent of all objects at present tracked in Earth orbit or beyond are non-functional.

24. Some States provide information on all space objects generated during and after launch that are detectable by Earth-based space surveillance systems. This includes payloads as well as non-functional objects that may be produced through explosions, impacts, break-ups and so on.

25. Registration of non-functional objects resulting from a launch is normally done by the States that provide launch services. Of the seven States whose entities provide launch services, France and the United States provide information on all non-functional space objects.

26. Other States provide information on functional objects and non-functional objects (such as third stages) that are produced during or just after launch. They do not include information on objects created after the launch phase. Launch providers China and India follow this practice, as does ESA.

27. The remaining States provide information on functional objects only. Israel, Japan and the Russian Federation, which have their own launch capabilities, provide information in this category.

28. Reusable space objects (such as the United States Space Shuttle) are registered by mission. Consequently, a single space object that is launched multiple times into Earth orbit is registered each time. For example, the Space Shuttle Endeavour (national designator: OV-105) has been registered as a space object 19 times.

## **B. Article II**

29. Article II of the Registration Convention requires that:

(a) The launching State shall register the space object by means of an entry in an appropriate registry which it shall maintain;

(b) Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry;

(c) Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object.

30. Article I states that for the purposes of the Convention the term “launching State” means:

(a) A State which launches or procures the launching of a space object;

(b) A State from whose territory or facility a space object is launched.

It also states that a “State of registry” means a launching State on whose registry a space object is carried in accordance with article II.

31. As at 1 January 2005, 16 of the 51 parties to the Convention had informed the Secretary-General of the establishment of national registers, in accordance with article II, paragraph 1.

32. It is increasingly common for a space object to be funded and operated by entities from multiple launching States. Most recently, after consultations with its partner, Cyprus, Greece registered the joint Greece-Cyprus geostationary communication satellite HellasSat 2 (2003-020A) with the United Nations (see ST/SG/SER.E/446).

33. However, some space objects have been registered by more than one party. Annex IV provides a list of space objects that have been registered by more than one party to the Convention.

34. In some instances, a space object has been registered by one State in compliance with the Registration Convention and also registered by another State under resolution 1721 B (XVI).

35. Multiple launching States can also result in the registration of a space object being overlooked. Consequently, a State may refer to a space object that its launch capabilities placed in orbit as being carried on another State's national registry as opposed to its own.
36. A common issue affecting which Party should register a space object is when ownership is transferred from a commercial entity of one State party to a commercial entity of another State party. It should be noted that the Convention has no specific provision for the "change of ownership" of a space object. Such changes in ownership have become common for geostationary communication satellites, which are leased or even sold years after their launch, so that the original State of registry may no longer have control over the space object.
37. In most instances, such transfers of ownership are not reported to the United Nations. Examples of instances where the transfer of ownership of space objects has been communicated to the United Nations are the transfer from the United Kingdom to China of the geostationary communication satellites Asiasat-1, Asiasat-2, Apstar-1 and Apstar-1A (see ST/SG/SER.E/333 and ST/SG/SER.E/334). The United Kingdom informed the United Nations that the objects had been removed from its national registry, while China informed the United Nations that the same space objects had been added to its national registry.
38. There are also instances where a State may not consider itself the "State of registry" for a space object purchased in orbit by a commercial entity incorporated within its territory. The United Kingdom notified the United Nations that it did not consider itself the State of registry for space objects operated by the company Inmarsat Ltd. (formerly the intergovernmental organization INMARSAT), which was incorporated in the United Kingdom. However, the United Kingdom has provided the United Nations with information on those satellites that is comparable to that required under article IV (ST/SG/SER.E/417/Rev.1).
39. The Netherlands has informed the United Nations (A/AC.105/806 and A/AC.105/824) that it does not consider itself the "State of registry" for space objects bought in orbit by New Skies Satellites, a company incorporated in the Netherlands. The Netherlands has further informed the United Nations that it does bear responsibility for those space objects under article VIII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI), annex).
40. In instances where a space object is placed in orbit on behalf of another State, parties jointly determine the State of registry, pursuant to article II. In some cases, the State that provides launch services registers the "foreign" object in its national registry. China has registered a number of space objects on behalf of its international launch clients.
41. In cases where the State that provides the launch vehicle does not register the "foreign" functional object, it only registers space objects associated with the launch vehicle, such as third stages and shrouds. France and the United States follow this practice.
42. Other States include a notification in registration submissions that their launch vehicles were used to place "foreign" space objects into Earth orbit but do not

include that object on its national registry. The Russian Federation follows this practice. France, in addition to registering space objects associated with the launch vehicle, also follows this practice.

43. In other cases, States do not provide any information on such objects.

### C. Article IV

44. Article IV of the Registration Convention specifies the types of information to be provided on a space object and the time frame for submission.

45. As indicated in paragraph 20 above, States that register space objects in accordance with General Assembly resolution 1721 B (XVI) generally provide the same information as required by the Convention.

46. Paragraph 1 of article IV states that information should be furnished “as soon as practicable” and does not define a time limit for submission of information. In general, the time taken for submission of information ranges from weeks after launch to years. On average, the time taken by parties for registration is between two and three months.

47. Most States that operate launch vehicles for their own use or for customers provide information on a bimonthly, quarterly or yearly basis.

48. Others provide information on a case-by-case basis. This practice can range from immediately after the launch to months afterwards.

49. It should be noted that, on a few occasions, the United Nations has received information on space objects prior to launch. In such cases, the information is kept on file and after launch the information is confirmed with the State before a registration document is issued. Pakistan provided the United Nations with registration information on the impending launch of its satellite BADR-B (2001-056C). Subsequent to its successful launch and after confirmation of the submission data, the information was issued (see ST/SG/SER.E/403).

50. Paragraph 1 of article IV requires parties to the Convention to provide the following information:

- (a) Name of launching State or States;
- (b) An appropriate designator of the space object or its registration number;
- (c) Date and territory or location of launch;
- (d) Basic orbital parameters, including:
  - (i) Nodal period;
  - (ii) Inclination;
  - (iii) Apogee;
  - (iv) Perigee;
- (e) General function of the space object.



51. In addition, paragraph 3 requires that each State of registry “shall notify the Secretary-General of the United Nations, to the greatest extent feasible and as soon as practicable, of space objects concerning which it has previously transmitted information, and which have been but no longer are in Earth orbit”.

52. A breakdown of information provided by all parties under article IV is provided in annex III. The matrix includes both parties to the Convention and States that have provided information in accordance with resolution 1721 B (XVI). The different registration practices followed by States under this article are highlighted below.

### **1. Name of launching State or States**

53. All States provide the launching State of a space object being registered. In cases where more than one launching State exists, the individual launching States are usually stated. A recent example of multiple launching States being provided is the registration of HellasSat-2 by Greece (see ST/SG/SER.E/446).

### **2. An appropriate designator of the space object or its registration number**

54. In practice, all States provide the common name of a space object. Most States provide more than one identifier for a space object.

55. Some parties also use the Committee on Space Research (COSPAR) international designator. This designator is nominally assigned by the World Warning Agency for Rockets and Satellites (SPACEWARN) on behalf of COSPAR, which has been done since 1957. The international designator is based on the year of launch, the number of successful launches and the priority/order of the space object’s deployment/detection.<sup>2</sup>

56. The international designator is made publicly available through SPACEWARN bulletins, which are in turn made available by facsimile and on the Internet.

