INTERNATIONAL SPACE PLANS AND POLICIES: FUTURE ROLES OF INTERNATIONAL ORGANIZATIONS+

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Introduction

Mankind's progress in space, whether through national, regional or global space programs, depends in large degree on the quality and continuity of organizations involved. The financial resources, physical facilities, cadres of specially qualified experts, and the capacity to sustain work over years of endeavor, are essential elements of any space program. In the first 30 years of human spaceflight activity, a wide variety of institutional forms have appeared to undertake management of space programs. These institutions shape, and are centrally involved in, the execution of space programs, policies, and practices.

Institutions involved in various relevant roles today include national, regional and global organizations. Among the national institutions are: civil governmental regulatory and operational agencies; civil governmental research/developmental agencies; defense agencies of the government; privately and publicly owned corporations; and professional associations and societies.

The regional organizations include: governmental cooperative operating agencies; privately and publicly owned corporations; and research and development centers.

Finally, the global institutions encompass: UNO regulatory institutions (specialized agencies); the UN General Assembly and the UN Secretariat; scientific and technical organizations and associations of a governmental nature; and intergovernmental operating global systems.

The future conduct of space activities will involve all of these and other, yet to be created, entities in various roles. International cooperation and coordination are essential to successful and safe spaceflight operations. This paper explores the potential roles of extant and possible new international organizations. It addresses in detail the roles that are becoming clearly appropriate for coordination and

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monitoring by a possible new agency within the structure of the United Nations.

Classification of Organizations Affecting Space Activities

Today, space activities are conducted by a varied complex of autonomous and interrelated national, regional, and global organizations.[1] Some organizations are governmental, some are quasigovernmental, others are nongovernmental business ventures. A general classification of organizations involved in space activities is surprisingly large when significant distinguishing characteristics are analyzed. One possible classification relates to the functional roles being performed which cover research and development; manufacture, test and logistic support; operational system management; lease and sublease of services; legislation and regulation; insurance of facilities and activities; information collection and dissemination; flight safety monitoring and control; and specialized finite studies and projects. Manufacturing, test and logistic support are performed today by national or regional cooperative entities only. There are no known global institutions (*i.e.*, with membership open to all nations) that engage in manufacturing, test and logistic support of space hardware.

National Organizations Affecting Space Activities

In the 1950s, and for much of the 1960s, national organizations dominated the conduct of space operational activities. Gradually, national and international organizations built up legislative and regulatory frameworks to constrain certain classes of activities, especially military activities, and to monitor, record, or authorize other spaceflight activities. Many of these organizations did not exist before October 1957,[2] but some of them are modified, prior-existing organizations, supplemented or restructured to deal with space activities.

One can identify the many entities by generic types such as "regulatory agencies," "advisory committees," or "corporations." There are many organizations in these categories today and a substantial commercial market exists for publications containing directories and descriptive information on aerospace agencies, aerospace companies, manufacturing and service suppliers for aerospace systems, consultants, technical

1. *See, e.g.*, organizational roles described in UNITED NATIONS, SPACE ACTIVITIES OF THE UNITED NATIONS AND INTERNATIONAL ORGANIZATIONS, U.N. Doc. No. A/AC.105/358 (1986) [hereinafter "SPACE ACTIVITIES"].
2. October 4, 1957 was the launch date of the first orbiting of a manmade satellite.

documentation sources, and other information services.[3] At the national level, in countries like Australia, Brazil, Canada, France, Germany, India, Japan, the United Kingdom, the USSR and the United States, there are extensive governmental structures, businesses, consultants, and service organizations, totally dedicated to the aerospace market sector. The examples of U.S. organizations affecting space activities could be substantially repeated for ten or more nations, developed and developing, around the globe. These national institutional infrastructures are multiplying as national and international space programs increase in number and complexity.

