The International Law of Outer Space

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The thoughts and opinions expressed are those of the authors and not necessarily of the U.S. government, the U.S. Department of the Navy or the Naval War College.
CHAPTER VI

LEGAL PROBLEMS ARISING FROM THE REASONABLE USES OF OUTER SPACE

Even outer space is finite. Like the oceans it is subject, in varying degrees, to sharable use. In the course of the use and exploration of outer space and celestial bodies for peaceful purposes, a need has arisen to establish the range of peaceful uses as well as a structured legal regime capable of dealing with disputes that may grow out of such uses. It is the purpose of this Chapter to investigate several of the major legal issues which must be resolved if disputes over ways of using outer space and celestial bodies for peaceful, i.e., non-aggressive and beneficial, purposes are to be kept to a minimum.

Several areas have been selected because of their importance to the reasonable uses of outer space. They include the problem of international responsibility and liability for damages for harms resulting from the use of space vehicles and devices, possessory rights over spacecraft, assistance to and return of space vehicles and personnel to the launching or operating authority, allocation of radio facilities to space users, nationality of space vehicles, and jurisdiction over space disputes.

The magnitude of these subjects may be affirmed through a recitation of some of the items which have been introduced into outer space. These include, but are not limited to, rockets, missiles, satellites, space stations or platforms, orbital laboratories, nuclear substances by way of explosions or as power for generators, copper needles, sodium vapor, water, such electrical impulses as radio, television and radar signals, and laser and maser beams. These instrumentalities and materials have had for their purposes the accumulation of scientific data regarding the nature of the universe, data relating to the functioning of many kinds of spacecraft, and a great variety of hybrid data. Acquisition of data will lead to improvement in weather meteorology and forecasting, geodetic and navigational facilities, scientific investigations, observational procedures, communications media, resource exploitation, transportation, and to a more complete understanding of all of the less tangible scientific, social, and political uses of outer space.
Space problems will arise from the conduct of those entities engaged in launching, orbiting, and return procedures. The conduct may be by a state, groups of states, international organizations, or even private business entities.

Through the formulation of specific rules, it may be possible to achieve a minimum interference with the reasonable uses of outer space. Further, by obtaining tentative answers to these issues, there will be greater insights into and a more substantial clarification of the body of outer space law. In particular, it will be possible to add meaning to the concept of the peaceful uses of outer space.

A. INTERNATIONAL RESPONSIBILITY AND LIABILITY FOR HARM AND DAMAGES

1. The Nature of the Problem

The relationship of individuals, governments, and international organizations to harm resulting from the practices and procedures of space vehicles has been analyzed by many commentators. They have stressed the possibility of damage occurring on the surface of the earth—either on land or at sea. Such damage may also occur in the airspace and in outer space. It may result from accident, mistake, or from intentional conduct. According to Haley:

Today, in spite of the extraordinary technological advances which have been made, a launched rocket vehicle occasionally descends to earth far from the spot chosen as its destination. Inevitably, the ever-increasing range attainable by rocket vehicles will enhance the probability that such mishaps will not be uncommon, since the greater distance will magnify the result of any error or defect in the vehicle’s guidance system. If a vehicle or parts of a vehicle should fall to earth causing property damage and personal injury, who will be liable for such damage and to what extent?

When a vehicle weighing thousands of pounds carrying great quantities of the most volatile fuels known to man leaves the earth it depends entirely for its guidance on an intricate system of thousands of precisely designed and engineered parts, both in the missile itself and on the ground. The slightest miscalculation in the design, manufacture, or function of any single part could result in disaster. Should disaster occur what would be the basis of liability on which those injured could claim compensation? Are there any analogies from which we can draw an answer? 1

Major harm, bordering on limited disaster, some day may—and probably will—result from the peaceful employment of satellites. The nature of the harm may differ from possible nuclear, bacteriological, or chemical accidents. Nonetheless, within an impact area the dangers may be of significant magnitude. Nuclear energy has been considered as the propulsion system for the Rover type satellite. The Transit-4A satellite launched by the United States on June 29, 1961, was equipped with an experimental nuclear device (developed by the Atomic Energy Commission) which continues to generate electricity for navigational transmitters. The Transit-4B also used nuclear powered generating equipment. Nuclear energy is considered by many to be a natural tool for the exploration of outer space.2

Disaster may also threaten from satellites and missile launches because of the properties of nonnuclear propellants. It has been stated that many such propellants possess extremely toxic qualities, that there is little knowledge about antidotes, and that despite safety measures, there remains the possibility that serious injury may result by reason of an accident at time of launch.3

Harm may also result from the uncontrolled return to earth of space vehicles and devices, either in the form of the launched vehicle or as fragments resulting from collision or in consequence of partial combustion caused by transiting through heavy atmosphere.4 There is a pressing need to provide for both safety of operation and to create legal rights and remedies ready for use after harms have resulted. This responsibility confronts both national and international policy makers.


3 Reeves, New York Times (Western ed.) February 5, 1963. Major Reeves has served as Chief of Experimental Toxicology and Biokinetics of the United States Air Force School of Aerospace Medicine.

4 For an account of the surveillance and recovery in Manitowoc, Wisconsin, on September 5, 1962, of a metal object weighing approximately twenty pounds constructed of alloy steel and which had been in outer space for a considerable period of time, one may consult the statements of the United States representative to the U.N. Committee on the Peaceful Uses of Outer Space on September 14, 1962. The tender of this piece of Sputnik IV to the Soviet delegate was rejected at that time. However, later at the request of the Soviet government it was turned over to their U.N. mission. The United States, prior to the return of the material, had conducted scientific tests to determine its composition. U.N. Doc. A/AC.105/PV.14, 56-60.
It is true, as a careful report has indicated, that the role of law may not serve to diminish the physical hazards of disastrous accidents. But it is "largely the law, supplemented by private arrangements such as insurance, that determines whether, when and to what extent the victims will be compensated and how the burden of compensation will be distributed among governments, industry and insurers. The problem of devising fair and practicable means of compensating the victims and distributing financial losses is in large measure a legal one; if accidents occur in a foreign country, it becomes in part a political and diplomatic problem as well."  

At the present there is a need for a threefold approach to the protection of persons and property (both real and personal) from space related torts, whether accidental or intentional. In the first place, the resource states must enact suitable laws providing adequate protection to those who may suffer injury. Secondly, nations generally will benefit from entering into express international agreements providing for national responsibility for such harms. Such agreements would of necessity have to make suitable provision for the torts of a state, of groups of states, for those of private persons, and for international organizations.  

Thirdly, after international standards have been


6 On December 24, 1963, the General Assembly of the U.N. unanimously adopted Resolution 1962 (XVIII), which contained, among others, the following declarations:

5. States bear international responsibility for national activities in outer space, whether carried on by governmental agencies or non-governmental entities, and for assuring that national activities are carried on in conformity with the principles set forth in the present Declaration. The activities of non-governmental entities in outer space shall require authorization and continuing supervision by the State concerned. When activities are carried on in outer space by an international organization, responsibility for compliance with the principles set forth in this Declaration shall be borne by the international organization and by the States participating in it.

8. Each State which launches or procures the launching of an object into outer space, and each State from whose territory or facility an object is launched, is internationally liable for damage to a foreign State or to its natural or juridical persons by such object or its component parts on the earth, in air space, or in outer space.

For the entire Resolution, see Annex 4, infra, p. 450–452.
established by express international agreement, there will be a need to conform national laws to these standards.\textsuperscript{7}

In the United States, existing legislative enactments have failed to make provision for any more than nominal damages on the part of the national government for extra-hazardous space activities, which are carried on at the instance of the government, and which may cause great harm to life and property. The 1963 study prepared by the Legislative Drafting Fund of Columbia University for the National Security Industrial Association has indicated that a member of the public in the United States would have to proceed for redress of injuries by way of law suit sounding in tort. It added:

\begin{quote}
The outlook for injured members of the public in the wake of a catastrophe is uncertain: apart from the problems of proof faced by plaintiffs in any tort action, to victims of a catastrophe special difficulties would be presented in identifying the actor for the injury, proving his liability in a lawsuit, and then finding sufficient assets from which a judgment could be satisfied.
\end{quote}

The United States Government would, of course, possess sufficient assets to satisfy judgments arising out of any but the most cataclysmic of accidents. However, even though the programs under consideration [including most space activities] are by definition governmental programs, there is considerable doubt that an injured member of the public will be able to recover damages from, or even to sue, the government.\textsuperscript{8}

Nations have a deep interest in the protection of their nationals from harm arising from distant places. It has been urged that the ultimate ascertainment of responsibility for compensation remains a domestic matter.\textsuperscript{9} However, as noted above, by international agreement states may arrive at standards which can be implemented and enforced in municipal law. Such problems may also be referred to international judicial bodies.

Factors to be considered at both the national and international level endeavoring to protect those likely to suffer harm include: suits against a government, sovereign immunity of government, suits

\textsuperscript{7} Quadri, "Droit International Cosmique," 98 Recueil des Cours 588, 589-592 (1959).


\textsuperscript{9} U.N. Doc. A/AC.105/C.2/SR.22, 14. The view was expressed by the representative of France.
against contractors and suppliers, protection through insurance coverages, liability of a state, possible liability of a state for private activity when authorized, liability of associations of states, liability of international organizations, procedures for pursuing claims, and legal bases for liability, including nuisance, negligence, fault, and strict or absolute liability.

2. Deliberations at the United Nations

Efforts at the United Nations to establish detailed rules of liability for space vehicle accidents, including accidents in outer space, have considerably clarified expectations as to acceptable space behavior. As early as 1959, the United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space suggested that the subject of liability for injury or damage caused by space vehicles was one susceptible of priority treatment. It put forward the following subjects for legal analysis and consideration:

First of all there is the question of the type of interest protected: that is, the kind of injury for which recovery may be had. Second, there is the question of the type of conduct giving rise to liability: should liability be without regard to fault for some or all activities, or should it be based upon fault? Third, should a different principle govern, depending on whether the place of injury is on the surface of the earth, in the air space or in outer space? Fourth, should liability of the launching State be unlimited in amount? Finally, where more than one State

10 Haley, supra note 1, at 294.
11 Ibid., 295.
participates in a particular activity, is the liability joint or several? 14

The discussions at the United Nations have proceeded on the assumption that international liability for mishaps involving space vehicles is governed by international law and the Charter. In draft proposals submitted by the United Kingdom, 15 the United States, 16 and the Soviet Union, 17 this point has been accepted. The United States and the United Kingdom have taken the view that space activity may also be governed by other international agreements. Proposals dealing with international liability have also been submitted by Belgium. 18 The many proposals culminated in the adoption of Resolution 1962 (8) (XVIII) on December 24, 1963.

The importance of the various proposals, the unanimous Resolution of the General Assembly, and national views as to acceptability of stated principles require a detailed analysis. In the first place, it should be noted that an effort was made by the representative of the United States to summarize before the legal subcommittee of the U.N. Committee on the Peaceful Uses of Outer Space, the conclusions arrived at in that body. In April 1963, he stated that in connection with the question of "liability for space vehicle accidents, there was general agreement that launching authorities should be held internationally liable for injuries or damage on land, on sea, and in the air caused by space vehicles for which they were responsible." 19 This is a carefully qualified statement, but it does suggest the existence of a legal duty on the part of a state, international organizations, and associations of states. It also suggests the responsibility of such entities for activities carried on with their permission by private persons. It was pointed out that "There was also a consensus of opinion that such liability should be incurred without proof of fault." 20 It will be noted that no reference was made to liability

20 Ibid., 4. The Australian delegate subsequently stated that there was "complete agreement in broad principle that a State launching a space vehicle should be internationally liable, without fault, for injury, loss or damage caused by the vehicle on the earth or in the air space." U.N. Doc. A/AC.105/C.2/SR.23, 3. Compare, Meyer, "Legal Problems of Outer Space," 28 The Journal of Air Law and Commerce, 344-346 (1962) ; Lyon, "Space Vehicles, Satellites, and the
for accidents occurring in outer space. The United States, by accepting General Assembly Resolution 1962 (8) (XVIII), has thereby agreed to a space law principle for outer space as well as for land, sea, and air accidents and events.

The United States, at the close of 1962, had put forward two proposals on the subject of liability. The first, dated September 11, 1962, contained specific rules, which if adopted—with modifications—would provide an adequate legal regulation of the problem of liability. The second, dated December 8, 1962, was broadly stated and somewhat limited in scope. The latter in Article 6 provided: “A State or international organization from whose territory or with whose assistance or permission a space vehicle is launched bears international responsibility for the launching, and is internationally liable for personal injury, loss of life, or property damage caused by such vehicle on the earth or in air space.”

The United States representative, Mr. Meeker, examined the import of Article 6 before the legal subcommittee on April 24, 1963. He stated that the provision for international responsibility “covered the possibility of a Government enlisting the help of a private corporation or firm, which it might authorize to carry out activities in space, subject to continuing Government supervision.” He noted that pursuant to specific United States legislation, namely, the Communications Satellite Act of 1962, there had been acceptance of the principle of national responsibility for national space activities. Since some space activities have been carried out under private auspices, this reference was intended to reassure a few states which have been of the opinion that international space activities should be conducted only by states. This restrictive position is no longer advanced by any state, as illustrated by the unanimous vote given to General Assembly Resolution 1962 (5) (XVIII).

Mr. Meeker stated that “The first part of the principle in the United States draft was designed to show the international responsibility of any Government from whose territory or with whose assistance or permission space projects were undertaken. The second


24 Annex 4, infra, p. 450.
part of the principle stated the idea of financial liability, which was also included in paragraph 11 of the Soviet draft. The United States draft, however, was more precise since it specified what types of injury and damage were envisaged and said that responsibility existed for such damage or injuries on the earth or in air space."  

He noted that it would be necessary to establish a different rule for outer space because of the difficulties involved in applying the doctrine of absolute liability in that dimension.  

The United States has maintained that intricate legal problems are involved in the launch, use, operation, and return of space vehicles, and that an express international agreement is the preferred process for coping with international rights and duties. The scope of legal liability may depend on many variables. These include, for example, the launch by one country of a space vehicle owned by another country, the launch by one country of a space vehicle in the territory of another country, and the cooperative launch by two or more countries in a third country of a vehicle owned by a fourth country. The variables are indeed wide.  

The United States has also sought specific agreement as to the procedures to be employed in the presentation of claims and as to the forum where a state might obtain an interpretation or application of such a convention. With this in mind, the United States submitted a draft proposal on liability for space vehicle accidents on September 11, 1962. The scope of this draft was limited to personal injury and loss of life or property damage occurring on land, sea, or in the air. It recognized that states and international organizations responsible for the launching of space vehicles should be liable internationally for resulting injury, loss, or damage. It accepted the rule of absolute liability for this kind of harm on the part of the launching entity, but noted that "the degree of care which ought reasonably to have been exercised by the person or entity on whose behalf claim is made might properly be taken into account."  


26 Ibid. Acceptance by the United States of Resolution 1962 (8) (XVIII) has signified acceptance of a single rule for earth, airspace, and space situated and damages.  

27 The representative of the United Kingdom has called attention to the need for a careful analysis of these issues, and has said: "Various combinations of interests might therefore be involved in an outer space project and one should not think only in terms of a State which owned both the launching apparatus and the space vehicle." U.N. Doc. A/AC.105/C.2/SR.25, 3.  

The United States draft further suggested that there was no need for a claimant to exhaust local remedies prior to filing a claim, noted the applicability of the concept of laches, and referred disputes "relating to the interpretation or application of the international agreement on liability in the absence of agreement between the States concerned upon another means of settlement" to the International Court of Justice. Finally, presentation of claims was to be accomplished internationally by dealing with the state or states or international organization responsible for the launching of the vehicle which caused the injury. 29

The representative of the United Kingdom also held the view in May 1963, that there was general agreement among the members of the legal subcommittee that "liability should be absolute." 30 It was pointed out that it would be possible for several states and international organizations, as well as private persons, to engage in cooperative space efforts, and that this presented problems affecting the assignment of liability. Several possible criteria were mentioned for the determination of liability, such as responsibility for launch, effective control over subsequent operation, and ownership. However, it was suggested that the need to arrive at a rule for the apportionment of liability would not modify the need to establish a rule of absolute liability. 31

The British representative, after noting that the United States favored imposing liability on the launching entity, observed that it was "doubtful whether that formula would work satisfactorily in the case where an international organization launched a space vehicle for a State which was not a member of the organization, but the organization itself had no control over the subsequent operation of the vehicle." 32 The United Kingdom also pointed out that the United States view (that liability was to be assigned against the state of launch), might not be appropriate where the state whose "territory was used for the launching was merely providing a convenient launching site and was not in any way concerned with the vehicle's subsequent operation." 33 These comments emphasized the possibility

29 Ibid. If such matters were to come before the World Court for adjudication, the claim would be presented by a nation-state or perhaps by an international organization.
31 Ibid.
32 Ibid., 4.
33 Ibid.
that operation as well as launch ought to be weighed in determining liability.\textsuperscript{34}

The British representative also called to the attention of the legal subcommittee the language of paragraph 11 of the Soviet statement of general principles, which made provision that a state undertaking activities in outer space bore international responsibility for such conduct.\textsuperscript{35} It was thought by the British representative that such a formula could be construed to mean that a launching state was responsible even when it had no control over the vehicle's subsequent operations or where its participation was limited to making its territory available for a launch. It was also pointed out by the British delegate that the Soviet formulation might exclude an international organization from responsibility for space vehicle accidents, but that the draft could be interpreted to mean that "the States composing the organization should always be held to be directly liable for any injury or damage caused by a space vehicle."\textsuperscript{36} It was noted that \textit{prima facie} it appeared that the international organization might be liable in the first instance, but that under the constitution of any international body it might be possible to provide that the members would be obliged to discharge the liability of the organization.

The inadequacy of the Soviet draft principle, despite its recognition of the need for a structured legal regime in outer space, may be observed by comparing it with the United States and Belgian proposals.

\textsuperscript{34} The French representative also noted that space activities might include launch, operation, and use by states or associations of states. In his view it was essential that such entities "should accept liability for the injuries which might arise from those activities." \textit{U.N. Doc. A/AC.105/C.2/SR.22}, 14.

\textsuperscript{35} The Soviet draft, like the British draft, has dealt only with broad principles. The Soviets have advanced the view that "A State undertaking activities in outer space bears international responsibility for damage done to a foreign State or to its physical or juridical persons as a result of such activities." \textit{U.N. Doc. A/AC.105/C.2/L.6}. The British draft has suggested that space activity should be conducted "with due regard to the interests of other States." \textit{U.N. Doc. A/C.1/879}, Annex 18, \textit{infra}, p. 469.