57. Other States provide designators based on entries in their national registry, in which case the common name is also provided. Germany follows this practice.

58. Some parties also use a designator assigned in a catalogue of space objects maintained by the United States Strategic Command (USSTRATCOM). The catalogue is based on observational/radar data and is made available through the Orbital Information Group of the National Aeronautics and Space Administration of the United States. This numerical designator is based on the numerical sequence in which the United States space surveillance network detects an object.

59. In a few cases, States provide the international designator, the USSTRATCOM catalogue designator and the common name. The United Kingdom follows this practice.

### **3. Date and territory or location of launch**

60. The majority of States use Greenwich Mean Time (GMT), also referred to as Universal Coordinated Time (UTC). GMT is the time standard against which all other time zones in the world are referenced.

61. In other cases, parties use the local time at the place of launch or the national meridian time. The Russian Federation uses local Moscow time for its registration submissions.

62. Most States provide detailed information on where a space object is launched. The information can be as specific as the launch facility from which the object was launched.

63. In cases where a space object is deployed from a parent space object (i.e. the deployment of a satellite from the Space Shuttle or a space station), some parties provide the date of launch of the parent space object, while others provide the time and date of deployment from the parent space object. In the placement into orbit of the Canadian Target Assembly (1992-070C), Canada provided the date of launch of the parent spacecraft, the Space Shuttle Columbia. It also provided the time and date of the deployment of the Canadian Target Assembly from the Space Shuttle, as well as the longitude and latitude over which the deployment took place (see ST/SG/SER.E/283).

64. A few States indicate only the territory from which the space object was placed into Earth orbit or beyond.

65. Instances can occur when an object that was launched from outside a State's territory is not reported as being so.

#### **4. Basic orbital parameters**

66. Some States provide basic orbital parameters for the initial orbit of a space object. Other States provide parameters for the intermediate (parking) orbit and still others for the final operational orbit.

67. The Registration Convention and resolution 1721 B (XVI) do not specify what units of measurement States should use in registering the basic orbital parameters of a space object.

68. The basic orbital parameters technically refer to objects orbiting the Earth only. "Apogee" and "perigee" refer specifically to Earth-centric orbits: for objects orbiting Jupiter, for example, the correct term would be "apojove" and "perijove". Generally, the terms "apoapsis" and "periapsis" are used to denote an orbit around a body. Consequently, for space objects that are in orbit around the Sun (solar probes) or around other planetary bodies (for example, Mars probes), the terms apogee and perigee do not strictly apply.

69. However, in these cases, some States provide comparable basic orbital parameters for objects that are in orbit around another celestial body, for example, the highest and lowest points from the surface of the planet Mars are provided. In other cases, the fact that the object is orbiting the Sun (heliocentric orbit) or is orbiting another planet is stated without any numerical values being provided.

70. In most cases, the apogee and perigee are given as the highest and lowest points of a space object's orbit from the Earth's surface. On occasion, however, the distance is given from the centre of the Earth (a difference in 6,378 kilometres (km)).

71. For objects that are in heliocentric orbit, values in astronomical units (149,597,870 km: the approximate mean distance between the Earth and the Sun) are sometimes provided for the apogee and perigee.
72. Most States provide the nodal period in minutes. On occasion, the nodal period is provided in hours and minutes. This practice is most common when States register space objects in the geostationary satellite orbit (GSO).
73. GSO represents a unique orbit for space objects. All space objects in this particular orbit have very similar nodal periods, apogees and perigees. The orbital parameter unique to a space object in this orbit is the location of the object relative to the surface of the Earth, which remains fixed during the operational phase of functional space objects in this orbit (known as the “GSO position”). This position is customarily given as the longitude on the Earth’s Equator.
74. The Registration Convention and resolution 1721 B (XVI) do not require provision of the GSO position. However, of the States that have registered space objects in this orbit, most provide the GSO position.
75. In the majority of cases, GSO positions are registered with the International Telecommunication Union and are in the public domain.
76. In some cases, an intermediate orbit known as the geostationary transfer orbit (an orbit with an apogee of approximately 35,000 km and a perigee of approximately 150 km) of a satellite placed in GSO is provided.
77. In cases of States registering information in accordance with resolution 1721 B (XVI), there is no stipulation as to what information is required. In the majority of cases, States provide basic orbital information similar to that requested in the Registration Convention. However, in some cases, other types of information are provided, including data sets known as “two-line elements”, which, using mathematical formulae, can predict the space object’s position relative to the Earth at a given time as well as the basic orbital characteristics required under the Convention. A recent example of such practice is the registration of Bilsat-1 by Turkey, which provided two-line elements for the epochs just after launch and after the operational orbit had been reached (see A/AC.105/INF.410).

## **5. General function of the space object**

78. The amount of information on the function of a space object ranges from a two-word statement of its function to a detailed account of its mission objectives, the science payload and radio frequency plans. Most States provide very basic information on the space object’s function. ESA, however, follows the practice of providing comprehensive information on space objects.
79. In the case of parties that launch space objects frequently, a standardized list of functions has been developed by each party, which is applied to a space object on a case-by-case basis. The Russian Federation and the United States follow this practice, though the Russian Federation provides mission-specific information (crew names, etc.) for some space objects.

## **6. Re-entry of space objects**

80. Article IV, paragraph 3, requires parties to notify the Secretary-General, to the greatest extent feasible and as soon as practicable, of space objects concerning which it has previously transmitted information, and which have been but no longer are in Earth orbit.

81. In practice, of the 16 parties to the Convention that have objects that have re-entered Earth's atmosphere, only 8 have forwarded this information to the United Nations. Of the States that have, some provide the actual date of re-entry and others provide information on a monthly basis, that is, an object ceased to exist by the end of a particular month.

82. Some use GMT as a time reference, while others use national time meridians when an object is no longer in Earth orbit.

83. The lack of information or non-specific dates of decay hamper the ability to identify a space object that has returned to Earth.

84. In some cases, States also provide information on the change of flight status of space objects that are not in Earth orbit. For example, the United States notified the United Nations that the Mars Exploration Rovers A (2003-027A) and B (2003-032A) were on Mars (see ST/SG/SER.E/449).

## **7. Additional information**

85. Article IV, paragraph 2, of the Convention states that "each State of registry may, from time to time, provide the Secretary-General of the United Nations with additional information concerning a space object carried on its registry".

86. This has been used by States:

(a) To provide additional information on space objects in orbit;

(b) To provide information when a satellite ceases to function, as has been done by the Czech Republic, France, India, Italy and Sweden.

87. It has also been used to report the impending re-entry of space objects. Notable instances include the Russian Mir Space Station and the United States' Compton Gamma-Ray Observatory.

88. The GSO position of space objects in that orbit are also updated under this provision. The most recent notification was from the United Arab Emirates, which informed the United Nations that the space object Thuraya-1 had been moved to a position 98.5° E over the Equator (see ST/SG/SER.E/455).

89. Article VI has also been used in conjunction with nuclear power source principles to provide emergency information concerning the impending decay of nuclear-powered space objects Cosmos-1402 (see ST/SG/SER.E/72 and Add.1-4) and Cosmos-1900 (see ST/SG/SER.E/176 and Add.1-6), as well as the Mars-96 probe (see ST/SG/SER.E/320, A/AC.105/647 and A/AC.105/648).

