HEGEMONIC STABILITY THEORY AND THE EVOLUTION OF THE SPACE WEAPONIZATION REGIME DURING THE COLD WAR

By

MATTHEW GILLARD

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Abstract

This study analyzes whether hegemonic stability theory can explain the evolution of the principles, norms, rules, and decision-making procedures of the outer space weaponization regime during the Cold War. The thesis begins by defining the term "space weapon." After outlining which weapons are included in this definition, the author argues that there are relative and absolute power variants of hegemonic stability theory. As a security issue, space weaponization is best examined using the relative power strand.

For the relative power strand to provide an adequate explanation of the evolution of the space weaponization regime, the regime must be established and remain strong in the presence of a hegemon with increasing relative power. The regime should also weaken when the hegemon's relative power is decreasing.

Relative power is measured through analyzing changes in annual military spending and GDP. Given that the time period under study is the Cold War era, data for the US (the hegemon) and the Soviet Union (the challenger) is examined. British, Chinese, French, German, and Japanese power is also discussed to explain why the thesis focuses primarily on American and Soviet power.

Beginning in 1955, the US began a campaign to establish a legal regime that would protect satellite overflight. This would ensure that US reconnaissance satellites could collect intelligence on the Soviet Union. In 1963, the Soviet Union dropped major opposition to satellite reconnaissance, marking the beginning of the space weaponization regime.

From 1963-1972, several international agreements expanded the regime. However, US power steadily declined vis-à-vis the Soviet Union as the space weaponization regime expanded.

Hegemonic stability theory thus cannot explain the formation and growth of the space weaponization regime.

From 1972 until the end of the Cold War, the space weaponization regime stagnated, neither expanding nor declining. Reagan helped prevent the expansion of the space weaponization regime by refusing to continue antisatellite (ASAT) talks with the Soviet Union. He also attempted to remove an important portion of the space weaponization regime related to the 1972 Anti-Ballistic Missile Treaty but ultimately failed. Both of these events cannot be explained by hegemonic stability theory.

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List of Acronyms

ABMs	Anti-ballistic missiles
ABMT	Anti-Ballistic Missile Treaty
ALMV	Air-Launched Miniature Vehicle
ASAT(s)	Anti-satellite weapon(s)
BM(s)	Ballistic missile(s)
COPUOS	Committee on the Peaceful Uses of Outer Space
COW	Correlates of War
DOD	Department of Defense
FOBS	Fractional orbital bombardment systems
GA	General Assembly
GDP	Gross domestic product
IGY	International Geophysical Year
KEW(s)	Kinetic energy weapon(s)
LTBT	Limited Test Ban Treaty
MHV	Miniature Homing Vehicle
MNC(s)	Multi-national corporation(s)
NSC	National Security Council
NSDD	National Security Decision Directive
NSDM	National Security Decision Memorandum
NTMV	National technical means of verification
OST	Outer Space Treaty
PD	Presidential Directive
PEW(s)	Pulse energy weapon(s)
PPP	Purchasing power parity
R&D	Research and development
SALT	Strategic Arms Limitation Treaty
SDI	Strategic Defense Initiative
TCP	Technological Capabilities Panel

Introduction

Space weaponization has become an important topic in international politics. This is not surprising, since over the last five decades, space has increasingly served as a medium to collect and transmit data for purposes as diverse as weather forecasting, reconnaissance, navigation, and communications. From the dawn of the space age, the perceived value of space has sparked concern over whether it would increasingly become a zone of military conflict, although there has never been any consensus regarding whether further space weaponization is either inevitable or desirable.

Despite the importance of space, very few scholars have attempted to apply international relations theory to the study of space weaponization.[1] This is unfortunate. As a pressing international issue, it is important for international relations scholars to determine whether their theories can add anything to the study of space weaponization.

Several international relations theories could arguably be applied to outer space weaponization. This thesis will attempt to test only one – hegemonic stability theory. Hegemonic stability theory holds that regimes are formed and maintained in the presence of a strong hegemon.[2] As the hegemon's power declines, regimes weaken and may even die.

I will test hegemonic stability theory by attempting to see whether it can explain the evolution of the space weaponization regime during the Cold War.[3] In order to do that, the thesis will focus primarily on two countries, the US and the Soviet Union. Both countries were the major space powers in the Cold War. Of these two countries, I will mainly examine the US since

[1]A notable exception is Morton H. Halperin, "The Decision to Deploy the ABM: Bureaucratic and Domestic Politics in the Johnson Administration," *World Politics* 25 (October 1972): 62-95.

[2]For a definition of hegemon and an outline of the phases of regime evolution, see chapter 1. For more information about hegemonic stability theory, refer to chapter 2.

[3]Chapter 3 describes how the thesis will apply hegemonic stability theory to the space weaponization regime.

it was widely viewed as being the hegemon. According to hegemonic stability theory, the hegemon has more influence over regimes than other states. Additionally, there is more data concerning US space weaponization activities than any other country. There is a paucity of data regarding space weaponization activities for the Soviet Union due to its highly secretive and closed nature.

The Benefits of This Study

This thesis is useful for several reasons. First, hegemonic stability theory is widely viewed as capable of providing reasonable explanations for the evolution of many different regimes. However, the key scholars who have developed hegemonic stability theory (Charles Kindleberger, Stephen Krasner, and Robert Gilpin) have not claimed that hegemonic stability theory applies to all regimes.[4] My attempt to use hegemonic stability theory as a test for space weaponization further enumerates what the theory can (and cannot) explain.

Second, the Cold War era provides an excellent period to test hegemonic stability theory.[5] I focus on the Cold War since two major powers – the Soviet Union and the US – dominated the international system. In this bipolar era, the Soviet Union was able to provide a strong challenge to the US, the hegemon. According to hegemonic stability theory, as the Soviet Union increases in power vis-à-vis the US, the space weaponization regime should weaken or even collapse.

Third, the study attempts to clearly enumerate the principles, norms, rules, and decision-making procedures of the outer space regime, which no scholar has done systematically.[6]

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[4]See chapter 2.

[5]For a more in-depth analysis of why the thesis focuses on the Cold War period, see chapter 3.

[6]When studying the space weaponization regime, scholars often merely assume that the regime exists without questioning if this is actually the case. Other scholars discuss legal aspects of the outer space regime (broadly defined) but do not attempt to clearly enumerate its principles, rules, norms, and decision-making procedures.

Outlining the principles, norms, rules, and decision-making procedures of the regime is very useful, since knowledge of these characteristics will provide a point of departure for others to test international relations theory against the space weaponization regime.

Plan of Thesis

The plan of this study essentially consists of three parts. Part I discusses the definitions, literature, and data that will form the bedrock of my analysis. Part II analyzes patterns of US space weaponization from 1955 to 1989, outlines the development of the space weaponization regime, and tests hegemonic stability theory. The final part is my conclusion.

Part I of the thesis is composed of three chapters. Chapter 2 discusses definitions used in the thesis. Chapter 3 is a literature review of seminal works concerning hegemonic stability theory. Chapter 4 explains how the space weaponization regime will be used to test hegemonic stability theory.

Part II of the thesis is composed of four chapters. Chapter 5 analyzes US military activity and policy regarding outer space from 1955-1974, the beginning of the Eisenhower presidency to the end of the Nixon administration. During this period, the US space weaponization regime was formed and maintained. Chapter 6 examines US military activity and policy from 1974-1989, the Ford to Reagan administrations. This was an era of stagnation and exceptional uncertainty

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For a major example of scholars assuming that the space weaponization regime exists without further analysis, see *Seeking Stability in Space: Anti-Satellite Weapons and the Evolving Space Regime*, which is a compilation of essays discussing anti-satellite weapons and anti-satellite weapon arms control. Although the title suggests that the space weaponization regime will be clearly defined in the book, the authors make no attempt to do so. See Joseph S. Nye, and James A. Schear, eds., *Seeking Stability in Space: Anti-Satellite Weapons and the Evolving Space Regime*, (Lanham, Maryland: University Press of America, 1987).

Examples of scholars discussing the legal regime for outer space but not enumerating its principles, rules, norms, and decision-making procedures include John Hickman and Everett Dolman, "Resurrecting the Space Age: A State-Centered Commentary on the Outer Space Regime," *Comparative Strategy* 21 (2002), 1-20; Frans von der Dunk, "The Undeniably Necessary Cradle – Out of Principle and Ultimately out of Sense," in Gabriel Lafferranderie and Daphné Crowther, eds., *Outlook on Space Law Over the Next 30 Years: Essays Published for the 30th Anniversary of the Outer Space Treaty* (Hague, Netherlands: Kluwer Law International, 1997), 401-414; Stephen Gorove, "Sources and Principles of Space Law," in Nandasiri Jasentuliyana, ed., *Space Law: Development and Scope* (Westport, Connecticut: International Institute of Space Law, 1992), 45-58.

for the space weaponization regime. Each chapter in section II will examine whether the empirical record suggests that the evolution of the space weaponization regime supports hegemonic stability theory.

In the conclusion, I will summarize my arguments and discuss the implications of my study.

Part I:

Research Project and Essential Concepts

Chapter 1: Definitions

International relations and space weaponization (not unlike other areas of study) is rife with definitions, many of which mean different things to different people. To avoid confusion, this chapter defines the terms used repeatedly in this thesis.

Hegemon

The term hegemon refers to the most powerful state in the international system. The definition makes no assumptions about what variables influence a hegemon's behavior or how a hegemon's behavior influences the world.[7]

Hegemonic Ascendancy and Decline

Hegemonic ascendancy refers to a time period in which a hegemon's power is increasing. Hegemonic decline refers to a period of time during which a hegemon's power is decreasing.

Absolute and Relative Power

Absolute power is the overall power of a state considered in isolation from other states. Relative power is the power of a state in relation to other states.

Stages of Weapon Formation

Weapon formation involves four major activities: research, testing, development, and deployment. Research refers to all weapon-related research and experimentation performed inside a laboratory. Testing means field testing (i.e. physical testing of a weapon outside the laboratory). Development refers to all activities to construct a weapon after a decision has been made to prepare it for potential deployment, including weapon construction. If a decision has been made to prepare a weapon for deployment, field testing is part of development, although

[7]This definition is also amoral. It does not assume that a hegemon is good or bad, or whether its activities are likely to lead to benevolent or evil ends, or whether the means by which it seeks those outcomes is right or wrong.

experiments conducted in a laboratory are not.[8] Deployment means placing a weapon in battle-ready status (i.e. a state in which it is ready to fire on enemy targets in combat).

With very few exceptions, most weapons are formed by gradual progression through all four of these major design stages, starting with research and ending with deployment. At any time during these phases, a weapon system can be cancelled. Many weapon systems are cancelled before they are deployed.

Space Weaponization

Space weaponization is the deployment of space weapons. Research, development, and testing of space weapons do not constitute weaponization, since states may conduct research, testing, and development for weapons that they do not have the desire or ability to deploy. I will nonetheless highlight specific efforts to research, test, and develop space weapons if they shed light on the willingness and ability of a state to deploy them.

Space Weapons[9]

What makes a weapon (e.g. something designed to inflict bodily harm or physical damage) a space weapon? Evidently, a space weapon must have some relationship with space. However, it is unclear precisely what this association with space should be. One could say that any relationship with space would be enough. Such a broad definition would nonetheless encompass so much that it would be extremely tedious (if not outright impossible) to employ.

The reason why this definition would be hard to operationalize is that space is becoming increasingly more important for modern high-tech combat. For example, satellites direct bombs

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[8]Sanford Lakoff, and Herbert F. York, *A Shield in Space? Technology, Politics, and the Strategic Defense Initiative: How the Reagan Administration Set Out to Make Nuclear Weapons "Impotent and Obsolete" and Succumbed to the Fallacy of the Last Move* (Berkeley and Los Angeles, California: University of California Press, 1989), 184.

[9]The following discussion of space weapons is uncommon in the literature on space weaponization. Most studies of space weaponization do not bother to define space weapon or space weaponization. Rather, the studies implicitly assume that certain weapons are space weapons.

to targets, as well as facilitate communication, reconnaissance, navigation, missile launch detection, and meteorology. Since space is important for high-tech warfare, many weapon systems are affected by space operations. Is the bomb directed to its target by satellite a space weapon? Is the soldier receiving commands from headquarters through a communication satellite a space weapon? For the sake of coherence and simplicity, such indirect applications are surely not.[10]

If the study of space weaponization is to be a manageable affair, it is necessary to specify clear limits on the relationship with space that makes a weapon a space weapon. One could say that a space weapon must be based in space. However, what about weapons designed to destroy satellites? Traditionally, they have been designed to launch from the ground or the air, and it is hard to see how something designed to destroy an object in orbit is not a space weapon. Another possibility is that a space weapon must target objects in space. This definition also presents problems, since one must explain why technologies based in space that target objects on the ground (such as space-based lasers) would not constitute space weaponization.[11]

Given the difficulties associated with the aforementioned definitions of space weapons, the most useful definition is that space weapons are "weapons that travel in space." This definition is very simple, which helps minimize confusion. There is no worry that the definition will leave out important weapons, since it encompasses all weapons that traverse space.

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[10]In military circles, people sometimes say that satellites have become so vital to modern high-tech warfare that they are weapons, even if they do not directly destroy or harm targets. However, many scholars disagree with this idea, preferring to use the term "militarization" instead of "weaponization" to refer to the deployment of satellites for military purposes.