\textsuperscript{36} \textit{U.N. Doc. A/AC.105/C.2/SR.25}, 4. The Soviet representative in September 1963, retreated from earlier Soviet proposals which would have sought to restrict space activities to states. In commenting on the conduct of activities in space by private companies, under the supervision or control of a government, it was stated: "The Soviet delegation considers it essential to point out that in this field it would be possible to consider the question of not excluding from the declaration possibility of activity in outer space by private companies, on the condition that such activity would be subject to the control of the appropriate State, and the State would bear international responsibility for it." \textit{U.N. Doc. A/AC.105/PV.22}, 37. Compare Resolution 1962 (XVIII).
The Belgian delegation to the United Nations submitted a detailed analysis dealing with the Unification of Certain Rules Governing Liability for Damage Caused by Space Vehicles.37 This draft dealt systematically with five phases of the problem: definitions, designation of states subject to liability, nature of the liability, extent of liability, and procedures for bringing action for liability.

The Belgian proposal made provision for extending compensation for damage to movable and immovable property and to natural and legal persons. Damage was understood to mean any loss for which compensation may be claimed under the national law of the injured person, “including judicial and legal costs and interest.” 38 The proposal made no provision for damage “caused on the territory of the State where the launching of the device or devices takes place, the State whose flag the device or devices fly or the State or States claiming ownership or co-ownership of the device or devices.”39 Territory of a state was defined to include only land areas, territorial and adjacent waters, and ships flying its flag and aircraft registered to it. Presumably the proposal would cover events taking place on the high seas, in non-national airspace, and in outer space.

Pursuant to Article 2 of this proposal, liability would be limited to a state or groups of states, and only a state might be a claimant although the latter would be permitted to act on behalf of injured nationals or residents. The claimant state would be authorized to proceed against the state on whose territory the launch took place, or the state whose flag was flown, or the state or states claiming ownership or co-ownership of the space device. In this connection it was provided that there could not be “joint liability or solidarity.” 40

The following provision was made as to liability:

The occurrence of the event causing the damage shall entail an obligation to give compensation once proof has been given that there is a relationship of cause and effect between the damage, on the one hand, and the launching, motion or descent of all or part of the space device on the other hand.

The presence or absence of a relationship of cause and effect shall be determined in accordance with the national law of the person injured.41

38 Ibid.
39 Ibid.
40 Ibid.
41 Ibid.
With regard to the extent of liability the proposal called for the application of the "ordinary law of the country of the person injured." 42

Claims for liability were to be brought initially through diplomatic channels, subject to a statute of limitations of one year. If the state against which the claim had been presented failed to arrive at a "decision considered satisfactory by the plaintiff State within six months, the latter shall be entitled to take the claims for compensation before the International Court of Justice." 43 The proposal established a six months statute of limitations applicable to these actions before the World Court.

The Belgian delegate to the legal subcommittee explained the proposals in May 1963. He asserted that damage occurring on the territory of the launching state or on the territory of the flag state or on that of the state or states claiming ownership of the device was not of an international character. In this connection he noted that "the States concerned would have to settle any problems that arose through bilateral and not multilateral channels." 44

It was explained that the Belgian proposal related to collisions between space devices, and apparently also between such devices and aircraft, for it was stated that "his delegation did not accept the idea of a space boundary and thought that space law should apply to space devices whether moving in controlled air space, in uncontrolled air space or in outer space; otherwise a space device could be subject to either air law or space law, depending on the altitude at which it was moving." 45 Damages were to be measured by the national law of the injured person so that compensation would reflect only particular national economic and social factors.

It was his view that Article 2 of this proposal, dealing with the liability of states, would not preclude private persons from launching and orbiting space devices. However, it was expected that such activity would be subject to prior authorization by the state from which the launch might take place. On this basis the launching state would be expected to be liable for both private and public harms

42 Ibid.
43 Ibid. Pursuant to the proposal each state would be obliged to conform to the decision of the Court within three months after it had given its judgment. Further, there could be no tolling of the statute of limitations. There could be a joinder of actions under certain circumstances. Presumably the claimant state would be able to make claims on behalf of its residents as well as for itself.
to others. There could be one exception to the right on the part of
the injured person (represented by a state) to bring a claim against
only one state and this would be where "several devices for which
different States were responsible simultaneously caused damage to
third persons." 46

In commenting on the nature and extent of national liability, the
Belgian representative noted that harm might result not only from
the descent of a space device but also that it might be the product of
the launching or motion of the device. The following example was
given: "An aircraft might be damaged because its crew had tried to
avoid a collision with a space device or because it had been struck
by a space device or part of a device, even though the latter itself
disintegrated and caused no direct damage." 47 It was also his view
that the nature and extent of liability ought to be based on the na­
tional law of the person injured rather than on an internationally
accepted definition "which could only be an arbitrary and unsatis­
factory common denominator." 48

During the April–May 1963 meeting of the legal subcommittee of
the Committee on the Peaceful Uses of Outer Space, many delega­
tions compared or commented on the matter of liability as contained
in the United States and the Soviet statements of principles and on
the United States and Belgian proposals relating to detailed rules.
The Indian representative noted the existence of "a parallel" be­
tween Article 6 of the United States principles and Article 11 of the
Soviet principles. 49 He held the view that Article 7 of the Soviet
statement of principles, which urged that launching of space vehicles
be limited to states only, was met by the terms of Article 6 of the
United States statement of principles, since the latter sought to
avoid the possibility of irresponsibility on the part of private launch­
ers. In order to further clarify the issue, however, it was his view
that provision might be made that space vehicles should not be "op­
erated by individuals or corporations except with a license granted
by the State of which they were nationals and that the State should
give full clearance before each launching." 50

46 Ibid.
47 Ibid., 7.
48 Ibid. The British representative had previously called attention to the
need to arrive at a decision how "liability should be assigned in cases where
more than one State or organization was involved and whether liability should
engage in space launches had been subjected to much criticism on the ground
that it sought to impose a single and preferred social and economic system for
space exploration.
General agreement was expressed that privately launched space vehicles should be required to obtain national licenses prior to launch. The Canadian representative observed that in order to “guard against irresponsible activities, the operation of space craft by private individuals, corporations or organizations should be explicitly forbidden save under license from the State of nationality. That would satisfy the Soviet Union’s rightful concern that States should bear final responsibility for the space activity of national and international organizations, and a valuable principle, applicable to both structures of society, could be drafted.”

A comparison was made by the Czechoslovakian delegate between the United States and Belgian proposals. In noting that the United States proposal did not cover events taking place in outer space, he failed to acknowledge the view of the United States that this subject should be dealt with separately. Regarding the Belgian proposal, he seemingly failed to realize that it did make provision for collisions in outer space when he told the subcommittee that this proposal did not cover damage caused by one space vehicle to another in outer space.

On the subject of liability he complained that neither draft considered “damage cause by explosions or other experiments conducted at very high altitudes.” These problems, of course, had been made the subject of numerous discussions at the United Nations wherein the United States had made known its policy to consult with COSPAR prior to injecting possibly dangerous or experimental materials into outer space. While acknowledging that both drafts took into account the principle of absolute liability, he stated that this was not in accordance with the “current practice of States as

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51 U.N. Doc. A/AC.105/C.2/SR.21, 6. This view was supported by Japan, which also held that licenses should be issued only to nationals. U.N. Doc. A/AC.105/C.2/SR.22, 11. The United Kingdom suggested that licensing might be accompanied by state supervision of private launches, since, “the underlying principle was that the nature of space operations required a continuing state of responsibility for them, whatever arrangements might be made between a State and private operators. The United States Communications Satellite Act (1962), expressed in very concrete form the concepts of governmental permission and governmental supervision.” U.N. Doc. A/AC.105/C.2/SR.24, 12.

52 Supra, p. 359.


54 Ibid. For the 1963 Moscow Treaty, Annex 10, infra, p. 470.

illustrated by Articles 20 and 21 of the Warsaw Convention\(^{56}\) [for the Unification of Certain Rules Relating to International Transportation by Air, 1929, governing liability of air carriers to passengers and to cargo consignees], nor with the provisions of the Brussels Convention on liability of nuclear ships [European Convention on Nuclear Damage]\(^{57}\). It should be noted, however, that the Rome Conventions for the Unification of Certain Rules Relating to Damage Caused by Aircraft to Third Parties on the Surface, of 1933 and 1952, have adopted the rule of liability without fault. In commenting on this aspect of liability, Beresford has written that since “contributory negligence is a defense under article 6, it is more accurate to say that the causing of ground damage creates a conclusive presumption of negligence.”\(^{58}\) Hingorani, on the other hand, considers the European Convention on Nuclear Damage to be inadequate as an analogy for liability for space activity. He has said that one may not receive “any guidance from the European Convention on Nuclear Damage, where liability is limited, because it is not a universal convention and is fixed arbitrarily.”\(^{59}\)

\(^{56}\) The Warsaw Convention, 49 Stat. 3000, T.S. 876. The United States ratified the Convention on July 31, 1934, with one reservation. Articles 20 and 21 excuse the carrier from liability if it can prove that all necessary measures were taken to avoid damage or in the alternative that it was impossible for it to take such measures. Liability on the part of the carrier was excused respecting the transportation of goods and baggage if there were a showing that there was a pilot, handling, or navigational error and in all other respects the carrier had taken all necessary measures to avoid damage. Contributory negligence could also be a complete or partial defense. Under the Hague Protocol of 1955, the carrier’s immunity from liability was restricted by eliminating the defenses of error in piloting, handling of the aircraft, or navigating. In the Protocol the following language no longer appeared: “in all other respects he and his agents have taken all necessary measures to avoid the damage.” An analysis of the Warsaw Convention, The Hague Protocol, and international limitation of liability relating to aircraft is contained in the addresses of Lissitzyn, Calkins, and Metzger at the 1962 annual meeting of the American Society of International Law. Proceedings of the American Society of International Law 115–132 (1962).


\(^{58}\) Beresford, “Principles of Spacecraft Liability,” Third Colloquium 156, footnote 5. This amounts to “absolute liability on the proof of damage * * *” Simeone, supra note 8, at 53. Compare, Meyer, supra note 20, at 344.

\(^{59}\) Hingorani, supra note 13, at 217. He has added that limitation of liability requires that there be an adequate means of assessing it, and that perhaps “future events may evolve a method of fixing liability based on weight or manufacturing cost of the satellite or even some arbitrary figure as fixed among nations.” Ibid., 217.
The Czech representative, without noting the differences between the Warsaw Convention of 1929, as modified at The Hague in 1955, and the Rome Conventions of 1933 and 1952, did recognize that liability provisions relating to air transport (as well as maritime transport) were not necessarily applicable to damages resulting from spacecraft accidents. In his view, states might be relieved of liability either partially or fully if damage resulted from the collision of a space vehicle with a meteorite, but suggested that responsibility and liability would apply to a state for causing harm by means of an explosion in space or by means of launching an uncontrollable object. Such conduct involved "harmful acts" and liability should be that of states and not other launching entities. In this way, claims for harms should be accomplished by means of direct negotiations between the state within which the damage was caused and "the State causing the damage." He was critical of the terms contained in the United States and Belgian drafts making provision for ultimate recourse to the World Court in view of the fact that the "Court's jurisdiction would not necessarily be recognized by all States."

The delegates from a number of states expressed views on the proposals contained in the several drafts. At the beginning of the discussions, the Austrian representative stated that the United States had put forward "a useful proposal." In summarizing the work of the legal subcommittee, he stated that there had been unanimity that the draft declaration of basic principles should make provision that "States were liable for damage caused by space vehicles." The Italian representative noted that states with limited space resources should be induced to participate in the space programs of international organizations and these organizations would be responsible for harms caused. The liability of each participant state would then be apportioned on the basis of the "actual participation of a given country in a project." The Canadian representative expressed the view that a state, states acting cooperatively, and international organizations engaging in space activities must assume responsibility for their conduct, and that "explicit reference might be made to the principle of the liability of States for internationally injurious acts.

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61 Ibid.
62 Ibid., 10.
of their nations or national organizations." 66 Albania subscribed to the view that a state should be considered liable for damage caused by it. 67 Argentina supported the view that states or international organizations "authorizing or carrying out the launching [of spacecraft] was internationally liable." 68

After taking note of the differing views as to liability to be found in divergent national legal systems, the Hungarian representative stressed the view that basic space principles should be accepted internationally prior to the elaboration of rules on liability. He limited his observations to a single cause of liability, namely, a collision affecting a space vehicle or its crew. He urged that in principle, liability should be imposed on the launching party, and that each of the "parties concerned should assume liability for the damage it had sustained, with the following exceptions: (1) if one of the parties had undertaken the launching with a view to pursuing an unlawful activity, or if the space vehicle or object in question had exercised an unlawful effect, that party should assume full liability; (2) if one of the parties produced evidence that damage had been caused through the wilful act or gross negligence of the other party, the latter should also assume liability for the damage caused to the former." 69 Following the views expressed by other members of the Communist bloc, it was suggested that disputes be resolved by pacific means pursuant to Article 33 of the U.N. Charter, with a preference for arbitration by mutual consent. Reference to the International Court of Justice was not regarded as a satisfactory procedure. 70 The Czech representative charged that some states sought to engage in "espionage" and unpermitted experiments in outer space and that it was their intent to refuse to accept liability for damages caused by such activities. 71 He also stated that existing legal norms probably covered damages caused by spacecraft on land, in the air, and on the

66 U.N. Doc. A/AC.105/C.2/SR.21, 6. The Soviet delegate in urging initially that space activities be conducted by states, noted that the states which held that private bodies be permitted to use outer space had taken the view that "the State concerned should have ultimate responsibility." U.N. Doc. A/AC.105/C.2/SR.22, 5.


68 U.N. Doc. A/AC.105/C.2/SR.24, 10. Argentina also expressed the view that "the answers to such questions as the class of interests protected, the type of activity giving rise to liability and other connected problems would vary with the particular legal system applied in analysing them." Ibid.

69 Ibid. A/AC.105/C.2/SR.26, 5.

70 Ibid., 6.

sea but that the "question of liability for damage caused in outer space had not been regulated * * *" \(^{72}\)

During the April-May 1963 discussions in the legal subcommittee, progress was made in complying with the mandate of the General Assembly contained in Resolution 1802 (XVII). Part A of the Resolution requested that urgent attention be given to the further "elaboration of basic legal principles governing * * * liability for space vehicle accidents * * *." \(^{73}\) It was not, however, possible to arrive at a consensus on all points raised.

Progress was made in establishing a consensus that harms caused by space vehicles should be compensated, particularly if the effects were experienced on the surface of the earth, including the oceans, and in the airspace. There was not the same consensus respecting harms taking place in outer space.

Liability was held to pertain principally to states, although when space activities were conducted by groups of states or by international organizations the liability became that of the responsible body. A state was thought to be responsible for damages caused by private entities having been authorized or permitted to launch a space vehicle from its territory. It was generally agreed that private space activities should be conducted only after having been licensed or registered by a state, and that the licensing state should undertake inspection and identification procedures prior to launch to insure the maintenance of adequate safety standards.

It was suggested that the state of launch need not be the only responsible party, in that liability might also result from operation and use of a space vehicle, and that many combinations as to launch, operation, and use might be expected. Where groups of states and international organizations engaged in launch, operation, or use, it was suggested that liability might be apportioned pursuant to express agreement and that international organizations might provide, in their own constitutional structure, for a formula for sharing payments of damages, but that states either as principals or as underwriters might ultimately be held accountable for the payment of damages.

There was general agreement that liability for harms resulting on the ground, on the sea, and in airspace should be strict or absolute, assuming the nonexistence of any intent to cause harm. However, in the event of collision between spacecraft—and probably between spacecraft and aircraft—some doubt was expressed as to the appli-

\(^{72}\) Ibid.

cability of the rule of absolute liability. While there was apparent agreement that an international standard ought to be established, the view was also expressed that states under their own domestic law should establish the monetary limitations on such liability. The need for an express international agreement establishing both the principle of absolute liability and the monetary limits of national liability was generally conceded. 74 No figure as to the limits of such liability was mentioned.

There was no agreement as to the legal or political procedures whereby claims for damages might be litigated or negotiated. The states of the Free World generally favored the use of existing legal institutions such as the International Court of Justice or international commissions. The members of the Communist bloc expressed their long standing opposition to regularized legal institutions, particularly the World Court, and suggested that settlements be negotiated. The members of the Communist bloc also asserted the need to establish a broad statement of principles, whereas the Free World states regarded the subject of liability for damages as being a very practical one capable of supporting detailed rules, and, in fact, requiring the early establishment of express provisions. 75

3. Communist Bloc Views

The views put forward in the legal subcommittee of the U.N. Committee on the Peaceful Uses of Outer Space have found general support in current legal literature. However, it should be noted that the academic literature coming from the Communist bloc countries is not always in agreement with the views expressed in the Free World. Soviet interest in the matter of liability has been incidental until quite recently, and early Soviet views were concerned almost entirely with such issues as sovereignty and security. 76

74 In the absence of such an agreement, claims against the United States for an extraterritorial or foreign catastrophe would be subject to existing law. See Financial Protection, supra note 5, at 42-47. Under existing international law, an international tribunal could “hold the United States liable to a state whose nationals were injured by its activity, whether this liability were predicated on a theory of absolute liability or one which entailed a greater balancing of interests.” Ibid., 85-86.

75 Discussions under the auspices of the U.N. Committee on the Peaceful Uses of Outer Space were conducted in Geneva during March 1964.

76 Survey of Space Law, supra note 20, at 32-33. Compare, Lipson, Outer Space and International Law 12-21 (1958). Crane has noted instances of Soviet concern in Soviet publications dating from 1956 for alleged damages caused on the ground by space vehicles. He has also noted Soviet contentions that damages have been caused by the nuclear contamination of space, copper
Korovin, writing in 1959, took passing note of the problem of liability. After observing that launches up to that time had been "solely under the auspices of governmental bodies * * *" he asserted that "full responsibility for eventual damage lies with the Government concerned in the event of personal or property losses for citizens of foreign countries." In this connection he held that "all universally accepted rules of international law (inadmissibility of the use of force in solving international disputes, noninjury of foreign citizens, and their property, governmental responsibility for the activities of their representatives, etc.) apply to the Cosmos as well." The Polish author, Zylicz, also assumed that civil liability would be related to launches by states, or by international organizations, and that "the states or the competent international organizations should in this case be held responsible * * *" i.e., liable for damages. Another Polish author, Machowski, has examined several of the important questions of liability for injury or damage from unmanned space vehicles. He has noted the possibility of collisions between space vehicles in outer space, of interference between spacecraft or disintegrating parts with aircraft in airspace, and of damage to persons or property on land or on the sea. It was his view that the injured party had a right against the launching state. His assumption is also that launched space vehicles would be state owned and considered that under international law the right to launch must be subject to the duty to pay compensation for resulting injuries. His analysis goes no further than enunciating the right and duty relationship.