**D. Article V**

90. Parties to the Registration Convention have not used article V.

**E. Article VI**

91. Article VI of the Registration Convention requires States parties, in particular those “possessing space monitoring and tracking facilities”, to respond to requests to “identify a space object which has caused damage to it or to any of its natural or juridical persons, or which may be of a hazardous or deleterious nature”.

92. While parties have not requested this type of information through the United Nations, in practice such information is exchanged on a frequent basis. The United States makes available information derived from its space surveillance system to interested parties. This tracking information can be used to determine when and where a space object may have returned to the Earth’s surface.

**F. Article VII**

93. Article VII extends the applicability of the Registration Convention to international intergovernmental organizations that conduct space activities and have declared their acceptance of the rights and obligations provided for in the Convention. Under this article, ESA and EUMETSAT provide registration information on space objects launched by them.

**V. Non-registration of space objects**

94. Of the approximately 5,730 functional space objects launched into Earth orbit or beyond since 1976, 390 have not been registered with the United Nations in accordance with the Registration Convention or General Assembly resolution 1721 B (XVI). A list of space objects not registered with the United Nations since 1976 is included in annex V.

95. Of the 39 Member States that have launched space objects into Earth orbit or beyond, 16 are not parties to the Convention.

96. As indicated in paragraphs 34-39 above, the presence of multiple parties in the launch of a space object may contribute to non-registration of space objects.

97. Another factor contributing to non-registration is the number of space objects owned and operated by present and former intergovernmental organizations, such as the International Telecommunications Satellite Organization, the European Telecommunications Satellite Organization (EUTELSAT), EUMETSAT and INMARSAT.

98. France and ESA have registered space objects on behalf of EUTELSAT.

99. As mentioned in paragraph 38 above, following the incorporation of the former intergovernmental organization INMARSAT as a private company, the United Kingdom notified the United Nations that it did not consider itself the State

of registry for satellites operated by that entity. The United Kingdom, however, has provided the United Nations with information comparable to that required under article IV.

100. Another source of non-registration are the satellites that comprise the low-Earth orbit communication satellite constellations Globalstar and Iridium. Approximately 50 per cent of the satellites in the Globalstar constellation and 20 per cent of the satellites in the Iridium constellation have not been registered under the Registration Convention or resolution 1721 B (XVI).

101. Cases of non-registration are also due to the understanding by parties that have acceded to the Registration Convention that registration is only required of objects launched after accession. Consequently, parties may have space objects in Earth orbit that were launched after the entry into force of the Convention but are not registered because their launch occurred prior to the party acceding to the Convention.

102. Modules of space stations are sometimes not registered with the United Nations. This may occur even when the modules are the primary payloads for the mission.

103. Some space objects that perform national security functions have not been registered by some parties to the Registration Convention.

104. Probes and recoverable capsules that separate from a space object and either return to Earth or land on another celestial body are also sometimes not registered.

## **VI. Enhancement of the function of the United Nations Register of Objects Launched into Outer Space**

105. The United Nations Register of Objects Launched into Outer Space is the sole central source of information provided by Governments and international organizations on space objects launched into Earth orbit or beyond.

106. As such, all States and intergovernmental organizations that operate space objects should be party to the Registration Convention or declare their acceptance of the rights and obligations provided for in it.

107. Parties should remember to determine who the State of registry is when more than one party is involved.

108. It is suggested that to facilitate the ability of Member States to determine the identity of space objects that have been registered in accordance with the Registration Convention and General Assembly resolution 1721 B (XVI), consideration should be given to achieving uniformity in the information provided by States of registry. Based on practices of States and international organizations, the information could include:

- (a) The COSPAR international designator;
- (b) GMT as the time reference for the date of launch;
- (c) Kilometres, minutes and degrees as standard units for basic orbital parameters.

109. Additional information that would prove beneficial to fulfilling the function of the United Nations Register include:

- (a) GSO locations, where appropriate;
- (b) Provision of the date of decay or re-entry based on GMT or UTC;
- (c) Web links to official information on space objects;
- (d) Notification when a space object is no longer “functional”.

*Notes*

<sup>1</sup> United Nations nomenclature refers to functional space objects in Earth orbit as “satellites”; to functional space objects in orbit around the Sun, in orbit around or on the surface of other celestial bodies (excluding Earth) or on interstellar trajectories as “probes”; to functional space objects that are manned as “spacecraft”; and to components of space stations (including modules and support equipment) as “space station components”.

<sup>2</sup> The international designators are included for specific space objects referred to in the present document.

## Annex I

## List of States parties to the Registration Convention

| <i>Party</i>                  | <i>Status</i> | <i>Party</i>  | <i>Status</i>                |
|-------------------------------|---------------|---|------------------------------|
| Antigua and Barbuda           | Succession    | Mongolia  | Ratification                 |
| Argentina                     | Ratification  | Netherlands   | Accession                    |
| Australia                     | Accession     | Nicaragua   | Signatory                    |
| Austria                       | Ratification  | Niger   | Ratification                 |
| Belarus                       | Ratification  | Norway  | Accession                    |
| Belgium                       | Ratification  | Pakistan  | Ratification                 |
| Bulgaria                      | Ratification  | Peru  | Accession                    |
| Burundi                       | Signatory     | Poland  | Ratification                 |
| Canada                        | Ratification  | Republic of Korea   | Accession                    |
| Chile                         | Accession     | Russian Federation  | Ratification                 |
| China                         | Accession     | Saint Vincent and the<br>Grenadines   | Succession                   |
| Cuba                          | Accession     | Serbia and Montenegro   | Succession                   |
| Cyprus                        | Accession     | Seychelles  | Accession                    |
| Czech Republic                | Succession    | Singapore   | Signatory                    |
| Denmark                       | Ratification  | Slovakia  | Succession                   |
| France                        | Ratification  | Spain   | Accession                    |
| Germany <sup>a</sup>          | Ratification  | Sweden  | Ratification                 |
| Greece                        | Accession     | Switzerland   | Ratification                 |
| Hungary                       | Ratification  | Ukraine   | Ratification                 |
| India                         | Accession     | United Arab Emirates  | Accession                    |
| Indonesia                     | Accession     | United Kingdom of Great<br>Britain and Northern Ireland                       | Ratification                 |
| Iran (Islamic<br>Republic of) | Signatory     | United States of America  | Ratification                 |
| Japan                         | Accession     | Uruguay   | Accession                    |
| Kazakhstan                    | Accession     |   |                              |
| Liechtenstein                 | Accession     | European Space<br>Agency  | Declaration<br>of acceptance |
| Mexico                        | Ratification  | European Organization for<br>the Exploitation of<br>Meteorological Satellites | Declaration<br>of acceptance |

<sup>a</sup> Through accession of the German Democratic Republic to the Federal Republic of Germany with effect from 3 October 1990, the two German States have united to form one sovereign State. As from the date of unification, the Federal Republic of Germany acts in the United Nations under the designation "Germany".



