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Peace in Space: Transparency and Confidence-Building Measures
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Let There Be Peace in Space, and on Earth[1]

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The use of outer space for peaceful purposes is a principle enshrined in the 1967 Outer Space Treaty; and is the "raison d'être" of the United Nations' Committee on the Peaceful Uses of Outer Space (COPUOS). Since the space age began in the 1950s, there has not been any "star wars", or acts of aggression, such as one Administration's intentional destruction of a spacecraft belonging to a different Administration. However, the intentional destruction of a satellite by its own Administration has occurred, as well as the accidental collision and destruction of satellites or satellite components, the most recent one taking place in February 2009.

Whether intentional or accidental, the destruction of spacecraft has added to the ever-increasing amount of space debris, creating hazards for all satellites, for space flights to the International Space Station, and for repairs to the Hubble Telescope. It could be that future collisions will no longer be considered merely accidental, but will attributed to the bad faith of some Administration, resulting in retaliation and further conflict, on Earth, and even in Space.

Are international agreements, such as the space treaties, sufficient to avoid or minimize the risk of a "star wars"? What additional measures can be taken by the international community, to ensure that the use of outer space does indeed remain for peaceful purposes?

Much of the literature on outer space focuses on the militarization and /or weaponization of that "province of mankind." The focus here will be on the peaceful uses of outer space, and the benefits that humanity has garnered therefrom.

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Introduction and Background

At the beginning of the space era in the late 1950s, there were 2 main players: the USA and the USSR, with the launch of the first satellites taking place under the aegis of their respective military / government entities. The fact that the military were the first to go to outer space has consequences even now, as satellites are still classified as weapons, and subject to export (and import) of weapons regulations. These limitations have economic / financial repercussions on the major manufacturers of satellites and launch vehicles and also affect international relations.

Satellites are considered "dual use" technology, since many of their components can be used for military (and possibly aggressive) purposes, as well as for civilian and peaceful purposes.[1] Their manufacture, launch and use require licenses from many different governmental entities, both national and international. In the United States, in addition to the Dept. of State's ITAR[2] regulations, satellite manufacturers are subject to rules and regulations of the Federal Communications Commission, the Dept. of Commerce, the Dept. of Defense, to name only a few of the governmental agencies involved.

At the international level, satellite launches and operations are subject to the International Telecommunication Union's Radio Regulations (ITU-RR), the treaties formulated by the UN COPUOS, as well as to telecommunication agreements signed at the World Trade Organization. In addition, regional agreements, national regulations and laws of other countries also must be taken into account.

The vast majority of operational satellites in outer space are used for communication purposes, whether military or civilian. These systems have generated billions of dollars for their manufacturers, their owners, operators and service providers, making them the most successful use of outer space from an economic viewpoint. That communication satellites are basic to the social and economic development of nearly every country is apparent when one looks at the number of satellite systems currently in operation, and the number of earth stations accessing them.[3] Several "developing" countries also have national systems, in addition to using satellites belonging to global or regional consortia.[4]

Satellites are essential to providing connectivity, especially in rural, isolated areas that cannot be reached economically by other telecommunication systems, such as cable or microwave. Even in the "developed" world, there are "pockets" where satellites are the only means of providing communications at reasonable costs. Even infrastructure components, however, are subject to export /import regulations, which may lead to the increase in cost of the communication system(s). Nevertheless, communication satellites have become ubiquitous, and the primary means of connecting the world community.[5]

United Nations COPUOS, the Outer Space Treaty, and the Development of Satellite Systems

By the late 1950s, the United Nations was already involved in the regulation of space activities, and after functioning as an ad hoc committee, the Committee on the Peaceful Uses of Outer Space, COPUOS, became a permanent committee in 1959. The key words and purpose of this committee were, and remain "*peaceful uses*", i.e., non-aggressive uses of outer space. The early work of COPUOS, and subsequent treaties and agreements which it drafted, were based on Resolution 1962 (XVIII), Declaration of Legal Principles Governing the Activities of States in the Exploration and
Use of Outer Space, adopted by the UN General Assembly in December 1963. This Resolution states at the outset that the UN [recognizes] the common interest of all mankind in the progress of the exploration and *use of outer space for peaceful purposes*. [Emphasis added].