Several American analysts have provided some insight to this Soviet view of liability. Whelan has stated that the Soviet writers

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77 Korovin, "International Status of Cosmic Space," International Affairs (Moscow) 56 (January 1959); Legal Problems of Space Exploration, A Symposium 1067.

78 Ibid., 1070.


have accepted the principle that a state is liable for personal and material damages caused by space vehicles because the same principle prevails in Soviet domestic legislation for damages caused by Soviet vehicles in their national airspace. At the time his conclusion was reached, Article 78 of the Soviet Air Code and Article 404 of the Soviet Civil Code governed such liability, yet claimants were denied damages presumably because of their intentional conduct or gross negligence. Whelan therefore speculated that it was conceivable the Soviets would “accept full responsibility of the state for damages caused by its outer space vehicles,” but also suggested that the reciprocal application of this view might be limited by the nature of the conduct of a claimant. Basing his interpretation on a 1961 article by Korovin, Whelan considered that Soviet acceptance of liability might be contingent upon whether the spacecraft of the claimant state had been previously engaged in civilian and peaceful


82 Section 78 of the August 7, 1935 code provided: “Any institution, enterprise, organization, or person exploiting a civil aircraft shall be liable, under the laws of the Soviet Union * * * to repair damages caused by death or bodily injuries to passengers during the takeoff, flight, and landing, as well as damages caused by injuries to property or persons not carried by aircraft, unless it is proved that the injury occurred as a consequence of the intent or gross negligence of the injured person himself.” Air Laws and Treaties of the World, Committee on Science and Astronautics, 87th Cong., 1st Sess., 1318 (1961). Significant changes were made in 1962 Soviet domestic legislation. According to Crane “Article 90 of the 1962 U.S.S.R. Civil Code provides for liability for injury resulting from extra-hazardous activities unless caused by force majeure (similar to the common-law concept of ‘act of God’) or by the intent of the injured party. Article 101 of the 1962 U.S.S.R. Air Code, on the other hand, provides for liability regardless of force majeure, although in cases of force majeure there is no liability where there is intent or gross negligence on the part of the injured.” “The principal pertinent changes in the 1962 codes are the elimination of gross negligence as a defense in Art. 90 of the U.S.S.R. Civil Code and the addition of gross negligence as a defense for cases of force majeure only in Art. 101 of the U.S.S.R. Air Code.” Crane, supra note 76, at 709 and footnote 84.


pursuits rather than those of an "aggressive" nature. This implies that if a claim were filed by a state against the Soviet Union for damages caused by a Soviet space vehicle, the Soviet Union would take into account its interpretation of the nature of the space activities of the claimant state in determining if it would concede liability.

It is clear that the Soviets prefer the process of negotiation to the use of legal institutions in resolving international disputes since the former makes it possible for the country to veto any previously accepted agreement fixing the existence and amount of liability. Crane has pointed out that "The significance of this emphasis on dispute-settlement will depend on the extent to which the problem of damages has been integrated into over-all Communist global strategy, just as has every other problem and area of Soviet space law." 87

4. Free World Views: Individuals

By contrast, the Free World publicists have been interested in the development of a series of substantive legal rules having applicability to practical space situations. The typical approach has visualized a comprehensive legal order for space activities somewhat paralleling existing air and sea practices as regulated by custom and international conventions. Typical of this approach have been the suggestions of Jenks, who has taken into account a comprehensive list of situations dealt with by conventional law. He has sought to relate such responses to space law. Thus, he has suggested, in so far as the matter of liability is concerned, that benefit might be derived from noting possible analogies to the provisions of the Rome Convention of 1952 on Damage Caused by Foreign Aircraft to Third Parties on the Surface, to the International Code of Signals, to the International Collision Regulations annexed to the International Convention for the Safety of Life at Sea, and to the Navigation Code of the Air consti-

85 Whelan, op. cit., 210-211; Crane, supra note 76, at 708-709.
86 Crane concurs with Whelan's conclusion that the Soviets may additionally require that the problem of return of space vehicles and personnel be related to liability. According to Crane "it is not clear whether the Soviets consider that the right of a nation—specifically the U.S.S.R.—to the return or recovery of its spacecraft should be made conditional upon the acceptance by that nation of liability for injury or damage caused by such spacecraft, or whether, to the contrary, the acceptance of liability should be made contingent upon recognition by the other countries of a duty to return the vehicle." Crane, supra note 76, at 708.
87 Crane, supra note 76, at 710. However, in General Assembly Resolution 1962 (XVIII) of December 24, 1963, the Soviets were able to agree to a statement of principles acceptable to the United States. See Annex 4, infra, p. 450.
tuted by the annexes to the International Civil Aviation Convention.88

Western writers, who generally emphasize the nature of the activity rather than the place of its occurrence, have sought to clarify such problems as: the basis or bases for liability in the event of space activity damage,89 whether liability should be imposed on those who have launched space devices or whether it should extend beyond the factor of launch to operation and use,90 whether such form of liability as may be agreed on (based on the standard of strict or absolute liability, or fault, or negligence, etc.) should be primarily that of a state, association of states, or international organization,91

89 Haley, supra note 1, at 296. Hingorani, supra note 13, at 214. Simeone, supra note 8, at 52. Mankiewicz, supra note 13, at 209. Verschoor, supra note 12, at 103. Vallado, “The Law of Interplanetary Space,” Second Colloquium 163. Beresford, supra note 58, at 153-155. Cooper, supra note 13, at 143. The foregoing have been in agreement that the standard of strict liability should apply to damages occurring on the ground, on the sea, and in airspace as a result of space activities. The rationale has been that at the present time space activities constitute extrahazardous dangers. Wright has supported this result with the maxim sic utere tuo ut non alienum laedas, and has written that states “must prevent the launching of missiles or satellites which might land in foreign territory or on the high seas, or, alternatively, assume full responsibility to repair damage to other states consequent upon such landing.” Wright, “Subversive Intervention,” 54 A.J.I.L. 528 (1960). This view is supported by holdings in the Trail Smelter Case, 1941, U.S. Arbitration Series 36, 35 A.J.I.L. 684 (1941), and in the Corfu Channel Case (Merits), 1949, I. C. J. Reports 4, 22. Compare Briggs, The Law of Nations 310, 2nd ed., (1952), McDougal and Schlei, “The Hydrogen Bomb Test in Perspective, Lawful Measures for Security,” 64 Yale Law Journal 682 ff. (1955), Regala, “Legal Problems Arising from the Use of Unmanned Earth Satellites,” 33 Philippine Law Journal 645 (1958), Schachter, “Comments,” 1958 Proceedings of the American Society of International Law 247.
90 Verschoor, “Observations on Comparing the Responsibility for Damage by Space Craft and that Caused by Nuclear Installations and Nuclear Powered Ships,” Fourth Colloquium 333 (1963). It was noted that the operator in most instances would be a state. The Davies draft takes note that where a collision takes place in outer space, the operating state (as distinguished from the launching or state responsible for launch) might reasonably be required to bear its own loss. Davies Draft Code of Rules on the Exploration and Uses of Outer Space 16. Compare the statements made by the representative of the United Kingdom to the legal subcommittee. Supra, p. 360-361.
91 Cooper, supra note 13, at 144. Cooper assumes that states will either launch or authorize the launching of space vehicles. Hingorani, supra note 13, at 216, also believes that the launching state must assume liability. Rivoire, “Design for a Law of Space,” First Colloquium 101, has advanced the view that opera-
whether the same standard should be applied to events occurring on
the ground, on the sea, in the airspace or in outer space, the special
problem of collision of spacecraft in outer space, the nature of acts
or events constituting damage, limits, if any, on the amount of dam-

92 Cooper has urged the acceptance of the standard of absolute liability
on the part of the launching state for damage on the surface and in air-
space. However, he would apply the standard of negligence to damage in
outer space. Supra note 13, at 134. Beresford has noted also that "proof of
negligence is apt to be very difficult. Not only may the necessary evidence
be complex and technical, but it may be known only to the Government, and
protected by rules of military security." Supra note 58, at 153. Thus he
supports the view that "liability without fault for personal injury and prop-
erty damage to third parties on the ground" should be accepted. Ibid., 155.
However, this does not take into account damages to spacecraft resulting
from collisions in outer space. In this connection it may be noted that Gerlach
has stated that the chances of collision between spacecraft are "practically
nil." "Contribution," First Colloquium 67, Compare Beresford, supra note 13,
at 242. However, the fact remains that such collisions or accidents may
occur between space objects while in outer space. Consequently, General
Assembly Resolution 1962 (8) provided that "Each State which launches or
procures the launching of an object into outer space, and each State from
whose territory or facility an object is launched, is internationally liable for
damage to a foreign State or to its natural or juridical persons by such
object or its component parts on the earth, in air space, or in outer space."

93 Such collisions might be with natural objects, such as celestial bodies
or meteors. It could involve contact with other spacecraft. Such contact
could be either intentional or accidental. Verschoor has suggested that a
launching state might claim nonliability on the grounds of force majeure where
there had been an "unforeseen collision with a meteor." Supra note 12, at
103. Mankiewicz has urged the acceptance of the standard of absolute liability
for "those who control the launching of the space vehicle or the activities for
which it is used * * *" [and] that the "same principle should apply to whatever
damage is caused by a space vehicle or a space activity, irrespective of
the kind of the damage and the place where it occurs." Supra note-13, at 209-
210. Compare Haley, supra note 1, at 299-300.

94 Most of the commentators have discussed harm as the product of tangible
destruction or injury to persons and property, such as toxic harm resulting
from inhalation of fumes from fuel, or destruction of property from explosion
or collision, or personal injury or death resulting from being struck by parts
ages, the implementation of international agreements in national laws, the jurisdiction of national courts over claims for damage,

of a space vehicle or debris. Harm may take varying forms. Keating has noted the possibility of trespass by satellite. "Space Law and the Fourth Dimension of Our Age," First Colloquium 87. Presumably this would take into account unsanctioned movement through a nation's airspace, and would raise the question of the reasonable measure of damage. In view of the fact that small satellites might make several or more orbits before being consumed in the atmosphere or landing, the measure of damages, if any, would have to consider the number of trespasses. Spent satellites may have a life expectancy of many years with a resulting interference with the proposed orbits of new satellites. This fact might be considered as a basis for damage, particularly when such satellites continued to transmit radio signals causing interference with frequencies allocated to other users by the International Telecommunications Union. Lyon, supra note 20, at 284. Noise may become a basis for liability.

There is general agreement that the conventions dealing with the liability for aircraft damage are inapplicable to space vehicles. Proposals range from full responsibility to limited liability. Comparisons have been made with liability for nuclear disaster where under the Price-Anderson amendments to the Atomic Energy Act of 1954 the maximum figure of $500,000,000 has been fixed for indemnification in connection with each domestic nuclear incident. See Financial Protection Against Risks of Major Harm in Government Programs 17; Verschoor, supra note 12, at 103; Haley, supra note 1, at 294. Beresford has noted that the OEEC draft convention on liability arising from nuclear risks fixes a limit of $15,000,000 and that "as a practical matter, damages must probably be limited since States are not likely to assume unlimited liability. On the other hand, the limit of damages should be set high enough to compensate litigants for the greatest injury or loss that can be reasonably expected." Supra note 58, at 154. However, under the OEEC draft, a state may be permitted to limit liability to $5,000,000. Compare, Verschoor, supra note 90, at 332.

This is essentially a national problem and depends on whether the international convention is or is not self-executing. In order to avoid uncertainties it may be desirable to specify in the convention that it is self-executing, that is, does not require implementing legislation. Or, certain provisions could be described as self-executing. In the United States there has been much attention given to the contents of treaties in order to ascertain if they fall into one of these categories, for example, the U.N. Charter. See Hudson, "Charter Provisions on Human Rights in American Law," 44 A.J.I.L. 543 (1950); Evans, "Some Aspects of the Problem of Self-Executing Treaties," 44 Proceedings of the American Society of International Law 68 (1951). Wright, "National Courts and Human Rights—the Fujii Case," 45 A.J.I.L. 62 (1951). Preuss, "Some Aspects of the Human Rights Provisions of the Charter and their Execution in the United States," 46 A.J.I.L. 289 (1952).

the extent to which a state might pursue claims against the entity causing the harm, and the process whereby international responsibility might be established.

5. Free World Views: Groups

The problems of liability have attracted the attention of several prominent international groups. In 1961, at the 12th Conference of the Inter-American Bar Association, a Magna Carta of Space was adopted in which that body favored the view that “In the event of injuries or death to persons or damage to property caused by space vehicles, rockets, missiles, satellites and the like, the sovereign power by or through which they have been launched shall be responsible and liable for all such damage without the requirement of any proof of fault, negligence, carelessness or recklessness.”

The Committee on Aeronautics of the Association of the Bar of the City of New York has suggested some tentative views in a pro-

98 See Note 93, supra. Cooper has urged recovery to include damage to individuals and damage suffered by a state. Supra note 13, at 144.

99 Judicial processes, such as the International Court of Justice, have been preferred. Rauchhaupt, “World Space Law,” Second Colloquium 127, has suggested an appropriate international court either connected with the World Court or a separate one as in the case of the Coal and Steel Community. He has also noted the suitability of arbitration. “The Problem of Damages in Space Law,” Third Colloquium 136. Weinmann and H. C. McDougall have considered diplomatic negotiations, voluntary arbitration, or the World Court to be appropriate methods. “The Law of Space,” 35 Foreign Service Journal 22 (April 1958). For an analysis of problems involved in the use of national commissions for settling international claims, see Lillich, International Claims: Their Adjudication by National Commissions (1962).

Cooper has said that where claims arise from collision or other damage in outer space states “should have the right to invoke the compulsory jurisdiction of the International Court of Justice.” Supra note 13, at 144. Beresford has urged that the compulsory jurisdiction of the World Court be used, and that claims heard there should include harms suffered both by states and by private persons. As an alternative he has noted the possibility of arbitration, “either by a permanent commission or by ad hoc commissions composed of representatives from the countries concerned.” He has noted the difficulties involved in suits in the municipal courts of the nation responsible for the harm. Supra note 58, at 155. Compare, Report to the United Nations General Assembly, United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space, U.N. Doc. A/4141, 23; Legal Problems of Space Exploration, A Symposium 1269.

100 Resolutions, Recommendations, and Declarations Adopted by The Twelfth Conference of the Inter-American Bar Association 4 (1961). In 1964 the leaders of this body were critical of General Assembly Resolution 1962 (XVIII) as not going far enough in establishing rules on liability. Los Angeles Times, April 6, 1964.
visional draft agreement. Its proposal provided that the participating states would “consider that injury or damage caused by space activities should, subject to any limits to be specified in the future, be reimbursed, regardless of fault, by the State or States responsible for the space activity.” The Bar group noted the need for express agreement on the “incidence and possible limits of liability, the procedures for obtaining reimbursement, liability in case of collision, and the possible desirability of regular contributions by States or other organizations engaged in space activities to an international fund out of which such reimbursement might be claimed.”

The Davies Draft Code of Rules, which took into account the possibility that a private person might be licensed to engage in space activity, placed responsibility for space harms squarely on the public launching entity. Paragraph 6 of the draft provided:

6.1 The State or States or international body responsible for the launching of a spacecraft shall be liable for any breach of the Draft Code in which it may be involved, for any injury or loss caused by the spacecraft, or any part of it
   a. by physical impact, contamination, or otherwise, to any person or property whatsoever outside the territory of the States responsible for the flight of the spacecraft;
   b. as a result of collision or navigational interference to any aircraft,
      1. in the airspace of another State: or
      2. of a nationality other than that of the spacecraft, without proof of negligence in the operation of the spacecraft being required.

The proponents of this rule urged that states should bear their own loss for the damage resulting from the collision of spacecraft in outer space, but was qualified that if by agreement a state were required to give prior notice of a launch and failed to do so, a valid basis for assigning liability to the noncomplying state existed. Additionally, since contamination might take several forms, including radiation and microorganisms returned to earth by space vehicles

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102 Ibid. As to indemnification see Financial Protection Against Risks of Major Harm in Government Programs 16–19, 50–53. The Inter-American Bar Association plan called for the establishment of an international insurance fund to provide for compensation for harms.
which had been in contact with celestial bodies, the need for an international body to enforce claims was also foreseen.\textsuperscript{104}

Meyer has reported the findings of the Legal Committee of the German Scientific Society for Air Navigation which, in 1962, considered the question of liability for damages caused by spacecraft.\textsuperscript{105} It was their view that tort liability should be imposed on the operator of a spacecraft, and that where such craft was engaged in flight to the surface of the earth or in airspace, the rule of absolute liability was to be imposed on any collisions between aircraft and spacecraft. In the event of a collision in outer space, liability was to depend on proof of fault, but by reason of the difficulty of such proof, this approach would result in each operator's bearing its own loss. The group considered that "contributory negligence of the person who suffers damages or of his servants or agents reduces the compensation or excludes it entirely."\textsuperscript{106} The group also considered such issues as: that liability should be limited, that every operator must provide evidence of insurance up to a given (but unstated) amount, that in the event of a private entity's tort, such person might be sued in the national courts where the injury took place, that if such an injury resulted in a stateless territory (such as the high seas), the private litigant might sue in the courts of the state of which he were a national, and that appeals might be taken to the World Court. The latter Court was considered to be the forum for interstate disputes, and was to have exclusive jurisdiction where the amount of the claim exceeded the limits of a state's insurance or the guarantee fund set up to compensate those harmed.

The German Legal Committee took note of the need for an international convention which would establish the conditions under which outer space activities would be subject to license by a state. According to it, state liability should extend to harms occurring in the territory of a state, on and over the high seas, and in outer space. A claim might be maintained by a person whose state had not become a party to the convention. Opposition was expressed to the view that an injured person should be entitled to pursue his claim against his own state when the harm was caused by another state's operator pursuant to some pre-established right of the former to have recourse against the latter. It was thought to be more practical to "channel the liability to the operator of the spacecraft to a certain maximum, and

\begin{itemize}
\item\textsuperscript{104}\textit{Ibid.}, 16-17.
\item\textsuperscript{105} Meyer, \textit{supra} note 20, at 344-345.
\item\textsuperscript{106} \textit{Ibid.}, 344.
\end{itemize}
then to require the Contracting State which licensed the spacecraft to assume liability for the damages in excess of the limits."  

From all of the foregoing, there is strong reason for believing that international lawyers accept the view that a state may be held to account for torts committed outside the territorial jurisdiction of that state. There is clearly an urgent need for an international convention to fix the details. It is particularly necessary to establish the liability of such international corporate bodies as groups of states and international organizations. As Jenks has noted "there remains the question whether its liability should be regarded as arising under and being measured by the law of the territory where the damage or injury is suffered or should be determined by an international standard." Until an appropriate international convention, buttressed by national legislation, makes specific provision for the myriad of tort problems arising from activities in space, the general consensus as to the substance of rights and duties may fail to afford real protection. It would be well to fix reasonable conventional rules prior to an event requiring the ascertainment of individual rights and the nature of international duties. Until this happens states will rely heavily on the principles of General Assembly Resolution 1962 (XVIII).