## Annex II

### Establishment of national registries under the Registration Convention

#### A. States parties to the Registration Convention that have established national registries

| <i>Party</i>   | <i>United Nations document symbol<sup>a</sup></i> |
|--|---|
| Argentina  | ST/SG/SER.E/INF.13                                |
| Australia  | ST/SG/SER.E/INF.15                                |
| Canada   | ST/SG/SER.E/INF.2                                 |
| Czech Republic <sup>b</sup>                          | ST/SG/SER.E/INF.5<br>ST/SG/SER.E/INF.12           |
| France   | ST/SG/SER.E/INF.16                                |
| Germany <sup>c</sup>                                 | ST/SG/SER.E/INF.9                                 |
| India  | ST/SG/SER.E/INF.8                                 |
| Japan  | ST/SG/SER.E/INF.7                                 |
| Russian Federation <sup>d</sup>                      | ST/SG/SER.E/INF.4                                 |
| Spain  | ST/SG/SER.E/INF.10                                |
| Sweden   | ST/SG/SER.E/145                                   |
| Ukraine  | ST/SG/SER.E/INF.11                                |
| United Kingdom of Great Britain and Northern Ireland | ST/SG/SER.E/129                                   |
| United States of America                             | ST/SG/SER.E/INF.3                                 |

#### B. International organizations that have declared acceptance of the Registration Convention and have established registries

| <i>Party</i>  | <i>United Nations document symbol<sup>a</sup></i> |
|---|---|
| European Space Agency   | ST/SG/SER.E/INF.6                                 |
| European Organization for the Exploitation of Meteorological Satellites | ST/SG/SER.E/INF.14                                |

<sup>a</sup> The United Nations document symbol indicates the document in which parties have informed the United Nations of the establishment of their national registries.

<sup>b</sup> On 19 January 1993, the Czech Republic was admitted to membership in the United Nations.

<sup>c</sup> Through accession of the German Democratic Republic to the Federal Republic of Germany with effect from 3 October 1990, the two German States have united to form one sovereign State. As from the date of unification, the Federal Republic of Germany acts in the United Nations under the designation "Germany".

<sup>d</sup> The Russian Federation continues, as of 24 December 1991, the membership of the former Union of Soviet Socialist Republics (USSR) in the United Nations and maintains, as from that date, full responsibility for all the rights and obligations of the USSR under the Charter of the United Nations and multilateral treaties deposited with the Secretary-General.

## Annex III

## Matrix of registration practices of States and international organizations

|   | Designator    |          | Date of launch |     | Territory/location |         |          | Basic orbital parameters |             |        | Function |         | Additional information <sup>a</sup> |              | Date of decay |             |          |
|---|---------------|----------|----------------|-----|--------------------|---------|----------|--------------------------|-------------|--------|----------|---------|-------------------------------------|--------------|---------------|-------------|----------|
|   | International | National | Name           | GMT | Local              | General | Specific | Nodal period             | Inclination | Apogee | Perigee  | General | Specific                            | GSO location | Other         | Month's end | Specific |
| <b>States parties to the Registration Convention</b>  |               |          |                |     |                    |         |          |                          |             |        |          |         |                                     |              |               |             |          |
| Argentina   | ✓             | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        |         | ✓                                   |              | ✓             |             | ✓        |
| Australia   | ✓             | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            |               |             | ✓        |
| Canada  | ✓             |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             | ✓        |
| China   |               | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             | ✓        |
| Chile   |               | ✓        | ✓              | ✓   | ✓                  |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | n/a          | ✓             | n/a         | n/a      |
| Czech Republic  | ✓             |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | n/a          |               |             | ✓        |
| France  | ✓             | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             | ✓        |
| Germany   |               | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             | ✓        |
| Greece  |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             | n/a         | n/a      |
| India   |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            |               |             | ✓        |
| Japan   | ✓             |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            |               |             | ✓        |
| Mexico  |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            |               | n/a         | n/a      |
| Pakistan  |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | n/a          | ✓             | n/a         | n/a      |
| Republic of Korea   |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             | n/a         | n/a      |
| Russian Federation  |               | ✓        | ✓              |     | ✓                  |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             | ✓           |          |
| Spain   |               | ✓        | ✓              |     | ✓                  |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             |          |
| Sweden  | ✓             |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             | n/a         | n/a      |
| Ukraine   |               | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | n/a          | ✓             | n/a         | n/a      |
| United Arab Emirates  |               |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            |               | n/a         | n/a      |
| United Kingdom of Great Britain and Northern Ireland  | ✓             | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   | ✓            | ✓             |             | ✓        |
| United States of America  | ✓             | ✓        |                | ✓   |                    | ✓       |          | ✓                        | ✓           | ✓      | ✓        | ✓       | ✓                                   |              |               | ✓           |          |
| <b>International organizations that have declared acceptance of the Registration Convention</b> |               |          |                |     |                    |         |          |                          |             |        |          |         |                                     |              |               |             |          |
| European Space Agency   |               | ✓        | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        |         | ✓                                   | ✓            | ✓             |             |          |
| European Organization for the Exploitation of Meteorological Satellites                         | ✓             |          | ✓              | ✓   |                    |         | ✓        | ✓                        | ✓           | ✓      | ✓        |         | ✓                                   | ✓            | ✓             | n/a         | n/a      |

| Designator  |                 | Date of launch |            | Territory/location |                |                 |                     | Basic orbital parameters |               |                | Function       |                 | Additional information <sup>a</sup> |              | Date of decay      |                 |
|---|-----------------|----------------|------------|--------------------|----------------|-----------------|---------------------|--------------------------|---------------|----------------|----------------|-----------------|-------------------------------------|--------------|--------------------|-----------------|
| <i>International</i>  | <i>National</i> | <i>Name</i>    | <i>GMT</i> | <i>Local</i>       | <i>General</i> | <i>Specific</i> | <i>Nodal period</i> | <i>Inclination</i>       | <i>Apogee</i> | <i>Perigee</i> | <i>General</i> | <i>Specific</i> | <i>GSO location</i>                 | <i>Other</i> | <i>Month's end</i> | <i>Specific</i> |
| <b>States providing voluntary information in accordance with General Assembly resolution 1721 B (XVI)</b> |                 |                |            |                    |                |                 |                     |                          |               |                |                |                 |                                     |              |                    |                 |
|   |                 | ✓              | ✓          |                    |                | ✓               | ✓                   | ✓                        | ✓             | ✓              | ✓              |                 | n/a                                 | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          |                    |                | ✓               | ✓                   | ✓                        | ✓             | ✓              |                | ✓               |                                     | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          |                    | ✓              |                 | ✓                   | ✓                        | ✓             | ✓              |                | ✓               |                                     | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          |                    |                | ✓               | ✓                   | ✓                        | ✓             | ✓              | ✓              | ✓               | ✓                                   | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          |                    |                | ✓               | ✓                   | ✓                        | ✓             | ✓              | ✓              | ✓               | ✓                                   | ✓            | n/a                | n/a             |
|   | ✓               | ✓              | ✓          | ✓                  |                | ✓               | ✓                   | ✓                        | ✓             | ✓              |                | ✓               | ✓                                   | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          | ✓                  |                | ✓               | ✓                   | ✓                        | ✓             | ✓              |                | ✓               | ✓                                   | ✓            | n/a                | n/a             |
|   |                 | ✓              | ✓          | ✓                  |                | ✓               | ✓                   | ✓                        | ✓             | ✓              | ✓              | ✓               | ✓                                   | ✓            | n/a                | n/a             |

<sup>a</sup> n/a = Information category not applicable to the registration practices.

