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Telecommunications and the Outer Space Treaty

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Abstract

Although telecommunications were identified by early UN Space Resolutions as important areas of the emergent space technologies, the 1967 Outer Space Treaty is silent about them as such. Given that the ITU has jurisdiction in these matters, the actual development of space telecommunications in the space age, and the undesirability of splitting terrestrial and space communications as a matter of legal regime, it is not desirable greatly to modify the 1967 Treaty to cover telecommunications in any detail. A useful addition would, however, be to emphasise the importance of space telecommunications as part of the 'benefit' of space in the general world interest so as to strengthen bulwarks against abuse of the ITU system. Further, given the inability of some governments properly to discharge their obligations, a move towards some wider regulatory/executive role for some international body would be desirable.

A. Introduction

When the space age opened with the launch of Sputnik 1 on 4 October 1957, scientific research was the purpose in immediate view. However, telecommunications services soon became a major aim, justifying to governments and the public much expenditure on experiment and research. Projects SCORE and Courier were delayed repeater systems launched in 1958 and 1959, which had limited success, as did Project LOFTI, a low orbit, low frequency system. More progress was made with Telstar, Relay and Syncom, the first two being low orbit systems the last of these being, as its name indicates, using the geosynchronous orbit first envisaged by Arthur C. Clarke as far back as 1945.[1] Thereafter we saw the development of the geostationary systems which dominated the provision of world satellite telecommunications, and will continue to do so for many purposes, particularly television, albeit that the Low Earth Orbit (LEO) systems recently proposed will have their effect on telephony. The US Communications Satellite Corporation (COMSAT) was created, and INTELSAT, INMARSAT and the regional systems established first in interim and then in their definitive forms.[2]

B. The International Legal Context

The international legal context for these developments was a mixture. When the Communications Satellite Act of 1962, the authority for COMSAT, was enacted all that formally existed at the international level was a couple of UN Resolutions. The UN Committee on the Peaceful Uses of Outer Space had been busy since its inception, but was still a year away from presenting what became the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (1963 GA Res. 1962 (XVIII)). The Outer Space Treaty itself was five years in the future.

Nonetheless, parts of the two relevant UN Resolutions had expressed the view of the members of the United Nations on space telecommunications matters. In 1961 it was the UN view that 'communication by means of satellite should be available to the nations of the world as soon as practicable on a global and nondiscriminatory basis'.[3] Part E of the space resolution of the next

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year, 1962, states *inter alia* the belief of the UN that 'communication by satellites offers great benefits to mankind, as it will permit the expansion of radio, telephone and television transmissions, including the broadcast of united nations activities, thus facilitating contact along the peoples of the world.'[4]

We should also note that the 1961 Resolution expressed in its Part A its commendation of the applicability of international law to outer space matters, and the principle that outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation.

The 1963 Declaration of Legal Principles Governing the Activities of States Pertaining to the Exploration and use of Outer Space (1963 GA Res. 1962 (XVIII)) took matters further. Of course it contains expression of many principles later more formally to be included in the Outer Space Treaty of 1967, which we are celebrating at this Colloquium. But I would stress the importance of the UN Resolutions of 1961, 1962 and 1963 as showing that the Principles expressed in treaty form in 1967 have thicker roots than the average international treaty.

But to go back a bit in time. The Declaration of Policy and Purpose that is sec. 102 of the US Communications Satellite Act of 1962 reflects some but not all of the aspirations of the UN for the new modality. 'Non-discriminatory access' is provided for, but for 'authorised users' (sec. 102 (c)). The provision of services to 'economically less developed countries and areas' is also intended as is the extension of the system 'as promptly as possible' to provide global coverage at the earliest practicable date' (sec. 102 (b)). As I have shown elsewhere, what was in the contemplation of many was a US owned system.[5] However, following negotiations Interim INTELSAT was established by the two linked agreements of 1964, and INTELSAT was eventually constituted in its definitive form in 1973. The 1964 documents show traces of the early UN Resolutions, while the 1973 arrangements were entered into in the light of the 1967 Treaty and other developments within international telecommunications law. INMARSAT followed a similar pattern.