I do not assume that militarization is tantamount to weaponization. The main reason for this is that considerable analytical benefit is derived from maintaining two distinct categories. Most states, scholars, and members of the attentive public accept militarization of space, while further weaponization of space is generally considered taboo and is widely resisted. By assuming that militarization is weaponization, analysts risk either overlooking these important normative considerations or overemphasizing them.

[11]I am aware that many of the potential technologies that may one day be able to strike terrestrial targets from space are currently impractical to deploy given the contemporary state of technology. Nonetheless, due to recurring interest in attempting to build such weapons, it would be utterly premature to consider dropping space-based earth targeting weapons from a study of space weaponization.

Furthermore, the definition does not include all of the indirect relationships between weapons and outer space, which would be unmanageable.

To use this definition, it is necessary to determine what components are included in the definition of space weapon. Otherwise, one could say that all of the components of a space weapon (down to a single screw) are space weapons, which is just nonsensical. Rather, given that a weapon must cause bodily harm or physical damage, the sum total of the parts working together to provide destructive power constitutes the weapon.[12]

Even with this qualifier regarding weapon components, some may argue that my definition of space weapons is too broad. Even so, I fail to see any practical alternative. Some may say that only weapons spending a certain specified length of time or a certain percentage of their flight paths in space should be considered space weapons. However, how can one determine if a weapon that spends, say, 40 minutes of its trajectory in space is a space weapon, while a weapon that spends 20 minutes there is not? Likewise, how can one ascertain if a weapon spending 80% of its flight path in space is a space weapon, while a weapon that spends 20% of its time there is not?

As I will soon argue, a fairly large list of weapons is incorporated in my definition of space weaponization. Due to space constraints, it will be impossible to examine all of these weapons. I will therefore make the list of weapons included in the definition and decide which of them should be examined in this thesis.

[12]Note that this definition includes the launcher, since the launcher is needed to deploy the weapon. However, if the launcher has no further destructive power after it launches the weapon, it ceases to be part of that weapon (such as when a ballistic missile launcher fires a missile).

A Note on Space Weapons

Before beginning to outline the list of space weapons, one should note that the list will not include weapons that have not yet progressed beyond the paper study phase (i.e. moved beyond an idea enumerated in an essay to active research in a laboratory). Otherwise, this thesis would be filled with relatively unimportant, technologically unfeasible schemes that never made it past the analyst's pen. The reader should nonetheless be aware of the possibility that in the coming years, other types of space weapons could move from the paper study stage to research, testing, and even deployment.

Categories of Space Weapons

Space weapons can essentially be broken down into two types: kinetic energy weapons (KEWs) and pulse energy weapons (PEWs). KEWs use their own mass to destroy targets, while PEWs do not use their own mass to produce destructive effects.[13] I will begin by discussing KEWs.

KEWs are composed of ballistic missiles (BMs), anti-satellite weapons (ASATs), and anti-ballistic missiles (ABMs).[14] BMs are (for the time being) the only space weapons used for force application (i.e. attacking terrestrial targets from space), although placing missiles in orbit around the earth (orbital bombardment weapons) would also be a KEW force application space weapon. ASATs are weapons designed to destroy satellites. In the past, these weapons have

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[13]Bob Preston, *et al.* *Space Weapons, Earth Wars* (Santa Monica, California: RAND, 2002), 24, available from http://www.rand.org/publications/MR/MR1209/

[14]I must add a caveat to the inclusion of ABMs as a space weapon. ABMs can intercept missiles during several stages of flight. In the final stage of a BM's trajectory (the terminal phase), the BM reenters the atmosphere. If the ABM is ground-launched and interception happens during the terminal phase, the ABM does not go into space. Since ground-launched ABMs conducting terminal intercepts do not enter outer space, they are not space weapons.

generally taken the form of missiles.[15] ABMs are used to intercept and destroy incoming missiles in outer space.[16] Since ABMs are used to target missiles, this arguably gives them a defensive character that non-ABM weapons do not have. Nonetheless, the ability to destroy an incoming missile gives ABMs the ability to shoot down satellites, ensuring that ABMs also have an inherent offensive capability.

For the time being, PEWs are composed entirely of laser, maser, and particle beam weapons.[17] These weapons destroy or damage targets through direct application of electromagnetic energy. Although these weapons have not been deployed, they have been researched by the US and other countries. In theory, PEWs could be ground-based, space-based, air-based (if mounted on aircraft), and sea-based (if placed on ships). As with KEWs, PEWs can (in theory) be used for attacking incoming missiles, satellites, and terrestrial targets.

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[15]Other weapons could also be used to destroy satellites. For example, a satellite could also be used to ram into another satellite, destroying it in the process. Additionally, a crude ASAT launching a cloud of pellets or sand could be launched into space. If the target satellite ran into the pellets or sand, it could be damaged.

KEW ASATs other than missiles will not be discussed in this thesis. States did not appear interested in developing other forms of KEW ASATs during the time period considered in my analysis. For more information on the time period under examination, see Chapter 3.

[16]In the Air Force Space Command *Strategic Master Plan FY06 and Beyond*, space force application is defined as "capabilities to execute missions with weapon systems operating from or through space which hold terrestrial targets at risk." See *Air Force Space Command*, "Air Force Space Command: Strategic Master Plan FY06 and Beyond," October 1, 2003, 2, available from http://www.peterson.af.mil/hqafspc/library/AFSPCPAOffice/Final%2006%20SMP--Signed!v1.pdf.

[17]PEWs are not always space weapons. Ground-based PEWs could use their beams to attack terrestrial targets, which would mean that the beams would not pass through outer space. To avoid confusion, whenever I refer to PEWs in this thesis, I am referring to space PEWs.

Space Weapons Examined in This Study[18]

This thesis will examine every space weapon I have mentioned except BMs and anti-missile systems (i.e. ABMs, lasers, masers, and particle beams) when they are used solely in an anti-missile role. The reason for this is that both BM force application and anti-missile system capacities have already been extensively researched (often in literature that does not assume such technologies constitute space weapons). Furthermore, BMs and ABMs are far less controversial than other forms of space weaponization (with the notable exception of deploying anti-missile systems in space).

When discussing ASATs, I will also examine the potential for anti-missile systems to destroy satellites. The reason for this is that little research has been conducted into this possible use of anti-missile technologies. Furthermore, ASAT systems are extremely controversial.

Space-based weapon systems will be analysed in this thesis, even when they are not designed to be used in an ASAT or force application role. Since space-based weapons are already in space, they are closer to satellites than terrestrial systems. This could ensure that the number of satellites within targeting range of space-based weapons is higher than for terrestrial systems, allowing space-based systems to have an exceptionally efficient ASAT role.

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[18]This study does not discuss any systems that are designed to temporarily disrupt satellite operations. I call these technologies "less than destructive systems" because the term "less than lethal" is already used to describe weapons that incapacitate people instead of injuring of killing them.

Less than destructive technologies do not "damage or destroy" and are thus not weapons. Unfortunately, very little research has been undertaken on less than destructive space systems. This is particularly true for the Cold War era.

There are three types of less than destructive systems: jammers, spoofers, and lasers. Jammers disrupt data transfers between satellites and earth-based receivers by overpowering signals sent to or from the satellite. Spoofers mimic satellite signals so that a satellite or ground station receives the "fake" signal instead of the real one. This could be used to make a satellite temporarily inoperable during a conflict. Lasers can be used to "dazzle" reconnaissance satellites by directing a beam of bright laser light to the target satellite's optical sensor. If the beam produces a light on the sensor that is brighter than the area it is trying to observe, the satellite will be increasingly unable to view that area. At a high enough brightness level, the beam completely saturates the detectability of the sensor. However, dazzling can be a tricky business, since the same laser used to dazzle an optical satellite could also "blind" that satellite (i.e. damage or destroy the detection system) if used at too high a power. Thus, if the dazzling laser is capable of producing a beam with the requisite amount of power, it could also be a space weapon.

Furthermore, space-based systems are able to take advantage of high orbital speeds to help propel them toward their targets, giving them an extremely long range against satellites.[19] Proximity to satellites and greater speed could also facilitate fast ASAT surprise attacks. Finally, space-based weapons could be used in an orbital bombardment role. For these reasons, space-based systems are extremely controversial and probably more likely to encourage a space arms race than other space weapons. Such an arms race could prevent growth of the space weaponization regime and even cause it to decline or die.

Table 1.1
Space Attack Systems Categorized According to Type and Purpose

■ = Examined ■ = Not examined □ = Examined only when used for purpose of attacking satellites	**Kinetic Energy Weapons**	**Pulse Energy Weapons**
Attacking Missiles	Dedicated anti-missile missile (including space-based missiles)	Laser, maser, particle beam (including space-based systems)
Attacking Satellites	Dedicated anti-satellite missile (including space-based missiles)	Laser, maser, particle beam (including space-based systems)
Force Application	Ballistic missile Space-based orbital bombardment missile system	Space-based laser, maser, particle beam

[19]David Wright, Laura Grego, and Lisbeth Gronlund, *The Physics of Space Security: A Reference Manual* (Cambridge, Massachusetts: American Academy of Arts and Sciences, 2005, 101), available from http://www.ucsusa.org/global_security/space_weapons/the-physics-of-space-security.html

The Space Weaponization Regime[20]

I define the space weaponization regime as the set of implicit or explicit principles, norms, rules, and decision-making procedures related to the weaponization of outer space around which actors' expectations converge.[21] "Principles are beliefs of fact, causation, and rectitude. Norms are standards of behavior defined in terms of rights and obligations. Rules are specific prescriptions or proscriptions for action. Decision-making procedures are prevailing practices for making and implementing collective choice."[22]

It is at times difficult to distinguish between principles, norms, and rules.[23] Principles define (in very broad, general terms) the purposes of regimes.[24] Norms provide somewhat clearer (but still fairly general) standards of behavior that members of regimes are supposed to follow.[25] Rules are highly specific injunctions that specify legitimate and illegitimate activities.[26]

Phases of Regime Evolution

I will refer to four stages of regime evolution in this thesis. These phases correspond to the following periods:

1) regime birth / formation / creation / establishment;

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[20]Since I am not focusing on ABMs except when used in an ASAT capacity, my discussion of the space weaponization regime will not examine principles, rules, norms, and decision-making procedures that only affect the use of ABMs in an anti-missile role.

[21]This is a none-too-subtle modification of Krasner's definition of "regime," which is "sets of implicit or explicit principles, norms, rules, and decision-making procedures around which actors' expectations converge in a given area of international relations." See Stephen D. Krasner, "Structural Causes and Regime Consequences: Regimes as Intervening Variables," in Stephen D. Krasner, ed. *International Regimes* (Ithaca: Cornell University Press, 1983), 2.

[22]Ibid.

[23]As noted by Robert Keohane, this is particularly problematic when studying norms and rules. He writes that "at the margin," rules and norms "merge into one another." See Robert O. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton: Princeton University Press, 1984), 58.

[24]Ibid.

[25]Ibid.

[26]Ibid.

2) regime maintenance / preservation. During the regime maintenance stage, the regime must not become weaker, although it may become stronger.

3) regime decline. Throughout this period, the regime becomes weaker;

4) regime death / end.

Regimes become stronger when their principles, norms, and rules are increasingly adhered to by other states and weaker when principles, norms, and rules are increasingly disregarded by other states. Provided that states adhere to new principles, norms, rules, and decision-making procedures, regimes also become stronger when their principles, norms, and rules expand in number and scope. Regimes become weaker when principles, norms, and rules decline in number and scope.

Chapter 2: Literature Review

In order to see if hegemonic stability theory can provide a plausible explanation for the evolution of the space weaponization regime during the Cold War, it is useful to conduct a brief literature review. What follows is a discussion of the chief literature concerning hegemonic stability theory.

Hegemonic Stability Theory Literature

Essentially, three authors have written seminal works establishing the principles of hegemonic stability theory. These authors are Charles Kindleberger, Stephen Krasner, and Robert Gilpin. Robert Keohane has also developed a highly influential theory of international regimes that challenges hegemonic stability theory.

Charles Kindleberger – The World in Depression, 1929-1939

Kindleberger does not refer to hegemonic stability theory in *The World in Depression, 1929-1939.*[27] In fact, Kindleberger rarely uses the term "hegemon," since he believes that it implies that the dominant state in the international system is not constrained by moral values when making choices.[28] Nonetheless, among international relations scholars, Kindleberger is widely viewed as the first academic to enumerate the principles of hegemonic stability theory.

In *The World in Depression*, Kindleberger argues that the failure of the hegemon[29] to make the necessary sacrifices to preserve an open international economic system led to the Great Depression. To advance his argument, Kindleberger focuses primarily on the economic system and state actors. In particular, Kindleberger examines US behavior, since he believes that the US

[27]There are two versions of this book. I refer to the more recent version.

[28]Charles P. Kindleberger, "Hierarchy Versus Inertial Cooperation," *International Organization* 40 (Autumn 1986), 844-845.

[29]Although Kindleberger does not like to use the term "hegemon," when discussing *The World in Depression, 1929-1939*, I will still use the term. The reason for this is to avoid causing confusion by employing another term to refer to the dominant state in the international system.

was the economic hegemon in the periods just before and during the beginning of the Great Depression.