## Annex IV

**List of space objects that have been registered by more than one party to the Registration Convention as at 31 December 2004**

| <i>Space object</i>   | <i>Party</i>  | <i>Registration document</i> |
|-----------------------|---|------------------------------|
| 1981-084A (AUREOLE 3) | France  | ST/SG/SER.E/445              |
|                       | Russian Federation  | ST/SG/SER.E/62               |
| 1981-100B (UOSAT 1)   | United Kingdom of Great Britain and Northern Ireland                    | ST/SG/SER.E/129              |
|                       | United States of America  | ST/SG/SER.E/59               |
| 1982-031A (INSAT 1A)  | India   | ST/SG/SER.E/79               |
|                       | United States   | ST/SG/SER.E/67               |
| 1983-051A (EXOSAT)    | European Space Agency   | ST/SG/SER.E/85               |
|                       | United States   | ST/SG/SER.E/96               |
| 1988-021A (IRS 1A)    | India   | ST/SG/SER.E/180              |
|                       | Russian Federation  | ST/SG/SER.E/182              |
| 1988-063B (ECS 5)     | European Space Agency   | ST/SG/SER.E/188              |
|                       | France  | ST/SG/SER.E/445              |
| 1989-067A (BSB 1)     | Sweden  | ST/SG/SER.E/352              |
|                       | United Kingdom  | ST/SG/SER.E/219              |
| 1990-051A (INSAT 1D)  | India   | ST/SG/SER.E/226              |
|                       | United States   | ST/SG/SER.E/250              |
| 1990-090B (ULYSSES)   | European Space Agency   | ST/SG/SER.E/266              |
|                       | United States   | ST/SG/SER.E/250              |
| 1996-061A (SAC-B)     | Argentina   | ST/SG/SER.E/317              |
|                       | United States   | ST/SG/SER.E/322              |
| 2000-075B (SAC C)     | Argentina   | ST/SG/SER.E/382              |
|                       | United States   | ST/SG/SER.E/385              |
| 2000-075C (MUNIN)     | Sweden  | ST/SG/SER.E/380              |
|                       | United States   | ST/SG/SER.E/385              |
| 2001-026A (ICO F2)    | United Kingdom  | ST/SG/SER.E/398              |
|                       | United States   | ST/SG/SER.E/400              |
| 2002-012A (GRACE 1)   | Germany   | ST/SG/SER.E/411              |
|                       | United States   | ST/SG/SER.E/412              |
| 2002-012B (GRACE 2)   | Germany   | ST/SG/SER.E/411              |
|                       | United States   | ST/SG/SER.E/412              |
| 2002-040B (MSG 1)     | European Space Agency   | ST/SG/SER.E/432              |
|                       | European Organization for the Exploitation of Meteorological Satellites | ST/SG/SER.E/415              |

## Annex V

**List of functional (or formerly functional) space objects not registered with the United Nations in accordance with the Registration Convention or General Assembly resolution 1721 B (XVI) as at 31 December 2004 (from 1976)**

| <i>Space object</i>      | <i>Date of launch</i> | <i>Space object</i>                | <i>Date of launch</i> |
|--------------------------|-----------------------|------------------------------------|-----------------------|
| 1976-087A (Chinasat)     | 30 Aug. 1976          | 1985-096A (FSW 1-7)                | 21 Oct. 1985          |
| 1976-117A (Chinasat)     | 7 Dec. 1976           | 1986-010A (STTW 1-1)               | 1 Feb. 1986           |
| 1978-011A (Chinasat)     | 26 Jan. 1978          | 1986-014H (USA 18)                 | 9 Feb. 1986           |
| 1978-106A (NATO 3C)      | 19 Nov. 1978          | 1986-026B (BRAZILSAT 2)            | 28 Mar. 1986          |
| 1980-015A (TANSEI 4)     | 17 Feb. 1980          | 1986-076A (FSW 1-8)                | 6 Oct. 1986           |
| 1980-018A (AYAME 2)      | 22 Feb. 1980          | 1987-029A (AGILA 1)                | 20 Mar. 1987          |
| 1981-093A (SJ 2)         | 19 Sept. 1981         | 1987-067A (FSW 1-9)                | 5 Aug. 1987           |
| 1981-093B (SJ 2A)        | 19 Sept. 1981         | 1987-075A (FSW 1-10)               | 9 Sept. 1987          |
| 1981-093D (SJ 2B)        | 19 Sept. 1981         | 1988-014A (STTW 1-2)               | 7 Mar. 1988           |
| 1982-090A (FSW 1-4)      | 9 Sept. 1982          | 1988-026A (SAN MARCO 5)            | 25 Mar. 1988          |
| 1982-097A (INTELSAT 505) | 28 Sept. 1982         | 1988-040A (NSS 513 (INTELSAT 513)) | 17 May 1988           |
| 1983-059C (PALAPA 3)     | 16 Jun. 1983          | 1988-051B (OSCAR 13 (AMSAT 3C))    | 15 Jun. 1988          |
| 1983-060C (USA)          | 20 Jun. 1983          | 1988-052A (NOVA 2 (NNSS 30490))    | 16 Jun. 1988          |
| 1983-086A (FSW 1-5)      | 19 Aug. 1983          | 1988-067A (FSW 1-11)               | 5 Aug. 1988           |
| 1983-105A (INTELSAT 507) | 19 Oct. 1983          | 1988-080A (FENG YUN 1-1)           | 6 Sept. 1988          |
| 1984-008A (Chinasat)     | 29 Jan. 1984          | 1988-111A (STTW 1-3)               | 22 Dec. 1988          |
| 1984-011D (PALAPA B-2)   | 3 Feb. 1984           | 1989-006A (INTELSAT 515)           | 27 Jan. 1989          |
| 1984-023A INTELSAT 508   | 5 Mar. 1984           | 1989-041A (SUPERBIRD A-1)          | 5 Jun. 1989           |
| 1984-035A (STTW T2)      | 8 Apr. 1984           | 1989-072A (USA 45)                 | 6 Sept. 1989          |
| 1984-098A (FSW 1-6)      | 12 Sept. 1984         | 1989-084E (GALILEO PROBE)          | 18 Oct. 1989          |
| 1984-115A (NATO 3D)      | 14 Nov. 1984          | 1989-087A (INTELSAT 602)           | 27 Oct. 1989          |
| 1985-015A (ARABSAT 1)    | 8 Feb. 1985           | 1990-005E (MICROSAT 4)             | 22 Jan. 1990          |
| 1985-015B (BRAZILSAT 1)  | 8 Feb. 1985           | 1990-007B (HAGOROMO)               | 24 Jan. 1990          |
| 1985-025A (INTELSAT 510) | 22 Mar. 1985          | 1990-021A (INTELSAT 603)           | 14 Mar. 1990          |
| 1985-048C (ARABSAT 1B)   | 17 Jun. 1985          | 1990-027A (OFFEQ 2)                | 3 Apr. 1990           |
| 1985-053A (USSR)         | 21 Jun. 1985          | 1990-031A (USA 56)                 | 11 Apr. 1990          |
| 1985-055A (INTELSAT 511) | 30 Jun. 1985          | 1990-031B (USA 57)                 | 11 Apr. 1990          |
| 1985-063B (PDP)          | 29 Jul. 1985          | 1990-031C (USA 58)                 | 11 Apr. 1990          |
| 1985-087A (INTELSAT 512) | 28 Sept. 1985         | 1990-056A (INTELSAT 604)           | 23 Jun. 1990          |