Regional Organizations Affecting Space Activities

National organizations like the U.S.'s NASA, France's CNES, Japan's NASDA, India's Department of Space and ISRO, the Soviet Union's Academy of Sciences, and many others, conduct some programs and participate in numerous international programs involved in, conducting, or promoting spaceflight activities. In addition, regional space organizations are formed on the basis of varied criteria. In some cases the dominant criterion may be geographical contiguity (European Space Agency - ESA); in another, the dominant criterion may be socio-political affiliation or commonality of language (ARABSAT); in still others there may be a mix of social, cultural and linguistic or economic interests that bring nations together in a regional collaborative effort in spaceflight activity (PEACESAT). Regional cooperative ventures may be created for economic reasons, political reasons, operational reasons, or any of a wide variety of other common interests among nations, or for a combination of several or many reasons.

One can also identify a variety of regional organizations which promote, facilitate, or engage in some form of regional exploitation or use of space. The total number of relevant regional entities is many tens, and may now exceed one hundred. In addition to "regional" entities, many national entities, also contribute to regional activities. A list of organizations active in Outer Space Affairs is included in the Annex at the conclusion of this article.

3. *See, e.g.*, AVIATION WEEK AND SPACE TECHNOLOGY 1988 BUYING GUIDE (1988); THE 1988 SATELLITE DIRECTORY (10TH ED. 1988); I & II WORLD AVIATION DIRECTORY (1986); DMS MARKET INTELLIGENCE REPORT (includes volumes devoted to Missiles, Strategic Defense Initiative, Space Systems, Aerospace Companies, and Aerospace Agencies); and AVIATION INFORMATION SERVICE, LTD., SPACE STATISTICS REVIEW (1988).

Global Organizations Affecting Space Activities

Global organizations affecting space activities existed prior to the first launch of a manmade satellite into orbit, but these prior-existing organizations, like the United Nations, the International Telecommunication Union (ITU) and UNESCO, as examples, had to adjust their structures, or modify their staff organizations and skill bases, in order to deal with spaceflight activities. In most cases, such adjustments were accomplished expeditiously and effectively.[4]

As the exploration and use of space expanded during the 1960s, new organizations emerged involving wholly new forms of cooperation and collaboration. One significant early institutional structure, created through multilateral action of nations, was the International Telecommunications Satellite Organization (INTELSAT), which was established under interim arrangements in 1964, and was brought under definitive arrangements in 1971.[5] In the 1970s, other global organizations for satellite communication services were formed, including INTERSPUTNIK and INMARSAT.[6]

The United Nations General Assembly took action in the late 1950s to establish an *ad hoc* Committee on the Peaceful Uses of Outer Space (COPUOS), which was soon converted to a permanent committee of the

4. SPACE ACTIVITIES, *supra*, note 1.

5. An excellent monograph on the negotiating history and issues involved in the creation of INTELSAT's definitive organization is contained in Colino, *The INTELSAT Definitive Arrangements: Ushering in a New Era in Satellite Telecommunications*, Mono. No. 9, EBU, Geneva, Switzerland (1973). *See also* Doyle, *Permanent Arrangements for the Global Commercial Communication Satellite System of INTELSAT*, 6 INT'L LAW. 248 (1972).

6. Analyses of the formative stages and characteristics of these organizations can be found in: Doyle, *Analysis of the Socialist States' Proposal for INTERSPUTNIK: An International Communication Satellite System*, 15 VILL. L. REV. 83 (1969); Doyle, *INMARSAT: The International Maritime Satellite Organization - Origins and Structure*, 5 J. SPACE L. 45 (1977).

General Assembly.[7] Major conferences and changes began to appear under auspices of the ITU, IMCO, and the WMO. Major new programs, activities and organizational structures were initiated to cope with and to use the resources provided by space activities. Few laymen, who are not students of the subject, appreciate how many global institutions exist today that are directly involved in or dependent upon space activities. The list in the Annex contains a representative sampling of global organizations which either monitor and regulate, own and operate, or depend in part or completely on spaceflight activities in the normal discharge of their functions and duties.