The Outer Space Treaty clearly states that activities in outer space shall be carried on in the interest of maintaining international peace and security and promoting international cooperation and understanding. (Art. III). Art. IV states in pertinent part that "States Parties to the Treaty… undertake not to place in Earth orbit …weapons of mass destruction," even while "the use of military personnel for scientific research or for other peaceful purposes shall not be prohibited."[6] Since the militarization of space is not prohibited, this article has been interpreted as meaning that the weaponization of outer space is likewise not prohibited – so long as the weapons are not of mass destruction. Thus, since most satellites are not weapons of mass destruction (WMD), but are used for communications (civilian and military), they have been populating outer space in increasing numbers, and slowly the distinction between the "militarization" and "weaponization" of outer space is being blurred.

At a national level, President Kennedy seemed to intuit that one of the best uses of satellites – and of outer space -- would be to improve commercial communications amongst the countries of the world. In 1962, he enacted the Communications Satellite Act, which led to the establishment of the Communications Satellite Corporation,[7] a civilian company, thus ensuring to some extent, that satellite communications would be developed for peaceful purposes, even though they are used by government / military entities for their communications.

In order to implement another important aspect of the Communications Satellite Act, namely to facilitate the development of less developed countries, in 1964, the International Telecommunication Satellite Organization, INTELSAT was created, with the support of at least 10 Administrations. By the early 1980s, more than 80 countries had joined INTELSAT, and were benefiting from satellite communications, using them not only for international communications but also for national communications. All the while, several countries, not just the USA and the USSR, were launching satellites, primarily to enhance national (and international) communications, i.e., for peaceful, not bellicose purposes. Indonesia and India were the pioneers of national satellite communication systems among the developing countries.

In the 1980s, a policy shift began, by allowing for competition among satellite systems separate from INTELSAT. Thus, SES Astra (Luxembourg) and PANAMSAT (USA), both privately owned satellite systems, were launched. There was also growing competition in the launch industry, with several US corporations providing launch services, albeit with certain restrictions that continued into the 1990s. In the mid 80s' the European launch system, ARIANE began operations. However, with the Challenger accident in 1986, and several other launch mishaps, access to outer space was curtailed until the end of the 80s.

In the early 90s, the commercialization of launches continued to grow, as well as the number of satellite systems that were being launched, although no longer nearly exclusively to geostationary orbit. Many satellite systems, referred to as the "LEO" and "MEO" constellations, were developed by private corporations.[8] Much of the technology used for the development and deployment of these non-geostationary constellations was adapted to civilian use from military systems.

Also in the 1990s, the government's financial participation in satellite systems decreased, while private investors were sought for the new LEO and MEO systems. Did this shift from government financing to private financing also help in keeping space for peaceful purposes? It is likely that it has, since the investors want to ensure that their investments are secure, and not subject to "star wars."

The privatization pendulum continued to swing, resulting in the privatization of the major international and regional intergovernmental satellite organizations, INTELSAT, INMARSAT, EUTELSAT, and ARABSAT in the early 2000s. INTELSAT and to a lesser degree, INMARSAT, were privatized according to the terms set forth in the US "ORBIT" Act of 2000.[9] While their privatization has helped some investors, the question of whether the former Signatories to INTELSAT have all benefited from the privatization needs to be explored, but this issue is beyond the scope of this paper.