| <i>Space object</i>                     | <i>Date of launch</i> | <i>Space object</i>                     | <i>Date of launch</i> |
|---|-----------------------|---|-----------------------|
| 1990-059A (BADR A)                      | 16 Jul. 1990          | 1994-065A (SOLIDARIDAD 2)               | 8 Oct. 1994           |
| 1990-081A (FENG YUN 1-2)                | 3 Sept. 1990          | 1994-065B (THAICOM 2)                   | 8 Oct. 1994           |
| 1990-081B (Chinasat)                    | 3 Sept. 1990          | 1994-073A (STS 66 (ATLANTIS F-13))      | 3 Nov. 1994           |
| 1990-081C (Chinasat)                    | 3 Sept. 1990          | 1995-001A (INTELSAT 704)                | 10 Jan. 1995          |
| 1990-089A (FSW 1-12)                    | 5 Oct. 1990           | 1995-002 (EXPRESS)                      | 15 Jan. 1995          |
| 1990-093A (INMARSAT 2 F-1)              | 30 Oct. 1990          | 1995-004H (ODERACS 2F)                  | 3 Feb. 1995           |
| 1991-018A (INMARSAT 2 F-2) <sup>a</sup> | 8 Mar. 1991           | 1995-013A (INTELSAT 705)                | 22 Mar. 1995          |
| 1991-055A (INTELSAT 605)                | 14 Aug. 1991          | 1995-016A (BRAZILSAT B2)                | 28 Mar. 1995          |
| 1991-060A (YURI 3B)                     | 25 Aug. 1991          | 1995-023A (INTELSAT 706 (VII-A))        | 17 May 1995           |
| 1991-062A (YOHKOH)                      | 30 Aug. 1991          | 1995-057A (USA 114)                     | 22 Oct. 1995          |
| 1991-075A (INTELSAT 601)                | 30 Aug. 1991          | 1995-069A (GALAXY 3R)                   | 15 Dec. 1995          |
| 1991-076D (USA 76)                      | 8 Nov. 1991           | 1995-072B (SKIPPER)                     | 28 Dec. 1995          |
| 1991-076E (USA 77)                      | 8 Nov. 1991           | 1995-073A (ECHOSTAR 1)                  | 28 Dec. 1995          |
| 1991-084B (INMARSAT 2 F-3) <sup>a</sup> | 16 Dec. 1991          | 1996-006A (PALAPA C-1)                  | 1 Feb. 1996           |
| 1992-010B (INSAT 2R)                    | 26 Feb. 1992          | 1996-012B (TSS-1R)                      | 22 Feb. 1996          |
| 1992-021B (INMARSAT 2 F-4) <sup>a</sup> | 15 Apr. 1992          | 1996-015A (INTELSAT 707)                | 14 Mar. 1996          |
| 1992-027A (PALAPA B-4)                  | 14 May 1992           | 1996-020A (INMARSAT 3 F-1) <sup>a</sup> | 3 Apr. 1996           |
| 1992-051A (FSW 2-1)                     | 9 Aug. 1992           | 1996-022A (MSAT M-1)                    | 20 Apr. 1996          |
| 1992-064B (FSW 1-13)                    | 6 Oct. 1992           | 1996-030A (PALAPA C2)                   | 16 May 1996           |
| 1992-070B (LAGEOS 2)                    | 22 Oct. 1992          | 1996-030B (AMOS 1)                      | 16 May 1996           |
| 1992-090A (OPTUS B2 (+3rd stage))       | 21 Dec. 1992          | 1996-035A (INTELSAT 709)                | 15 Jun. 1996          |
| 1993-017B (SEDS 1)                      | 30 Mar. 1993          | 1996-040A (ARABSAT 2A)                  | 9 Jul. 1996           |
| 1993-058B (ACTS 1)                      | 12 Sept. 1993         | 1996-040B (TURKSAT 1C)                  | 9 Jul. 1996           |
| 1993-061D (POSAT 1)                     | 26 Sept. 1993         | 1996-048A (ZHONGXING 7)                 | 18 Aug. 1996          |
| 1993-061F (ITAMSAT)                     | 26 Sept. 1993         | 1996-052B (UNAMSAT 2)                   | 5 Sept. 1996          |
| 1993-066A (INTELSAT 701)                | 22 Oct. 1993          | 1996-053A (INMARSAT 3 F-2) <sup>a</sup> | 6 Sept. 1996          |
| 1993-073A (SOLIDARIDAD 1)               | 20 Nov. 1993          | 1996-059A (FSW 2-3)                     | 20 Oct. 1996          |
| 1993-073B (METEOSAT 6)                  | 20 Nov. 1993          | 1996-063A (ARABSAT 2B)                  | 13 Nov. 1996          |
| 1993-078B (THAICOM 1)                   | 18 Dec. 1993          | 1996-070A (INMARSAT 3 F-3) <sup>a</sup> | 18 Dec. 1996          |
| 1994-006H (BREMSAT)                     | 3 Feb. 1994           | 1997-009A (INTELSAT 801)                | 1 Mar. 1997           |
| 1994-010B (KF 1)                        | 8 Feb. 1994           | 1997-016A (THAICOM 3)                   | 16 Apr. 1997          |
| 1994-034A (INTELSAT 702)                | 17 Jun. 1994          | 1997-021A (DFH 3A2)                     | 11 May 1997           |
| 1994-040A (PANAMSAT 2)                  | 8 Jul. 1994           | 1997-025A (THOR 2)                      | 20 May 1997           |
| 1994-049A (BRAZILSAT B1)                | 10 Aug. 1994          | 1997-027A (INMARSAT 3 F-4) <sup>a</sup> | 3 Jun. 1997           |
| 1994-049B (TURKSAT 1B)                  | 10 Aug. 1994          | 1997-029A (FENG YUN 2)                  | 10 Jun. 1997          |
| 1994-064A (NSS 703 (INTELSAT 703))      | 6 Oct. 1994           | 1997-030A (IRIDIUM 914)                 | 30 Jun. 1997          |