According to Kindleberger, a hegemon is needed to maintain a relatively open trading system in times of economic crises. This is because the international economic order is characterized by a great deal of disagreement.[30] For example, in the years leading up to the Great Depression, the US, Britain, and France clashed over satisfactory outcomes regarding currency stabilization, debt payment, and reparations.[31] Since all countries have a different determination of what economic measures will satisfy their interests, the hegemon must create economic arrangements that maintain an open international trading order. Otherwise, states erect trade barriers and the economic system eventually breaks down.[32]

To maintain a liberal economic system, the hegemon must assume five (presumably expensive) duties during periods of economic crisis.[33] First, it must maintain an open market for distress goods. Second, it must provide long-term lending during recessions. Third, it must provide a stable system of exchange rates. Fourth, it must coordinate macroeconomic policies. Fifth, it must be a "lender of last resort" by providing liquidity.

Kindleberger thinks that only a hegemon is able to assume these duties.[34] The reason for this is mainly because no other state has enough absolute power to do so.[35] However,

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[30]Charles P. Kindleberger, *The World in Depression: 1929-1939* (*Revised and Enlarged Edition)*, (Berkeley, California: University of California Press, 1986), 9-11.

[31]Ibid., 10.

[32]Ibid., 11.

[33]For a more in-depth analysis of these duties than provided here, see Ibid., 289-295.

[34]Despite the costs associated with preserving a liberal international trading regime during an economic crisis, Kindleberger believes that the hegemon has a moral duty to bear the expenses. Kindleberger calls the act of assuming the costs "leadership" or "responsibility." Refusing to take the necessary measures to preserve the international trading system is "irresponsibility."

[35]While Kindleberger does not use the term "absolute power" in his book, he also does not argue that a change in the power of other states will affect the hegemon's ability to maintain an open international system. Rather, he argues that change in a hegemon's own power affects the international trading system. This is consistent with the definition of absolute power. See Duncan Snidal, "The Limits of Hegemonic Stability Theory," *International Organization* 39 (Autumn 1985), 588-589.

Kindleberger also doubts that a group of states would be able to stabilize the international trading system. He suspects that such cooperative arrangements would likely fail.[36]

Stephen Krasner – "State Power and the Structure of International Trade"

Krasner attempts to explain the formation, preservation, and decline of liberal international trading systems. In order to do so, he argues that states have four major interests affected by international trade. These interests are aggregate national income, social stability, political power, and economic growth.

Krasner writes that the way in which international trade affects each of these interests differs for small and large states, as well as relatively more economically developed and relatively less developed states. Krasner believes that a system of a few very large but unequally developed states would lead to a closed trading system, since the gains from trade would be moderate, openness would cause social instability, and growth in less developed areas would stall while growth in more advanced areas would increase.[37] Additionally, given that developed states are more involved in the international trading system, they increase their political power vis-à-vis less developed states.[38] The relative cost of closure (i.e. erecting trade barriers or coercive means) is consequently lower for more developed than less developed states.[39]

A system of a large number of highly developed small states could, in theory, lead to an open international system. Aggregate income and economic growth would increase, while social

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[36]Kindleberger writes that "The 1980s equivalent [of a cooperative arrangement to maintain a liberal trading system] is the frequently proposed troika of Germany, Japan, and the United States . . . However, economists and political scientists usually agree that such arrangements, whether duopoly or bilateral monopoly, are unstable." Kindleberger also argues that three possible outcomes could occur as US hegemonic power weakens: revived US leadership, assumption of responsibility to ensure stability of the economic system by another country, or "an effective cessation of economic sovereignty to international institutions." Kindleberger believes that the last alternative is the least likely. See Kindleberger, *The World in Depression*, 298, 304-305.

[37]Stephen D Krasner, "State Power and the Structure of International Trade," *World Politics* 28 (April 1976), 321-322.

[38]Ibid., 320-322.

[39]Ibid., 320.

instability would be mitigated by high levels of development.[40] Any loss of political power would be unimportant because all states would be equally dependent on the international trading structure.[41] This structure is nonetheless unlikely to come about because a group of small states would probably not be able to cooperate well enough to provide adequate liquidity for the international system.[42]

Since a system of a large number of highly developed states is not likely to produce an open international economic system, the arrangement most conducive to forming and preserving a liberal trading structure is a hegemonic system (i.e. one characterized by the presence of a hegemon, which is "much larger and relatively more advanced than its trading partners").[43] International trade increases the national income of a hegemon and its rate of growth during ascendancy.[44] Social instability caused by increased trade is reduced by the low level of the hegemon's participation in the international economy.[45] An open economic system also increases the hegemon's political power, since the relative costs of closure are lower for the hegemon than for any other state.[46]

Most of the other states in the hegemonic system will support an open international system. According to Krasner, small states will "opt for openness because the advantages in terms of aggregate income and growth are so great, and their political power is bound to be restricted regardless of what they do."[47] Although the actions of medium-sized states are hard to

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[40]Ibid., 321.
[41]Ibid.
[42]Ibid., 323.
[43]Ibid., 322.
[44]Ibid., 322.
[45]Ibid.
[46]Ibid.
[47]Ibid.

predict, the hegemon can entice or coerce them to accept an open trading structure through symbolic, economic, or military means.[48]

After arguing that the presence of a hegemon in its ascendancy is necessary to ensure economic openness, Krasner attempts to test whether this hypothesis is supported by the empirical record. He does this by examining shifts in the economic power of the hegemon (i.e. Britain or the US) from the early 19th to the late 20th centuries in comparison to the next highest power.

Upon examining the empirical record, Krasner argues that shifts in hegemonic power explain economic openness or closeness for the periods of 1820 to 1879, 1880 to 1990, and 1945 to 1960.[49] Krasner then states that the theory of hegemonic stability cannot explain 1900 to 1913, 1919 to 1939, or 1960 to the present.[50] The reason for this is that states are not compelled to enact actions conducive to their interests until external events ("usually cataclysmic ones") compel them to do so.[51] Once these external events force states to adopt new policies, they "are pursued until a new crisis demonstrates that they are no longer feasible."[52] This is because prior choices become locked into domestic political structures and institutions created in periods of hegemonic ascendancy continue to exist long after they are appropriate.[53]

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[48]Of these three types of power, Krasner believes that economic power is the most relevant. He writes, "most importantly, the hegemonic state can use its economic resources to create an open structure. In terms of positive incentives, it can offer access to its large domestic market and to its relatively cheap exports. In terms of negative ones, it can withhold foreign grants and engage in competition, potentially ruinous for the weaker state, in third-country markets. The size and economic robustness of the hegemonic state also enable it to provide the confidence necessary for a stable international monetary system, and its currency can offer the liquidity needed for an increasingly open system." See Ibid., 322-323.

[49]Ibid., 335.

[50]Ibid.

[51]Ibid., 341.

[52]Ibid.

[53]Ibid., 341-342.

Robert Gilpin

Gilpin's ideas regarding hegemonic stability theory are expressed in *War and Change in World Politics* and *US Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment.*

War and Change in World Politics

In *War and Change in World Politics*, Gilpin primarily attempts to explain systemic change in international systems. Systemic change involves a transformation in the governance of an international system (i.e. a change in which state develops the principal regimes[54] of the system).[55] To a lesser extent, the book focuses on system change, which consists of a transformation of the nature of the principal actors in the international system (e.g. empires, nation-states, multinational corporations, etc).[56]

Gilpin clearly specifies several key theoretical assumptions that guide his analysis in *War and Change in World Politics*. He believes that the state is the dominant actor in an international system characterized by anarchy.[57] In an anarchical world in which there are few state actors, states are compelled to maximize their relative power over other states[58] in order to ensure their own security.[59]

Gilpin argues that systemic change is produced by hegemonic war. A hegemonic war is fought by all of the most powerful states in the world. The goal of a hegemonic war is to gain

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[54]Robert Gilpin has a tendency to use the terms "rules" and "regimes" interchangeably. To avoid confusion, when discussing *War and Change in World Politics* and *US Power and the Multinational Corporation*, I will use the term "regime."

[55]Robert Gilpin, *War and Change in World Politics,* (Cambridge: Cambridge University Press, 1981), 42.

[56]Gilpin also discusses interaction change, or gradual "modifications in the political, economic, and other interactions or processes among the actors in an international system." Interaction change can result in shifts of power in the international system, although Gilpin appears to doubt that it could lead to sweeping, fundamental changes in the governance of the system. This is probably why Gilpin only discusses interaction changes "insofar as they are relevant to a broader understanding of systemic change and systems change." See Ibid., 41, 43-44.

[57]Ibid., 17.

[58]Gilpin believes that although states are driven to maximize power, they pursue both a mix of power and welfare goals. See Ibid., 20.

[59]See Ibid., 87-88.

(or maintain) dominant control of the ability to make the regimes that structure power in the international system.

The principal regimes of the international system are established by the leading power in the aftermath of a hegemonic war. These regimes are accepted (albeit perhaps reluctantly) by the most powerful states in the world for three reasons. First, the hegemon provides collective goods.[60] Second, non-hegemons may share religious, ideological, or other values with the hegemon.[61] However, the third and most important reason is that non-hegemons fear the power and prestige (i.e. reputation for power)[62] of the dominant state.[63]

Following a hegemonic war and the establishment of regimes that structure the power of the international system, the relative power of the hegemon decreases over time. This occurs as a result of both internal and external factors that reduce the hegemon's economic surplus.[64] As the economic surplus decreases, the hegemon finds it increasingly difficult to expend the resources necessary to maintain governance over the international system.[65]

As the non-hegemons increase in power in relation to the hegemon, the former increasingly believe that they should no longer tolerate the power system established at the end

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[60]Ibid., 34.

[61]Ibid.

[62]A still more thorough definition of prestige is "the perceptions of other states with respect to a state's capacities and its ability and willingness to exercise its power." See Ibid., 31.

[63]Gilpin states that the "right to rule" of the hegemon is mostly based on "its victory in the last hegemonic war and its demonstrated ability to enforce its will on other states; the treaties that define the international status quo and provide the constitution of the established order have authority in that they reflect this reality." See Ibid., 34.

[64]The internal factors consist of the following changes within the hegemon: an increase in the cost of defence in relation to national income; a rise in private and public consumption, leaving less money for military spending; a shift from a manufacturing to a service-based economy, resulting in lower rates of growth; laziness and moral decline; the law of diminishing returns (i.e. the tendency for each additional unit of production for land, labour, and capital to yield a lower level of returns than the previous unit).

The external factors are composed of: the increasing costs of hegemonic control caused by the tendency for the hegemon to overpay to provide collective goods; the loss of the hegemon's economic and technological dominance. The loss of economic and technological preponderance is due to a shift in the international system's locus of economic activity, diffusion of the hegemon's military and technological techniques to other states, or both. See Ibid., 159-185.

[65]Ibid., 156-157.

of the last hegemonic war. This is caused by the stark difference between the power base of the old system and the power realities of the current one.[66] As this disjuncture is formed, the prestige of the dominant state is increasingly called into question and a challenger decides that the benefits of changing the system exceed the costs of accepting it.[67]

In an effort to avert war, the hegemon can increase the resources devoted to governing the international system or reduce its external commitments.[68] However, more often than not, the hegemon is unwilling or unable to pursue either strategy, or the strategy does not work.[69] A hegemonic war is the result. At the end of the war, the dominant state creates a new international order maintained by its preponderant power and prestige.

US Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment

In *US Power and the Multinational Corporation*, Gilpin attempts to develop a theory of international political economy centered on the multinational corporation (MNC).[70] To do this, Gilpin argues that the success of certain economic transnational actors largely depends upon the structure of political relations established by the hegemon.[71]

According to Gilpin, the principal means of American hegemonic expansion has been the MNC.[72] To expand the reach of MNC operations across the globe (and increase America's

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[66]Ibid., 14.

[67]Part of the reason for this is that as the economic surpluses of the non-hegemons increase, the law of demand comes into effect. According to the law of demand, as a state's resources increase, its wants will also rise, including the desire to govern the international system. See Ibid., 94-95.

[68]Ibid., 187-188.

[69]For a discussion of the difficulties associated with pursuing either strategy, see Ibid., 188-197.

[70]Gilpin defines a multinational corporation as "any business corporation in which ownership, management, production, and marketing extend over several national jurisdictions." See Robert Gilpin, *U.S. Power and the Multinational Corporation: The Political Economy of Foreign Direct Investment* (New York: Basic Books, 1975), 8.

[71]Ibid., 4.