But by 1963, however, telecommunications had disappeared as a separate matter for mention in the UN Resolution of that year, nor does the matter receive mention in the 1967 Treaty. In part this is because by 1963 the International Telecommunication Union had clearly taken space matters under its jurisdiction, and (perhaps) the UN had realised that it really was not technically competent to pronounce anything other than platitudes on such matters.

Even before UN Resolution 1721 the 1959 Administrative Radio Conference of the ITU (held along with the Plenipotentiary Conference which revised the ITU Convention) had defined a 'space service' and 'earth-space service'. However, its allocations of radio spectrum for space purposes made in paras 70 and 71 of the then Radio Regulations were directed to space research, not to telecommunications purposes. That development starts with the 1963 World Extraordinary Administrative Radio Conference. There frequencies were allocated, and much of the present set of space services were envisaged and started on their way with spectrum allocation and special procedures tailored more to the requirements of the new developments than were the previous terrestrial service procedures. The ITU was therefore doing what the UN had suggested it should do in Part D of Resolution 1721 of 1961. The ITU has, of course, continued to make progress. The Constitution and Convention of the ITU deal explicitly with space matters, and, of course the Table of Allocations and the procedures for notification and registration laid out in the Radio Regulations are crucial elements in the operation of space communications.

The other element in the disappearance of telecommunications as a matter for separate mention in the Principles Resolution of 1963 and the resultant 1967 Outer Space Treaty may be that it was thought that the language of 'freedom of use' and of 'benefit' was sufficient to cope with the matter of space communications. The generality of the words is capable of the specific reference. Perhaps someone who knows will inform me.

Whatever the case, the fact is that the Principles Resolution of 1963 and the Outer Space Treaty itself four years later make no explicit mention of telecommunications. The question should therefore be asked whether the time has come to change that position. Should there be an amendment to the Treaty, as envisaged by art. 15, to meet some of the worries which I am about to express, and the difficulties which the law of international space telecommunications is encountering?

We must first list these matters before turning to whether an amendment to the Outer Space Treaty would help. Some of these I have tagged in earlier papers for the IISL, Colloquia and would refer to those for a fuller statement of the matters.

C. Problems

1. First come, first served or engineered spectrum?

Traditionally the position within the ITU structure is that an assignment of a frequency which is in conformity with the Table of Allocations is entered in the Master International Frequency Register provided that there is no prior registered frequency to which it may cause interference. Later notified assignments have to be coordinated with earlier, thus giving a degree of protection to the earlier. With modifications in detail but not principle, the procedure applies to both terrestrial and to space services.

This system is known colloquially as the 'first come, first served', priority being given in order of notification. It applies not only to radio frequencies, but, in relation to space services also has application in the matter of geostationary orbital positions (slots).

The protection thus afforded to registered assignments and slots has caused concern among the newer countries who are anxious lest the most useful frequencies and slots be entirely taken up before they have the finance or opportunity to enter the fray.

Some have suggested that instead of the 'first come, first served' system it would be more sensible, and arguably more just, formally to agree a division of spectrum use in advance of actual use. The counter argument is that it would be inefficient not to make use of frequencies simply because a state having a right to a slots and appropriate frequencies lacks the capacity to make use of it.

In fact, as far as space broadcasting is concerned, the ITU has 'engineered' both frequencies and slots for satellite broadcasting, the World Administrative Radio Conference of 1985-88 allocating every country in the world a position within an orbital arc and up-link and down-link frequencies to go with it for these purposes. Telecommunications systems are not covered.