Commonly the International Council of Scientific Unions (ICSU) and its Committee on Space Research (COSPAR) are described as "nongovernmental" organizations.[8] However, when one examines the sources of operating revenue, and the identity and sponsorship of many participants involved in the work of the ICSU and COSPAR, it appears a more accurate classification to treat ICSU as a mixed governmental and nongovernmental organization. If all direct government sponsored financial support for these organs were to be removed precipitously, it is doubtful that they could survive. They may be considered nongovernmental in the nature and roles of the participants in the Union's work, but there is an undeniably large and steady infusion of governmental funding into the work of ICSU and COSPAR. Consequently, it appears more appropriate to treat these organizations as "mixed" in nature rather than "nongovernmental." Opinions in this regard may differ.

Perhaps the most striking aspect of the global organizations is the absence of entries for nongovernmental organizations conducting research

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7. See the excellent recapitulation of the formation and work of the *ad hoc* committee in Galloway, *The United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space Accomplishments and Implications for Legal Problems*, 2 PROC. COLLOQ. L. OUTER SPACE 30 (1960); the article may also be found in LEGAL PROBLEMS OF SPACE EXPLORATION - A SYMPOSIUM (prepared for the Senate Committee on Aeronautical and Space Sciences), 87th Cong., 1st Sess., Doc. No. 26, at 613 (1961). The report of the *ad hoc* committee, U.N. Doc. A/4141 (1959), is included in the same Senate symposium at 1246. On the creation and initial work of the permanent committee, see Galloway, *The United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space*, 5 COLLOQ. L OUTER SPACE un-paginated (1963). The activities and accomplishments of the U.N. COPUOS during its first decade are well documented in Reis, *United Nations Committee on the Peaceful Uses of Outer Space and Its Legal Subcommittee* in INTERNATIONAL COOPERATION IN OUTER SPACE - A SYMPOSIUM (prepared for the Senate Committee on Aeronautical and Space Sciences), 92d Cong., 1st Sess., Doc. No. 57 (1971) [hereinafter "INTERNATIONAL COOPERATION"], at 247; and Frutkin & Anderson, *The Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space* in INTERNATIONAL COOPERATION, *supra*, at 261.

8. *See, e.g.*, Porter, *International Scientific Community: International Council of Scientific Unions and COSPAR* in INTERNATIONAL COOPERATION, *supra* note 7, at 527.

and development, manufacturing and operating space systems on a global basis. Characteristics of space programs, such as cost, complexity, duration and control contribute to the absence of private global institutional structures conducting research and development, system operations and manufacturing. Private enterprises exist and conduct these functions on regional and national bases, but as yet, not on a global basis.

Identification of Future Needs

The existing complex of international and national organizations involved in spaceflight activity is extensive. Activities being conducted today are registered, regulated, reported and restrained in accordance with various treaties, conventions, agreements and national laws. The pace of expansion of spaceflight activity does not slacken. New entrants approach the threshold of launching nations soon to be capable of consistent, effective placement of manmade objects into space. As we move outward from the Earth, first to low Earth orbit, then to higher orbits, to the Moon, to the planets, their moons, and beyond, more and more functions will require globally centralized and standardized monitoring, coordination, reporting, regulation and control.

(1) Standardization of Astronautic Cartography. Today there are many standards applied to and central phenomena and events. There are standards for astronomical disseminating procedures for astronomical cartographs and charts. As humanity becomes more active and expands it scope of activity, the preparation of travel plans and operational locations for extraterrestrial activities will require a new standard form of cartography and cartographics for astronautical (as distinguished from astronomical) events. Technical language, symbols, multilingual equivalencies, and systems of units measure must be standardized and uniformly practiced to achieve effective communication and reliable charts and cartographs for use by spacefarers coming from different nations and different organizations.