The International Telecommunication Union (ITU) and the Fight for Frequencies and Orbital Locations

While the number of satellite systems continues to grow, so does the need for frequencies and optimal orbital slots. The ITU's role in the allocation of frequencies has become more important, especially with the increase in "paper" satellite systems that were and are being notified.[10] The ITU has proposed two mechanisms to help reduce this backlog of network filings: cost recovery and administrative due diligence. It adopted a cost recovery approach that assigns fees to cover the costs of processing notifications filed after November 7, 1998. The ITU also adopted and implemented administrative due diligence requirements as a regulatory measure to reduce the backlog of "paper satellites." This requires administrations to notify the ITU that a satellite network has been brought into use in the time frame provided for in the Radio Regulations. If this does not occur, the network will be cancelled by the ITU, and will no longer be included in the

coordination process with other satellite networks.

In addition to the ITU's procedures, several national governments have adopted regulations and /or policies to mitigate the "paper satellites," instituting certain milestones that must be met by the system's proponents. These milestones include dates by which the construction and launch of the satellite will occur, as well as financial showing of viability.

The US's Federal Communications Commission (FCC) instituted milestones several years ago, and in 2003 it adopted other revisions to its satellite licensing system, to allow market mechanisms to play a greater role in determining spectrum use by satellite systems. The FCC adopted, inter alia, safeguards to discourage speculation, including a requirement that licensees post a $5 million to $7.5 million bond within 30 days after receiving a license. The FCC retains the discretion in reviewing assignments and transfers of control to determine whether the initial license was obtained in good faith with the intent to construct a satellite system. These new procedures, however, do not apply to the Direct Broadcast Satellite Service or the Digital Audio Radio Satellite Service. The licensing process for non- U.S.-licensed satellites also was revised to make them consistent with the new FCC procedures. [11]

Despite the ITU's and the FCC's procedures to mitigate or discourage the notification of paper satellite systems, the practice continues, and new satellite systems continue to be notified to the ITU. One deterrent, according to the ITU, may be the current global economic crisis. On the one hand, scarcity of funds might reduce submissions of satellite network notifications during 2009–2011, if administrations or satellite operators find it hard to finance manufacturing and launches in time to meet regulatory deadlines for bringing the satellites into use. On the other hand, the market for satellite services is buoyant and it is likely that it will continue to expand over the next few years, despite scarcity of funds.[12] A major challenge is to ensure that the satellite systems do not cause harmful interference, and that the ITU coordination process is observed.

Will Pieces in Space lead to Peace in Space?

With every launch a certain amount of space debris is created, adding to the debris already in outer space, and the risk of damage to other spacecraft, to the International Space Station (ISS) increases. Until now, mankind has not devised any adequate means of mitigating the space debris, of cleaning up what is already there, even though mankind has made strides in increasing the number of objects in space, with most of the debris (different stages of launch vehicles, scientific probes, toolkits, astronauts' gloves, etc.), floating at random, and creating hazards to satellites in orbit. The question which arises is what measures can be taken to mitigate the detrimental impact that space debris has on existing systems, and may have on future systems?

Space debris is an inherently international problem whose solution requires international co-operation. The Inter-Agency Space Debris Coordination Committee (IADC) whose members include ESA, Japan, NASA, and the

Russian Space Agency RKA, provides a forum for discussion and coordination of technical space debris issues. These organizations have instituted programs to track space debris, as well as to mitigate the damage caused thereby. The European Space Agency (ESA), for example, as a result of the accidental collision between a Russian non-operational satellite and a US-Iridium satellite, announced that it planned to set up a $64-million space program, designed to monitor space debris and their orbit, to avoid other accidents such as the one in February 2009. The agency will also set up a new service that will ensure that proper standards are met for future launches, to minimize the risks involved with space collisions.[13]

Several years ago, the International Academy of Astronautics (IAA) undertook a "Cosmic Study on Space Traffic Management", and proposed several measures that could be instituted to mitigate the problem of space debris.[14] One issue that arose in the course of the study was how to monitor space objects, how to enforce the requirements of the 1976 Registration Convention, which are often disregarded even by States which have ratified this convention.[15] The accidental collision of a "dead" Russian satellite with an operational Iridium satellite in February 2009 highlighted the need to adhere to the Registration Convention's requirement to notify the UN Secretary-General of space objects that are no longer operational.[16]

Space debris creates a risk not only while it is in outer space, but also as segments or pieces of debris re-enter the Earth's atmosphere. According to the US press, in February 2008, the US intentionally destroyed a non-responsive spy satellite because the fuel on board could present a hazard if it were to land on Earth. This intentional destruction—and creation of space debris-- as well as the Chinese destruction of one of its satellites in 2007 were highly commented on and criticized by the international space community.