That said, the argument is not yet finished. My own preference is for the 'first come, first served' approach as making for a more efficient use of the radio spectrum and orbital positions. However, the problem of the late-comer must not be overlooked, or unduly prejudiced. Art. 1 of the Outer Space Treaty requires that all countries shall share in the benefits of space. It does not provide that these shares shall be equal, or proportionate. But surely a share must mean some minimum value in the matter. This must be defended.[6]

2. ITU and COPUOS Voting : Power without Responsibility

The problem of the different competences of the space-faring and the less-developed countries shows up also in the making of decisions. In the ITU the absolute minimum class of financial contribution is 1/640th of the maximum, yet each member state has one vote. This led *inter alia* to the constitution of the Development Sector as one of the three new Sectors into which the work of the ITU was divided in the revisions to the ITU structures agreed at Geneva in 1992.[7] The creation of the Development Sector is a departure from previous ITU concentration on technical matters. While one can have some sympathy with the desire of the less-developed nations to see the ITU channel expertise and technology to them, it is not what the ITU is basically about, and, in my view should have been left to other UN development organisations. In COPUOS, and later in the UN, we have seen the problem caused by a departure from the principle of consensus and the forcing through of the Principles regarding Direct Broadcasting in 1982.

The reason for the use of voting power unaccompanied by financial burden is the natural desire of the less-developed world to progress. The problem is that it threatens the whole institutional structures that are involved, especially as they were originally designed for quite different purposes, and makes other progress on technical matters difficult. The developed states are, naturally, not willing freely to pass on their assets and the fruit of their endeavour and investment.

3. Abuse of procedures

The procedures of the ITU were intended to maximise the efficient use of the radio spectrum and geostationary orbital resource. They have been used and arguably abused for other purposes. Thus, in 1992 the Kingdom of Tonga filed assignments for 31 geostationary slots, with the then International Frequency Registration Board (IFRB)[8] - far more than it needed for its own domestic or international telecommunications requirements - and claimed them on the 'first come, first served' basis.[9] It was not going to operate those slots to meet its own telecommunications needs.

The then International Frequency Registration Board (IFRB) asked it to justify its claims, and did persuade Tonga to reduce their number from thirty-one to six. These were duly entered on the ITU Register. Since then Tonga rented one position to a US company based in Colorado. It also bought and moved two former

Soviet satellites into two of the slots. Finally it auctioned the remaining two to other enterprises, leaving one slot unused.

Apparently Tonga claimed to have done nothing illegal. But the claim 'nothing illegal' is a defensive position. It might be argued that this is space being used for the benefit of all, and for the benefit indeed of a less developed country. If so, it is certainly not a use of space in contemplation of those who hammered out the ITU arrangements.

4. Non-compliance with Procedures

In recent years there have been instances of non-compliance with ITU procedures. Two in particular call for comment: the action of Indonesia in relation to the Tonga affair, and the instance of the Apstar launch.

In 1993 when the Tonga matter referred to above was starting, Indonesia moved one of the PALAPA satellites into one of the slots claimed by Tonga on the ground that the assignment of that slot to Tonga was wrong in law. This matter was negotiated to settlement between Tonga and Indonesia in November 1993. But that departure from procedures is unwelcome. The fear of many countries is precisely that those who can launch satellites will launch them into slots suitable for themselves, to the detriment of those who might come later. Indonesia's actions, going outwith normal procedures, foster such fears.

In the China instance, on 21 July 1994 Apstar-1 was launched by the Chinese Long March system and was scheduled to start operation from 1 September 1994 from a position at 131°E. That position is 1° away from satellites belonging to Japan and to Tonga, by then registered with the ITU. That Tongan slot is occupied by a Russian Gorizont satellite, Rimsat-1, operated by Rimsat Ltd, a company of Fort Wayne, Indiana, USA. The Japanese slot is used by the Telecommunications Advancement Organisation of Japan, which operates a CS-3A satellite for various Japanese companies and government bodies. The Apstar satellite is owned by APT Satellite of Hong Kong, and is sponsored by the Chinese government, although offering service to various organisations such as Turner Broadcasting, Time Warner and Viacom International.