B. POSSESSORY RIGHTS, ASSISTANCE TO PERSONNEL AND RETURN OF PERSONNEL AND SPACE VEHICLES

1. Possessory Rights

At an earlier stage in the development of the myriad uses of space vehicles, and at a time during which control of the vehicle after launch was less sophisticated than at present, there was some inclination to draw an analogy between spacecraft after launch and a fired
bullet, over which it was suggested the firer no longer exercised property or possessory rights. 111 Others were quick to compare the space vehicle with a baseball or a golf ball with the view that they, like the bullet, were aimed, but unlike the bullet were intended to come again into the possession of the player for future and additional use. 112 The assumed inability or limited ability of the launcher to control the space vehicle after launch suggested the possibility that the vehicle, at least by implication, was to be considered as having been abandoned. It was soon realized that such vehicles, and to a lesser extent the launching mechanism which followed the vehicle into space or orbit, were subject to some management from the ground. With the development of many improvements in command systems, particularly with the perfection of the manned satellite and techniques employed in deep space probes, the measure of their control and proprietary attitudes have been substantially increased. 113

Many factors have influenced the conclusion that the launcher, operator, or user of a space vehicle (and presumably its accompanying launching device) retained ownership and possession of the vehicle or device. For example, no express abandonment has ever been recorded and there have been no implied abandonments. Rather, there has been much national pride in the fact that "our" satellite was launched successfully on a given date. Haley has expressed the view that for space vehicles legal abandonment can not take place where "the intent to abandon is lacking." 114

Many factual considerations support the view that a launch does not constitute an intentional abandonment of property and possessory rights. The extraordinary value of the launched item, the identify-

proved in advance by [the AEC] * * * for public liability arising out of or in connection with the program, and (b) the reasonable costs of investigating and settling such claims, and defending suits for damage for such public liability provided, however, that this indemnification is subject to the availability of appropriated funds to the [AEC] * * * " TIAS 4739.


113 However, Pierce has stated that "Space payloads and command systems have been sadly fallible in practice." "Hazards of Communication Satellites," 17 Bulletin of the Atomic Scientists 183 (1961) ; Haley has stated that "No object should be placed in any orbit in outer space which cannot be guided back to earth or destroyed by some other means, such as being guided into the surface of the sun." "Survey of Legal Opinion on Extraterrestrial Jurisdiction," Third Colloquium 47. Compare, Bush, letter to The New York Times, November 22, 1963.

114 Haley, supra note 1, at 309.
ing symbols affixed to the vehicle and device, the placing of human beings on board,\textsuperscript{115} the significant efforts to recover both manned and unmanned vehicles either from the oceans or by seizing the vehicles while still in the air, all lead to this result. Commentators have been quick to compare a manned spacecraft with manned aircraft and have noted continuing ownership over aircraft during flight and after landing at a foreign airfield.

The U.S. Congress has made provision for conforming to certain procedures if government property is to be abandoned. In Haley's view "while missiles and similar devices may be 'abandoned' in the physical sense, there can be no abandonment which transfers title to another person unless the statutory methods of abandonment are complied with."\textsuperscript{116} Thus, from the point of view of the municipal law of the United States, abandonment of these publicly owned vehicles and devices cannot take place, and it would not be possible to support a contention that a lawful finder could exist. At the international level, however, the most plausible argument for return of these vehicles would be based on the analogy of aircraft, particularly where it had been agreed that the spacecraft had been employed for peaceful, i.e., nonaggressive and beneficial, uses.

It might also be argued that there is a relationship between the doctrine of absolute liability for space torts and ownership of the vehicle or launching device. To permit a state to deny ownership of a vehicle or device launched, used, or operated by it might result in a claim by such state that it was under no duty to use care in the course of such launch, use, or operation. This could lead to a chaotic, rather than a structured, regime for outer space involving a refusal to report launchings, disregard for radio regulations, and other procedures necessary for the maximum exploitation and use of outer space for peaceful purposes. For these, and other reasons,\textsuperscript{117} a working consensus exists which assures to those engaged in the launch, use, or operation of space vehicles and devices full property and possessory rights in such equipment so long as it is used for peaceful purposes.\textsuperscript{118}

\textsuperscript{115}It has been suggested that the duty of the state to the astronaut includes both the providing of a safe place for space transit and the retention of the data situated within the spacecraft, and hence the craft itself. Cucca, "Legal Status of the Astronaut," \textit{Fourth Colloquium 146}.

\textsuperscript{116}Haley, \textit{supra} note 1, at 309.

\textsuperscript{117}Lyon, \textit{supra} note 20, at 282. Lyon has suggested that the vehicle might be regarded as a "detached part of its national territory, subject to national law, whether it be governable or not, manned or unmanned."

\textsuperscript{118}Compare the Soviet writer, Galina, "On the Question of Interplanetary Law," \textit{Legal Problems of Space Exploration, A Symposium 1057}. 
The nature of the consensus may be determined by examining United States and Soviet proposals at the United Nations. On December 8, 1962, the United States suggested, along with other principles contained in its draft declaration, that "Ownership and property rights in a space vehicle and its components remain unaffected in outer space or upon return to the earth." 119

On April 16, 1963, the Soviet Union submitted a revised draft declaration of basic principles to the legal subcommittee. In paragraph 8 it was suggested that "States shall retain their sovereign rights over objects they launch into outer space. Rights of ownership in respect of objects launched into outer space and their components remain unaffected while they are in outer space and upon their return to earth." 120

The major difference, other than the Soviet reference to "sovereignty," has to do with the description of items placed in space. The United States expression "space vehicle and its components," is a more restricted term than "objects" and "their components." It becomes a matter of definition, and in an express international agreement on this subject it might be desirable to employ the term "space device" as contained in the Belgian Working Paper on the Unification of Certain Rules Governing Liability for Damage Caused by


120 U.N. Doc. A/AC.105/C.2/L.6a. Annex 16, infra, pp. 466-468. In September 1963, the Soviet delegate told the Committee on Peaceful Uses of Outer Space that its April 16, 1963 revised draft declaration of basic principles had "adopted the United States wording with regard to the inalienable right of ownership of States to objects launched by them in space." U.N. Doc. A/AC.105/PV.20, 37. He also said that it was "universally accepted that the sovereign rights of States with regard to objects launched by them into space is preserved." Ibid., 41. The earlier Soviet Declaration of the Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Outer Space is U.N. Doc. A/AC.105/L.2; U.N. Doc. A/5181, Annex III, infra, pp. 480-482, Annex 21. With the adoption of General Assembly Resolution 1962 (7) (XVIII) on December 24, 1963, a well defined principle was established. This portion of the Resolution provided "The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space. Ownership of objects launched into outer space, and of their component parts, is not affected by their passage through outer space or by their return to the earth. Such objects or component parts found beyond the limits of the State of registry shall be returned to that State, which shall furnish identifying data upon request prior to return."
Space Vehicles where it was defined as “any device which is intended to move in space, remaining there by means other than the reaction of the air.”

There is, of course, the additional problem of whether ownership—if recognized internationally—will result automatically in the return of a space vehicle used for peaceful purposes. Efforts have been made, notably by the Soviet Union, to connect the right to return a space vehicle to the requesting state with provision for payment of damages caused by the requesting state or its persons to the state to which the request for return is directed. This view was not incorporated into Resolution 1962 (XVIII).

2. Assistance to Personnel and Return of Personnel and Space Vehicles

The 1959 United Nations Ad Hoc Committee on the Peaceful Uses of Outer Space pointed to the need for express international agreements, on a bilateral and multilateral basis, to regulate assistance to space personnel and return of such personnel and space vehicles to the responsible entity. It was noted that a structured regime was required for both manned and unmanned vehicles and for accidental as well as planned landings. The committee stated “among the subjects that might be covered by such agreements would be the return to the launching State of the vehicle itself—and in the case of a manned vehicle—provision for the speedy return of personnel.” It was the view of the committee that certain “substantive rules of international law already exist concerning rights and duties with respect to aircraft and airmen landing on foreign territory through accident, mistake or distress. The opinion was expressed that such rules might be applied in the event of similar landings of space vehicles.”

The United States, on December 8, 1962, submitted to the First Committee on the U.N. General Assembly a Draft Declaration of Principles Relating to the Exploration and Use of Outer Space. It contained a principle dealing with assistance and return of space personnel and a separate principle dealing with the return of space vehicles and their component parts. Each principle was based on

121 U.N. Doc. A/AC.105/12, 11.
123 Ibid., 25. This referred to Annexes 12 and 13 on Search and Rescue and Accident Investigation to the International Civil Aviation Convention. Also pertinent is the Convention Promoting Safety of Life at Sea, 1936, T.S. 910, 50 Stat. 1121, and the International Convention for the Safety of Life at Sea, 1948, 3 UST 3450, TIAS No. 2495.
a need resulting from possible accident, distress, or mistake. The December 1962 Draft Declaration of Principles provided in part:

4. States shall render all possible assistance to the personnel of space vehicles who may be the subject of accident or experience conditions of distress, or who may land by reason of accident, distress, or mistake. Space vehicle personnel who make such a landing shall be safely and promptly returned to the launching authority.

5. States shall return to the launching authority any space vehicle or part that has landed by reason of accident, distress, or mistake. Upon request, the launching authority shall furnish identifying data prior to return.\footnote{124}

The comparable Soviet proposal of April 16, 1963, provides:

10. States shall regard cosmonauts as envoys of mankind in outer space and shall render all possible assistance to ships and their crews which may make an emergency landing on the territory of a foreign State or on the high seas; spaceships, satellites or capsules found beyond the limits of the launching State shall be returned to that State.\footnote{125}

There are notable differences in the two proposals. However, before making a comparison, it should be noted that the United States on September 11, 1962, presented to the U.N. Committee on the Peaceful Uses of Outer Space a Draft Proposal on Assistance to and Return of Space Vehicles and Personnel which employed language not found in the later Draft Declaration of Principles.\footnote{126}

Paragraph 1 of the earlier Draft Proposal can be compared with the first sentence of paragraph 4 of the Declaration of Principles, but includes after the word “mistake,” the expression “or otherwise than as planned.”\footnote{127} The Draft Proposal provided that “All possible assistance shall be rendered * * *” rather than “States shall render all possible assistance * * *.” The second sentence in paragraph 4 of the Draft Declaration of Principles modified paragraph 2 of the Draft Proposal, which had provided that “Space vehicles—and their personnel in the case of manned vehicles—that land by reason of accident, distress or mistake, or otherwise than as planned, shall be safely and promptly returned to the State or States or international organization responsible for launching.”\footnote{128}

\begin{footnotes}
\item[127] Ibid.
\item[128] Ibid.
\end{footnotes}
The Draft Proposal did not contain the sentence found in the Draft Declaration of Principles providing “Upon request, the launching authority shall furnish identifying data prior to return.” The final paragraph of the Draft Proposal, number 3, provided “Any expense incurred in providing assistance to or return of space vehicles and their personnel shall be borne by the State or States or international organization responsible for launching.” This was not contained in the Draft Declaration of Principles. These changes make it clear that the United States wished to establish a broad duty, limited to states, to provide assistance, and by excluding the expression “or otherwise as planned” from the Draft Declaration of Principles, sought to limit such an assistance rendering duty to conditions of accident, distress, or mistake. The December Draft Declaration of Principles made mention of the role of the launching authority rather than “State or States or international organization for launching.” The duty to provide identifying data was added in the December Declaration of Principles while no duty to make compensation for assistance rendered was suggested. This latter aspect was a part of the earlier Draft Proposals because they would have established a duty on the part of persons, as well as states, associations of states, and international organizations, to engage in assistance activities.

The detailed United States Draft Proposals, September 11, 1962, may be compared with Articles 4 and 5 of the Draft Code for International Co-operation in the Peaceful Uses of Outer Space, submitted to the U.N. by the United Arab Republic in March 1962. These paragraphs proposed that:

4. Member States agree to provide every possible assistance to personnel of space vehicles who may be the subject of accident or experience conditions of distress or who may land by reason of accident, distress or mistake;

5. Member States shall undertake to return to the State or international organization responsible for launching space vehicles and their personnel.

These proposals are practically identical with the United States detailed Draft Proposals except, as noted above, the United States Draft Proposals in paragraph 3 took into account launchings by associations of states and made provision for payment of expenses incurred in providing assistance.

129 Ibid.
The Soviet Union on September 10, 1962, also proposed a detailed Draft International Agreement on the Rescue of Astronauts and Spaceships Making Emergency Landings. This detailed Draft Agreement provided, in Article 1, that contracting states should assist crews involved in accidents, should rescue astronauts making emergency landings, and that states should use all means at their disposal in achieving this dual responsibility. Article 2 suggested that each contracting state which discovered a space vehicle accident should so notify the launching state without delay. Article 3 suggested that where there was an emergency landing in the territory of a state, the launching state should be notified and the discovering state should rescue and render assistance to the personnel. Under Article 4, each launching state was entitled to make application to contracting states to engage in joint search for astronauts in the event of a presumed emergency landing on the high seas. Pursuant to Article 5, the standard of care on the part of an assisting state was to be the same as it would render to its own personnel. Article 6 called for a state to "facilitate the early return to their own country of any astronauts of another Contracting State who may make an emergency landing on its territory or who may be rescued on the high seas."

Article 7 imposed the following limits on the duty to return space vehicles:

Foreign spaceships, satellites and capsules found by a Contracting State on its territory or salvaged on the high seas shall be returned without delay to the launching State if they have identification marks showing their national origin and if the launching State has officially announced the launching of the devices found.

Space vehicles aboard which devices have been discovered for the collection of intelligence information in the territory of another State shall not be returned.

The last operative article of the Soviet Draft Agreement suggested that expenses incurred by a state in fulfilling the obligations contained in Articles 6 and 7 were to be reimbursed by the launching state.

From the foregoing it will be seen that in 1962, the major resource states, supported by the United Arab Republic, were in general agree-


133 Ibid.
ment that assistance should be rendered to astronauts endangered by accident or other peril. There was also a general consensus that space personnel and space vehicles should be returned, although the United States Draft Proposals of September 11, 1962, made reference of return to a state, states, or international organizations, whereas the Soviet drafts made reference only to launching states. Further, the Soviet Draft Declaration of Basic Principles, April 16, 1963, made reference only to the return of the space vehicle, whereas its earlier agreement, September 10, 1962, specified both personnel and space vehicles. Only the Soviet Draft Agreement contained a condition which would forestall the return of space vehicles (but not personnel), namely, the presence on such vehicle of intelligence information gathering devices. Both the United States detailed Draft Proposal and the Soviet detailed Draft Agreement made reference to reimbursement for expenses involved in providing assistance to or return of personnel and spacecraft, although neither indicated whether reimbursement was to be a condition precedent for such return. Insofar as the United States draft of September 11, 1962, called for the prompt return, and the Soviet Draft Agreement called for return without delay, it would be reasonable to believe that such reimbursement should not be regarded as a condition precedent for a return.

A major difference encountered between the detailed U.S. Draft Proposal and that of the Soviet Draft Agreement had to do with the entity entitled to assistance and return. The U.S. proposal consistently referred to a launching state, states, or international organization. However, the December 1962 United States Draft Declaration of Principles referred to return to the launching authority. The Soviets continued to propose that such rights as were under consideration belonged to states only.

To date the resource states have linked subjects of rescue and assistance of personnel and their return with the subject of return of space vehicles. It would appear that for manned spacecraft this is a practical approach, and, also, that the return of unmanned spacecraft might be regulated on the same basis as prescribed for manned vehicles.

These propositions have not received definitive analysis in the Legal Subcommittee of the Committee on Peaceful Uses of Outer Space, although careful attention has been given to this continuing problem. Enough has been said to point to the need for careful drafting of an ultimate convention on these subjects. The United States representative noted on April 16, 1963, that there had been general agreement on the limited subject “that every effort should
be made to assist and return astronauts in distress and that astronauts rescued by authorities other than the launching authorities should be safely and promptly returned." 134 On April 24, 1963, he noted that paragraph 5 of the United States Draft Declaration of Principles made reference to the return of parts of space vehicles but that paragraph 10 of the Soviet Draft Declaration of Basic Principles made no reference to parts. He also observed that there was a difference between the United States Draft Declaration of Principles, which called for the return of space personnel in paragraph 4, and the Soviet paragraph 10, which failed to make mention of the matter. However, as previously noted, the detailed draft proposals of both states called for the return of personnel and vehicles. 135 Neither the Soviet Draft Declaration of Basic Principles nor the Soviet Draft International Agreement made any mention of the return of parts. The United States representative further observed that the U.S. view, as contained in paragraph 5 of the Draft Declaration of Principles, holding that a launching authority might be requested to supply identifying data (not contained in the United States detailed Draft Proposal), was in fact embodied in paragraphs 4 and 5 of the UAR draft and in paragraph 10 of the Soviet Declaration of Basic Principles. 136 Neither the UAR draft nor the Soviet Draft International Agreement made specific reference to this condition, and it is doubtful if the attribution to them was correct, although Article 7 of the Soviet detailed Draft International Agreement called for space vehicles to have identification marks showing their national origin.

The Soviet representative on April 19, 1963, spoke about the favorable prospect of arriving at an international agreement on the question of “assistance and rescue.” 137 It was his view that an agreement on this subject might take into account the principles contained in international agreements dealing with the rescue of and assistance

134 U.N. Doc. A/AC.105/C.2/SR.16, 4. The term “launching authorities” may be construed to mean a state, states, or an international organization.

135 Supra, pp. 458–460, 464–468. Resolution 1962 (7) and (9) (XVIII), which was unanimously adopted by the General Assembly of the United Nations on December 24, 1963, resulted from these early proposals. Annex 4, infra, pp. 450–452.


137 U.N. Doc. A/AC.105/C.2/SR.17, 8. This was based on the fact that “no serious objection had been raised * * *” to the general principle of the Soviet’s paragraph 10 nor to the detailed draft. However, he asserted that it would be necessary to get agreement on the concepts contained in the Draft Declaration of Basic Principles before any specific agreement might be entertained. The same position was stated on May 2, 1963. U.N. Doc. A/AC.105/C.2/SR.25, 10.
to aircraft and vessels in distress and their personnel. On May 2, 1963, in discussing the import of paragraph 10 of the Soviet Draft Declaration of Basic Principles, the Soviet delegate sought to enlarge and reconcile the subject of return of astronauts with the Soviet position as contained in the Soviet detailed Draft International Agreement. He brought into focus the Soviet position with respect to the return of the parts of space vehicles by saying, “Astronauts and the components of spaceships should assuredly be returned.”

This new position, it must be remembered, must be interpreted in the light of restrictions and reservations contained in the detailed Soviet Draft International Agreement.