(2) Standardization of Mission Safety Practices. The expanding spaceflight capability available to multinational, regional, and national entities already requires significant terracentric regulatory activity including:

- radio use coordination through the ITU,
- aeronautical coordination through ICAO, and
- maritime coordination through IMO,

in order to insure safe and compatible operations in all of the terrestrial spheres likely to be affected by spaceflight activities. When flight operations begin to originate on orbit, to originate from the Moon on more than an infrequent basis, or to involve missions with capability to tarry in one space location, move to another, tarry, then again move on, and thus create multiple "missions," some central traffic coordinating role will be

required by some institution. For example, how will we ensure that transiting vehicles do not jettison debris into the path of another vehicle transiting the same locale at a later time? Similarly, how are we to keep transiting vehicles from interfering with or occluding the operation of highly sensitive scientific systems like the Hubble Space Telescope? How can we ensure, for example, protection of the immediate environment of such systems from pollution by exhausts? If pre-mission notification, global coordination, cislunar space coordination, and eventually translunar mission clearances are to be obtained, there must be a competent, central authority in place to function.

That new authority will require specialized expertise, extensive and complex analytical techniques and devices, probably computer capabilities far beyond what is realizable today. Launch, recovery, and in-transit operational standards and procedures for flight activities away from the Earth are required. In addition, controls are required on the generation of space debris, abandonment of artifacts, salvage operations, space object recoveries, crew rescue operations, and methods of emergency marking, lighting and communications. Once universal standards and procedures are in place, training and certification of spaceflight personnel will be required. It is not too early to begin to define the appropriate entity to do these things, its scope, its nature, its locale, and many of its attributes, such as staffing, funding, facilities, and construction.

(3) Standardized Health and Contamination Controls. We have universally accepted, for a long time, the notion that aeronautical flight crews should have health validations of their capacity to function during flight, and the likelihood of their surviving flight operations. In most countries, licensed commercial flight crews are routinely required to undergo periodic health examinations. The demands of spaceflight on the human organism are substantially greater than those of aeronautical flight, and the deleterious effects of long duration space missions on humans is a matter of concern and continuing study. At some point, a general system of health monitoring and crew health standard definitions will be required.

Individual countries sponsoring and conducting manned missions in space today pay a great deal of attention to physical conditioning, pre-flight training, and in-flight health monitoring. An extraordinary degree of cooperation and collaboration in crew health and human biological effects analysis has characterized U.S./USSR relations in the space arena for many years. The first major joint scientific publication in their respective languages by the U.S. and the USSR was a compendium of information on the human biological aspects of crew flight in space.[9] But unilateral practices and bilateral collaboration in this area will not be sufficient in the twenty-first century.

The decontamination or sterilization of artifacts launched into space intended to land on or otherwise contact other celestial bodies has been a matter of unilateral administration for the last 30 years. As

9. Calvin, & Gazenko, I, II & III FOUNDATIONS OF SPACE BIOLOGY AND MEDICINE (1975).

interplanetary flight increases, concerns about contamination of the Earth's ecosystem, will increase. The establishment of recognized and enforceable standards in this arena will require more than voluntary national action.

In both crew qualification and contamination control areas, new centrally formulated and administered standards will be required. This is a complex area, like cartography and safety, requiring special expertise, analyses, substantial information base consolidation, and effective central world administration. Despite current attitudes and practices, no single nation is likely to know all that is needed in these areas.

(4) The Definition and Policing of Criminal Activity. Although the need may be substantially further in the future than some of the foregoing subject areas, considering the human propensity to seek to abridge, ignore or violate rules of conduct, it will become necessary in due course to manage the space environment to control and deter criminal action. If it is generally accepted that without law there is no crime, then it is not too early to begin serious analysis of the legal requirements for maintenance of order and harmony in space. Commentators have already addressed a range of topical areas which will require some form of definition, declaration and enforcement.[10] It is clear that some central authority should serve as the focal point for study, analysis, drafting and ultimately promulgation of a code to deal with crimes in space. The administration of that code, its enforcement, and the judicial processes by which it will be administered must be agreed. A great deal of work is necessary in this area to begin subject definitions and to contemplate appropriate mechanisms for promulgation, enforcement, and administration.