Neither China nor Hong Kong had taken the matter through ITU procedures, and when I first wrote of this negotiations were at present under way on the question of radio interference between the three satellites.[10] I am not aware of what has happened.

China's action in disregarding the international procedures is a threat to the stability of the system which has been developed by the ITU. Unless the system is adhered to by all parties, it could very soon fragment.

5. Phantom Satellites

A further instance of abuse of ITU procedures is the case of the phantom satellites, that is notifications made by states of planned space systems which are at a very embryonic stage (and may well not be proceeded with at all) so as to secure a priority position within the 'first-come, first served' system. This was the subject of my paper to the Beijing Colloquium in 1996.[11] The matter has not significantly improved. The Director of the Radiocommunication Bureau recently indicated the extent of the problem in a fascinating document. By mid-1996 nearly 1800 space networks were in the ITU processes for advance publication and coordination. Of these some 1500 notified by 54 Administrations (including on behalf of 6 international satellite organisations) were planned to use the most congested space frequency bands - the C, Ku and Ka bands. Twenty four Administrations had notified less than 10 systems. Ten had notified between 10 and 20 each, eight between 20 and 30 each, five between 30 and 50 each, four between 50 and 100 each, and two had notified between 100 and 200 each. One Administration had notified over 300 systems.[12]

There are various effects of this problem. First, of course, the whole ITU system has been slowed down. A huge amount of resource, both financial and human, is required to process such a volume of submissions. Second, as indicated above, there is a duty of coordination between the several systems, the onus basically lying on the later to approach the earlier. Telecommunications administrations are therefore also overworked by the need to coordinate with earlier notified systems. And in both the ITU and in states, there is a huge waste, because, as said, many of the notified systems seem not to be likely to eventuate in working systems. Notifications are made to 'book' spectrum and orbital space, and in effect to claim such before there is an actual system. The fact is that some orbits and some spectrum space are better than others for particular purposes. Orbital positions which can 'see' continental America, or trans-Pacific, or trans-Atlantic, or Europe, are at a premium. If a state can deter others from making proposals to use such positions because it has got its notice in first, and the later state has not the personnel or assets to engage in long negotiations, it

appears it will do so. The processing of these 'phantom' systems within the ITU and state procedures is therefore a complete waste of resource.

6. Lack of Supervision of Activities

Another conundrum which emerges from the various developments mentioned above is whether all states are equally able to discharge their obligations properly to supervise the space activities which are engaged in either by themselves, or by those whom they license to act. Questions have been asked in relation to the 'phantom satellite' problem as to whether all notifications to the ITU have been properly screened by the state authorities making the submission.[13] It would be interesting to have the opinion of the staff of the ITU Radiocommunication Sector as to the competence in radio and space matters of the state officials in many of the countries with which they have to deal. One wonders whether there is any correlation between the class of contribution of an ITU Member state, and the capabilities of that state in conducting or supervising space activities.

7. Lack of Supervision of Nationals: the 'appropriate state' question

Under Art. VI of the Outer Space Treaty states bear international activities for national activities in outer space, whether the activity is carried out by governmental agency or non-governmental entities. These last require authorization and continuing supervision by the 'appropriate state'. Under the Liability Convention, of course, the liability of a launcher state is involved, but how might another state come to be involved other than is a damages question? Is the formula of Art. VI not indicative of a state responsibility and duty for companies whose nationality they possess? Or can companies of one state be excused from supervision by their home state on the ground that what they are doing is authorised by another?