The Soviet representative, in linking the rescue and return of astronauts and space vehicles as a single subject, asserted that no detailed express convention on the subject could be arrived at until there had been agreement with the Soviet Draft Declaration of the Basic Principles Governing the Activities of States in the Exploration and Use of Outer Space. As to the rescue and return of astronauts and space vehicles he stated, “treatment of the problem of return must be based on the principle that States retained their sovereign rights over objects they launched into outer space, and that rights of ownership in respect of objects launched into outer space and their components remained unaffected while in outer space or upon their return to the earth (A/AC.105/C.2/L.6, paragraph 8). The duty to render all possible assistance to astronauts and spacecraft which might make an emergency landing was dictated not only by humanitarian considerations but also by the principle that the exploration and use of outer space should be carried out for the benefit and in the interests of the whole of mankind (ibid., paragraph 1).”

On April 26, 1963, the Japanese representative took note of an apparent consensus of the subcommittee which “seemed to be that space vehicles which landed outside the territory of the launching State should be promptly returned to that State.” It would have been more accurate to state that the consensus favored assistance to personnel and return of personnel and spacecraft and parts, subject to United States or Soviet reservations, and that such return in the

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139 This was also the view of the representative of Austria, who noted the availability of multilateral and bilateral agreements. U.N. Doc. A/AC.105/C.2/SR.16, 6.
view of the United States was not limited to the Soviet view of states but also took into account other entities engaged in space activities, as groups of states or international organizations.

From this point of view the appraisal of the Argentinian representative appears to have been too narrow. He told the legal subcommittee that on the question of "assistance to and return of astronauts and space vehicles * * * a resolution should be prepared, stressing * * * the singular character of the astronaut as a civilian explorer of outer space and the duty of States to render him all possible assistance in the event of a forced landing outside the borders of the launching State." On the other hand, the Austrian representative expressed the judgment that opinion had been "unanimous that the draft declaration of basic principles should contain the following principle [namely] * * * assistance should be accorded to space vehicles and their personnel in distress." The Australian representative seems to have come somewhat closer to the views generally expressed when, in making an appraisal of the work of the subcommittee in April and May 1963, he suggested that "there was complete agreement in broad principle * * * that States should be under a duty to render all possible assistance to the personnel of a space vehicle landing by accident, distress or mistake and to return to the launching State both personnel and vehicle."

However, even here there was not complete agreement. As noted previously, the Soviet government, possibly for tactical purposes, insisted on formulating a broad statement of general principles on many subjects prior to negotiating a detailed agreement on assistance to astronauts in distress and return of astronauts, space vehicles, and component parts. Further, the Japanese representative urged that states negotiating on this subject should take into account the prior notice of space launches. He stated that his delegation "did not consider it reasonable or appropriate to expect a nonlaunching State, within whose territory a space vehicle or its parts landed, to return such objects unless it had been given advance knowledge about the vehicles in transit or in orbit that might come down suddenly and without warning on its territory. The obligation of the nonlaunching States to return space vehicles should be conditional

146 Supra note 120, at p. 383.
upon the obligation of launching States to provide adequate information in advance.”

At the time the Committee on Peaceful Uses of Outer Space met in September 1963, a clarification of ideas relating to these subjects had resulted. According to the representative of the United States, such areas as “assistance to astronauts in distress” and “return of space vehicles and their personnel forced down by accidents or emergency” had reached the stage of “general agreement.” The Soviet representative indicated that “Nobody raised any objections against such an important principle as the obligation of States to consider cosmonauts as emissaries of humanity into space and to give all possible help to space craft and their crews which have been forced down by accident on the territory of a foreign State or on the open seas, and also to return these space craft and their crews to the States which originally launched them.”

He also took note of the views advanced by several delegates that the proposed U.N. draft declaration on space law should “include a provision by which States, on the territory of which a space craft actually lands, could, before the return of the ship or the space craft, demand that identification should be given to it.” In order to obtain a generally acceptable draft declaration, in view of the possibility that a universally acceptable one would not be forthcoming, he expressed approval for making reference to such identification in the declaration.

Although a pattern is in the process of developing whereby assistance to and return of personnel is being linked with the return of space vehicles and parts, the two subjects are in reality separate and distinct. The return of an astronaut after having been provided with varying forms of assistance, including the saving of his life from adverse elements, may be supported on basic principles of humanity. If he were a national of a state other than the state of launch,

147 U.N. Doc. A/AC.105/C.2/SR.22, 12. He also suggested the possibility of improving the timing and contents reported by launching states to the United Nations Secretary-General pursuant to General Assembly Resolution 1721 B (XVI).


149 Ibid., 41-42.

150 Ibid., 43.

151 Following the Soviet launch of Vostok V on June 14, 1963, and Vostok VI on June 16, 1963, a Department of State spokesman indicated on June 18, 1963 “that the United States would do everything it could to help rescue Soviet astronauts, should they come down in American territory. The department press officer * * * said he knew of no request by the Russians for such help.” New York Times, June 19, 1963.
operation, or use—or if he were a stateless person—he would still be entitled to receive all benefits accorded to those in danger or distress, and upon his own request might be expected to return to the place from whence he has departed. A launching or interested state or group of states engaging in joint space activities, or an international organization could be expected on humanitarian grounds to intercede with the state where he had come to rest or in the hands of whose authorities he might be found.

The return of a space vehicle or its parts would not rest on humanitarian grounds, but rather on property or possessory rights, although the Soviet drafts have made reference also to sovereign rights to return. Return of space vehicles is encumbered with security considerations which do not appear to be involved to any significant extent in the return of an astronaut. Thus, the Soviets have proposed that vehicles equipped for intelligence-gathering activities (presumably the entire vehicle, including the observational equipment) need not be returned, and this is urged despite the conflicting principle of a sovereign, property, or possessory right to the vehicle and its contents after launch. The Japanese view would permit the return of astronauts even though no advance notice as to the launch, operation, or use were conveyed to other states. However, under the Japanese proposal, a state would have no legal right to a return of a space vehicle or its parts in the absence of prior effective notification of a launching.

While custom and usage have not been given an opportunity to provide substance to this difficult political-legal problem, it is clear that the humanitarian analogies contained in the law of the sea and of airspace will unquestionably have an impact on state practice so far as assistance to and return of astronauts is concerned. Unilateral views of national interest will undoubtedly govern the problem of return of vehicles and parts until a practical condition of mutual benefit or advantage can be developed concerning such objects. When a joint recognition of such mutual benefits or advantages is clearly understood, it is expected that a workable express international agreement will regulate the return of vehicles and parts. The ongoing obsession on the part of the Soviet Union with secrecy and the gathering of observational data ("espionage" according to Soviet writers and governmental representatives) may make it difficult to achieve such an express agreement. However, this need not deter other states from entering into express agreements on these subjects.

In September 1963, the Chairman of the Committee on Peaceful Uses of Outer Space suggested that prospects were becoming increasingly more favorable for a resolution of the problems of assist-
ance to astronauts and return of both astronauts and space objects and their parts. The following Declarations were made in separate articles of the unanimous General Assembly Resolution of December 24, 1963:

7. [O]bjects [launched into outer space] or component parts found beyond the limits of the State of registry shall be returned to that State, which shall furnish identifying data upon request prior to return.

9. States shall regard astronauts as envoys of mankind in outer space, and shall render to them all possible assistance in the event of accident, distress, or emergency landing on the territory of a foreign State or on the high seas. Astronauts who make such a landing shall be safely and promptly returned to the State of registry of their space vehicle.\(^{152}\)

C. SATELLITES AND SPACE COMMUNICATIONS

The importance of this subject is seen in the fact that control over means of communicating can serve the national interest in many significant and effective ways. As a means of influencing the minds of men and their activities—by appealing to reason or emotion—its only serious rival is direct coercion. National security and well-being cannot afford to disregard the practical and legal implications of space communications.

The precise nature of permitted space communications is a significant part of the larger problem of defining the substance of the concept of "peaceful uses of outer space." Although, as pointed out above, this concept or principle has received the approval of nations, there still remains the very considerable task of developing reasonable working rules and legal standards for specific aspects of legally permitted conduct.

With the advent of communications by satellite, either passive or active, as well as reliance on radio and other devices to control vehicles already in outer space, additional international efforts have been initiated. The public international organizations, through which major efforts have been undertaken to maximize space communications and to provide a structured legal regime therefor, have been the International Telecommunications Union (ITU) and the United Nations. COSPAR, the private scientific consultative body, has also begun to play an important role in this field.

When the regulation of communications in outer space is compared with other types of space control, one is immediately forced to take account of the long experience and ongoing technical qualifications of the ITU. Since 1947 it has had the assistance of its International Frequency Registration Board (IFRB) and its International Radio Consultative Committee (CCIR). The ITU has already assumed a key role in radio communications in outer space and has undertaken the important responsibility of assisting in the assignment of radio frequencies.¹⁵³

Before analyzing the legal problems affecting space communications, it is necessary to identify uses, users, and major problems. Major uses of telecommunications facilities fall into three primary classes, namely, commercial, military, and scientific. These involve the use of such specific facilities as radio, television, data transmission, telephone, and telegraph. All involve the rapid dissemination of information over immense distances. These capabilities, when applied to active or passive satellites or other space vehicles, permit the performance of such vital functions as tracking, guidance, radio positioning, telemetering, and increasingly accurate control. Additionally, the techniques of radio astronomy have made it possible to acquire scientific data from the wide and distant ranges of space.

The users of space communications include not only the resource states which have demonstrated an ability to launch, operate, and use space vehicles, but also a great variety of public and private entities which have already participated, in varying degrees, in the management of space communications. These include states, associations of states, international organizations, and private legal persons (private companies, corporations, and individuals). The latter engage in both national and international activities and a great variety of forms are employed in any single state. In the United States, for example, there are both private and public communications operations, and combinations thereof, and it may be possible to have both military and nonmilitary management of them. In other states, exclusive military management may be the preferred operational technique. Even where states monopolize this function, however, operations are frequently carried on by both civil and military administrations.

The development of space communications coincidental with the development of space vehicles has added new, but not necessarily

¹⁵³*Infra*, pp. 396–400. The IFRB engaged in technical preparations for the 1963 Extraordinary Administrative Radio Conference on Space Communications, and the CCIR through its Study Group IV has engaged in special studies of space telecommunications systems and of radio astronomy.
dissimilar, problems from those communications problems experienced in the past. With the development of spacecraft there has become a greater awareness of the need to use space communications. This awareness has presented a finite situation disclosing the need for careful commercial, scientific, and military analyses of all factors which must be considered in assigning radio frequencies.

The entire regime of world-wide communications was constructed on the basis of seeking to avoid harmful interference. However, with the advent of the space vehicle, the Soviet Union began to use radio frequencies previously assigned to other users. This resulted in impaired reception and impeded radio astronomy. Furthermore, capabilities for jamming foreign broadcasts either at source or at the point of reception have long existed. The impact of these factors upon military security and the needs of national self-defense, has not gone unnoticed. In addition to the problem of frequency assignments which will be beneficial to states, there has also been the problem of effecting allocations between differing uses within a given state, i.e., commercial, scientific, and military. Making acceptable assignments of frequencies at an early stage is necessary in order that suitable equipment capable of performing a variety of assigned technical tasks may be manufactured. Confusion as to assigned frequencies—or worse yet, no assignment at all—would defeat the maximum beneficial use of space communications facilities.

The seriousness of these problems was noted by Congressman Brooks, in 1961, when he stated in referring to the allocation of radio frequencies for space use: “Frequencies have been used in violation of treaty provisions, and transmissions have continued, interfering with normal communications, long after their purpose had been served. Looking to the future, we can see a coming war of the radio-frequency spectrum. In effect, the spectrum is a scarce natural resource, already overloaded, which will be required to carry more and more traffic. The growing overload will come not only from military but from scientific and commercial use. Rapid communications will be needed among an increasing number of points for production, transportation, and other economic activities. In outer space, unless agreement is reached on frequency allocations, the information acquired by difficult and costly experiments may well be lost.” 154

154 Brooks, “The Place of Government in the Utilization of Space,” in Ramo, ed., supra note 2, at 209. The ITU’s role with respect to radio frequencies is that of a coordinator rather than a manager of details. The conventions dealing with radio divide states into regions in such a way as to avoid the prospect of national interference. They also divide various kinds of services, such as amateur, broadcasting, or maritime mobile. Over-all frequency bands are allo-
Haley has documented the early Soviet use of frequencies at 20,005 and 40,002 megacycles in connection with Sputniks I and II which were launched in 1957. He has observed that “The first departure from the rules and regulations promulgated pursuant to international treaties, was occasioned by the USSR’s use of the frequencies of 20,005 and 40,002 megacycles (mc).” 155

The magnitude of the difficulties resulting from failure to conform to frequency allocations has been commented on by many authorities. Mr. Frederick R. Kappel, president of the American Telephone and Telegraph Company has stated:

These questions are both domestic and international. Some of the most crucial arise from the fact that to communicate via satellite it is necessary to use radio frequencies in huge quantities. The radio-frequency spectrum is of course a natural resource, and the frequencies that can be used for satellite communications are limited. The best area is from roughly 1,000 to 15,000 megacycles, with some possibility also of using the range from 15,000 to 20,000. In the extremely high frequency range, rain blocks off transmission. In the lower range, sky noise increases, and besides, big bundles of frequencies are already in use.

cated to the various services with an indication as to whether they may be used world-wide or regionally. States make the detailed assignments to users within their respective jurisdictions, and this decision is the product of regional agreements among adjacent states. There are three ITU regions, i.e., Region I, Western Europe, U.S.S.R. and Africa; Region II, the Western Hemisphere; and, Region III, Asia excluding the Soviet Union. In order to avoid frequency interference the ITU has sought to allocate nonadjacent bands in the spectrum to different kinds of service. Thus, the major processes to avoid interference are to grant spectrum occupancy on the basis of region and frequency. Another means is to effect allocations for fixed periods of time of broadcast. With the advent of the space age the ITU, in 1959, designated “use” as another basis for allocation, and made reference to allocations for space research.

155 Haley, “Space Age Presents Immediate Legal Problems,” First Colloquium 14. He said “On no occasion did the USSR apply to the appropriate agencies of the International Telecommunication Union at Geneva for permission to use the frequencies * * *. [t]he appropriate agencies of the * * * Union were not officially notified of the use of these frequencies by the Sputniks.” Ibid. 15. The Soviet Union is a member of ITU. Compare, Haley, “Law of Outer Space—Radio Controls Urgently Needed,” Space Law, A Symposium 458; Haley, “A Basic Program for the 1963 Extraordinary Administrative Radio Conference on Space Communications,” Legal Problems of Space Exploration, A Symposium 694-695; Bloomfield, “The Prospects for Law and Order.” in Bloomfield, ed., Outer Space 169 (1962).
Obviously, satellite communication systems must not interfere with each other, and matters must also be arranged so that other uses of microwave radio—uses that have nothing to do with satellites—will not interfere with and overpower the faint signals from space.156

From the point of view of limitations imposed on pure research, the views of Goldberg are pertinent. He has said that “Man-made interference caused by radio transmitters on the earth and in satellites constitutes the most serious kind of threat to radio astronomy from which it may be possible to escape by putting radio astronomy observatories on the other side of the moon.”157 In order to forestall unreasonable radio interferences with space activities, the United States Navy has engaged in the use of intricate electronics systems to detect radio interference with satellite launching operations. Naval aircraft “make antenna pattern and/or miscellaneous field strength measurements, using radio interference and field intensity meters with associated open recorders, in their primary role as frequency interference control.”158

Interference with assigned frequencies may take several forms. It may be the product of inadequate equipment so that broadcasts are unable to maintain the allocated wave lengths. The interference may result even when suitable equipment is used because of a belief that broadcasts on shared frequency assignments will be minimal as a result of distances between broadcast points or other considerations. On the other hand, the interference may be intentional—i.e., jamming. Jamming may take several forms such as efforts to prevent reception of broadcasts in the territory of the state doing the jam-


157 Goldberg, “Studying the Universe from a Space Platform” in Ramo, ed., supra note 2, at 130. The conflict between scientific and commercial uses of radio frequencies comes into focus with regard to radio astronomy research, particularly when conventional radio services may be requested to vacate assigned bands with the possible abandonment of costly equipment. This in turn would require difficult negotiations to establish new commercial frequencies. “Policy Planning for Space Telecommunications,” and “Radio Frequency Control in Space Telecommunications,” Committee on Aeronautics and Space Sciences, U.S. Senate, 86th Cong., 2nd Sess., 1960. For two important recent studies of space communications see Haley, Space Law and Government 159-232 (1963), and Reiger, Nichols, Early and Dews, Communications Satellites: Technology, Economics, and System Choices 1 (1963).

ming, or in other areas. This may be accomplished either by jamming the broadcast at its source or at the point of reception. Jamming radio transmissions passing through superjacent airspace or outer space in order to forestall receipt of the broadcast by the intended receiver is also possible—especially when the intended receiver is situated at a place other than on the surface of the earth or within the territory of the jamming state. Such efforts are generally considered to be politically motivated and reflect the protection of such important national interests as peace, security, self-defense, ideological preferences, and perhaps others. Such efforts contribute to closed societies.

Important legal considerations condition and affect jamming procedures. Where nationally licensed broadcasts fail to conform to ITU promulgated frequencies, either by reason of inadequate broadcast equipment or by reason of intentional departure from such allocations, a prima facie case of breach of treaty or convention would exist. As in any other express agreement, the principle of pacta sunt servanda would be applicable. A state having received frequency allocations has the duty to require all operators within its territory—licensed or unlicensed—to conform to such allocations and to its implementing national laws. Frequency allocation agreements, being based on the exchange of bargained benefits and detriments, constitute the basis for valid rights and duties.

The 1959 Geneva ITU Radio Regulations promulgated frequency assignments for space and earth-space services. These were restricted to use for research purposes only, and no definition of research was made. However, these frequencies were typical in that they were allocated subject to a duty to avoid "harmful interference to the services rendered by the stations of another country." In this regard, it has been suggested that research purposes would not include "navigation, weather reporting, and commercial communications."

159 ITU Radio Regulations and Additional Protocol, Geneva 1959, TIAS 4893. 160 Ibid., Article 3 "General Rules for the Assignment and Use of Frequencies," especially paragraphs 113-117. As noted previously, the duty to avoid "harmful interference" with frequency assignments is fundamental to regulated broadcasts.