(5) Personal Status and Nationality Issues. A combination of issues that do not arise in current spaceflight activity will arise early in the next century in the presence of permanently manned space stations, possible lunar settlement, or other permanently settled space locales. A form of central registry now exists for space missions, and personal

10. *See, e.g.*, discussion in A.G. HALEY, SPACE LAW AND GOVERNMENT 296-97 (1963); also analysis of jurisdiction, including criminal jurisdiction, in C.Q. CHRISTOL, INTERNATIONAL LAW STUDIES 1962: THE INTERNATIONAL LAW OF OUTER SPACE 418 (1962). *See also* Delmas Saint-Hilaire, *Réflexions sur le droit pénal aérien et de l'espace* (Reflections on Penal Air and Space Law), 28 REVUE GÉNÉRALE DE. L'AIR 84 (1965); S. Gorove, *Criminal Jurisdiction in Outer Space* in BASSIONNI AND NANDA, A TREATISE ON INTERNATIONAL CRIMINAL LAW 48 (1973); Haughney, *Criminal Responsibility in Outer Space* in PROC. CONF. SPACE SCIENCE & L. 146 (Schwartz ed. 1963); *Claims Relating to Jurisdiction Over Space Activities and Spacecraft* in MCDOUGAL, LASSWELL & VLASIC, LAW AND PUBLIC ORDER IN SPACE 695 (1963); Fasan & Gross, *Zivil und Strafrecht in Weltraum* (Civil and Penal Law in Outer Space), 10 ZEITSCHRIFT FÜR LUFTRECHT UND WELTRAUMRECHTSFRAGEN 106 (1961); and Lay & Taubenfeld, *Jurisdiction of the United States over 'Crimes' and Certain Other Acts in Outer Space* (An American Bar Foundation Study) in THE LAW RELATING TO ACTIVITIES OF MAN IN SPACE 210 (1970).

information on individuals is recorded in national registers (births, deaths, marriages, and divorces). In due course, there may emerge issues of dealing with denationalized personnel - people who may disavow national citizenship or nationality, who may thereby become stateless persons.[11] How will the marriage, childbearing and death of such individuals be recorded? Who will maintain and validate such records? Spaceflight regulation up to this time has been largely terracentric, focused on aspects of missions related to the Earth, or their effects upon activities on or near the Earth. Some future operations will be far less Earth oriented, or totally extraterrestrial.

As spaceflight activities are undertaken by individuals away from the Earth for long periods of time, it will be essential to have a body of law and regulations that deal with anthropocentric aspects of law - man-centered issues - in addition to those dealing with nations and institutions. Organizational concerns have been the primary focus of most space law up to this time. Development of extraterrestrial regulations must give more attention to the individual than to the institution because the individual in space is entirely vulnerable and potentially subject to institutional malaise or bureaucratic complacency. Law should serve the governed and not become a yoke on them. Before we create the situations that will involve individuals in legally undefined, extraterrestrial situations and environments, we should begin a centrally managed, internationally collaborative study on the natures and dimensions of the problems involved, and begin to consider solutions that can be generally effective and acceptable.

(6) Management of Resource Exploitation. Under the existing regulatory regimes of national governments there are very few constraints on extraterrestrial resource exploitation. There are numerous possible resource exploitation practices that have been conceived. They include: propellant production from lunar resources, extraction of rare or exotic materials from lunar soil, reduction of metals from asteroids or lunar materials, extraction of useful chemicals from lunar materials, establishment of material mining or processing facilities in space or on celestial bodies, and conduct of any of the foregoing activities on planets or moons of other planets in the solar system.

Recent experience in attempts to establish resource exploitation regimes have not met with general success or wide acceptance.[12] It is

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11. This prospect was first raised by Vladimir Mandl in V. MANDL, WELTRAUM RECHT: EIN PROBLEM DER RAUMFAHRT (SPACE LAW: A PROBLEM OF SPACEFLIGHT) (1932). The issue is further explored in multiple dimensions in G.S. ROBINSON, LIVING IN OUTER SPACE (1975) and in G.S. ROBINSON & H.M. WHITE, ENVOYS OF MANKIND (1986).