The UK would seem to consider that nationality is a link within the terms of the requirement of Art. VI. Thus, as a catch-all, and subject to exception, s. 3 of the UK Outer Space Act 1986 which implements the UK obligations under various of the UN space treaties, prohibits anyone through whose activities the international liability of the UK might be engaged (other than the UK itself) from procuring or carrying on any space activities without both obtaining and complying with the terms of the licence (s.3(1)). By s.2 of the Act, those required to obtain a license are UK nationals, Scottish firms and bodies incorporated under UK law, the term "UK national" including British citizens, the citizens of British Dependent Territories, British Nationals (Overseas), British Overseas citizens, British subjects under the 1981 British Nationality Act and persons who are British protected persons in terms of that Act (s.2(1)(2)), and that list may be extended (s.2(3)).

However, under s. 3(2)(b) of the 1986 Act the Secretary of State may exempt a person from the licensing requirement if satisfied that it is not needed to comply with the UK international obligations (s.3(3)). And most importantly, as noted in relation to the activities to be licensed, a UK licence is not required if other arrangements have been made between the UK and another country to secure compliance with UK obligations. In other words the UK legislation does require that the supervision of space activities by UK nationals is real. How many other states make such provision in their legislation?

What is practice in the case of companies incorporated in one state, but which are licensed by other states to conduct space activities on their behalf? Mention has been made above of US companies involved in activities licensed by the Kingdom of Tonga. This is the problem of the definition of the 'appropriate state' which has been discussed before in these Colloquia.[14] It is time that the matter was authoritatively clarified. There should be an express duty imposed on both a state licensing an activity and the state whose corporate national or non-governmental entity is involved in such activities by licence, franchise, hire or other commercial arrangement.[15] This could go beyond the question of telecommunications, but within that sphere would include a clear statement of an obligation on the home state of a telecommunications corporation to exercise proper supervision of the conduct of its nationals even when they are active outwith the formal territorial jurisdiction of the state and licensed to act by others. This might also help reduce qualms about the supervisory capacities of some states which may be tempted to enter the space business by proxy, as it were.

8. Privatisation and Competition

I would here do no more than point to the privatisation of national telecommunications services in many countries, to the establishment of many other service providers and the opening up of competition within countries. Pressures towards privatisation and competition have had their effect also on the international organisations which were

created to provide the global non-discriminatory service referred to in both the UN Resolutions and their constituent treaties.[16] Within the European Union also there has been significant progress towards the fostering of competition and freedom for telecommunications service providers to operate within the Union, with little regard to traditional territorial jurisdictions.

9. World Trade in Telecommunication Services

Last, and inevitably related to the above, I must, however, mention as something separate the discussions that are going on within the World Trade Organisation *fora* as to Telecommunications Services. These matters were left unresolved by the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) in 1994. The New Fourth Protocol to the General Agreement on Trade and Services done at Geneva on 15 February 1997,[17] significantly commits its parties towards permitting freedom. I do not want to go into detail on this Agreement: suffice it to say it is a step towards the dismantling of protectionism in the provision of telecommunications services.[18]

Taken with the matters indicated under 8.. above, one can see that the world is increasingly being considered as a single marketplace within which deregulations and freedom of competition is to be allowed to mould developments.

D. Resultant Concern?

In the light of the foregoing, the concern which I would draw attention to is that amid the technical and economics developments indicated, the goal of global non-discriminatory telecommunications services may be lost, or at least considerably obscured. If unopposed, the object of profit inexorably means one of two things. Either all telecommunication services will be required to be cost-effective and profit-making, with low density traffic routes becoming very expensive, or low density traffic routes will be neglected and service either not provided, or given insufficient investment to deliver an efficient, reliable and satisfactory facility. What we might call 'public utility' services may cease to be provided either completely, or for some areas of the globe, and the telecommunications needs of small-market countries may well be under-serviced.

Now, I would not lightly accede to the more clamorous demands for aid, technology transfer and the like. The history of the last few decades has produced shocking examples of waste, profligacy and the depredations of the kleptocracy. Nonetheless, there is a balance to be kept. The aspirations of the two early UN Resolutions referred to above are right. The Outer Space Treaty has the right emphasis. There should be a global telecommunications network providing service to all countries irrespective of their degree of economic or technological development.