161 Estep and Kearse, "Space Communications and the Law: Adequate International Control after 1963?" 60 Michigan Law Review 887 (1962). The authors qualify the foregoing by observing, "It has been suggested that these systems would not be forbidden per se, but merely would not be given protection and would be required to protect from harmful interference the services operating according to ITU Radio Regulations. See Glazer, "The Law-Making Treaties of the International Telecommunication Union Through Time and in Space," 60 Michigan Law Review at 290, n. 72. Ibid., 887, n. 63.
The 1959 Regulations also made provision for the enforcement of allocations. Article 15 is entitled “Procedure in a Case of Harmful Interference,” and Article 16 deals with “Reports of Infringements.” When the infringed-upon state notifies the infringing state of an interference, the latter is obliged to stop the interference. If the infringing state does not end the interference, paragraph 716 of Article 15 provides that “the administration concerned shall forward details of the case to the International Frequency Registration Board for its information.”

Since harmful interference may be intentional as well as unintentional or accidental, and since the ITU possesses no effective coercive means to forestall or eliminate such unpermitted conduct, injured states and other users are obliged to look elsewhere for the effective redress of grievances. Outer space communications are complicated by the fact that space vehicles may be manned as well as unmanned, and harmful interference with communications by anyone for whatever cause could seriously prejudice the life of the astronaut, as well as the success of his mission. There would be little time to resolve the matter in a judicial or quasi-legislative-executive forum, such as the World Court or the United Nations. Reciprocal conduct against the entity engaging in or permitting the interference might not be possible, if it did not have the same or similar kind of satellite in orbit. Jamming of the interfering broadcast would probably not be helpful, but might, in fact, make communication with the subject astronaut or space vehicle all the more difficult. Meticulous adherence to assigned frequencies, based on the expectation of reciprocal benefit, would seem to be required under such circumstances. The easy availability of unilateral measures will provide for respect for spectrum allocations.

On the other hand, where there is a grave suspicion on the part of a state that the space vehicle—either manned or unmanned—is engaged in a nonpeaceful purpose, i.e., an aggressive and nonbeneficial activity, then a form of radio interference would unquestionably be considered to be a minimum reasonable response to the actual or apparent harm to national security. Under the assumed condition of extreme provocation, it is clear that even more drastic action would be permitted to the threatened state on the basis of its inherent right of self-defense.

162 TIAS 4893. Pursuant to Article 9, Section VII, the Board may make studies and recommendations. The aggrieved state may, under certain conditions, be able to obtain new frequencies. Neither the Board nor the ITU is equipped to prevent a state from continuing a harmful interference.
However, a more difficult problem is to determine under what conditions, if any, there may be a legal interference with radio broadcasts, either to or from space vehicles, when there appears to be no reasonable prospect of aggressive national conduct. The Soviet position relating to purported propaganda broadcasts has already been noted.\textsuperscript{163} Further, the Soviet Union has recorded its opposition to observational activities of space vehicles, and has labeled such conduct “espionage,” and has put forward a view—generally unsupported—that such observational activity is in violation of international law.\textsuperscript{164} Jamming would most probably be resorted to in both instances, but probably with less practical effect in the latter instance because space vehicles can store up recorded data for transmissional release upon command under favorable circumstances. However, it may be anticipated that, as time goes on, technological means may be used to forestall either the storing or the read-out processes.

Some guidance may be obtained on this issue from the work of the United Nations and from customary international law. The report of the Ad Hoc Committee on the Peaceful Uses of Outer Space, July 14, 1959, assigned a high priority to the allocation of radio frequencies for peaceful space uses. It stated:

13. It was recognized that there are stringent technical limits on the availability of radio frequencies for communications. The development of space vehicles will pose new and increasing demands on the radio spectrum. It was emphasized that rational allocation of frequencies for communications with and among space vehicles would be imperative. In this way, what might otherwise come to constitute paralyzing interference among radio transmissions could be avoided.

15. Attention should also be given to the desirability of terminating transmissions from space vehicles once these transmissions have outlived their usefulness. Such a measure would help conserve and make optimum use of the frequencies which are assigned for space communications. In considering this problem, it would be necessary to balance this factor against the interest in conserving a means for continuous identification of space vehicles.\textsuperscript{165}

\textsuperscript{163} Supra, pp. 271–275, 295–300.
\textsuperscript{164} Supra, pp. 271–295, 368.
\textsuperscript{165} U.N. Doc. A/4141, 24. Annex 20, infra, p. 472. Paragraph 14 called attention to the capabilities of the ITU. With respect to signals emanating from spacecraft, it is generally thought that these may be given a life of many hundreds of years.
Implementation of these recommendations has become the special responsibility of the U.N. Committee on Peaceful Uses of Outer Space. It has sought to stress the need for a structured legal regime for space communications by receiving national proposals and through discussions which have been largely conducted in its scientific and technical subcommittee. The proposed principles have been formulated in the most general terms, unlike proposals for the rescue of astronauts, apparently based on the view that the ITU is responsible for promulgating detailed regulations.

Thus, the United States Draft Declaration of Principles Relating to the Exploration and Use of Outer Space, December 8, 1962, commends to states for their guidance that:

1. Outer space and celestial bodies are free for exploration and use by all States, on the basis of equal rights, in conformity with international law; [and]
2. In the exploration and use of outer space and celestial bodies, States are bound by the relevant rules of international law and the relevant provisions of international treaties and agreements including the Charter of the United Nations.\(^\text{166}\)

By reference to international agreements, the provisions of the ITU conventions dealing with harmful interference must be taken into account. Furthermore, under the Charter considerations affecting the maintenance of international peace and security and self-defense must also be considered as applicable.

The Draft Declaration of Basic Principles Governing the Activities of States Pertaining to the Exploration and Use of Outer Space submitted by the United Kingdom on December 4, 1962, also has general relevancy. Article 1 provided:

Outer space and celestial bodies are free for exploration and use by all States in conformity with international law. This freedom shall include free navigation by means of space vehicles, the establishment of space stations and other like devices, the conduct of scientific research, and the landing on and exploration of celestial bodies, and shall be exercised by all States with due regard to the interests of other States in the exploration and use of outer space, and to the need for consultation and co-operation between States in relation to such exploration and use.\(^\text{167}\)

The U.K. proposal also noted the applicability of the Charter, international law, and "other international agreements which may be

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applicable," 168 This proposal has taken into account the practical problems involved in the use and exploration of outer space, and clearly indicates that space activities can not be conducted successfully without employing adequate and effective communications facilities. While due notice is taken of the role of the ITU, the affirmative need to protect, facilitate, and enlarge space communications capabilities is recognized in this draft.

The draft Code for International Co-operation in the Peaceful Uses of Outer Space submitted by the United Arab Republic in March 1962, also broadly suggested principles respecting space communications. The Code sought to establish the following points for guidance:

1. The activities of Member States in outer space should be confined solely to the peaceful uses;
2. In their policies toward outer space Member States should promote international peace and co-operation. 169

The general tenor of these three proposals favors the broad use of outer space for peaceful purposes, and subsumes the fact that effective use must take into account the presence of adequate communications facilities. All illustrate a strong conviction that activities undertaken must be based on a reciprocity of interests, including due regard for the interests of others.

The Soviet Draft Declaration of the Basic Principles Governing the Activities of States in the Exploration and Use of Outer Space, as amended in April 1963, incorporated many of the points noted in the United States, United Kingdom, and UAR proposals. However, no reference was made to the applicability of pertinent international agreements other than the U.N. Charter. Two Soviet views call for special comment. First, paragraph 5 provided that “The use of outer space for propagating war, national or racial hatred or enmity between nations is inadmissible.” 170 As noted previously, this suggestion is based on the Soviet policy of maintaining a closed society, and involves the very serious legal difficulty of realizing an acceptable internationally sponsored definition of the substance of “propagating” or “propaganda.” 171 Second, paragraph 6 of the Soviet proposal contained the following language: “Any measures that

168 Ibid.
might in any way hinder the exploration or use of outer space for peaceful purposes by other countries may be implemented only after prior discussion of and agreement upon such measures between the countries concerned." While this provision was apparently aimed at the West Ford copper needle project of the United States, it might also serve as a means of forestalling and interdicting harmful interference with peaceful uses of communications facilities in outer space.

General Assembly Resolutions relating to the peaceful uses of outer space have not made specific provision for communications practices by space vehicles. Nonetheless, Resolutions 1721 (XVI), 1802 (XVII), and 1962 (XVIII) anticipated the fullest use of communications capabilities for the successful use and exploration of outer space. Thus, the 1961 Resolution of the General Assembly, 1721 (XVI), announced support for the ITU’s program of allocating radio frequencies for outer space activities and expressed the belief that communications by “means of satellites should be available to the nations of the world as soon as practicable on a global and non-discriminatory basis.” At this time the U.N. also expressed an interest in an effective communications system so that the organization and the specialized agencies might employ such facilities for operational and informational requirements.

The 1962 Resolution 1802 (XVII), also recognized the role of the ITU in the advancement of efficient space communications. The Resolution took account of the fact that “communication by satellite 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 among the peoples of the world.” In 1962, as in 1961, the General Assembly acknowledged that it was of utmost importance that the ITU allocate radio frequency bands for space facilities adequate to meet expected outer space needs.

With this encouragement the Space Radio Communication Conference of the ITU, officially known as the Extraordinary Administrative Radio Conference of the International Telecommunication

173 Supra, pp. 302-304, 314. The Soviet Union like the United States, has engaged in high-altitude nuclear tests. The United States has, through its Argus experiment, obtained data related to military activities. The problems of reviewing in advance with the international scientific community prospective experiments is considered in a study conducted by the United States Space Science Board. “A Review of Space Research,” Publication No. 1079, National Academy of Sciences-National Research Council 16-14, 16-15 (1962).
tion Union to Allocate Frequency Bands for Space Radio Communications, met in Geneva in October and November 1963. The purpose of the conference has been described by Congressman Harris of Arizona, who attended, as seeking to “secure agreement internationally with respect to the allocation of frequencies in the radio spectrum for satellite communications, space research, navigational satellites, meteorological satellites, telecommand, telemetry, tracking of space vehicles, amateur radio, and radio astronomy.”174

The achievements of the conference were noted by President Kennedy on November 20, 1963, at which time he called attention to the fact that frequencies had been allocated for the foregoing purposes and that procedures had been adopted governing the use of such frequencies.175 The American delegation concluded that the various allocations were necessary to the development of a single global commercial space communications system, with nondiscriminatory access open to all nations, as well as to the advancement of the foregoing space needs.176

The conference agreed to set aside 2800 megacycles for communications satellite services, some 1200 more than initially suggested by the Soviet Union. Further, the conference decided that such allocations should be available for immediate use, subject, as was typical, to the monitoring of actual use by the ITU’s International Frequency Registration Board.177

Ambassador Joseph H. McConnell, chairman of the United States delegation, summed up the need for an effective international understanding on frequency allocations when he stated that the “orderly development and operation of the space programs of the United States and other nations will depend in large measure on the agreements reached at this conference. Adequate communications, protected from harmful interference, are essential to continued progress.”178 Regrettably, for the first time in the history of international radio regulation a Western Hemisphere (region 2) nation (Cuba), refused to accept the radio frequency allocations agreed to by other Western Hemisphere nations. According to Ambassador

174 110 Congressional Record 160 (January 9, 1964).
176 Ibid.
177 Ibid., 162.
178 The communication-satellite service allocation, consisting of 2,675 megacycles on eleven bands, almost all of which must be shared with existing services, is set forth for regions 1, 2, and 3 at ibid., 170. The Western Hemisphere consists of region 2.
McConnell, the United States was reluctantly obliged to file a reservation to the Cuban action. He stated that "because of important radio and space operations in the Caribbean area which are dependent upon frequency bands agreed to throughout the hemisphere, the U.S. delegation could not place the United States in the position of having to honor Cuban radio operations which do not conform to the frequency allocations acceptable to all other delegations from region 2." 179

The December 24, 1963 Resolution of the U.N. General Assembly, 1962 (XVIII), expressed only in general terms that body’s substantial interest in an effective system of communications with space objects. Nonetheless, the 1963 principles which had been the product of extended discussion and consideration over a period of years included the solemn declaration that "4. The activities of States in the exploration and use of outer space shall be carried on in accordance with international law, including the Charter of the United Nations, in the interest of maintaining international peace and security and promoting international co-operation and understanding." The liability provisions of the 1963 Resolution asserted that states bear "international responsibility for national activities in outer space, whether carried on by governmental agencies or by non-governmental entities **. The activities of non-governmental entities in outer space shall require authorization and continuing supervision by the State concerned." Paragraph 8 of the resolution provided that where a space object causes harm a condition of international liability for damages will exist. Although no discussions, other than on the subject of propaganda, have been held relating to the harms resulting from an improper use of communications on board such an object, as contrasted with the object per se, it could well be that this principle is adequate to cover situations other than those of physical collision or impact directly causing harm or damage.

Further, Article 6 of the 1963 Resolution sets forth the principle that "In the exploration and use of outer space, States shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space with due regard for the corresponding interests of other states." At the very least this would require consultation between states as to the prospect of misuse of

179 The United States indicated in the additional protocol, as a part of the final act of the conference, its declaration that it could not accept "any obligation to observe the exception claimed by Cuba in those footnotes to the table of frequency allocations which were adopted by the present conference and which specifically named Cuba." Ibid., 173.
allocated radio frequencies and communications systems. The ITU provides an institutional means whereby cooperative procedures may be used in order to maximize radio and other communications facilities in outer space.

However, as is well known, the Soviet government has demonstrated much concern that radio broadcasts might carry propaganda type information. Although assurance against such conduct was announced as a principle of acceptable space conduct in the 1963 General Assembly Resolution, it has been the practice of some states, including the Soviet Union, to engage in jamming procedures for ground-to-ground radio broadcasts.

At this time there appears to exist some doubt as to what type of "material" may be broadcast and what type of transmissions a receiving state may object to. Until such details can be agreed upon, it would appear that the traditional practices will continue, namely, states will accept responsibility for maintaining circuit discipline, thereby preventing and punishing gross distortions which might result in loss of life at sea, in the air, or in outer space, but they will continue to determine for themselves the content of broadcasts which will remain unregulated and uncensored. Receiving states confronted with policies of secrecy and with accentuated notions of a communications "right of privacy" will endeavor to engage in jamming procedures to prevent broadcasts coming down to them from outer space. Other states may endeavor to interdict transmissions through their airspace.

The vagueness of the legal situation is suggested by Estep and Kearse who have analyzed the customary international law inhibiting "transgression by radio-waves." It is their conclusion that it is an "accepted principle of customary international law that a state has the right to object to transgression of its territory of offensive radiowaves of foreign origin." The means of protest according to these authors are restricted to diplomatic protest or to interference with the transgressor's radio signal, e.g., by jamming. In this connection they state:

The latter is the state's only unilaterally effective means of enforcing its sovereign right to exclude a signal from its territory. The right to jam bears with it the duty, so far as possible,

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180 Estep and Kearse, supra note 161, at 876. A dictionary definition of "transgression" suggests "violation, infringement, breaking" and a "transgressor" as one who has "stepped across." These authors have explored the writings of Briggs, Hyde, Jessup and Taubenfeld, Lauterpacht-Oppenheim, and Stenuit, ibid., at footnotes 8-10.

181 Ibid.
not to transmit with so much power that reception of the signal is prevented in other states; however, it has been suggested that if reception in other innocent states is interrupted unavoidably, the right to jam has not been abused. Moreover, a state is entitled to jam an offending signal even though its jamming signal must obliterate radio communication on that frequency within the territory from which the transmission emanates.\footnote{Ibid. It is their view that the jamming by one state of another state's internal radio broadcasts at a time when radio was the only available means by which a government could communicate with its own nationals at home is a clear violation of international law.}

These authors suggest two theories on which a state could support jamming in order to inhibit the presence within the responding state of offensive radiowaves of foreign origin. Under the first theory, jamming would be a valid national response to the invasion by a foreign state of its sovereignty in its superjacent airspace. Under the second, such jamming might be undertaken in the interests of national security, based on the premise that a state may punish crimes against its security even though they may be instituted outside of the territory of the harmed state.

The first theory is regarded as inadequate by its proponents who argue that "to base the right to jam solely on the ownership of airspace is to assume a context artificial for the purposes of regulating radio transmission. Since radiowaves do not in fact observe airspace as a controlling boundary, airspace alone should not govern the right to use or jam them."\footnote{Ibid., 877.} Whatever the merit this theory may possess for airspace, it is completely inapplicable in the present context, since the airspace is not outer space, and different legal conditions prevail. While states exercise sovereign control over their superjacent airspace, it is generally recognized that outer space is res communis omnium. As such, like the high seas, it is available to all for peaceful use, and subject to such controls as may be established under international law. The theory is also inadequate to the needs of space law in that it deals with radio broadcasts emanating from the territories of states, whereas much radio broadcasting affecting outer space and terrestrial areas will emanate not from land, on the sea, or in the air, but will come from very distant points in outer space.

The theory of protecting national security by means of jamming appears to be a sounder one, particularly when there has been a careful delineation of occasions where collective action will be preferred over unilateral action. The security theory focuses on the
nature or quality of the signal rather than the place from whence it emanates or the medium through which it passes. Thus, if a radio signal or a series of them were to constitute a grave and unacceptable threat to the security of a state, the inherent right of self-defense recognized in Article 51 of the U.N. Charter could be relied on in support of the response by jamming.

Pursuant to this theory, the response by jamming might be instituted against the unpermitted signal after transmission had been initiated and, on the basis of all reasonable facts, might also be employed in a preventive or precautionary manner prior to any actual transmission. It has been suggested that the direct jamming of another state would result in a violation of the latter's sovereign rights. However, this need not impose a paralyzing limitation upon the state which is seeking to protect itself. The fact that legal principles appear to be opposed to each other merely calls for the impressing of significant values on such principles so that no unreasonable or unpermitted harm need befall any state. This is recognized by Estep and Kearse who state that "Only if the offending broadcast were an act of the other government or condoned by the government would it seem that a direct jamming of the transmission would not constitute a breach of the duty * * * not to infringe on the sovereignty of another state." Where the offending broadcast is initiated from a satellite in outer space, and jamming is applied to such a transmission, it would appear that there would not be an infringement on the sovereignty of the broadcasting state. This is true even though there seems to be general agreement that the launching, operating, or using entity retains both property and possessory rights in the orbiting vehicle both while it is in space as well as when it has come to rest on land or water surfaces of the earth. The same legal principle of security would apply to radio spectrum management involving the transmission of signals from within one state to another and to transmissions from one operating satellite to another, or to the earth. Since the product of effective interruption of communications is the same whether the transmission is initiated on or within the territory of a state or in outer space, the legal result should also be the same. This can be realized by recognizing the inherent right of self-defense. It might also be supported by the right to maintain international peace and security. The right in this context would be implemented by recognition of the power to jam unreasonable broadcasts both because of the substance and because of use of nonauthorized broadcast

184 Ibid., 878.
185 Ibid.
bands. The provocation would have to be actual, or imminently threatened, aggressive conduct; the responsive defensive action would have to be reasonable and proportionate to the threat.\textsuperscript{186}

The prospect that states may deem it necessary to engage in the jamming of broadcasts to and from satellites in outer space is so bleakly probable that many commentators have called for the negotiation of express agreements specifically relating the principle of peaceful uses of outer space to such broadcast capabilities. These proposals are based on the premise that there is a need to improve the existing self-enforcing terms of the ITU Radio Regulations, which largely depend upon disruptive radio conduct as a response to nonconformity on the part of a violating state.