[72]Gilpin lists several ways in which American MNCs have been important for increasing and maintaining US power. This list includes: ensuring that the US has a steadily available supply of resources at relatively low prices; controlling the location of industrial production and technological development; promoting democracy and pluralism through technology transfers and encouragement of free enterprise; allowing the US to have closure over a

power in the process), the US has created a liberal international trading order centered on ensuring relatively unrestricted flows of foreign direct investment.[73]

Gilpin believes that American economic interests will be increasingly threatened as US economic power erodes relative to other states. As American power declines, host governments will increasingly make demands on American MNCs, forcing them to "sacrifice the perceived interests of their home governments."[74] As a result, the American ability to use MNCs as an instrument of state policy will decrease over time.[75] At best, this means that the open international trade regime would be modified to incorporate the interests of the rising powers. At worst, the system would break down[76] into mercantilist trading blocs.[77]

The State as the Dominant Actor

It is important to note that Kindleberger, Krasner, and Gilpin assume that the state is the dominant actor in the works I have just discussed. Kindleberger and Krasner both implicitly hold that the state is the dominant actor since they focus on the ability of states to preserve a liberal international trade regime. In *U.S. Power and the Multinational Corporation*, Gilpin implicitly assumes that the state is the dominant actor, since the book focuses on how states are capable of structuring the international system to empower certain transnational actors

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portion of the world oil supply; and raising money for US overseas diplomatic and military engagements to such an extent that "The technological and monopolistic rents extracted from abroad by American corporations are, in fact, essential to the financing of America's global hegemonic position." See Ibid., 147-149.

[73]Ibid., 5-7, 138-139.

[74]For example, "the MNCs will be forced to export a higher percentage of their local output and to limit the percentage of their profits that they can take out of the host country. They will be pressured to import higher levels of technology and to locate research and development activities in the host country. Corporations will have to accept greater local participation, to guarantee a positive influence on the host's balance of payments, and to incorporate a given percentage of "local content" into their output." See Ibid., 243-244.

[75]Ibid., 245.

[76]Gilpin argues that the relative decline of America's economy incites domestic interest groups to criticize policies favourable to foreign direct investment. This also helps contribute to the formation of a mercantilist international economic system. See Ibid., 257-258.

[77]Ibid., 258-262.

(particularly MNCs) for state interests. As I have already mentioned, Gilpin explicitly writes that the state is the dominant actor in *War and Change in World Politics*.

Robert Keohane – After Hegemony: Cooperation and Discord in the World Political Economy

Kindleberger, Krasner, and Gilpin assume that a hegemon must use its power to form regimes and maintain them. This is the traditional view of hegemonic stability theory. However, in *After Hegemony*, Keohane challenges hegemonic stability theory by arguing that regime maintenance is possible "after hegemony" (i.e. during periods of hegemonic decline).

In an attempt to explain how cooperation in the international economy is possible after hegemony, Keohane starts by making realist assumptions. He writes that the state is the dominant actor, existing in an anarchical world in which power is very important.[78] However, unlike many realists, Keohane believes that power considerations do not make durable international cooperation impossible.

Keohane largely structures his functional theory of regimes around the Coase theorem. According to the Coase theorem, the existence of market externalities does not always prevent effective cooperation, provided that three conditions exist: a framework of legal liability, no transaction costs, and perfect information.[79] While Keohane does not believe that these three conditions are completely met in the international system, he believes that they often exist to enough of an extent to compel states to cooperate.

Since states are all autonomous, international regimes do not create perfect legal liability. Rather, they create mutual expectations. These expectations modify transaction costs so that costs of adhering to regime commitments are decreased, while costs of violating regimes are

[78]Keohane, *After Hegemony*, 18.
[79]Ibid., 87.

increased.[80] Transaction costs are also reduced if regimes make it cheaper for governments to meet to negotiate agreements.[81] If regimes combine a great many previously separate issues into one bloc, they further decrease transaction costs, since the marginal cost of dealing with each issue is lower than it would be in the absence of the regime.[82] Moving issues into one bloc lowers costs as well by reducing the number of bureaucratic units that must be consulted before action is taken.[83]

Regimes provide information to state actors. By so doing, they help counter three particular products of market failure: asymmetrical information (different levels of knowledge about a bargaining situation), moral hazard (the unintentional provision of incentives for uncooperative behavior), and irresponsibility (making commitments that are unable to be honored).[84] Asymmetrical information is problematic since states may not wish to cooperate if they suspect that the other negotiating party possesses enough knowledge about a situation to manipulate or deceive.[85] Likewise, moral hazard and irresponsibility are harmful since states will be less inclined to support regimes that promote recklessly risky behavior.[86]

Information flows lessen the negative effects of asymmetrical information, moral hazard, and irresponsibility because they let states in the regime know about each others' behavior.[87] Those states are then able to penalize actors that do not adhere to the rules of the regime,

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[80]Ibid., 89.
[81]Ibid., 90.
[82]Ibid.
[83]Ibid., 91.
[84]According to Keohane, "market failure refers to situations in which the outcomes of market-mediated interactions are suboptimal, given the utility functions of actors and the resources at their disposal. That is, agreements that would be beneficial to all parties are not made." During "situations of market failure, the difficulties are attributed not to inadequacies of the actors themselves (who are presumed to be rational utility-maximizers), but rather to the structure of the system and the institutions, or lack thereof, that characterize it. Specific attributes of the system impose transaction costs (including information costs) that create barriers to effective cooperation among the actors. Thus institutional defects are responsible for failures of coordination. To correct these defects, conscious institutional innovation may be necessary." Ibid., 82-83.
[85]Ibid., 93.
[86]Ibid., 95-96.
[87]Ibid., 94.

particularly if the regime links many issues, since the consequences of the harmful behavior extend across more issue areas.[88] Even if states are not penalized for a particular negative action, the activity may harm their reputation, which may make other states less likely to negotiate with them in the future.[89]

Keohane makes three more arguments for the idea that regimes will survive after hegemony. First, citing Mancur Olson, Keohane states that regimes can give private goods to members, which provides an incentive to maintain regimes.[90] Second, regimes can create "sunk costs," or costs that have been expended to create a resource (in this case a regime). Quoting Arthur Stinchcombe, Keohane says "if these sunk costs make a traditional pattern of action cheaper, and if new patterns are not enough more profitable to justify throwing away the resource," the sunk costs will entice states to preserve the regime.[91] Third, although regimes help reduce transaction costs and uncertainty, enough transaction costs and uncertainty exist to ensure that regimes are expensive to create.[92] This expense discourages states from creating new regimes and encourages them to maintain old ones.

Regime Formation in After Hegemony

In *After Hegemony*, Keohane seems to believe that the presence of a hegemon in ascendance is sometimes (but not always) useful for regime creation. He says that in "particular circumstances" (that are left unspecified) a hegemon can promote international cooperation.[93] However, in sharp contrast to hegemonic stability theory, Keohane explicitly states that the existence of a hegemon is neither a necessary nor a sufficient cause of cooperation.[94]

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[88]Ibid.
[89]Ibid.
[90]Ibid., 77.
[91]Ibid., 102.
[92]Ibid., 100.
[93]Ibid., 46.
[94]Ibid., 31.

Chapter 3: Testing of Hegemonic Stability Theory

Chapter 3 describes how I will test if hegemonic stability theory can explain the space weaponization regime. The chapter will begin by outlining the two variants of hegemonic stability theory and specifying which one will be tested. The chapter will then describe what the hegemon needs to do in order for the tested variant to provide a reasonable explanation of the space weaponization regime. I will then discuss the indicators that will be used to measure the hegemon's power. Finally, I will explain why the bipolar Cold War era is examined in this thesis and specify the time interval under study.

Variants of Hegemonic Stability Theory

An analysis of Kindleberger, Krasner, and Gilpin's views of hegemonic stability theory suggest that the theory has two variants: the relative power and absolute power versions.[95] Both strands assume that the state is the dominant actor, since Kindleberger, Krasner, and Gilpin all make this assumption in their works developing hegemonic stability theory.

The relative power variant of hegemonic stability theory is supported by Gilpin and Krasner. It holds that in order for a hegemon to create and maintain particular international regimes, the hegemon's power must be increasing relative to other states. The relative power variant also states that as a hegemon's power declines, the regimes falter and may even die.

The absolute power variant of hegemonic stability theory is essentially drawn from Kindleberger's analysis of the causes of the Great Depression. The variant holds that a hegemon will create regimes to provide public goods to other states, even though providing those goods may be very costly. According to Kindleberger's version of the theory, the ability of a hegemon

[95]This discussion of the two variants of hegemonic stability theory draws heavily on the literature review in chapter 2.

to provide this function requires that it have enough absolute power to do so. However, for reasons described below, this thesis will focus on relative power, not absolute power. The absolute power variant of hegemonic stability theory will thus not be tested.

Power – Relative or Absolute?

In order to test hegemonic stability theory, it is necessary to choose whether absolute or relative power of the hegemon matters. I will focus on the relative power variant for two reasons. First, space weaponization is a security issue. Unlike economic issues, the defining characteristic (indeed, the entire basis for existence) of the security realm is violent conflict. The only reason why states would research, test, develop, procure, and use weapons is because they fear the prospect (whether real or imagined) that other actors are willing or will be willing to use deadly force. Since the security realm is characterized by this fear, power must be considered in relation to real and potential rivals.

The second reason for focusing on relative power is that there does not appear to be any plausible argument for concentrating on absolute power in this thesis. Granted, a certain degree of absolute power is required to deploy space weapons. For example, in order to launch a weapon into space, a state must have enough resources and have reached a certain level of technological maturity. Many states nonetheless have the resources and level of scientific sophistication to deploy space weapons but have not decided not to do so. Additionally, there does not appear to be any plausible argument for holding that after reaching a certain threshold of absolute power, states will increasingly weaponize space as power rises.

Testing the Relative Power Variant of Hegemonic Stability Theory

In order to show that the relative power variant of hegemonic stability theory can provide an adequate explanation of the evolution of the space weaponization regime, it is necessary for the space weaponization regime to:

1) be established and remain strong in the presence of a hegemon in ascendance. Given the relative strength of the hegemon's power base during ascendance, other states should not be able to mount an effective challenge to the regime;

2) weaken or collapse during periods of hegemonic decline as a result of pressure from non-hegemons. Attempts by the hegemon to preserve the space weaponization regime should fail given the increased relative power of non-hegemons.

Basic Force and Force Application Models

To test hegemonic stability theory, I will use a basic force model. Basic force models apply given inputs to measure power and hold that changes in those inputs will result in specified modifications of behavior.[96] This is how most scholars test hegemonic stability theory.

To a limited extent, I will also test hegemonic stability theory using a force application model. Like basic force models, force application models assume that specified inputs measure power. However, force application models also assume that a factor other than the power inputs is needed to activate those inputs.[97] The difficulty with using such a model is that it can encourage the development of *post hoc* explanations to save a theory.[98] In order to avoid this, I will only test the idea that grave crises shock states into carrying out the activities suggested by

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[96]James G. March, "The Power of Power," in David Easton, ed., *Varieties of Political Theory* (Englewood Cliffs, New Jersey: Prentice-Hall, 1966), 54-56.

[97]Ibid., 58-61.

[98]Ibid., 61.

the relative power variant of hegemonic stability theory. As a noted in chapter 2, this is one of Krasner's main arguments.

Keohane's Critique of Hegemonic Stability Theory

Keohane's theory of international regimes holds that the decline of a hegemon's relative power does not translate into regime failure, since states can cooperate to sustain international regimes after hegemony. If the space weaponization regime remains strong during periods of hegemonic decline, this will provide support for Keohane's theory.

As mentioned in chapter 2, Keohane seems to believe that a hegemon can encourage the creation of regimes in certain (but not all) circumstances. For testing purposes, the statement that a hegemon may or may not assist in regime establishment is not useful. The thesis thus makes no assumptions regarding whether Keohane's theory holds that a hegemon can help encourage the formation of the space weaponization regime.

Power Indicators

To measure the power of the hegemon, I will use two indicators: annual military spending and annual gross domestic product (GDP). Being concerned with relative power and the Cold War era, the thesis compares data for the Soviet Union and the US.

Overall annual military spending is one of my power indicators since it provides a useful rough estimate of military power. Of course, high levels of military spending will not necessarily compensate for poor training, failure to procure effective capital equipment, administrative deficiencies, etc. Nonetheless, it does not seem unreasonable to believe that higher military spending will allow states to better address qualitative deficiencies. It also does not seem unreasonable to assume that higher military spending will generally give states advantages in the form of more advanced military technologies and equipment. Finally, there are

serious problems with using other indicators to measure military power, as will be discussed shortly.

Annual GDP in millions of dollars is an indicator because it measures the overall strength of a state's economy. A strong economy helps project economic power, which can persuade or compel states to adhere to the principles of regimes. Additionally, without a strong economy, maintaining an economic surplus becomes difficult. An economic surplus increases a state's ability to supply collective goods, which can provide incentives for non-hegemons to adhere to regimes. Furthermore, a surplus is essential to maintain strong, effective armed forces. As noted in Paul Kennedy's *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000*, and Gilpin's *War and Change in World Politics*, as a hegemon's economy declines in relation to other great powers, it becomes increasingly difficult to counter those challengers over the long term.[99]

Reason for Rejection of the Correlates of War Index Indicator

Another power indicator is the Correlates of War (COW) National Material Capabilities index, which is not used in this thesis. The COW index is designed to measure overall state power from 1816 to the present. It is a popular data source for analysts who wish to have a composite power index for time-series comparisons. The index indicators are total population, urban population, energy consumption, iron and steel production, military expenditures, and military personnel. All of the indicators are assigned equal weights.