One result of the USA's destruction was a call from Russia and China to ban the development (or deployment?) of weapons in space, putting in sharp relief the Bush's Administration's antipathy to treaties limiting anti-satellite weapons.[17] It also led to the Council of the European Union's drafting a Code of Conduct for outer space activities.[18] The aim of the Draft Code is for the subscribing countries to undertake certain measures in space operations to minimize risk of collisions, to refrain from intentional actions which might directly or indirectly cause damage or destruction of objects in outer space, unless "such action is conducted to reduce the creation of space debris and/or justified by imperative safety considerations."[19]

While the initial draft of the Code of Conduct was approved by the Council of the European Union in December 2008, it may take some time for it to become legally binding international customary practice, in part because adhering to the Code of Conduct would be on a voluntary basis, in part because of differing, and often opposing views of States on what is meant by "weaponization," "disarmament," let alone "peaceful uses of outer space." Could the creation of space debris, whether accidental or intentional, lead to the further "weaponization" of outer space?

Conclusion

The distinction between the use of satellites for peaceful purposes and their use for defensive purposes, as weapons needs to be maintained and strengthened. However, so long as satellites are classified as weapons, the launch of any satellite, whether for communications, reconnaissance, or remote sensing, will be deemed as contributing to the "weaponization" of outer space, despite their use for civilian communications and other peaceful purposes. While it may be difficult to separate the civilian from the military uses of satellites, it seems that most adherents to the Outer Space Treaty (OST) believe that this Treaty allows for the military use of outer space --so long as there is no overt act of aggression or orbiting weapons of mass destruction-- and that in doing so, there is no violation of the OST.

If outer space is to be used for peaceful purposes, it is submitted that there are three "levels" of peace which need to be taken into consideration, as they are interrelated. First of all, personal peace, at the individual level: if a person is at peace with him or herself, accepting his/her talents and limitations, that sense of peace will permeate his or her relations with others, and likely to have a "ripple effect." Secondly, peace among nations: respecting of our "differentness" and settling political differences by means other than wars. If there is more peace on Earth, there will be less or no need to have weapons in outer space. In brief, we need to achieve inner peace and terrestrial peace in order to have peace in outer space. "Let there be peace on Earth, and let it begin with me..."[20]

[1] Should satellites continue to be classified as weapons? After all, any object can become a weapon, and be used for aggressive – or peaceful – purposes. How often do we talk about a "double-edged sword", an adage that reflects the dual use of most objects? Perhaps the primary purpose of the object should be the basis for its classification, and in the case of communication satellites, their peaceful use should be emphasized.

[2] ITAR is the acronym for the International Traffic in Arms Regulations, a set of US government regulations that control the export and import of defense-related articles and services on the United States Munitions List. These regulations implement the provisions of the Arms Export Control Act and are described in Title 22 (Foreign Relations), Chapter I(Dept. of State), Subchapter M, Code of Federal Regulations. The Department of State interprets and enforces ITAR. Its goal is to safeguard US national security and further US foreign policy objectives.

[3] For many years "development" has been measured by more than economic factors; "teledensity", the number of telephones, computers, and other means of communications in a given country now are considered important indicators of their "development."