Proposals for a structured legal regime in outer space for radio, resulting from the employment of satellite communications, place central emphasis on the duty of launching states to register satellites and satellite radio data with the United Nations. Glazer has suggested the following considerations:

In order to qualify for the protections set forth in the ITU Convention and Service Regulations, nations involved in launching space vehicles would be required to furnish the United Nations with technical details of the vehicles or systems to be launched and their intended purposes. Upon approval of such purposes, the United Nations would ‘register’ the vehicle or system. Radio signatures for ‘registered’ vehicles or systems would be provided by the ITU and the vehicles or systems identified in an official international document through publication of their frequencies, and their orbital and other technical characteristics. Vehicles or systems not ‘registered’ by the United Nations would be deemed by operation of law as containing ‘military radio installations,’ and as such not entitled to protection from harmful radio interference whether caused deliberately or unintentionally. Abuses caused by ‘registered’ vehicles or systems could be corrected by revoking through notice and publication their international radio signatures, after exhaustion of administrative due process and a right of appeal to the International Court of Justice.\textsuperscript{187}

Furthermore, Haley has summarized this need by stating that “Within the framework of the pertinent international treaties, lawful use

\textsuperscript{186} For a more detailed development of this rationale see supra, pp. 341-351.

must be made of radio frequencies for all forms of astronautical communications.”

Efforts have been made to bring into focus in international forums the serious problems confronting the users of space communications in their varied scientific, commercial, and military uses. As reported above, the General Assembly of the United Nations on December 20, 1961, in the well-known resolution entitled “International Co-operation in the Peaceful Uses of Outer Space,” took into account the fact that communication “by means of satellites should be available to the nations of the world as soon as practicable on a global and non-discriminatory basis.” The resolution took note of the need for effective communications by space satellites, the role of the ITU in conjunction with such international organizations or agencies as the U.N.’s Special Fund, the Expanded Program of Technical Assistance, UNESCO, and COSPAR. The resolution expressed the satisfaction of the General Assembly that in 1963, the ITU would hold a special conference “to make allocations of radio frequency bands for outer space activities.” As a result of the resolution the ITU has prepared reports for the U.N. Economic and Social Council and for the General Assembly. These reports have been made available to the Committee on the Peaceful Uses of Outer Space, and on several occasions a representative of the ITU has appeared before the latter committee or the First Committee to explain the objectives of the 1963 ITU Extraordinary Administrative Radio Conference. On one occasion the ITU representative referred to the 1963 conference as a technical one and that the “technicians of the various members of the Union who will participate in it will obviously be experts on frequency assignments, which, of course, is the prime object of the conference.” In 1962 the ITU representative indicated that “the main task of the Conference will be to consider the allocation of radio frequency bands for operational earth satellite systems, to-

190 Ibid. The 1962 General Assembly Resolution 1802 (XVII), expressed the view that “it is of utmost importance that this Conference make allocations of radio frequency bands sufficient to meet expected outer space needs.” U.N. Doc. A/RES/1802 (XVII). Annex 3, infra, p. 446.
gether with bands for telemetry command and control facilities necessary for such systems.\textsuperscript{192}

The U.N. has also been kept advised of developments in space communications through the International Council of Scientific Unions' Committee on Space Research. COSPAR, in conjunction with other of ICSU's committees, such as the International Scientific Radio Union, the International Astronomical Union, and the International Union for Geology and Geophysics, has displayed much interest in the development of systems of space communications, and has been used to provide technical information to both of the sub-committees of the Committee on the Peaceful Uses of Outer Space. COSPAR has also worked closely with the ITU, and was permitted to send an observer to the 1959 Ordinary Administrative Conference of that body. Subsequently, COSPAR was granted permission to work with the ITU's International Radio Consultative Committee, particularly in the fields of space systems and ionospheric propagation.\textsuperscript{193} COSPAR's influence is extensive not only because of its liaison with ITU and the U.N., but primarily because the national scientists included in its membership exchange information on a world-wide basis and are influential in the consultations carried on in every state.

The ITU has received the confidence and respect of its member states.\textsuperscript{194} This was also demonstrated in the 1962 Dryden-Blagonravov understandings relating to cooperation in communications experiments by means of a United States Echo type satellite. The agreement took particular note of the role of the ITU and made provision for a program "for the working out with other nations of

\textsuperscript{192} U.N. Doc. A/AC.105/PV.14, 27. The ITU submitted a report to the U.N. in 1962 as a result of Resolution 1721 D (XVI). U.N. Doc. E/3645. "The report stresses the fact that telecommunication is not only involved and essential in practically all uses of outer space, but that space systems will provide new telecommunication facilities for terrestrial requirements, new meteorological data to be used in improved weather forecasting and new navigational aid facilities for ships and aircraft." U.N. Doc. A/5181, 2. Attention was also called to relay satellites, direct broadcasts to earth from satellites, radio astronomy, and allocation of bands for telemetry and the foregoing purposes.

\textsuperscript{193} 2 COSPAR Information Bulletin 4-5 (June 1960). COSPAR also maintains a working group on tracking and telemetry with a subgroup on Radio Tracking and Telemetry.

\textsuperscript{194} This is clearly borne out by the discussions conducted in the scientific and technical subcommittee of the Committee on the Peaceful Uses of Outer Space in 1962 and subsequently. U.N. Docs. A/AC.105/C.1/SR.1 and following.
a project for an experimental global system of space communications with due regard to the recommendations of the ITU."  

There has been recognition on the part of Soviet bloc writers of the need for an orderly legal regime for radio communications in outer space. One writer has called attention to the need to "secure an interference-free operation of radio equipment on spaceships and satellites and to avoid interference with other radio stations on the Earth by stations from space." A leading American observer of Soviet space law attitudes has summarized the Soviet viewpoints:

(1) allocation of radio frequencies is an acute problem of common concern to all nations, particularly to the Soviet Union and the United States; (2) success or failure of scientific space exploration and the application of its results depend critically on a solution of this problem; (3) the Soviet Union has been fully aware of the potential value of space communications and has encouraged its development; (4) the principle of sovereignty is the most important element in Soviet thinking on the legal aspects of space communications; (5) the Soviets assert the right of unrestricted use of radio frequencies so long as no harm to other states can be proven; (6) yet, owing to the complexities of space communications, they presumably hold, at least in the view of Dr. Busak, that multilateral conventions will be needed when the problem becomes acute; and (7) the universally acknowledged complexities of space communications suggest the possibility that future international agreement may be reached if vital Soviet political interests dictate such a course, thereby contributing to an emerging body of international space law.

The position of the United States was put forward in 1963, by Deputy Assistant Secretary of State Gardner. He has cited the Communications Satellite Act of 1962 as defining United States objectives in space communications. This statute has demonstrated the interest of the United States in the early operation of a com-

195 U.N. Doc. A/C.1/880, 5. The agreement also contained the following language: "Telecommunications by means of satellites is expected to lead to a considerable improvement of communications facilities all over the world and can be a most important contribution to the extension of contacts and friendship among nations." Ibid., 3.

196 Busak, "Radio Communications in Outer Space," Legal Problems of Space Exploration, A Symposium 1127.

197 Kucherov, "Soviet Attitude toward International Law and Outer Space," Chapter VI in Soviet Space Programs, supra note 82, at 215. The Kucherov reference to Busak is cited in the preceding footnote.

communications satellite system and recognizes the need to make efficient use of the restricted number of radio frequencies available for space communications. 199 In Gardner’s view an express international agreement would best serve the needs of efficient space communications. He stated, “Agreement on the reservation of an adequate part of the frequency spectrum for space communication, and the establishment of ground rules which will assure noninterference of space communications of different countries with each other or with other services on earth, are an obvious prerequisite to progress.” 200 Unlike Busak, who suggested that such express agreements should be multilateral, it was Gardner’s opinion that a functional rather than a doctrinaire approach was required. This could result, in his view, in different kinds of arrangements, which could be either bilateral and regional as well as multilateral.

Implicit in the views of all who have written on the subject of space communications is the belief that no state or other person should engage in harmful interference so long as space vehicles are being used for peaceful, i.e., nonaggressive and beneficial, purposes. The most general demand has been for the express allocation and subsequent international control of radio frequencies. Furthermore, specific demands have been voiced that spacecraft shall not transmit radio messages which may interfere with other telecommunications systems. It has been frequently suggested that transmissions from spacecraft shall be terminated when the mission of the satellite has been completed. 201 The Committee on Aeronautics of the Association of the Bar of the City of New York has put forward the following principle for radio spectrum management:

The High Contracting Parties agree to take all measures necessary:

(a) within the International Telecommunications Union, to assign and allocate spectrum bands so as to avert undue interference between radio transmissions to or from space and other radio transmissions;


200 Gardner, op. cit., 743.

201 Magna Carta of Space, Resolution Adopted by the Twelfth Conference of the Inter-American Bar Association 3 (1961); Davies Draft Code of Rules on the Exploration and Uses of Outer Space 12.
(b) to assure, by appropriate devices for cut-off, detonation, or other means of termination, that radio transmitters in space craft will not outlive their period of useful activity;
(c) to notify the International Telecommunications Union upon the termination provided in subparagraph (b) above.202

The need to prevent harmful interference in radio transmissions to and from space vehicles must not only be accepted as a central principle of the law of outer space, but there must also be a sufficiently precise express agreement detailing the rights and duties of those engaging in broadcasting. There is a need for greater legal precision in allocating rights, and for conforming to allocations. The need to clarify procedures whereby a state injured by harmful interference may take appropriate legal action to correct the injurious conditions is also paramount.

The criticality of interference during an operating situation necessitates immediate responses which are likely to remedy the wrongful interference. The seriousness of this situation has been described by Pierce. He said that "if orientation is achieved or influenced by command, there is an added hazard that the system will be activated by a foreign transmitter. If elaborate codes are used to avoid this, there is a great hazard that malfunction will make the equipment unresponsive to legitimate commands. These are not idle worries; space payloads and command systems have been sadly fallible in practice."203

Glazer has warned if mankind is to enjoy effective communications through the use of space satellites, and if such satellites are to engage in the functions for which they have been designed, that it will be necessary for states to make provision in international communications agreements for rules which are different both in kind and degree from earlier ones. In comparing past efforts with present needs, he has stated that the older "equivocal regulations satisfying all of the nations all of the time may not prove technically reconcilable with the uses of radio for command and orientation of space vehicles, destruction of perilously errant vehicles, and safety of rocket-borne astronauts."204 For all of these reasons a suitable express international agreement is urgently needed. Until such an agreement is negotiated and becomes operational, cooperative measures among states will be required to forestall or minimize violations

204 Glazer, supra note 161 at 310.
of the basic principle prohibiting harmful interference. To the extent that states engage in practices which result in harmful interference to vital space communications, it will be necessary for the injured state to employ all measures of redress permitted by international law. These measures range from mere protest to such reasonable and peaceful measures, involving a minimum of coercion, as may be required to insure compliance with the principle. The joint sanctions of reciprocity and potential retaliation would probably protect the principle except in cases of unlawful aggression.

D. NATIONAL JURISDICTION OVER OUTER SPACE ACTIVITIES

Jurisdiction as used herein means the "capacity of a state under international law to prescribe or to enforce rules of law." For these purposes, the position of the United States that international law applies to relations among states in outer space is adopted.

National jurisdiction relating to space activities may be considered under the traditional categories of territory as a basis for jurisdiction, nationality as a basis for jurisdiction, the protection of other state interests, and the protection of certain universal interests. It will also be necessary to analyze means whereby national jurisdiction may be yielded amounting to the process whereby special exemption from such jurisdiction may be established.

The factual pattern for the following analysis of jurisdiction will be limited to events involving two or more vehicles in outer space and to events on board nationally registered or other legally authorized space vehicles.

National jurisdiction over space vehicles and their activities must be related to the manner in which such vehicles are used and also to the legal base upon which their employment is founded. It is clear that space vehicles have been and will be used for commercial, scientific, and military purposes. Private entities have been engaged in commercial and scientific activities; public entities have used the vehicles for all three purposes. In addition, private persons, states, associations of states, and international organizations are also included as having used or having announced plans for the use of space vehicles.


With the general acceptance that outer space, like the high seas, is a *res communs omnium*, the analogy of the high seas as to jurisdictional rights and duties becomes of considerable significance. Thus, the general approach taken by McDougal, Burke, and Vlasic as to maritime situations has direct applicability to national jurisdictional problems relating to outer space. They have written (the reader may wish to transpose spacecraft for ships and outer space for high seas):

The implementing, jurisdictional principles by which the general community of states seeks to make effective its overriding policies of shared use have long been built, in response to the omnipresent imperatives of harmonious and economic co-operation, about certain allocations of competence which require high certainty and easy prediction in identification of the national character of ships. For interactions upon the high seas, each state has imposed upon it responsibility under both customary international law and by many explicit agreements for the lawful conduct of ships to which it has ascribed its national character; each state may apply its authority to the ships to which it has ascribed its national character and to events occurring upon such ships; each state may protect the ships to which it has ascribed its national character against interferences and deprivations by others. No state may preclude the ships of other states from access to the high seas or directly apply its authority to the ships of other states, except as may be authorized by international law. Every ship is required to have a national character, and scant protection is afforded ships which have no nationality.207 Each of the foregoing four subjects will be analyzed.

207 "The Maintenance of Public Order at Sea and the Nationality of Ships," 54 A.J.I.L. 25 (1960). The authors also take into account the concept of territorial waters where no space law-sea law analogy exists, despite the need for a doctrine of "space innocent passage" whereby a spacecraft might be permitted to transit through another state's sovereign airspace while departing from or returning to the earth's surface while engaged in peaceful, i.e., non-aggressive and beneficial, purposes. Thus, excluding at this time any analogy between territorial waters and outer space, and considering only the situation where a foreign spacecraft is situated within the territory of another state, the final sentence of McDougal's views have applicability to jurisdiction over spacecraft, namely, "For interactions within their internal waters and territorial sea, coastal states are of course authorized to assert authority over ships of other states for the protection of their exclusive interests, but states which have ascribed their national character to these ships are also conceded a limited concurrent jurisdiction for the protection of their interests." *Ibid.*, 27. Compare McDougal, Lasswell and Vlasic, *supra* note 1, at 646-749.
1. Territory as a Basis for Jurisdiction

As is well known, the territory of a state consists of its land, internal waters, territorial waters, the seabeds underlying such waters, the subsoil below these seabeds, and its superjacent airspace. It is also accepted that there is an approximately fixed, but yet to be determined, point separating the airspace from outer space. In this connection it should also be noted that whereas there is a “right of innocent passage” for surface vessels through the territorial waters of another state, there is no right of innocent passage for aircraft through the airspace above those waters. As to space events taking place in the foregoing areas, and affecting the subjacent state, there can be little doubt that the state exercising sovereignty therein will expect to exercise territorial jurisdiction.

The concept of territory serves as a positive basis whereby international law confers to states the right to exercise jurisdiction. Such jurisdiction may be over criminal matters or over civil matters. The basis of territory, as one among several possibilities, has the merit of affording jurisdiction to a state which is well able to prescribe punishments or award damages as a result of its singular possession of persons and facts. Under this theory of jurisdiction, it is extremely probable that the prescribing state will have available under its control the persons and most or all of the essential evidence required for legal judgment.

However, a state’s jurisdiction to prescribe need not be exclusive under the territorial principle. As is well known, when national vessels or aircraft or members of a national force are in a foreign state, the state of which they are nationals may impose certain rules upon them. This is treated in section 32 of the Restatement of Foreign Relations Law under the heading “Jurisdiction to Enforce Aboard National Vessel or Aircraft or Against Member of National Force.” It provides that “A state has jurisdiction, as to rules within its jurisdiction to prescribe, to enforce them (a) aboard a vessel or aircraft having its nationality while under the control of its commanding officer; and (b) against a member of its military forces.”

Comment on this proposition follows:

The enforcement action which a state has jurisdiction to take under the rule stated in this Section includes enforcement action in the territory of another state. It is immaterial that the person involved is not a national of the state taking the action.

Although a state has enforcement jurisdiction under the rule

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208 Restatement of Foreign Relations Law, supra note 205 at 92-93.
stated in this Section, it may not exercise that jurisdiction in
the territory of another state (except in the case of a vessel in
innocent passage) without the express or implied consent of the
territorial state; to do so would be a violation of the rights of
the territorial state under international law.209

Although the Restatement limits the application of the foregoing
rules to nonspace entities or personnel, it should, nonetheless, fol-
low that where a public spacecraft, engaged in peaceful activities,
comes to rest in a state other than that of nationality, it should be
entitled to the same treatment as the recited individuals or entities.
In the event that a foreign public space vehicle comes down on the
territory of another state as the result of bona fide distress, the
case would appear to be even clearer against the exercise of jurisdic-
tion over the internal affairs of the space vehicle by the territorial
state.210

These, of course, are exceptions or variations on the central rule
that a state has jurisdiction to enforce within its territory rules of
law which are validly prescribed by it. Thus, where a spacecraft
causes damage as a result of its coming into the territory of a foreign
state, the latter state could validly adjudicate claims presented by
injured persons. The victims might be affected by conflicts of law
problems along their way to ultimate recovery, and would perhaps
have to consider such matters as the enforceability of foreign judg-
ments, choice of law problems, and characterization problems.211 The
victim's government would also be able to pursue diplomatic remedies
or to engage in international litigation.212 Additionally, where space-
craft personnel, when in the territory of another state, or while out-
side the territory of that state, violate the criminal laws of that
state by breaching its peace and good order, through disturbing
public tranquility, they would be subject to the criminal jurisdiction
of that state.213 It has previously been suggested that the manner
of entry into the territory of another state by astronauts is a factor
to be taken into account, and that where such entry is occasioned by
distress, the general principles of humanity should guide the conduct
of the receiving state.214 The general principle of jurisdiction over

209 Ibid., 93.
210 Ibid., 173-175. Compare, McDougal, Lasswell and Vlassic, supra note 1,
at 695-704.
211 Financial Protection, supra note 5, at 78-84.
212 Ibid., 46, 84-85.
213 Wildenhus' Case, 120 U.S. 1 (1887).
214 Supra, pp. 384-394.
aliens would apply under such circumstances. As stated by Brierly, this means that "no state is legally bound to admit aliens into its territory, but if it does so it must observe a certain standard of decent treatment towards them, and their own state may demand reparation for an injury caused to them by a failure to observe this standard." 215

2. Nationality as a Basis for Jurisdiction

Nationality may be the basis for exercising jurisdiction over a legal person, including individuals, corporations, and other private legal entities. The Restatement of the Foreign Relations Law of the United States, placing reliance on the Nottebohm Case, 216 accepted the view that "nationality is not within the absolute determination of a state" under international law so that "an individual has the nationality of a state that confers it upon him provided there exists a genuine link between the state and the individual." 217 Allegiance of the individual must be given suitable weight in determining his nationality, and since the practice at the time of this writing has been to place manned spacecraft under the control of military personnel while in flight, there would not seem to be any question as to the nationality of individual astronauts.