The main problem with the COW index is that it assumes that the material sources of national power have remained unchanged since 1816. In particular, it favors economies with high steel production. The steel production indicator is supposed to be a measure of industrial

[99]Paul Kennedy, *The Rise and Fall of the Great Powers: Economic Change and Military Conflict from 1500 to 2000* (London: Unwin Hyman Limited, 1988), xv-xvi, 439-440; Gilpin, *War and Change in World Politics*, 156-210.

strength. However, during the Cold War, other materials became more useful. For example, near the end of the Cold War, one type of plastic used heavily in aircraft construction was five times more durable than the best steels.[100] As a result of the rising utility of other building materials, the US began to manufacture less steel.[101] The Soviet Union was less economically advanced than the US and made large quantities of steel throughout the Cold War.[102]

The index assumes that population size is an effective measure of the number of people who can be used for war. Since people must be mobilized to fight, this is a measure of potential power as opposed to actual power. In order for potential power to become actual power, a state may have to overcome political barriers to mobilize large numbers of troops. Furthermore, in the last century (at least), warfare has become increasingly high-tech. To fight effectively in high-tech warfare, troops need to be well-trained. The time needed to train soldiers for high-tech war ensures that only prolonged conflicts (as opposed to crises of short duration) will allow enough time for a large population to translate into a large number of effective soldiers. During the Cold War, many key military conflicts consisted of short crises, during which mobilizing civilian populations to fight would have been exceptionally difficult.[103]

There are also problems with the military personnel indicator. In an effort to overcome poor funding, equipment, and training, states may raise large armies. These armies may fare badly against small armies with better funding, equipment, and training.

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[100]John R. Oneal, "Measuring the Material Base of the Contemporary East-West Balance of Power," *International Interactions* 15 (Number 2), 181.

[101]Ibid.

[102]Ibid.; William C. Wohlforth, "The Stability of a Unipolar World," *International Security* 24 (Summer 1999), 13.

[103]A key reason for the importance of crises during the Cold War was the dawn of the nuclear age. Once both superpowers had developed nuclear weapons, major military conflicts between the two states would almost certainly have been exceptionally destructive. In order to avoid nuclear war, both the Soviet Union and the US were encouraged to prevent crises from degenerating into more destructive forms of conflict.

Era Under Study

For any study involving historical analysis, it is necessary to choose a period in time to begin one's examination. Since space has not been weaponized for very long, two major time periods are available for study when considering space weaponization: the bipolar Cold War era, or the post-Cold War unipolar era. This thesis focuses on the former period instead of the latter.

In order to explain why I will focus on the bipolar era, it is necessary to examine economic and military power of the US and other key countries from the Cold War to the present day. These key countries are China, France, Western Germany / Germany, Japan, the Soviet Union / Russia, and the United Kingdom, since they (or their predecessors) have historically been strong enough to vie for hegemonic dominance.

At the end of this chapter, tables 3.1 and 3.2 provide data regarding US relative military and economic power from the Cold War era to the present. Table 3.1 indicates that British, Chinese, French, German, and Japanese military spending levels remained low compared to the US during and since the Cold War. Even in the 1970s, when China's relative military spending peaked, the US spent about three times as much as China on the military. Only Soviet military spending was able to compete with US funding during the Cold War. From 1971-1988, the Soviet Union even surpassed US military spending.

According to table 3.2, relative GDP levels for France, Germany, and the United Kingdom did not change much during the Cold War. Japan's GDP strengthened throughout the Cold War, becoming over one-third of US GDP throughout the 1970s and 1980s. Although they fluctuated rapidly, China's GDP levels were about one-quarter to nearly one-third of US GDP from 1955-1974. After dropping significantly in 1975, China's relative GDP again increased to one-quarter of US GDP by 1988.

Soviet economic power was inferior to its military power. The Soviet Union was never able to reach even one-half of US GDP during any part of the Cold War. Nonetheless, its GDP was closer to America's than any other country for most of the Cold War. In the late 1970s, Japan's relative GDP started creeping up very close to the Soviet Union's. In 1988, Japan even surpassed Soviet GDP (although barely). However, Japan never exceeded one-tenth of US military spending during the Cold War. When considering both economic and military indicators, the Soviet Union was the only power capable of challenging the US in the Cold War era.

In 1989, the relative military and economic power of the Soviet Union plummeted. Soviet military spending dropped to 41% that of the US. Soviet GDP fell to 23% of US levels, on par with Germany and China and lower than Japan. The Soviet Union never recovered from these exceptional losses. Although the Soviet Union did not officially break up until 1991, 1989 marked the end of bipolarity and the beginning of a new unipolar order.

Since 1989, no country has come anywhere near reaching US military spending levels. By the late 1990s, Russian military spending dropped to about one-fifth that of the US. China, France, Germany, Japan, and the United Kingdom have not matched Russian military spending.

The picture is different when GDP is considered. While Russia's GDP has plummeted to about one-quarter of US levels, China's GDP has more than doubled since 1989. In 2003, China's GDP was 59% of US levels. However, predicting China's wealth is a difficult and hotly debated undertaking. Even assuming that the economic statistic does not overstate China's GDP, Chinese military spending remains far lower than the US. Finally, virtually everyone believes that it will take several decades for China to become a great power or superpower. All of this

suggests that the US is more secure in its position as a hegemon post-1989 than it ever was during the Cold War.

The above analysis of US relative power means that the post-Cold War era provides a relatively poor testing period for hegemonic stability theory. The lack of powerful challengers to the hegemon after 1989 makes it difficult to test hegemonic stability theory, since the crux of the theory is that regimes will decline due to external pressure from non-hegemons as US relative power decreases. On the other hand, the Cold War era provides an excellent testing period for hegemonic stability theory, given that the Soviet Union was a serious challenger to US dominance and Soviet power gradually increased throughout the Cold War.

Another reason this thesis focuses on the bipolar period is that hegemonic stability theory does not specify what happens to a regime if it survives after hegemony and moves into an era of renewed hegemonic dominance.[104] Is the hegemon supposed to leave the regime intact during a period of renewed hegemony? Or (as after a hegemonic war in Gilpin's *War and Change in World Politics*) will the hegemon do away with the regime (in whole or in part) and form new principles, norms, rules, and decision-making procedures? Finally, are fluctuations in the relative power of the hegemon measured through comparison with the hegemon's power when the regime was formed or at some point in the era of renewed hegemony? Hegemonic stability theory does not currently provide an answer to these questions.

Specific Years of Analysis

Given that the bipolar era is more appropriate for testing hegemonic stability theory against space weaponization than the unipolar period, the final year of analysis in this thesis will be 1989. The starting year of analysis must also be determined.

[104]This is exceptionally important when considering the space weaponization regime. Section II will argue that the space weaponization regime remained intact at the end of the Cold War.

Since testing hegemonic stability theory requires measuring fluctuations in power, the starting year of analysis is very important. For example, indicators generally show that the US was at the peak of its strength in 1945.[105] Beginning to measure fluctuations in relative power in 1945 is thus likely to show a continuous gradual decline in the American power base over several decades.[106]

The starting year of analysis for this study is 1955. The reason for this is that 1955 marked the first year in which the US began to take actions to create principles, norms, rules, and decision-making procedures to form the space weaponization regime (this point will be further explained in the next chapter).[107]

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[105]Bruce Russett, "The Mysterious Case of Vanishing Hegemony; or, is Mark Twain Really Dead?" *International Organization* 39 (Spring 1985), 210.

[106]Ibid.

[107]The Truman administration (1945-1953) was mostly uninterested in space. There are several reasons for this. First, affected by high postwar inflation, the US military budget declined, compelling the armed forces to focus on their core missions. Second, many top military and scientific leaders believed that space technologies would not be able to significantly improve defence for many years. Third, the US government was very reluctant to fund undefined programs with little apparent military potential. The government saw military space programs in this light. See Peter Hays, *Struggling Towards Space Doctrine: U.S. Military Space Plans, Programs, and Perspectives During the Cold War*, Ph.D. Thesis, (Fletcher School of Law and Diplomacy, 1994), 62; Walter A McDougall, . . . *The Heavens and the Earth: A Political History of the Space Age*, (New York: Basic Books, 1985), 91.

Table 3.1
Comparison of Annual Defence Spending for Seven Countries, 1955-2001
US = 100[108]

Year	China	France	Germany	Japan	Soviet Union / Russia	United Kingdom	United States
1955	6	7	4	1	73	11	100
1956	13	9	4	1	64	11	100
1957	14	8	5	1	62	10	100
1958	13	8	4	1	66	10	100
1959	14	8	6	1	74	10	100
1960	15	9	6	1	81	10	100
1961	17	9	7	1	91	10	100
1962	18	9	8	1	95	10	100
1963	20	9	10	1	90	10	100
1964	25	10	10	2	92	11	100
1965	27	10	10	2	89	11	100
1966	24	8	8	1	71	9	100
1967	22	8	7	1	69	8	100
1968	22	7	6	1	78	7	100
1969	25	7	7	2	84	7	100
1970	31	8	8	2	99	8	100
1971	29	8	10	3	110	9	100
1972	29	10	12	3	115	10	100
1973	31	12	15	4	123	11	100
1974	31	12	16	5	127	11	100
1975	31	14	17	5	141	13	100
1976	35	15	17	5	152	12	100
1977	32	15	17	5	148	12	100
1978	32	17	20	7	149	13	100
1979	25	19	20	8	147	16	100
1980	20	18	19	6	140	19	100

[108] All data was originally in current year US dollars and taken from the Correlates of War National Material Capabilities dataset, version 3.02, available from http://www.correlatesofwar.org. Article of reference for dataset: J. David Singer, Stuart Bremer, and John Stuckey, "Capability Distribution, Uncertainty, and Major Power War, 1820-1965," in Bruce Russett, ed., *Peace, War, and Numbers* (Beverly Hills: Sage, 1972), 19-48.

Table 3.1
Comparison of Annual Defence Spending for Seven Countries, 1955-2001
(continued)
US = 100

Year	China	France	Germany	Japan	Soviet Union / Russia	United Kingdom	United States
1981	18	14	12	7	130	15	100
1982	17	11	11	6	121	12	100
1983	16	10	11	5	115	11	100
1984	10	9	8	5	111	10	100
1985	3	7	7	6	112	10	100
1986	2	9	9	8	108	10	100
1987	2	11	10	9	111	12	100
1988	2	11	10	10	113	11	100
1989	2	10	9	10	41	11	100
1990	2	12	13	10	44	13	100
1991	7	14	12	12	51	15	100
1992	8	12	12	13	16	15	100
1993	9	13	12	14	10	11	100
1994	10	15	12	16	33	12	100
1995	12	17	15	18	30	12	100
1996	13	17	14	16	27	13	100
1997	13	15	12	15	23	13	100
1998	14	15	12	14	20	14	100
1999	14	13	11	14	19	12	100
2000	14	11	9	15	17	12	100
2001	14	10	8	12	20	11	100

Table 3.2
Comparison of Annual GDP for Seven Countries, 1955-2003
US = 100[109]

Year	China	France	Germany	Japan	Soviet Union / Russia	United Kingdom	United States
1955	27	15	19	13	36	22	100
1956	29	15	20	14	38	22	100
1957	30	16	20	15	38	22	100
1958	33	16	21	16	41	22	100
1959	31	16	22	16	39	21	100
1960	29	17	23	18	42	22	100
1961	23	17	24	20	43	22	100
1962	22	17	23	20	42	21	100
1963	23	18	23	21	39	21	100
1964	25	18	23	22	42	21	100
1965	26	17	23	22	41	20	100
1966	27	17	22	23	41	19	100
1967	26	18	21	25	41	19	100
1968	24	18	22	27	42	19	100
1969	25	18	23	29	41	19	100
1970	29	19	24	29	44	20	100
1971	30	20	24	33	44	19	100
1972	29	19	23	33	42	19	100
1973	30	19	23	34	43	19	100
1974	30	20	23	34	44	19	100

[109]Data for 1955-1974 has been taken from Angus Maddison's *Monitoring the World Economy: 1820-1992*. Data for US / Soviet comparisons for 1975-1988 is also from *Monitoring the World Economy*, while US / Soviet-Russian comparison data for 1989-2003 is from the *World Development Indicators CD-ROM*. For 1975-2003, all data for US comparisons with China, France, Germany, Japan, and the United Kingdom is from the *World Development Indicators CD-ROM*. See Angus Maddison, *Monitoring the World Economy: 1820-1992* (Washington, D.C.: Development Centre of the Organisation for Economic Co-Operation and Development, 1995), 180-183, 186-187, 190-191; The World Bank, *World Development Indicators CD-ROM* (Washington, D.C.: The World Bank), 2005.

Data from *Monitoring the World Economy* is measured in 1990 Geary-Khamis dollars. The Geary-Khamis approach compares GDP using a combination of purchasing power parity (PPP) and international average prices of commodities. Data from the *World Development Indicators CD-ROM* are in constant 2000 international dollars. International dollars are derived from converting local currencies with purchasing power parity rates. For more information about these methods of multilateral GDP comparison, refer to the data notes on the *World Development Indicators CD-ROM* or appendix C (pages 161-169) of *Monitoring the World Economy*.