| <i>Space object</i>                     | <i>Date of launch</i> | <i>Space object</i>           | <i>Date of launch</i> |
|---|-----------------------|-------------------------------|-----------------------|
| 1997-030B (IRIDIUM 12)                  | 30 Jun. 1997          | 1998-043C (TMSAT)             | 10 Jul. 1998          |
| 1997-030C (IRIDIUM 9)                   | 30 Jun. 1997          | 1998-043D (GURWIN TECHSAT 1B) | 10 Jul. 1998          |
| 1997-030D (IRIDIUM 10)                  | 30 Jun. 1997          | 1998-044A (SINOSAT 1)         | 18 Jul. 1998          |
| 1997-030E (IRIDIUM 13)                  | 30 Jun. 1997          | 1998-048A (IRIDIUM 3)         | 20 Aug. 1998          |
| 1997-030F (IRIDIUM 16)                  | 30 Jun. 1997          | 1998-048B (IRIDIUM 76)        | 20 Aug. 1998          |
| 1997-030G (IRIDIUM 911)                 | 30 Jun. 1997          | 1998-049A (ST 1)              | 25 Aug. 1998          |
| 1997-031A (INTELSAT 802)                | 30 Jun. 1997          | 1998-059A (MAQSAT 3)          | 21 Oct. 1998          |
| 1997-051A (IRIDIUM 29)                  | 14 Sept. 1997         | 1998-060A (SCD 2)             | 23 Oct. 1998          |
| 1997-051B (IRIDIUM 32)                  | 14 Sept. 1997         | 1998-065A (PANAMSAT 8)        | 4 Nov. 1998           |
| 1997-051C (IRIDIUM 33)                  | 14 Sept. 1997         | 1998-067A (ZARYA)             | 20 Nov. 1998          |
| 1997-051D (IRIDIUM 27)                  | 14 Sept. 1997         | 1998-070A (SATMEX 5)          | 6 Dec. 1998           |
| 1997-051E (IRIDIUM 28)                  | 14 Sept. 1997         | 1999-002A (ROCSAT 1)          | 26 Jan. 1999          |
| 1997-051F (IRIDIUM 30)                  | 14 Sept. 1997         | 1999-004A (GLOBALSTAR FM 36)  | 9 Feb. 1999           |
| 1997-051G (IRIDIUM 31)                  | 14 Sept. 1997         | 1999-004B (GLOBALSTAR FM 23)  | 9 Feb. 1999           |
| 1997-053A (NSS 803 (INTELSAT 803))      | 23 Sept. 1997         | 1999-004C (GLOBALSTAR FM 38)  | 9 Feb. 1999           |
| 1997-066A (MAQSAT H (+TEAMSAT))         | 30 Oct. 1997          | 1999-004D (GLOBALSTAR FM 40)  | 9 Feb. 1999           |
| 1997-066B (MAQSAT B)                    | 30 Oct. 1997          | 1999-008B (OERSTED)           | 23 Feb. 1999          |
| 1997-066C (YES (TEAMSAT))               | 30 Oct. 1997          | 1999-008C (SUNSAT)            | 23 Feb. 1999          |
| 1997-071B (CAKRAWARTA 1)                | 12 Nov. 1997          | 1999-009A (ARABSAT 3A)        | 26 Feb. 1999          |
| 1997-077A (IRIDIUM 42)                  | 8 Dec. 1997           | 1999-012A (GLOBALSTAR FM 22)  | 15 Mar. 1999          |
| 1997-077B (IRIDIUM 44)                  | 8 Dec. 1997           | 1999-012B (GLOBALSTAR FM 41)  | 15 Mar. 1999          |
| 1997-083A (INTELSAT 804)                | 22 Dec. 1997          | 1999-012C (GLOBALSTAR FM 46)  | 15 Mar. 1999          |
| 1997-086A (HGS1 former ASIASAT 3)       | 24 Dec. 1997          | 1999-012D (GLOBALSTAR FM 37)  | 15 Mar. 1999          |
| 1998-006A (BRAZILSAT B3)                | 4 Feb. 1998           | 1999-014A (DEMOSAT)           | 28 Mar. 1999          |
| 1998-006B (INMARSAT 3 F-5) <sup>a</sup> | 4 Feb. 1998           | 1999-019A (GLOBALSTAR FM 19)  | 15 Apr. 1999          |
| 1998-014A (NSS 806 (INTELSAT 806))      | 28 Feb. 1998          | 1999-019B (GLOBALSTAR FM 42)  | 15 Apr. 1999          |
| 1998-021A (IRIDIUM 62)                  | 7 Apr. 1998           | 1999-019C (GLOBALSTAR FM 44)  | 15 Apr. 1999          |
| 1998-021B (IRIDIUM 63)                  | 7 Apr. 1998           | 1999-019D (GLOBALSTAR FM 45)  | 15 Apr. 1999          |
| 1998-021C (IRIDIUM 64)                  | 7 Apr. 1998           | 1999-027A (NIMIQ 1)           | 20 May 1999           |
| 1998-021D (IRIDIUM 65)                  | 7 Apr. 1998           | 1999-031A (GLOBALSTAR FM 52)  | 10 Jun. 1999          |
| 1998-021E (IRIDIUM 66)                  | 7 Apr. 1998           | 1999-031B (GLOBALSTAR FM 49)  | 10 Jun. 1999          |
| 1998-021F (IRIDIUM 67)                  | 7 Apr. 1998           | 1999-031C (GLOBALSTAR FM 25)  | 10 Jun. 1999          |
| 1998-021G (IRIDIUM 68)                  | 7 Apr. 1998           | 1999-031D (GLOBALSTAR FM 47)  | 10 Jun. 1999          |
| 1998-024A (NILESAT 101)                 | 28 Apr. 1998          | 1999-033A (ASTRA 1H)          | 18 Jun. 1999          |
| 1998-033A (ZHONGWEI 1)                  | 30 May 1998           | 1999-042A (TELKOM 1)          | 12 Aug. 1999          |
| 1998-037A (INTELSAT 805)                | 18 Jun. 1998          | 1999-049A (GLOBALSTAR FM 33)  | 9 Sept. 1999          |