12. A survey of commentators' opinions on the relationships between law of the sea experience since 1960 and the prospects of resource use and management in outer space is presented at 28 PROC. COLLOQ. L. OUTER SPACE 118 (1986). This theme session of the IISL Colloquium focused on *Comparison Between Sea and Space Law Especially in View of Exploration and Exploitation Activities.*

clear that nations of the world, collectively, have a substantial way to go to reach mutually acceptable, effective management provisions for extraterrestrial resource exploitation. That work should be begun soon, within a global discussion context in order that timely progress can be made toward a viable solution.

Perceived Needs Suggest An Organizational Response

Selected topic areas of future needs include: standardization of astronautic cartography; standardization of mission safety practices; standardized health and contamination controls; definition and policing of criminal activity; personal status and nationality issues; and management of resource exploitation. This list is not a comprehensive register of work needed to be done, but it is a substantial example of emerging needs. Aerospace system management teaches no discipline so profoundly or so repeatedly as it teaches that the future cannot be foreseen fully and not all future contingencies can be provided for. But the future of any aerospace venture is made more manageable and less surprise generating when future problem anticipation and contingency planning are done. Often, national governments, like operational entities, are so focused on immediate problems that they put off or fully ignore future needs. The progress in astronautics by mankind now requires that the global community organize an institutional structure to begin consistent and sustained analysis of and formulation of approaches to identifiable future problems.

The United Nations would appear to be the logical focal point for the establishment of a world space agency to begin to address such issues. The creation of such an agency will have to be in stages and correlated with the needs of the global community. Among the first requirements will be the need for an agreed mission statement and the definition of an organizational structure.

A Proposed World Space Agency

(a) Mission. The mission of this new agency would be to centralize information on spaceflight activities by nations, regional and global organizations, and private enterprise. The Secretary General of the United Nations could assess the extent and nature of current involvement of the UN Secretariat in managing and implementing provisions of the outer space treaties today, and recommend to the UNGA, which, if any, of the current Secretariat functions should be considered for transfer to the new space organization, once it is established. The collection, maintenance and appropriate dissemination of space activity information would be provided. Coordination with extant international and specialized organizations would be undertaken. The new organization would expedite the planning and convening of specialist conferences or meetings to address space issues. The organization could recommend questions or matters to be considered by the UN Committee on the Peaceful Uses of Outer Space. The world space

agency would serve as a clearinghouse and a central repository for technical, scientific, economic and operational information on past, current and future space activities. Eventually, when adequately staffed and qualified, the organization might provide a framework to develop and recommend standards in areas such as: astronautic cartography and cartographics; the decontamination and sterilization of interplanetary spacecraft; appropriate and necessary flight safety procedures, markings, flight registration and notifications; the definition of and recommendations for enforcement of criminal law concerning extraterrestrial activities; recommendations for handling issues of legal personality and status and record maintenance of significant events such as births, deaths, marriages and other interpersonal transactions in extraterrestrial areas; and the formulation and enforcement of regulations involving protection of particular environments, ecosystems, or resource exploitation projects. The list of appropriate subject areas for the attention of this new organization cannot be fully defined in advance of actual experience in space. New needs will emerge as the kinds and numbers of spaceflight missions expand. The constitutional charter of the organization should be flexible enough to permit internationally agreed adjustments in the organization's roles and mission over time in light of future events.

(b) Organizational Structure. The structure of the new organization suggests itself to some extent. Considering the nature and functions of the several UN specialized agencies that exist today, it appears that such an organization, in concept, would require four main elements: (1) a directorate; (2) an advisory/support staff; (3) a resource staff; and (4) appropriate functional staff, depending upon the nature of roles and functions the organization is assigned.

The agency directorate would include the office of the Director General, the Deputy Director General and their immediate staff support. The advisory/support staff would include: (1) legal counsel, (2) a political affairs office, (3) an office of interagency affairs, and (4) a planning office. The resource staff of the organization would be composed of: (1) personnel and administration, (2) information resources management, (3) controller, and (4) research and library services.

The distinctions in missions or functions between the proposed Information Resources Management (IRM) staff and the proposed Research and Library Services (RLS) staff are not readily apparent to observers who have not ever been involved in one or the other of these functions. Generally, a competent and efficient RLS staff provides data and information on request within a reasonable time, without making known or visible to the management personnel requesting the data or information, the procedures, processes and mechanisms employed in the collection, compilation, analysis, validation, production and delivery of the data requested. The skills, knowledge and staff required for these functions are specialized, rather sophisticated, and require both professional and institutional training.