Table 3.2
Comparison of Annual GDP for Seven Countries, 1955-2003
(continued)
US = 100

Year	China	France	Germany	Japan	Soviet Union / Russia	United Kingdom	United States
1975	13	20	28	37	45	19	100
1976	12	19	27	36	45	18	100
1977	12	19	27	36	44	18	100
1978	13	19	26	36	42	18	100
1979	13	19	27	37	41	18	100
1980	15	19	27	38	41	17	100
1981	15	19	27	38	40	17	100
1982	17	20	27	41	42	18	100
1983	18	19	26	39	42	17	100
1984	19	18	25	38	40	17	100
1985	21	18	25	38	39	17	100
1986	22	17	24	37	39	16	100
1987	23	17	24	38	39	17	100
1988	25	18	24	39	38	17	100
1989	25	18	24	39	23	17	100
1990	25	18	25	40	22	16	100
1991	28	18	26	42	21	16	100
1992	31	17	26	40	18	16	100
1993	34	17	25	39	16	15	100
1994	37	16	24	38	14	15	100
1995	40	16	24	38	14	16	100
1996	43	16	24	38	13	15	100
1997	44	16	23	37	14	15	100
1998	47	16	23	36	13	15	100
1999	48	15	22	34	14	15	100
2000	50	15	22	34	15	15	100
2001	54	16	22	34	16	15	100
2002	56	16	22	33	17	15	100
2003	59	15	21	33	18	15	100

Part II:

Empirical Analysis

Chapter 4: The Rise of the Space Weaponization Regime (Eisenhower to Nixon, 1955-1974)

First, chapter 4 will discuss all relevant space weapon related activities occurring between 1955 and 1974. Second, chapter 4 will outline the principles, norms, rules, and decision-making procedures of the space weaponization regime that emerged during 1955-1974. Third, the chapter will discuss the nature and strength of the space weaponization regime. Fourth, it will examine whether hegemonic stability theory can explain the evolution of the regime.

Space Weapon Related Activities, 1955-1974

The Importance of Satellite Surveillance and Space Weaponization

An extremely important early initiative affecting the space weaponization regime was the development of the idea that satellites should be allowed to travel freely in space. If satellite overflight became a legitimate activity, states would be legally bound not to damage, destroy, or otherwise interfere with satellites.

The Eisenhower Administration and the Reconnaissance Requirement

Developing a capacity for effective satellite reconnaissance of the Soviet Union was Eisenhower's chief concern. Several factors pushed the Eisenhower regime to develop reconnaissance satellites. First, as an open society, the US needed overhead intelligence collection capabilities far more than the highly secretive Soviet Union. Second, spy planes could be legitimately shot down over Soviet territory, while the legality of destroying a reconnaissance satellite still needed to be determined.[110] Third, in a report to the National Security Council (NSC) in February 1955, Eisenhower's top secret Technological Capabilities Panel (TCP)

[110]McDougall, . . . *The Heavens and the Earth*, 117.

highlighted the need to further develop technical intelligence gathering capabilities to monitor the growth of the Soviet strategic nuclear arsenal.[111]

The TCP report quickly compelled the Air Force to begin development of US reconnaissance satellites. On March 16, 1955, the Air Force issued requirements for a satellite project called WS-117L.[112] The project quickly grew to encompass secret development programs for three types of surveillance satellites.[113]

The Scientific Satellite Development Program and "Freedom of Space"

To ensure that US reconnaissance satellites would be able to collect data without interference from the Soviet Union, Eisenhower intended to promote an international legal regime protecting satellites. The main component of this regime would be "freedom of space," or a belief that satellites should be able to pass through space without interference.

The first step to developing such a legal regime would be to orbit a scientific satellite over the Soviet Union to test Russian reaction and potentially set a precedent for satellite overflight. The timing appeared to be right for such an initiative, since July 1, 1957, to December 31, 1958, would be the International Geophysical Year (IGY), a cooperative scientific exercise to promote research in various domains, including outer space.[114]

Eisenhower decided to support development of a scientific satellite for the IGY in a secret NSC document labeled NSC 5520, which was approved on May 27, 1955.[115] NSC 5520 stated that "a small scientific satellite will provide a test of the principle of 'Freedom of Space'" and that the project should not "imply a requirement for prior consent by any nation over which

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[111]Ibid., 116.

[112]Hays, *Struggling Towards Space Doctrine*, 73.

[113]The three programs included under the WS-117L project were CORONA, SAMOS, and MIDAS. CORONA focused on reconnaissance through recoverable film systems, while SAMOS focused on reconnaissance through electro-optical systems. MIDAS used infrared surveillance for missile launch detection. See Ibid., 74.

[114]Ibid., 75.

[115]Ibid., 77.

the satellite might pass in its orbit."[116] The report further stated that the IGY would provide "an excellent opportunity" to emphasize the scientific and peaceful uses of outer space.[117] In response to NSC 5520, the Navy was selected to build the booster for the IGY satellite on August 3, 1955.[118]

The Sputnik Crisis

The US scientific satellite did not herald the beginning of the space age. Instead, the Soviet Union successfully launched Sputnik I into orbit on October 4, 1957, and Sputnik II on November 3, 1957.[119] The successful launch of the two satellites surprised the Eisenhower administration, horrified the American public, and unleashed waves of harsh media criticism.[120]

In response to the Sputnik crisis, Eisenhower felt compelled to further define military space policy. Formal expressions of Eisenhower's military space policy were contained in the Purcell Report and NSC 5814/1. The former was written by the Presidential Science Advisory Committee, which provided independent science advice for Eisenhower, while the latter was a NSC document.

The Purcell Report

The Purcell Report received Eisenhower's approval on March 26, 1958.[121] It emphasized the scientific benefits of space exploration and briefly mentioned the possible military benefits of

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[116]Ibid., 76-77.

[117]Ibid., 76.

[118]McDougall, . . . *The Heavens and the Earth*, 111.

[119]Sputnik I weighed 183 pounds, while Sputnik II weighed 1120 pounds and carried a dog. See Herbert York, *Race to Oblivion: A Participant's View of the Arms Race* (New York: Simon and Schuster, 1970), 108.

[120]The Soviet Union did little to dampen US hysteria. As noted by Walter McDougall, "in the weeks and months to come [after the launch of Sputnik I], Khrushchev and lesser spokesmen would point to the first Sputnik, "companion" or "fellow traveler," as proof of the Soviet ability to deliver hydrogen bombs at will, proof of the inevitability of Soviet scientific and technological leadership, proof of the superiority of communism as a model for backward nations, proof of the dynamic leadership of the Soviet premier. At the fortieth anniversary of the revolution in November 1957, Khrushchev predicted that the Soviet Union would surpass the US in per-capita economic output in fifteen years." See Ibid., 62.

[121]Paul B. Stares, *The Militarization of Space: U.S. Policy, 1945-1984* (Ithaca, New York: Cornell University Press, 1985), 47.

reconnaissance and communication satellites.[122] It also stated that space weapons were not useful. According to the report:[123]

> Much has been written about space as a future theater of war, raising such suggestions as satellite bombers, military bases on the moon, and so on. For the most part, even the more sober proposals do not hold up well on close examination or appear to be achievable at an early date. Granted that they will become technologically possible, most of these schemes, nonetheless, appear to be clumsy and ineffective ways of doing a job . . . In short, the earth would appear to be, after all, the best weapons carrier.[124]

NSC 5814/1

NSC 5814/1 was approved by the President on August 18, 1958.[125] Among other things, NSC 5814/1 discussed potential military programs for outer space. On the whole, the document gave more weight to non-weapon space systems. Military reconnaissance systems were "Now Planned or in Immediate Prospect," while systems "Feasible in the Near Future" were weather, communications, navigation, and electronic counter-measures satellites.[126] Manned defensive vehicles and orbital bombardment satellites were confined to the "Future possibilities" category.[127]

NSC 5814/1 made clear that Eisenhower continued to place a high priority on the development of reconnaissance satellites and a legal regime to protect satellite overflight. The document stated that "reconnaissance satellites are of critical importance to US national security" and that the US needed to "seek urgently a political framework which will place the uses of US

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[122]Ibid.

[123]The quote has been taken from a public version of the Purcell Report. Interestingly enough, Eisenhower urged the public to read the document and it became a best seller. See Hays, *Struggling Towards Space Doctrine*, 135.

[124]Ibid.

[125]Ibid., 143.

[126]Ibid., 143-144.

[127]Ibid., 144.

reconnaissance satellites in a political and psychological context most favourable to the United States."[128]

"Peaceful" use of Outer Space

Like NSC 5520, NSC 5814/1 mentioned the principle of the "peaceful" use of outer space. According to NSC 5814/1, the US needed to maintain its position "as the leading advocate of the use of space for peaceful purposes."[129] However, it was becoming increasingly clear that the US did not intend for "peaceful purposes" to mean foregoing all research, development, testing, and deployment of space weapons. Instead "peaceful purposes" was a rhetorical device meant to define the range of acceptable activities in outer space.[130] In particular, for the US, this meant scientific exploration and non-interference with satellites. Space weapon research, development, testing, and deployment would also presumably be peaceful if such activities did not directly interfere with the idea of "freedom in space." This was reflected in the fact that US space weapon research and testing increased significantly after the launch of the Sputnik satellites.

Space Weapons Under Eisenhower

For Eisenhower, increased US space weapon research and testing was a means to expand future US options in outer space and maintain technological superiority in relation to the Soviet Union.[131] However, the Eisenhower administration did not want to deploy space weapons considered in this study. Besides believing that space weapons had little military utility, Eisenhower was worried that robust development of US ASATs would compel the Soviet Union

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[128]Ibid.

[129]McDougall, . . . *The Heavens and the Earth*, 182.

[130]Stares, *The Militarization of Space*, 57.

[131]Approved on February 19, 1958, NSC 5802/1 suggests that "Defense against Satellites and Space vehicles" was an area of "particular importance" where a "vigorous research and development program should be maintained in order to develop new weapons and needed improvements in the continental defense system and to counter improving Soviet technological capabilities for attack against the United States." See Ibid., 47-50.

to reciprocate.[132] This could threaten the idea of "freedom of space" that the Eisenhower administration wanted to promote as a legal norm.

While Eisenhower was worried that development of an ASAT would cause the Soviets to respond in kind, he did not want to completely cut off all US ASAT research. Some limited ASAT tests occurred under the Eisenhower administration.[133] However, once research and testing progressed to the point where advanced weapon development was possible, Eisenhower refused to allow development and deployment to occur.[134]

Kennedy and the Establishment of the Idea of Freedom of Space

One of the principal goals of the Kennedy administration regarding outer space was to continue Eisenhower's effort to foster an international legal regime protecting satellite overflight. As expected, the Soviets were not pleased with the prospect of US reconnaissance satellites collecting data on their activities.[135] In June 1962, the Soviets started their campaign against satellite overflight.[136] They submitted a draft declaration at the UN that stated "The use of artificial satellites for the collection of intelligence information in the territory of foreign states is incompatible with the objectives of mankind in its conquest of outer space."[137]

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[132]Ibid., 52.

[133]For information on these ASAT tests, see Stares, *The Militarization of Space*, 106-111.

[134]Ibid., 50. Eisenhower's restraint regarding the development of space weapons is quite remarkable. One of the reasons for this is that after Sputnik, the aerospace press and various parts of the military started an aggressive campaign to push for the development and deployment of space weapons. The number of speeches for robust space weapon development initiatives increased significantly. In just six weeks after the launch of Sputnik I, the Army, Navy, and Air Force each proposed ASAT programs. The services also produced plans for developing orbital bombardment weapons. The Air Force and Army even proposed developing weapons to control the moon!

Eisenhower's restraint is also remarkable given the tone of the hearings chaired by Senate Majority Leader Lyndon B. Johnson through his position as Chairman of the Preparedness Investigating Subcommittee of the Senate Armed Services Committee. Subcommittee hearings on the Sputnik crisis ran for about 30 days from November 25, 1957, to January 23, 1958, and received wide media coverage. Most of the military leadership and several civilians who appeared before the hearings stated that the US needed to control space for crucial national security needs. By the end of the hearings, many Democrats and some Republicans held this view. See Ibid., 47-50, Hays, *Struggling Towards Space Doctrine*, 124-127, 149-150.

[135]By autumn 1960, US reconnaissance satellites had started to return crude intelligence data regarding the Soviet Union. See Stares, *The Militarization of Space*, 62.

[136]Ibid., 69.

[137]Ibid.

The first major response to the Soviet draft resolution was a speech from the US ambassador at the UN First Committee on December 3, 1962.[138] He stated that the US thought "Observation from space is consistent with international law, just as observation from the high seas," which supports the idea of freedom in space.[139] The ambassador also said that "Outer Space should be used for peaceful – that is, non-aggressive and beneficial – purposes."[140]

The Soviet Union continued to object to satellite reconnaissance for several months. However, in September 1963, the Soviet Union dropped its arguments against satellite reconnaissance.[141] This effectively ended all major opposition concerning the use of reconnaissance satellites. No other significant opposition against any other form of satellite data collection arose from 1955-1974.

The Soviet Union gave up its campaign against satellite reconnaissance for several reasons.[142] First, Soviet satellites had begun routine intelligence collection missions.[143] Second, the Soviet Union was becoming increasingly anxious about China and needed reliable intelligence data.[144] Third, the potential existed for satellite reconnaissance to provide an alternative to on-site inspections for verification of the terms of the draft Limited Test Ban Treaty (LTBT).[145] Fourth, obstruction would have reduced prospects for completing the negotiations for the Outer Space Treaty (OST).[146]

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[138]Ibid., 70.
[139]Ibid., 71.
[140]Ibid., 70.
[141]Ibid., 71.
[142]Ibid., 71.
[143]Ibid., 71.
[144]M.J. Peterson, "The Use of Analogies in Developing Outer Space Law," *International Organization* 51 (Spring 1997), 255.
[145]Stares, *The Militarization of Space*, 71.
[146]Ibid., 71.