| <i>Space object</i>             | <i>Date of launch</i> | <i>Space object</i>            | <i>Date of launch</i> |
|---------------------------------|-----------------------|--------------------------------|-----------------------|
| 1999-049B (GLOBALSTAR FM 50)    | 9 Sept. 1999          | 2001-049B (PROBA)              | 22 Oct. 2001          |
| 1999-049C (GLOBALSTAR FM 55)    | 9 Sept. 1999          | 2001-056D (MAROC TUBSAT)       | 10 Dec. 2001          |
| 1999-049D (GLOBALSTAR FM 58)    | 9 Sept. 1999          | 2002-003C (VEP 3)              | 4 Feb. 2002           |
| 1999-053A (LMI 1)               | 26 Sept. 1999         | 2002-007A (INTELSAT 904)       | 23 Feb. 2002          |
| 1999-058A (GLOBALSTAR FM 31)    | 18 Oct. 1999          | 2002-014C (SHENZHOU 3 ORB MOD) | 25 Mar. 2002          |
| 1999-058B (GLOBALSTAR FM 56)    | 18 Oct. 1999          | 2002-015B (ASTRA 3A)           | 29 Mar. 2002          |
| 1999-058C (GLOBALSTAR FM 57)    | 18 Oct. 1999          | 2002-016A (INTELSAT 903)       | 30 Mar. 2002          |
| 1999-058D (GLOBALSTAR FM 59)    | 18 Oct. 1999          | 2002-019A (NSS 7) <sup>b</sup> | 17 Apr. 2002          |
| 1999-061A (SHENZHOU 1)          | 19 Nov. 1999          | 2002-025A (OFEQ 5)             | 28 May 2002           |
| 1999-062A (GLOBALSTAR FM 29)    | 22 Nov. 1999          | 2002-027A (INTELSAT 905)       | 5 Jun. 2002           |
| 1999-062B (GLOBALSTAR FM 34)    | 22 Nov. 1999          | 2002-041A (INTELSAT 906)       | 6 Sept. 2002          |
| 1999-062C (GLOBALSTAR FM 39)    | 22 Nov. 1999          | 2002-044A (HISPASAT 1D)        | 18 Sept. 2002         |
| 1999-062D (GLOBALSTAR FM 61)    | 22 Nov. 1999          | 2002-053A (ASTRA 1K)           | 25 Nov. 2002          |
| 2000-003A (ZHONGXING 22)        | 25 Jan. 2000          | 2002-057A (NSS 6) <sup>b</sup> | 17 Dec. 2002          |
| 2000-011A (GARUDA 1)            | 12 Feb. 2000          | 2002-058B (LATINSAT B)         | 20 Dec. 2002          |
| 2000-039C (RUBIN)               | 15 Jul. 2000          | 2002-058C (SAUDISAT 1S)        | 20 Dec. 2002          |
| 2000-046A (BRAZILSAT B4)        | 17 Aug. 2000          | 2002-058D (UNISAT 2)           | 20 Dec. 2002          |
| 2000-046B (NILESAT 102)         | 17 Aug. 2000          | 2002-058H (LATINSAT A)         | 20 Dec. 2002          |
| 2000-050A (ZI YUAN 2)           | 1 Sept. 2000          | 2002-061A (SHENZHOU 4)         | 29 Dec. 2002          |
| 2000-054A (Astra 2B)            | 14 Sept. 2000         | 2002-061C (SHENZHOU 4 ORB MOD) | 29 Dec. 2002          |
| 2000-057A (SAUDISAT 1A)         | 26 Sept. 2000         | 2002-062A (NIMIQ 2)            | 29 Dec. 2002          |
| 2000-057C (UNISAT)              | 26 Sept. 2000         | 2003-007A (INTELSAT 907)       | 15 Feb. 2003          |
| 2000-074A (QUICKBIRD 1)         | 20 Nov. 2000          | 2003-009A (IGS-1A)             | 28 Mar. 2003          |
| 2000-076A (ANIK F1)             | 21 Nov. 2000          | 2003-009B (IGS-1B)             | 28 Mar. 2003          |
| 2000-079A (EROS A1)             | 5 Dec. 2000           | 2003-021A (BEIDOU 1C)          | 24 May 2003           |
| 2000-081A (ASTRA 2D)            | 20 Dec. 2000          | 2003-031A (MONITOR)            | 30 Jun. 2003          |
| 2001-001C (SHENZHOU 2 module)   | 9 Jan. 2001           | 2003-031C (DTUSAT)             | 30 Jun. 2003          |
| 2001-002A (Eurasiasat 1)        | 10 Jan. 2001          | 2003-031D (MOST)               | 30 Jun. 2003          |
| 2001-005A (SIRCAL 1)            | 7 Feb. 2001           | 2003-031G (AAU CUBESAT)        | 30 Jun. 2003          |
| 2001-024A (INTELSAT 901)        | 9 Jun. 2001           | 2003-031H (CANX 1)             | 30 Jun. 2003          |
| 2001-025A (ASTRA 2C)            | 16 Jun. 2001          | 2003-036A (SCISAT 1)           | 13 Aug. 2003          |
| 2001-028B (JOINT AIRLOCK QUEST) | 12 Jul. 2001          | 2003-045A (SHENZHOU 5)         | 15 Oct. 2003          |
| 2001-029B (BSAT-2B)             | 12 Jul. 2001          | 2003-045G (SHENZHOU 5 ORB MOD) | 15 Oct. 2003          |
| 2001-038B (VEP 2)               | 29 Aug. 2001          | 2003-049A (CBERS 2)            | 21 Oct. 2003          |
| 2001-039A (INTELSAT 902)        | 30 Aug. 2001          | 2003-049B (CX 1)               | 21 Oct. 2003          |
| 2001-041 (PIRS (DC 1))          | 14 Sept. 2001         | 2003-051C (FSW)                | 3 Nov. 2003           |



| <i>Space object</i>             | <i>Date of launch</i> | <i>Space object</i>       | <i>Date of launch</i> |
|---------------------------------|-----------------------|---------------------------|-----------------------|
| 2003-052A (ZHONGXING 20)        | 14 Nov. 2003          | 2004-035B (SJ 6B)         | 8 Sept. 2004          |
| 2003-055A (GRUZOMAKET)          | 5 Dec. 2003           | 2004-039A (FSW 3-3)       | 27 Sept. 2004         |
| 2003-059A (AMOS 2)              | 27 Dec. 2003          | 2004-042A (FENG YUN 2C)   | 19 Oct. 2004          |
| 2003-061A (DOUBLESTAR 1)        | 29 Dec. 2003          | 2004-043A (EXPRESS AM-1)  | 30 Oct. 2004          |
| 2004-001A (ESTRELA DU SOL)      | 11 Jan. 2004          | 2004-044A (ZIYUAN 2-3)    | 6 Nov. 2004           |
| 2004-007A (MBSAT)               | 13 Mar. 2004          | 2004-045A (USA 180)       | 6 Nov. 2004           |
| 2004-011A (SUPERBIRD)           | 16 Apr. 2004          | 2004-046A (TANSUO 2)      | 18 Nov. 2004          |
| 2004-012A (SHIYAN 1 (TANSUO 1)) | 18 Apr. 2004          | 2004-047A (SWIFT)         | 20 Nov. 2004          |
| 2004-012B (NAXING 1)            | 18 Apr. 2004          | 2004-048A (AMC 16)        | 17 Dec. 2004          |
| 2004-018A (ROCSAT 2)            | 20 May 2004           | 2004-049A (HELIOS 2A)     | 18 Dec. 2004          |
| 2004-022A (INTELSAT 10-02)      | 16 Jun. 2004          | 2004-049B (NANOSAT 1)     | 18 Dec. 2004          |
| 2004-024A (APSTAR 5)            | 29 Jun. 2004          | 2004-049C (ESSAIM 1)      | 18 Dec. 2004          |
| 2004-025A (APRIZESAT 2)         | 29 Jun. 2004          | 2004-049D (ESSAIM 2)      | 18 Dec. 2004          |
| 2004-025D (SAUDICOMSAT 1)       | 29 Jun. 2004          | 2004-049E (ESSAIM 3)      | 18 Dec. 2004          |
| 2004-025E (SAUDICOMSAT 2)       | 29 Jun. 2004          | 2004-049F (ESSAIM 4)      | 18 Dec. 2004          |
| 2004-025G (APRIZESAT 1)         | 29 Jun. 2004          | 2004-049G (PARASOL)       | 18 Dec. 2004          |
| 2004-025H (UNISAT)              | 29 Jun. 2004          | 2004-050A (USA 181)       | 21 Dec. 2004          |
| 2004-027A (ANIK F2)             | 18 Jul. 2004          | 2004-051A (PROGRESS M-51) | 23 Dec. 2004          |
| 2004-029A (TAN CE 2)            | 25 Jul. 2004          | 2004-052A (SICH 1M)       | 24 Dec. 2004          |
| 2004-031A (AMAZONAS)            | 4 Aug. 2004           | 2004-052B (MIKRON)        | 24 Dec. 2004          |
| 2004-033A (JB 4-2)              | 29 Aug. 2004          | 2004-053A (GLONASS)       | 26 Dec. 2004          |
| 2004-035A (SJ 6A)               | 8 Sept. 2004          | 2004-053B (GLONASS)       | 26 Dec. 2004          |
| 2004-025F (SAUDISAT 2)          | 29 Jun. 2004          | 2004-053C (GLONASS)       | 26 Dec. 2004          |

<sup>a</sup> Information related to this space object has been provided by the United Kingdom of Great Britain and Northern Ireland to the United Nations.

<sup>b</sup> Information related to this space object has been provided by the Netherlands to the United Nations.