The providers of IRM, on the other hand, generally know little of libraries, research techniques, data bank contents, information collection

procedures, analytical methods, research validation procedures or document production. The IRM staff knows the computer systems on line within an organization, how to operate and interconnect them, how to network communication and data retrieval systems, how to program system executive logic and system functional activities, and how to install, verify, operate, maintain and troubleshoot the computers, their modems and communication links. Thus, the Information Resources Management staff is totally different in personality, competence, and technical language from that staff that uses the resources which the IRM staff installs and maintains. Increasingly, institutions within and outside of the government are coming to understand the necessity of having these two staffs, and to recognize that the staff skills are very different in the two departments. Neither should be subordinated to the other, if both are to be effective and responsive staffs.

Finally, concerning organization, the ultimate makeup of the functional elements will be directly related to the organizational charter and the organizational missions.

(c) Funding. There are two key questions involved with the funding of any organization: (1) What is the size of the budget that is required for the organization? and (2) How will the funds to meet this budget be obtained?

(1) The Budget Requirements. For purposes of quantifying a budget, the planning, physical establishment, and staffing of a new international organization can be defined in incremental phases. Budgetary Phase I will involve studies and definition of the organization desired based upon the charter of missions contemplated. This phase would be conducted in a series of organizational meetings sponsored through the UN Organization by individual nations. Basic costs in Phase I will be administrative and secretariat costs. These costs could be met through the UN general budget as an agreed special assessment for participating nations. The costs of national participation and representation would be borne by the respective sponsoring governments. This phase should be less than three years.

Budgetary Phase II would involve the expenditure of facility acquisition capital, or rent and capital, to obtain offices and appropriate furnishings, equipment, computers and library. This phase would involve expenditures over time, but the initial facilities will be required about the final year of Budgetary Phase I, and they will grow over time in response to the needs of the organization.

Budgetary Phase III would involve the acquisition of permanent staff and management personnel, and the expenditure of operational funds to discharge the duties of the organization. Funding for this phase begins last and continues over the duration of the operation of the organization.

The initial phase of studies would have relatively modest cost. The establishment of facilities and establishment of computer and library resources will make Phase II costs considerably higher than Phase I. It must be borne in mind that costs will be driven by organizational size and missions. The costs will necessarily relate to the organization defined as

changes in size, or roles and missions of the organization will significantly influence costs.

(2) Obtaining Revenue. The new organization will be established pursuant to an international agreement that will serve as the charter of the organization. Various funding methods could be considered and will be studied by the organizing meetings.

The first funding method that suggests itself is an allocation of costs among member nations in proportion to each nation's allocated portion of the UN General Budget. The justification for use of the UN scale of contributions is that the scope of the new agency is global in concern, it is global in representation and global in effect. Every nation, active in spaceflight or not, will be influenced or affected, directly or indirectly, by the actions and standards of the new agency.

An alternative funding scheme, possibly made applicable to a portion of the total budget, could be based upon the total tonnage launched per year or per annual quarter by the signatory nations. The rationale of this approach is that those nations conducting launches and placing objects in space create the need for the new agency and in at least some measure, possibly half of the total budget, they should have organizational costs in proportion to their total weight of payloads placed in outer space. A variation on this approach would be to assess budgetary costs to payload owners, rather than launching nations, and obtain proportional contributions to the budget in relation to the percentage of ownership by a nation held in a given payload. The payload would be assessed initially by weight and the allocation of assigned contribution would be distributed among owners in proportion to their investment in or in proportion to derivation of revenue from a given payload. It would be possible to allocate by weight alone on scientific, research, or exploratory missions, and by weight distributed among owners in proportion to revenue share for those applications missions that generate revenues.

The question will not likely be solved simply, and some time will be needed to study options, consider alternatives, and to arrive at a generally accepted compromise solution. The sooner the roles and missions of a new agency can be defined, the sooner discussion of appropriate funding alternatives can begin. Putting these matters off will not make them easier to resolve.