The Development and Deployment of US ASAT Systems

Unlike Eisenhower, Kennedy and Johnson decided to proceed with the development and deployment of an ASAT system.[147] This was largely due to concern that the Soviet Union would place nuclear weapons in orbit.[148] At a Kremlin reception on August 9, 1961, Khrushchev said "You do not have 50 and 100 megaton bombs. We have bombs stronger than 100 megatons. We placed Gagarin and Titov in space and we can replace them with other loads that can be directed to any place on earth."[149] Twenty-one days later, the Soviet Union announced that it was ending its moratorium on testing nuclear weapons.[150] In less than a week, the Soviet Union carried out three nuclear tests, one with a yield of approximately 58 megatons.[151] On December 9, 1961, Khrushchev remarked that 50 and 100 megaton nuclear weapons would "hang over the heads of the imperialists when they decide the question whether or not they should unleash war."[152] The next day, Khrushchev said that the Soviet Union was capable of sending "other payloads" into space and could "land them wherever we wanted."[153]

Worried about the Soviet's aggressive statements, Kennedy ordered the army to develop an ASAT system in May 1962.[154] The system was codenamed MUDFLAP but eventually

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[147]The US military pressured Kennedy to deploy systems other than ASATs. In particular, the Air Force was very interested in developing manned military space systems. All major manned military space programs were cancelled during the Johnson and Nixon administrations. See Hays, *Struggling Towards Space Doctrine*, 188-197, 225-230.

[148]During congressional testimony in January 1963, the US Secretary of Defence, Robert McNamara, said that "the Soviet Union may now have or soon achieve the capability to place in orbit bomb-carrying satellites." While McNamara claimed to be skeptical of the utility of such satellites as weapon systems, he declared that "we must make the necessary preparations now to counter it if it does develop." See Stares, *The Militarization of Space*, 80.

[149]Ibid., 74.

[150]Ivo H. Daalder, "The Limited Test Ban Treaty," in Albert Carnesale, and Richard N. Haass, eds. *Superpower Arms Control: Setting the Record Straight* (Cambridge, Massachusetts: Ballinger Publishing Company, 1987), 11.

[151]Ibid.

[152]Stares, *The Militarization of Space*, 75.

[153]Ibid.

[154]Ibid. Over Christmas in 1961, McNamara had also told the Aerospace Corporation in Los Angeles that developing an ASAT system was of the "highest priority" and that the company should immediately begin work on

became known as Program 505.[155] It used a Nike Zeus missile and had a range of only 225 kilometers.[156] The ASAT system destroyed targets through proximity detonation of the nuclear warhead (which probably had a yield of 1 megaton).[157]

Program 505 was declared operational on August 1, 1963, although doubts existed as to how well it would be able to respond to any potential threat.[158] The Johnson administration decided to downgrade the system in 1964.[159] In May 1966, NcNamara told the army to completely begin phasing out the program, which it completed doing by 1967.[160]

The Kennedy administration had also ordered the Air Force to develop another ASAT system under Program 437. Program 437[161] involved the deployment of two-launch ready Thor missiles, which could hit targets vertically to 370 kilometers and horizontally to 2,780 kilometers.[162] It used a 1.5 megaton nuclear warhead to destroy targets.[163] According to the August 1963 operational plan for the system, it had a launch time of 24 to 36 hours, although a later report to the President said that the system could intercept satellites twice per day.[164]

President Kennedy gave final approval for the program on May 8, 1963.[165] The system reached initial operational capability (with one missile ready to fire) on May 29, 1964, and full

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the system. Interestingly enough, within a month, the request was cancelled. A senior member of the Aerospace Corporation later said that the request had been a "heat of the moment decision." See Ibid., 76.

[155]Program 505 was based in the Kwajalein Atoll. See Ibid., 118.

[156]Ibid.

[157]The nuclear blast would produce a fireball and electromagnetic pulse, both of which could damage or destroy satellites. See Ibid.

[158]Ibid., 119.

[159]Ibid., 120.

[160]Ibid.

[161]The Program 437 ASAT system and its support facilities were based on Johnston Island. See Ibid., 122.

[162]Ibid., 123.

[163]Ibid.

[164]Ibid., 122.

[165]Ibid., 80.

operational capacity (with two missiles ready to launch) on June 10, 1964.[166] The Program 437 system remained deployed for the entire Johnson administration.

Program 505 and Program 437 were meant be quickly deployed in the face of a potential threat from Soviet orbital bombardment systems. Both programs were developed using existing systems and had a highly limited ASAT capability.[167] While the Kennedy and Johnson administrations could have focused on developing more robust ASAT systems to address the potential threat of Soviet deployment of nuclear orbital bombardment weapons, they refrained from doing so. Instead, Kennedy and Johnson believed that the best way to deal with the Soviet Union was through space arms control efforts.

Arms Control Under the Kennedy and Johnson Administrations

Kennedy and Johnson were committed to implementing arms control agreements concerning space weaponization.[168] The Kennedy administration's efforts helped produce the LTBT, General Assembly (GA) Resolution 1884, and GA Resolution 1962 (the resolutions came into force on 10 October 1963, 17 October 1963, and 13 December 1963, respectively). The Johnson administration furthered these efforts by negotiating the OST, which entered into force on October 10, 1967.

The Limited Test Ban Treaty

Unlike the other arms control resolutions documents discussed below, the LTBT does not exclusively concern itself with outer space. Instead, the LTBT is primarily concerned with the

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[166]Ibid., 123.

[167]Ibid., 81-82.

[168]Kennedy's interest in exploring the option of banning the placement of WMD in space was amply demonstrated in negotiations over GA Resolution 1884. Kennedy's advisors told him to reject a Canadian proposal calling for a ban on placing WMD in orbit not included in the comprehensive UN negotiations for General and Complete Disarmament. Kennedy responded by ordering more thorough examination of the possibility of an independent declaratory ban, which helped promote increased interdepartmental support for negotiating GA Resolution 1884. See Raymond L. Garthoff, "Banning the Bomb in Outer Space," *International Security* 5 (Winter 1980-1981), 27-32.

nuclear arms race. As stated in the preamble of the LTBT, the original parties to the treaty seek to "put an end to the armaments race and eliminate the incentive to the production and testing of all kinds of weapons, including nuclear weapons."[169] Nonetheless, the LTBT affects the space weaponization regime by banning nuclear weapon test explosions in the atmosphere, under water, and outer space.[170]

General Assembly Resolution 1884

Despite its exceptional brevity,[171] GA Resolution 1884 places specific limits on the weaponization of space. Holding that the GA is "*Determined* to take steps to prevent the spread of the arms race to outer space," the resolution calls for states to:

> refrain from placing in orbit around the earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, installing such weapons on celestial bodies, or stationing such weapons in outer space in any other manner.[172]

General Assembly Resolution 1962

GA Resolution 1962 is a fairly broad document. The preamble recognizes "the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes."[173] The main text of the resolution holds that "Outer space and celestial bodies are

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[169]US Department of State, "Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water" (downloaded on April 29, 2006), preamble, available from http://www.state.gov/t/ac/trt/4797.htm

[170]The LTBT states that "Each of the Parties to this Treaty undertakes to prohibit, to prevent, and not to carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control: (a) in the atmosphere; beyond its limits, including outer space; or under water, including territorial waters or high seas." See Ibid., article 1.

[171]The entire resolution is about 150 words long.

[172]United Nations,"1884 (XVIII), "Question of General and Complete Disarmament," (17 October 1963), preamble, article 2, available from http://daccessdds.un.org/doc/RESOLUTION/GEN/NR0/185/59/IMG/NR018559.pdf?OpenElement

[173]United Nations Committee on the Peaceful Uses of Outer Space, "Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space," *United Nations Treaties and Principles on Outer Space*, (New York: United Nations, 2002), 39, preamble, available from http://www.unoosa.org/pdf/publications/STSPACE11E.pdf

free for exploration and use by all States" and "Outer space and celestial bodies are not subject to national appropriation."[174]

The Outer Space Treaty

The OST builds upon the work of GA 1884 and GA 1962. The preamble of the resolution recognizes the common interests of mankind in the use of outer space for peaceful purposes, while the body restates the rules that are mentioned above for GA 1884 and GA 1962.[175] However, the OST adds several important rules, stated in Article IV:

> The Moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the Moon and other celestial bodies shall also not be prohibited.[176]

Implications of the Arms Control Agreements

The arms control implications discussed above imposed some important limits on space weaponization. Although the military utility of orbiting weapons of mass destruction in space or weaponizing celestial bodies was (and remains) quite dubious,[177] the possibility that both superpowers would attempt to do so in the 1960s could not be discounted.

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[174]Ibid., 39-40, articles 2, 3.

[175]The preamble of the OST recognizes "the common interest of all mankind in the progress of the exploration and use of outer space for peaceful purposes." The body states: "Outer space, including the Moon and other celestial bodies, shall be free for exploration and use by all States;" "Outer Space, including the Moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty;" "States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner;" See US Department of State, "Treaty on Principles Governing the Activities of Space in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies" (downloaded on April 29, 2006), preamble, articles 1, 2, 4, available from http://www.state.gov/t/ac/trt/5181.htm

[176]Ibid., 4.

[177]Placing WMD in space would have little military utility for several reasons. First, the extreme heat caused by reentry could damage or destroy any chemical or biological agents before they reached the earth's surface. Second, if a weapon was placed in orbit relatively close to earth, the weapon would only pass over its target a few times in a given day. Consequently, the weapon could not attack targets except during short predetermined intervals. While placing a weapon farther away from the earth would increase the targeting area, it would also

Despite placing some limits on states, the aforementioned arms control treaties do not impose restrictions on most forms of space weaponization. While the LTBT held that states could not explode nuclear weapons in space, it did not prevent the US from deploying nuclear ASAT weapons in the form of Program 505 and Program 437. The arms control agreements also do not prevent states from orbiting conventional space weapons. The "peaceful" use of space envisioned in GA Resolution 1884, GA Resolution 1962, and the OST would thus still allow countries to consider further space weaponization as a potential option for enhancing national power.[178]

Fractional Orbital Bombardment System

It is unclear whether the arms control agreements prohibit the use of fractional orbital bombardment systems (FOBS) using nuclear warheads. FOBS, like orbital bombardment systems, are weapons that enter orbit. However, unlike orbital bombardment systems, they de-orbit before completing one full orbital rotation. FOBS thus exist in a grey area between BMs and orbital bombardment weapons.

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greatly increase the time needed for the weapon to arrive at its target. As a result, the possibility of detecting the space weapon would also rise. Ground, sea, or air-launched missiles are far more effective because they can strike anywhere on the globe with little warning. Furthermore, since they would not have to be placed in orbit before being fired, non-space based missiles are much cheaper to use.

It is exceptionally farfetched to think about placing weapons on non-earth celestial bodies, at least given the current state of technology. For example, the moon is about 384,000 kilometers away from the earth. This distance ensures that weapons fired from the moon would take a long time to reach the earth, giving the enemy plenty of time to detect their arrival. This makes earth-based BMs or cruise missiles far more effective than any weapons that can be currently placed on the moon. It is also expensive to send weapons to the moon when they can be launched far more easily from the earth.

[178]When negotiations for the OST began, the State Department informed Arthur Golberg, US Ambassador to the UN, that the text of the OST should not ban all military activity in space. During the Senate hearings concerning the ratification of the OST, the fact that the OST allowed for further space weaponization was made quite clear. Dean Rusk, US Secretary of State, said that the OST "does not inhibit, of course, the development of an antisatellite capability in the event that should become necessary." Additionally, Senator J. William Fulbright stated that only WMD were banned in orbit. See Hays, *Struggling Towards Space Doctrine*, 223; McDougall, . . . *The Heavens and the Earth*, 416, 418.

Between September 1966 and November 1967, the Soviets tested a FOBS 11 times.[179] On 3 November 1967, McNamara publicly stated that the Soviet Union had developed a FOBS.[180] The purpose of the weapon was to approach the US from the south, which was the least defended area. McNamara stated that FOBS did not violate GA 1962, although he may have stated otherwise if he believed that the FOBS tests used nuclear weapons.[181] Nonetheless, after the FOBS were placed on alert on August 25, 1969, US estimates held that the systems each carried a 1-3 megaton nuclear warhead.[182] The US also declined to attempt to include a ban on FOBS during the OST negotiations, partly because the US Department of Defense was unwilling to foreclose potential research and development of such systems.[183]

Arms Control Under the Nixon Administration

Upon coming into office, Nixon continued to implement arms control initiatives with the Soviet Union. The Anti-Ballistic Missile Treaty (ABMT) was one of the highlights of arms control efforts finalized by his administration. The ABMT is bilateral and entered into force on October 3, 1972.[184]

The ABMT was designed to prohibit both the US and the Soviet Union from aggravating the nuclear arms race through unrestrained deployment of ABM defence systems. This is relevant for this thesis to the extent that limitations on such systems prevent the development of ABM weapons that can be used in an ASAT or force application role.

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[179]Stares, *The Militarization of Space*, 99.