That there are these and other emergent problems shows that there is something wrong. It raises questions as to whether treaty provisions are being dealt with in good faith, as is required by art. 26 of the Vienna Convention on the Law of Treaties,[19] a provision which most take to be declarative of customary international law, not only constitutive of a treaty-law principle.[20]

The other point to make here is that not all the indicated problems (or the others that can be thought of) are such as can be tackled by amendment to the Outer Space Treaty. Some of these problems are mirrored almost exactly in the concerns that have arisen internally within states as they have engaged in privatisation. Often the solution has been the creation of a regulatory body with appropriate powers to ensure competition. no abuse of market dominance, and the continuation of public utility services. Elsewhere I ave contemplated the development of the International Telecommunication Union into a World Communications Commission.[21] Perhaps that is a way forward to deal with some such problems.

E. An Amendment to the Treaty?

But what is to be done? Amend the Outer Space Treaty, or draft something new?

I have to say that as of September 1997 I am not sure. Some of the difficulties with space telecommunications are solvable by a return to a good faith observance of international obligations, coupled with a willingness by the ITU to flex its muscles a little.[22] Part of the solution is simply to be found in a genuine application of the principles that have already been agreed.

Need we go further? One problem with an amendment to the Outer Space Treaty is that it may well not suit all existing members of the Treaty. That could produce a 'limping' treaty, with not all members being bound by the same obligations. More importantly it might provoke some to make more extreme proposals for amendments, with the possibility that other states might consider that their interests are better served by using the provisions of art. 16 to withdrawal from the Treaty and rely on the more inchoate principles as to the use of outer space which most of us would say were now part of customary international law. Treaties are not

legislation. They are agreement. They can go beyond the principles of customary international law. The Outer Space Treaty is a magnificent tree. I doubt whether its terms would be arrived at were its negotiation to be started in the present day, and I am nervous of shaking its trunk lest too many useful but not entirely well-secured fruits of the Treaty should drop to the ground. Notwithstanding recent developments,[23] the debate between the space-faring nations and others as to the meaning and application of the phrases of Art. I of the Treaty as to the exploration and use of outer space being carried out for the 'benefit and in the interests of all countries irrespective of their degree of economic or scientific development', and the horrible example of the failure of consensus and the resultant Principles on Direct Television Broadcasting do not reassure me. I am wary of reopening the Treaty by proposals for its amendment.

On the other hand it would be no bad thing to make states responsible for the activities of their corporate nationals, irrespective of whether these nationals are being licensed by another state to act on its behalf. And it would be no bad thing to incorporate some of the tenor of the recent Resolution on the 'common benefit' concept into the Treaty, although what is a 'mutually acceptable basis' is obscure to me.

But, as I end I find myself coming back to this. The problems I have identified above are not fundamental problems of the international agreements on the matter. They are problems of their implementation by states. Businessmen must be made to realise that international agreements are not merely inconvenient regulations if possible to be by-passed, disregarded and ignored. Governments must be governments, and upholders of principle, not agents of profit-seekers. The last sentence of Para 1 of the 1996 Declaration says that in the exploration and use of outer space 'particular account should be taken of the needs of developing countries'.[24] I would suggest that the interests and needs of the world as a global community also need to be stressed.

Perhaps I am calling for a religious conversion rather than a legal modulation.

NOTES

1 Arthur C. Clarke, 'Extra-terrestrial Relays. Can Rocket Stations Give World-Wide Radio Coverage?', *Wireless World*, October 1945, 303-8.

2 See F. Lyall, *Law and Space Telecommunications* (Aldershot: Dartmouth Publishing; Gower Press: Brookfield VT, 1989), chs. 2-7.

3 'International Cooperation in the Peaceful Uses of Outer Space', 1961 GA Res. 1721 (XVI) Part D.

4 'International Cooperation in the Peaceful Uses of Outer Space' 1962 GA Res. 1802 (XVII).