[4] Algeria, Argentina, Brazil, Canada, China, France, Greece India, Indonesia, Israel, Italy, South Korea, Luxembourg, Mexico, Morocco, Nigeria, Russia, Turkey, United States, Venezuela, are among some of the countries that own and operate their own satellite systems. Several systems are wholly owned and operated by private parties. Some countries also have remote sensing/earth observation satellite systems, as well as global positioning (GPS) satellites. Not all these countries, however, have laws or regulations governing their national space activities, nor have they signed or ratified the principal UN treaties related to outer space activities.

[5] While economies worldwide remain mired in recession, this slowdown hardly seems to have touched the international Internet market. International Internet traffic grew 74 percent in 2009—up from 55 percent in 2008. Despite fears that operators would delay upgrades resulting in overcrowded networks, international Internet bandwidth grew 64 percent, resulting in only a modest uptick in network utilization. Carriers added 9.4 Tbps of new international capacity in 2009—more than the total capacity of all

international Internet links in existence in 2007. While demand for Internet capacity soared, prices continued to decline, particularly for high capacity ports. Telegeography [email] Feed, 15 Sept. 2009.

[6] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Entered into force December 1967. (Outer Space Treaty or OST hereinafter).

[7] Communications Satellite Act of 1962, P.L. 87-624, 76 Stat. 4199, August 31, 1962, 47 U.S.C. .Sec. 701 [8] LEO is the acronym for Low Earth Orbit, while MEO is the acronym for medium earth orbit. Orbcomm is among the LEOs that succeeded and is in operation. Iridium, Globalstar and ICO Global Communications were the 3 major contenders among the MEOs. Iridium survives in great part due to its contracts with the US Dept. of Defense; Globalstar recently received a financial infusion from the French government, and ICO Global Communications belongs to a consortium of investors. et seq.

[9] In 2000, the US Congress passed the Open-market Reorganization for the Betterment of International Telecommunications Act (ORBIT Act) to help promote a more competitive global satellite services market. On October 25, 2004 an amendment to ORBIT Act became law. The Act had previously required Intelsat to dilute the ownership interests of its former signatories through an initial public offering (IPO), but the amendment permits Intelsat to comply with the dilution objectives of the ORBIT Act by means other than an IPO.

[10] "Paper" satellite systems are those proposed and notified to the ITU, but with little possibility of becoming operational, either for lack of funds, or other technical deficiencies. Many such systems are notified simply to "reserve" the frequencies, and /or the orbital positions. This practice is being discouraged by the ITU as well as national regulators, which are imposing milestones that must be met to demonstrate the viability – and good faith - of the system's proponent.

[11] Action by the [Federal Communications] Commission April 23, 2003, by First Report and Order and Further Notice of Proposed Rulemaking (IB Docket No. 02-34) and First Report and Order (IB Docket No. 02-54) (FCC 03-102).

[12] ITU News, 1/09. This article draws upon the ITU report "Confronting the Crisis: Its impact on the ICT Industry", published in February 2009. (http://www.itu.int). (Accessed Sept. 2009).

[13] http://esapub.esrin.esa.it. (Accessed Sept. 2009).

[14] "Cosmic Study on Space Traffic Management", C. Contant-Jorgenson, P. Lála, K-U. Schrogl, editors. Published by the International Academy of Astronautics, Paris, France, 2006.

[15] Convention on Registration of Objects Launched into Outer Space., entered into force 1976.

[16] Ibid. In addition to notifying the UN Secretary-General of the object launched to outer space (Art. III.1,) the State of Registry is to notify the UN Secretary-General of objects that are no longer in Earth orbit (Art. IV.3).

[17] China and Russia presented a draft treaty, "On the Prevention of Placement of Weapons in Outer Space, the Threat or Use of Force against Space Objects" (PPTW), to the Conference on Disarmament in 2008.

[18] Draft Code of Conduct for Outer Space Activities. Council of the European Union doc. 16560/08, published in Brussels, 3 Dec. 2008

[19] Ibid, Art. II.4.2.

[20] Choral Companion, World Library Publications (2006), p.473. Text and music copyright 1955, 1983, Jan-Lee Music.