The jurisdiction over astronauts, based on the consideration of nationality, could vary depending—at least in the United States—on whether they were military or civilian personnel. One writer has noted that "the general laws of the United States, either civil or criminal, would not automatically apply to space stations created by the United States. Our statutes do not have extraterritorial application, except to the extent Congress has provided and as recognized by international law. Congress may extend the application of its laws to conduct aboard United States space vehicles and space stations as it has to persons aboard its national vessels and aircraft. The provisions of the Uniform Code of Military Justice, however, would continue to apply to personnel of our Armed Forces while

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215 Brierly, The Law of Nations 203 (4th ed. 1949). Brierly, as have many writers on international law, has placed more emphasis on jurisdiction over areas than on activities conducted in such areas. Ibid., 173–228. However, there has been a general consensus that so far as the high seas are concerned, jurisdiction must pay special heed to its uses. This approach is being adopted respecting space activities.


217 Restatement, supra note 205 at 80-81. For an opposing view see McDougal, Burke and Vlassic, supra note 207, at 25.
aboard spacecraft and space stations, as jurisdiction under the code is personal without regard to physical location.” 218

Although the Restatement does not make reference to the nationality of space vehicles, it does call attention to the provisions of Articles 5, 6, and 7 of the Convention on the High Seas of April 29, 1958. Article 5 provides in part that “Ships have the nationality of the State whose flag they are entitled to fly. There must be a genuine link between the State and the ship ***” Since for the present there does not appear to be the likelihood of “flags of convenience” for spacecraft, the substantial controversy relating to the meaning of “genuine link” will not affect the nationality of space vehicles.219 Such nationality, like that of aircraft, pursuant to Article 17 of the Convention on International Civil Aviation of December 7, 1944, will unquestionably be the product of registration. National laws will make provision that spacecraft have the nationality of the state in which they are registered, and this may subsequently be confirmed in international conventions. A long step has been taken in this direction through the unanimous adoption of General Assembly Resolution 1962 (XVIII) of December 24, 1963, which provided, “7. The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space.” The importance of the “state of registry” approach is seen in the assimilation of registry to ownership and the duty to return objects or component parts “found beyond the limits of the State of registry *** to that State ***”220 subject to the latter state’s furnishing of identifying data upon request prior to return. The nationality principle is also given support in paragraph 5 of the Resolution which takes into account “national activities” in outer space.

It is noteworthy that the Restatement does not refer to ships and aircraft as parts of the territory of a state. This indicates the preference for the concept of nationality, even though jurisdiction based on nationality “is similar to the jurisdiction over its territory.” 221 The same approach may be taken respecting spacecraft. Evidences of nationality may be established not only by means of national registration, but also by reason of the information furnished to the

219 McDougal, Burke, and Vlasic, supra note 207, at 104-114; compare Boczek, Flags of Convenience: An International Legal Study (1962).
221 Johnson, supra note 205, at 38.
United Nations in consequence of Paragraph 1 of General Assembly Resolution 1721 B (XVI) by states launching objects into orbit and beyond. National symbols and identification devices also give proof of nationality, as well as the ready national identification of astronauts aboard.

Although nationality at present has been reposed in a single state for a given spacecraft, it is possible that groups of states may wish to afford joint nationality to a given space vehicle. This could be accomplished via agreement, and it may be anticipated that such an agreement would make due provision for jurisdiction.

3. The Protective Principle

Jurisdiction on the part of a state may also be supported by the so-called protective principle. According to the Restatement:

(1) A state has jurisdiction to prescribe rules of law attaching legal consequences to conduct outside its territory that threatens its security as a state, provided the conduct is generally recognized as a crime under the law of states that have reasonably developed legal systems.\(^{222}\)

This is explained as permitting a state to “prescribe a rule of criminal law applicable to conduct outside its territory that does not have sufficient effect within its territory to bring it within the rule stated in § 18 but that has a potentially adverse effect upon the security of the state.”\(^{223}\) Under this principle a state might seek to enforce action under its espionage laws. There would appear to be no reason why a state could not inhibit conduct described generally as “espionage” when conducted from outside its territory, including outer space, if serious security considerations existed. This would be based on national policy. If one resource state were to implement such a policy, others would probably pass reciprocal legislation. Such information gathering activities do not, however, violate the principles and rules of international law.\(^{224}\)

The 1935 Harvard Draft also accepted the protective principle where an alien outside the jurisdiction of a state engaged in conduct against the security, territorial integrity and political independence of a state, provided such conduct on the part of the alien was not the exercise of a liberty guaranteed to the alien under the law of the place where the act was performed. Johnson, in commenting on the

\(^{222}\) Restatement of Foreign Relations Law, supra note 205, at 94.

\(^{223}\) Ibid. Section 18 is entitled “Jurisdiction to Prescribe With Respect to Effect Within Territory,” and involves application of the territorial principle.

\(^{224}\) Supra, pp. 271–295, 368.
Harvard Draft, has stated that “there were some threats to the state which the territorial theory, even objectively applied, could not cover, and that a jurisdiction must exist under which such threats could be repressed. But how to deal with these threats, without appearing to grant totalitarian regimes carte blanche to apply the protective principle in an arbitrary manner * * *” is a continuing dilemma.225

4. The Universality Principle

The fourth principle mentioned in the Restatement is known as the principle of universality, i.e., “Protection of Certain Universal Interests.”226 Included within this category are piracy, collision and salvage on the high seas, and the conservation of fisheries.

It is well known that piracy is a crime under international law. Although the prospects of space piracy are remote, such pirates in space may well be treated as maritime pirates and for the same reasons. The Restatement provides that “a state has jurisdiction to take enforcement action in its territory or on the high seas against the crime of piracy under international law, provided such action is consistent with the Convention on the High Seas of April 29, 1958.”227 This Convention restated the customary law on the subject. The 1935 Harvard Draft accepted the universality principle without qualification.

225 Johnson, supra note 205, at 40. Jessup has stated that the principle is a sound one but that it is capable of leading to “extravagant extensions of state power.” Transnational Law 50 (1951); compare, Mora, “Criminal Jurisdiction over Foreigners,” 1958-1959 University of Pittsburgh Law Review 567 (1959) who considers it to be subject to abuse. McDougal, Lasswell and Vlasic note that this principle takes into account both physical location and “impact upon value processes * * *” Supra note 1, at 647. They add: “States whose territorial community processes are substantially affected by crimes committed on board foreign ships or aircraft, beyond their boundaries, may be accorded competence under both the highly abstract ‘protective’ principle and the only slightly more concrete ‘impact territoriality’ principle. Both technical formulations are but expressions of the fundamental community policy which requires that states should be authorized to assert whatever competence is reasonably necessary for the protection of their exclusive interests in their more important bases of power.” Ibid., 700. See, generally, Harvard Research, Jurisdiction, Articles 7 and 8, pp. 543-563. Values protected by this principle will include security, territorial integrity, political independence, fiscal and monetary stability, among others. Compare, Haley, Space Law and Government, supra note 157, at 257-267.

226 Restatement of Foreign Relations Law, supra note 205, at 96.

227 Ibid.
On the subject of collision and salvage on the high seas the Re-
statement provides:
A state has jurisdiction to prescribe rules of general maritime
law, as understood by the state, to govern the substantive re-
sults of civil claims for collision or salvage service on the high
seas when those claims are asserted for adjudication or other
determination in its territory against persons or vessels located
there.\textsuperscript{[228]} Although drafted for a nonspace situation, the foregoing provision
takes into account a situation which might befall spacecraft. The
prospects of collision, though limited, do exist, although the possi-
bility of salvage of spacecraft in outer space does not appear to be
realizable. The exercise of national jurisdiction over such events
would serve to protect state interests and can be readily justified.
Indeed, it is already assumed that a state will exercise such jurisdic-
tion, and much analysis has been directed toward the achievement of
the measure of liability to be applied to such situations.\textsuperscript{[229]}

5. Analysis
Before considering the respective qualities of the varying theories
of national jurisdiction, it may be well to stress the fact that through
international consent it may be possible to establish an international
jurisdiction which could be either exclusive of or complementary to
national jurisdictions. There have been suggestions on the part of
respected observers that an international space authority should be
created and then vested with jurisdiction to control the operation of
space vehicles and their equipment.\textsuperscript{[230]} Others have suggested that
space activities should be removed entirely from national manage-
ment and placed in the hands of an operating international institu-
tion.\textsuperscript{[231]} In both instances the international organization, either
through establishing the conditions under which national activities

\textsuperscript{[228]} Ibid., 99.
\textsuperscript{[229]} Supra, pp. 351-380.
\textsuperscript{[230]} Mankiewicz, supra note 12 at 202. Rivoire has suggested that an interna-
tional space agency be vested with the authority to deal with space vehicles
which exceed 300 kilometers in height or when they go into orbit. "The Agency
would then be responsible for any damage which might be caused, for example,
by a collision in space, by disintegration and damage caused by pieces of the
craft falling on earth, etc." Rivoire, "Design for a Space Law," First Col-
loquium 101.
\textsuperscript{[231]} Leopold and Scafuri, "Orbital and Super-Orbital Space Flight Trajectories
—Jurisdictional Touchstones for a United Nations Space Authority," Legal
Problems of Space Exploration, A Symposium 533-535. It has frequently been
suggested that such a body should be a part of the United Nations.
might be carried on and supervising them, or by actually engaging in all space activities, would exercise exclusive jurisdiction. It has been suggested that through such possible international control, space vehicles would not become devices used to intimidate or subjugate states and peoples.\(^{232}\)

Jenks has compared the desirability of vesting jurisdiction over all space activities in an international organization with the typical cooperative procedures which have developed for shipping and aircraft. He has favored the first approach, and stated that "great advantages in vesting the necessary authority in an international body [exist] if this should be politically practicable, but the difficulties of so doing may well be formidable, particularly in view of the close relationship between the exploration and exploitation of space and questions of defense."\(^{233}\) His final judgment was: "Failing such an international solution of the problem of jurisdiction in space beyond the atmosphere, it will be necessary to determine such jurisdiction on the basis of appropriate criteria inspired by analogies drawn from maritime and aviation law and to develop common international rules and standards governing the wide range of problems which would exist."\(^{234}\) With the advent of the latter situation, despite the substantial capabilities of, and contributions by, the United Nations, the alternatives presented through the different theories of national jurisdiction have become very important.

It should be noted that the four theories of national jurisdiction relating to the peaceful, i.e., nonaggressive and beneficial, uses of outer space are complementary rather than exclusive. At the time of this writing, it is becoming increasingly clear that the protective principle, despite the possibility of its abuse, and the nationality principle are being accorded a preferred status. This has resulted from the focus of attention on activities carried on in outer space and the causal relationship between such activities and the general welfare of mankind divided into nation-states.\(^{235}\) While the principle has been established at the United Nations that outer space is free for use solely for peaceful purposes, in the age of the atom it is not


\(^{234}\) *Ibid.*, 44.

\(^{235}\) McDougal and Lipson, *supra* note 187, at 407; Feldman, "An American View of Jurisdiction in Outer Space," *First Colloquium 47*; *Legal Problems of Space Exploration, A Symposium* 456. The latter has noted that the "right of a State to regulate and control conduct occurring entirely outside its territory which may have direct effects within its territory [must rely on a] jurisdiction [which] is not territorial or spatial but causal." *Ibid.*
possible for states to accept a theory of jurisdiction which does not take into account the defensive needs of the state. It has been stated that “the rationale of the protective principle of jurisdiction is * * * the principle of self-defense.” 236 The nationality principle may be derived from the sovereignty which a state exercises over its nationals and over its property. For this reason there has never been any doubt as to the applicability of that principle to the conduct of nationals and national spacecraft in outer space, thereby permitting the exercise of jurisdiction on such facts. The real problem for a theory of space jurisdiction has been to provide a basis for the exercise of jurisdiction over nonnationals and nonnational spacecraft in an area beyond the sovereignty of a state. The protective principle of jurisdiction serves this purpose.237 Of course, it hardly need be noted that a theory of jurisdiction based on protection and self-defense is a far cry from the exercise of sovereignty in outer space.

The fact that there are four principal theories relating to national jurisdiction over criminal or tortious conduct suggests the presence of inadequacies or defects in all of them. The United States, it has been said, has employed the territorial principle to cope with the problem of jurisdiction over crimes.238 Judge Carter in commenting on this has indicated that “as a statement of the entire international law of jurisdiction it is inadequate.” 239 Nonetheless, international law does provide guidance as to which nation or nations may take jurisdiction, for it permits “any nation which has a reasonable relationship with the persons involved, or with the occurrence itself, to take jurisdiction and to adjudicate the matter.” 240 Whether the final decision is based on the four preceding principles (some writers stress only three, namely, nationality, territoriality, or protective)241 the concept of jurisdiction exists to support the need for legal order and stability in outer space and in space related activities, just as there is a need for such order and stability in the airspace, on the high seas, and on the land surfaces of the earth.

236 Johnson, *supra* note 205, at 41.

237 For a description of how such a process evolves, and a statement of the values involved, see McDougal and Lipson, *supra* note 187, at 419-422.


Various standards have been suggested with respect to the selection of one principle of jurisdiction as opposed to another in any given situation. Some writers have called attention to guidance through the concept of the “proper law” which emphasizes that jurisdiction be exercised by that entity having the closest and most real connection with, and interest in, the problem.\textsuperscript{242} Reese, for example, has set up certain factors to be considered in making a choice of law, and these have application to the problem of jurisdiction over outer space activities. He has suggested the need to take into account certainty, predictability, and ease of application in making a selection of rules. He has also noted the need to take into account such conflicting considerations as the duty to make fine distinctions, to be flexible, and to permit change to take place so that justice may be accomplished.\textsuperscript{243}

The answer to such a problem as here presented must be a practical one, but this is affected by the political considerations which so measurably influence the growth of the law of outer space. At the United Nations there has been some attention given to the matter of nationality of spacecraft, but little comment has taken place as to the application of competing principles of national jurisdiction. Further, the matter of nationality has generally been connected with the factors of ownership and registry. Thus, the United States Draft Declaration of Principles Relating to the Exploration and Use of Outer Space contains the following:

7. Jurisdiction over a space vehicle while it is in outer space shall be retained by the State or international organization which had jurisdiction at the time of launching. Ownership and property rights in a space vehicle and its components remain unaffected in outer space or upon return to earth.\textsuperscript{244}

\textsuperscript{242} Sarkar, op. cit. 467-468; compare Morris, “The Proper Law of Tort,” 64 Harvard Law Review 881 (1951), and see Jenks, supra note 88, at 41.


Additionally, the Soviet Draft Declaration of the Basic Principles Governing the Activities of States in the Exploration and Use of Outer Space makes reference to sovereign rights on the part of states over objects launched. Article 8 provides:

8. States shall retain their sovereign rights over objects they launch into outer space. Rights of ownership in respect of objects launched into outer space and their components remain unaffected while they are in outer space and upon their return to the earth. 245

The emphasis on the need for nationality of spacecraft and component parts is general. 246 The same holds true for the astronaut. 247 Both factors may result in jurisdiction based on nationality, but as heretofore suggested, jurisdiction may be based on each of the other theories with equal plausibility under pertinent fact conditions. Of the theories mentioned, it has been suggested that the principle of universality is the broadest, least precise, and rests on a more complex foundation. Johnson has noted that its foundation may consist in four separate, but related, elements, namely: "(i) the sovereignty of each state, (ii) its right to defend itself, and its collective right to defend its fellow members of the international community, (iii) its responsibility to the other members of the international community in such matters as piracy and war crimes and finally (iv) the consent of the other members of the international community." 248

Any consideration of national jurisdiction must not lose sight of the fact that these theories or doctrines must satisfy not only the needs of states, as such, but also the world community, and that in the course of serving practical needs they will contribute measurably to the reduction of tensions among states. It should be noted that these jurisdictional concepts have been applied by states only with difficulty to activities taking place on the high seas or in the airspace. Many difficulties can be imagined in the application of one or more of the theories to activities taking place in outer space. 249

247 Cocca, supra note 115, at 147-148.
248 Johnson, supra note 205, at 41.
all to events which take place, or will, in outer space, but that have
effects which are not limited to that dimension. In view of this situa-
tion, McDougal and Lipson have suggested the possibility of a com-
promise through the establishment of a rule allocating jurisdiction
over space activities to the state of last departure or first landing.249
This solution, which might be the product either of customary in-
ternational law or of express international agreement, like the others,
would permit "any state substantially affected to assert its compe-
tence, when it has effective control over persons and assets * * *"
Taken together, these approaches might provide "sufficient alterna-
tives in choice to encourage flexible accommodation in reciprocal de-
mand and mutual tolerance." 250 Without the presence of this last
quality none of the theories will be of much use.

At the present time much additional thought will have to be given
by states to the problems of jurisdiction over space objects. Resolution
1962 (XVIII) of December 24, 1963, was notable in what it
failed to say, although it did produce modest clarification in pro-
viding "7. The State on whose registry an object launched into
outer space is carried shall retain jurisdiction and control over such
object, and any personnel thereon, while in outer space." 251 Addi-
tional declarations setting forth an international consensus as to
jurisdictional rules affecting spacecraft in the atmosphere or land
or water areas of the nonowning state are sorely needed. Until such
a consensus can be expressly stated, existing understandings as to
rights based on registry or ownership may have little if any impact
on the jurisdictional rights of the receiving state for objects coming
within its sovereign boundaries. Under such circumstances the re-
ceiving state may be held to be free to determine which theories it
is willing to apply in the exercise of its national jurisdiction.

Finally, the subject of national jurisdiction requires brief refer-
ence to the matter of immunities and waiver. With regard to outer
space activities having a jurisdictional impact on the affairs of a state,
it is possible for claims to be made relating to the immunity of
state owned property, the rights of public representatives of foreign
states, and the immunity of international organizations and their
personnel. Other situations in which such claims may be asserted
may be predicted when space activities take on a heightened tempo.
The various considerations which have proven acceptable with re-

249 McDougal and Lipson, supra note 187, at 407.
250 Ibid.
spect to nonspace assertions of immunity will unquestionably be pertinent to the subject of immunities;\textsuperscript{252} the same would undoubtedly prevail for matters of waiver. Both the subject of national jurisdiction and the subject of international jurisdiction are pressing ones and could readily be treated in appropriate express agreements between states and other public entities.