5 F. Lyall, above n.2, 74-9.

6 Cf. The Declaration on International Cooperation in the Exploration and Peaceful Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries' GA Res. 51/122, 4 February 1997; cf. also M. Benko and K. Schrogl, 'The 1996 UN Declaration on "Space Benefits" Ending the North-South Debate on Space Cooperation' (1996) 39 *Proc. IISL*, 183-6.

7 F. Lyall, 'The International Telecommunication Union Reconstructed' (1994) 36 *Proc. IISL*, 78-88.

8 The duties of the former International Frequency Registration Board are now performed by the Radiocommunication Sector of the Union.

9 See M.L. Smith, 'Legal and Policy Developments in International Satellite Communication' 1991 34 *Proc. IISL*, 342-7 at 345-6; D. Riddick, 'Why does Tonga own Outer Space?', 19 *Air and Space Law*, 15-29. Cf. *Space News* vol. 4, no. 11, March 15-21, 1993 22; vol. 5, no. 4, January 24-30, 1994, 3 and 29; no. 25, June 21-27, 8.

10 See *Financial Times* (London), 2 August 1994, 1 and 10; *Space News*, Vol. 5, no. 29, July 25-31, 1994, 3 and 20; no. 31, August 8-14, 1994, 18.

11 F. Lyall, 'Paralysis by Phantom: Problems of the ITU Filing Procedures' (1996) 39 *Proc. IISL,* 187-93.

12 Some Aspects of Resolution 18 Issues, ITU Docs SC-RG4/037 and SC-RG5/032.

13 Paper cited above, n.11.

14 On the 'appropriate state' question see recently: K-H Bocksteigel, 'The Term 'Appropriate State' in International Space Law' (1994) 37 *Proc. IISL,* 77-9; W.B. Wirin, 'Practical Implications of Launching State - Appropriate State Definitions' (1994) 37 *Proc. IISL,* 109-15; G. Silvertrov, 'On the Notion of "Appropriate State" in Article VI of the Outer Space Treaty' (1991) 34 *Proc. IISL,* 326-30; and, H.L. van Traa-Engleman, 'Problems of State Responsibility in International Space Law' (1983) 26 *Proc. IISL,* 139-42.

15 Steps would also need to be taken so that the veil of incorporation and the device of multiple contracts and jurisdiction flitting can not be used to insulate the state of nationality of the ultimate owners of the corporation from this duty.

16 D. Wear, 'INTELSAT: Evolving to Meet the Challenges of a New International Telecommunications Marketplace' (1995) 38 *Proc. IISL,* 123-33.; A. Auckenthaler, 'Recent Developments at INMARSAT' (1995) 38 *Proc. IISL,* 149-59; C. Roisse, 'Recent Developments at EUTELSAT' (1995) 38 *Proc. IISL,* 160-7; F. Lyall, 'Privatisation and International Telecommunications Organisations' (1995) 38 *Proc. IISL,* 168-74.

17 World Trade Organisation Agreement on Telecommunications Services (Fourth Protocol to the General Agreement on Trade in Services) (1997) 36 *International Legal Materials*, 354-95.

18 I note that the Commission of the European Union has objected to the way in which the US proposes to implement the Agreement on Telecommunications Services under its national law; *Financial Times* (London) 6/7 September 1997, 4.

19 Convention on the Law of Treaties, Vienna, 23 May 1969, 1155 UNTS 331; (1980) UKTS 7964; (1969) 8 ILM 679; (1969) 63 AJIL 875.

20 The US has not ratified the Vienna Convention on the Law of Treaties.

21 F. Lyall, 'The International Telecommunication Union: A World Communications Commission?' (1994) 37 *Proc. IISL,* 42-47.

22 Cf. F. Lyall, ''Paralysis by Phantom: Problems of the ITU Filing Procedures', cited above n.11.

23 Cf. n.6 above.

24 See n.6 above.