Conclusion

With an increase occurring in the number of nations capable of launching objects into space, and a steady expansion of national, regional, and global space program activity, the time is rapidly approaching when effective global management and standardization of important aspects of spaceflight activities must occur.

It is time to begin the serious and necessary work of defining the needs, the functions, and the structure of a new global space agency, to be created as a specialized agency of the United Nations. This need is being

increasingly recognized.[13] The longer the problem is put off the more difficult the solutions are likely to become. This paper proposes an approach. Others may be more practical or feasible. The issue is no longer whether or not we need an agency. The question now is: When will it be established? All things considered, the answer is: The sooner the better.

Annex

Organizations Active in Outer Space Affairs

AAS	American Astronautical Society
AIAA	American Institute of Aeronautics & Astronautics
ARABSAT	Arab Corporation for Space Communications
ARINC	Aeronautical Radio, Inc. (US)
ARRSTC	Asian Regional Remote Sensing Training Center
ARSP	African Regional Remote Sensing Program
ATU	Asian Telecommunication Union
CCIR	International Consultative Committee on Radio (ITU)
CCITT	International Consultative Committee on Telegraph & Telephone (ITU)
CEPT	Conference of European Postal & Telecommunications Administrations
CITEL	Conference on International Telecommunications (OAS)
CNES	Centre National d'Études Spatiales (National Center for Space Studies, France)
COPUOS	Committee on Peaceful Uses of Outer Space (UN), also referred to as UNCOPUOS
COSPAR	Committee on Space Research (ICSU)
DoC	Department of Commerce (US)
DoD	Department of Defense (US)
DoS	Department of State (US)
DoT	Department of Transportation (US)
EBU	European Broadcasting Union
ECA	Economic Commission for Africa
EOSAT	Earth Observation Satellite Corporation (US)
ESA	European Space Agency
ESTEC	European Space Research & Technology Center (ESA)
EUMETSAT	European Meteorological Satellite Organization
EUTELSAT	European Telecommunication Satellite Organization
FAO	Food and Agriculture Organization
GARP	Global Atmospheric Research Program (ICSU/WMO)
GEMS	Global Environmental Monitoring System (UNEP)
IAA	International Academy of Astronautics (IAF)
IAF	International Astronautical Federation
ICAO	International Civil Aviation Organization

13. A recent article following up on a USSR initiative in this regard is Piradov, *Creating a World Space Organization*, 4 SPACE POL'Y 112 (1988).

ICSU	International Council of Scientific Unions
IFRB	International Frequency Registration Board (ITU)
IISL	International Institute of Space Law (IAF)
IMO	International Maritime Organization
INMARSAT	International Maritime Satellite Organization
INTELSAT	International Telecommunications Satellite Organization
INTERCOSMOS	Council on International Cooperation in the Study & Use of Outer Space
INTERSPUTNIK	International Organization of Space Communications
ISRO	Indian Space Research Organization
ITU	International Telecommunication Union
NASA	National Aeronautics and Space Administration (US)
NASDA	National Space Development Agency (Japan)
NOAA	National Oceanic & Atmospheric Administration (US)
NORDSAT	Nordic Countries Satellite System
OECD	Organization for Economic Cooperation and Development
OIRT	International Radio and Television Organization
PEACESAT	Pan Pacific Education & Communication Experiment by Satellite
RRSP	Region Remote Sensing Program
UN, UNO	United Nations, United Nations Organization
UNDC	United Nations Disarmament Commission
UNDP	United Nations Development Program
UNDRO	United Nations Disaster Relief Organization
UNEP	United Nations Environmental Program
UNESCO	United Nations Educational, Scientific & Cultural Organization
UNGA	United Nations General Assembly
UNIDIR	United Nations Institute for Disarmament Research
WARC	World Administrative Radio Conference (ITU)
WIPO	World Intellectual Property Organization
WMO	World Meteorological Organization
WWW	World Weather Watch (WMO)