[180]Ibid.

[181]Ibid.

[182]Globalsecurity.org, "R-360 / SL-X-? FOBS," April 28, 2005, available from http://www.globalsecurity.org/wmd/world/russia/r-36o.htm

[183]Stares, *The Militarization of Space*, 103-104.

[184]Federation of American Scientists, "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems," available from http://www.fas.org/nuke/control/abmt/text/abm2.htm

The ABMT holds that the US and Soviet Union may not "develop, test, or deploy ABM systems or components which are . . . space-based."[185] The ABMT also states that its stipulations are to be verified through national technical means of verification (NTMV).[186] NTMV is a widely used term referring to satellites employed to verify compliance with international treaties. To protect satellites while they are carrying out verification functions, the ABMT says that the Soviet Union and the US must not "interfere with the national technical means of verification of the other Party."[187]

The ABMT provides a definition of an ABM system. According to article 2 of the ABMT, an ABM system is:

> a system to counter strategic ballistic missiles or their elements in flight trajectory, currently consisting of:
>
> a) ABM interceptor missiles, which are interceptor missiles constructed and deployed for an ABM role, or of a type tested in an ABM mode;
> b) ABM launchers, which are launchers constructed and deployed for launching ABM interceptor missiles; and
> c) ABM radars, which are radars constructed and deployed for an ABM role, or of a type tested in an ABM mode.[188]

Implications of the Anti-Ballistic Missile Treaty

The ABMT has two important implications for the space weaponization regime. First, the ABMT prohibits space-based strategic ABM systems. As explained in chapter 1, space-based weapon systems could be well-suited to an ASAT role and for orbital bombardment.

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[185]Ibid., article 5.

[186]Ibid.

[187]Ibid., article 12; The same words are used to protect NTMV in the Strategic Arms Limitation Treaty (SALT). SALT was a bilateral treaty between the US and Soviet Union. It came into force on October 3, 1972, the same day as the ABMT. See Federation of American Scientists, "Interim Agreement Between the United States of America and the Union of Soviet Socialist Republics on Certain Measures with Respect to the Limitation of Strategic Offensive Arms," article 5, available from http://www.fas.org/nuke/control/salt1/text/salt1.htm;

[188]Federation of American Scientists, "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems."

Second, the ABMT compels states to refrain from interfering with reconnaissance satellites. However, reconnaissance satellites are only protected under the ABMT when they are collecting data regarding treaty compliance. Protection of NTMV should thus not be viewed as a blanket ban on using weapons against reconnaissance satellites.[189] Furthermore, the Soviet Union and the US did not specify what they meant by "interference" with NTMV.[190]

A Lull in US ASAT Deployment

While ASAT research programs continued during the Nixon administration, Nixon was not very concerned about maintaining an operational US ASAT capability. On October 1, 1970, the Program 437 ASAT missiles and most of the launch personnel were moved away from the Program 437 launch facilities, reducing the ASAT system's response time to 30 days.[191] This effectively ended the system, although it was not completely shut down until April 1, 1975.[192]

Interestingly enough, the Nixon administration considered using a fixed land-based anti-missile missile system as an ASAT interceptor. During NASA budget hearings in 1969, John Foster, Director of Defense Research and Engineering, stated that "The Safeguard ABM system[,] when deployed beginning in early fiscal year (FY) 1974, will have an anti-satellite capability against satellites passing within the field of fire of the deployed system."[193] In 1970, Foster stated that Safeguard could offer an economical ASAT system.[194] Nonetheless, any

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[189]It is often difficult to determine whether a reconnaissance satellite is verifying treaty compliance. For better or for worse, this will ensure that states will be able to develop excuses to destroy target satellites. For example, a state could accuse another state of using reconnaissance satellites to collect military intelligence to carry out an imminent attack. See Hays, *Struggling Towards Space Doctrine*, 236.

It is not always impossible to ascertain whether a reconnaissance satellite is verifying treaty compliance. Reconnaissance satellites may be used in areas in which treaty verification is not an issue.

[190]Stares, *The Militarization of Space*, 166.

[191]Ibid., 127.

[192]Ibid;

[193]Ibid., 120.

[194]Ibid.

possibility for Safeguard to be used in an ASAT capacity ended when the program was cancelled in 1972.[195]

Soviet ASAT Testing

On October 19, 1968, a Russian satellite called Kosmos 248 was sent into orbit. The next day, Kosmos 249 was launched.[196] Within four hours, Kosmos 249 passed by Kosmos 248 and exploded.[197] This is the first known full Soviet ASAT intercept test.[198] Six more intercepts occurred between the Kosmos 249 test and December 3, 1971, after which the Soviets stopped their testing.[199]

The ASAT destroyed satellites by maneuvering close to the target and detonating a conventional "hot-metal kill" warhead, which produced a cloud of shredded metal that would fly outward.[200] Unlike the Program 437 and Program 505 ASATs, the Soviet ASAT did not head straight to its target. Instead, the Soviet weapon entered orbit, maneuvered close to the target satellite, and then "dived" toward it within one to two orbits (this took about 90-200 minutes).[201] It was believed to be effective if detonated within about 1 kilometer of the target satellite.[202] The ASAT tests indicate that the system could probably destroy satellites anywhere from 230-1,000 kilometers away.[203]

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[195]Ibid.
[196]Ibid., 137.
[197]Ibid.
[198]Ibid.
[199]Ibid., 137-140, 262.
[200]Matthew Mowthorpe, *The Militarization and Weaponization of Space* (Lanham, Maryland: Lexington Books, 2004), 117.
[201]Laura Grego, "A History of US and Soviet ASAT Programs," *Union of Concerned Scientists* (April 9, 2003), available from http://www.ucsusa.org/global_security/space_weapons/a-history-of-asat-programs.html
[202]Ibid.
[203]Ibid.

Pulse Energy Weapon Research

Early in the 1960s, the Department of Defense began researching PEWs. However, funding remained at relatively low levels and research efforts were primarily exploratory in nature.[204] This situation had not changed by the end of the Nixon administration.[205]

The Space Weaponization Regime, 1955-1974

My analysis of events from 1955-1974 suggests that the space weaponization regime grew to 3 principles, 4 norms, and 8 rules, all of which are shown in table 4.1. The principles, norms, and rules are primarily developed in international treaties, with the exception of one rule. The rule to "generally refrain from interfering with data collection satellites" stems from state practice, reflecting the Soviet Union's decision to stop its campaign to outlaw satellite reconnaissance in 1963 and the fact that no state appeared to interfere with another nation's satellites from 1955-1974. The term "generally refrain from interfering" instead of "refrain from interfering" is used since the conditions in which a state could legitimately interfere with a foreign satellite have not been specified in the space weaponization regime (with the exception of the rule that the US and Soviet Union should not interfere with reconnaissance satellites while acting as NTMV). This ambiguity means that a state may still be able to legitimately destroy other states' satellites. Nonetheless, since the US and Soviet Union did not object to satellite overflight or interfere with each other's satellites, the space weaponization regime at the end of 1974 appeared to call for considerable restraint concerning interference with satellites used for data collection.

Table 4.1 also maintains that no relevant decision-making procedures have been established as part of the regime. Instead, every principle, norm, and rule of the regime has been

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[204]Stares, *The Militarization of Space*, 111; Robert W. Seidel, "From Glow to Flow: A History of Military Laser Research and Development," *Historical Studies in the Physical and Biological Sciences* 18 (1987), 111-145.
[205]Stares, *The Militarization of Space*, 213-214.

established through negotiations between states. Although the US and the Soviet Union could have worked together to form an independent non-state organization with broad powers to structure the space weaponization regime, neither superpower appeared to want this.[206] They preferred to develop the space weaponization regime on a gradual basis through state-driven bilateral or multilateral negotiations.

[206]A US-sponsored resolution forming the UN Ad Hoc Committee on the Peaceful Uses of Outer Space (COPUOS) passed in 1958 at the UN. The US and other states used the COPUOS in the coming decades as a forum to create space law. However, the COPUOS had little power. As noted by Walter McDougall, "Its first instructions were to survey the resources of the UN relating to space, report on areas of likely cooperation, organize exchange of information, and suggest future organizational and legal problems for UN consideration. The rhetoric was uplifting; the mandate restricted. There would be no UN space agency, no discussion of space disarmament, no action of any kind without agreement between the two space powers." See McDougall, . . . *The Heavens and the Earth*, 185.

Table 4.1
Characteristics of the Space Weaponization Regime

Source	Principles	Norms	Rules	Decision-making Procedures
State Practice (from 1963 onward)	Peaceful use of outer space	Free passage in space and celestial bodies for peaceful activities	Generally refrain from interfering with data collection satellites	No major decision-making procedures established as part of the regime
Limited Test Ban Treaty (1963)	Curbing the nuclear arms race	No nuclear test explosions in the atmosphere, outer space, and under water	Refrain from detonating nuclear weapons in the atmosphere, outer space, and under water	
General Assembly Resolution 1884 (1963)	Prevention of an arms race in outer space	No WMD in orbit	Refrain from placing WMD in orbit	
General Assembly Resolution 1962 (1963)	Peaceful use of outer space	Free passage in space and celestial bodies for peaceful activities	Refrain from appropriating outer space and celestial bodies	
Outer Space Treaty (1967)	Prevention of an arms race in outer space Peaceful use of outer space	No WMD in orbit Free passage in space and celestial bodies for peaceful activities	Refrain from placing WMD in orbit Refrain from appropriating outer space and celestial bodies	

Birth

Maintenance

Table 4.1 (continued)
Characteristics of the Space Weaponization Regime

Source	Principles	Norms	Rules	Decision-making Procedures
Outer Space Treaty (continued)	Peaceful use of outer space	Free passage in space and celestial bodies for peaceful activities	Refrain from placing military bases, installations, fortifications, and weapons on the moon	No major decision-making procedures established as part of the regime
	Peaceful use of outer space	Free passage in space and celestial bodies for peaceful activities	Refrain from testing weapons and conducting military maneuvers on the moon	
Anti-Ballistic Missile Treaty (1972)	Curbing the nuclear arms race	Promote manageable strategic stability by limiting growth of strategic defences	Refrain from developing, testing, or deploying space-based strategic ABM systems or components	
	Curbing the nuclear arms race	Free passage in space and celestial bodies for peaceful activities	Refrain from interfering with NTMV	

Maintenance

The Nature of the Space Weaponization Regime

Table 4.1 indicates that the space weaponization regime prohibits some significant space weaponization activities, such as placing WMD in orbit, interfering with NTMV, and deploying space-based ABM systems or components. It also prohibits states from detonating nuclear weapons in space, which may have helped convince the Soviet Union to deploy a non-nuclear ASAT and the US to kill Program 437 and Program 505.[207]

While the regime prevents some space weaponization activities, it did not prevent the testing of FOBS or deployment of ASAT systems. Of the activities that the regime does limit, some will likely not be feasible options for a long time (if ever), such as weaponizing the moon or appropriating outer space and celestial bodies.

Even when including the unfeasible space weaponization activities, the space weaponization regime is composed of few principles, norms, rules, and decision-making procedures. It is thus "thin" (as opposed to "broad" or "thick") in scope.[208] The regime is also exceptionally ambiguous. It does not specify what constitutes "peaceful activities" or "interference" with NTMV.

Given the apparent shortcomings of the regime, one must ask why the regime even exists. The answer is simple: it is what the superpowers wanted. Early on in the Cold War, the US believed that space was vitally important for its national security interests. The Soviet Union

[207]The fact that exploding nuclear weapons in space risks harming a state's own satellites may have also been the reason for this. Furthermore, the Soviet Union (now Russia) did not start removing nuclear warheads from its ABM system until 1998. Even today, Russia may have nuclear warheads on some of its ABMs. The reluctance of the Soviet Union to remove nuclear warheads from its space weapons suggested that the LTBT had little (if any) affect on the Soviet decision to remove nuclear warheads from its ASAT systems. See Hans M. Kristensen, Matthew G. McKinzie, and Robert S. Norris, "The Protection Paradox," *Bulletin of the Atomic Scientists* 60 (March/April 2004), available from http://www.thebulletin.org/print.php?art_ofn=ma04kristensen

[208]Interestingly enough, some of the regimes' norms and rules are very similar. As indicated in table 4.1, GA 1884 established a norm of "no WMD in orbit" and a rule to "refrain from placing WMD in orbit." The LTBT established a norm of "no nuclear test explosions in the atmosphere, outer space, and under water" and a rule to "refrain from detonating nuclear weapons in the atmosphere, outer space, and under water." Highly similar norms and rules may be indicative of thin regimes, although a comparative study of several different regimes would be necessary to be certain of this.

thought likewise, particularly after its reconnaissance satellites began to return useful data on China in 1963. In an effort to maximize freedom of potential future military action in space, the US and Soviet Union resisted efforts to place all but basic restrictions on the research, testing, development, and deployment of space weapons.

Strength of the Space Weaponization Regime

Even though the space weaponization regime is not broad, it is strong. GA Assembly Resolution 1884 and GA Assembly Resolution 1962 were both adopted unanimously.[209] By the end of the Nixon administration, 63 states had ratified or acceded to the OST, while 106 had ratified or acceded to the LTBT.[210] Furthermore, the US and the Soviet Union adhered to all of the rules mentioned in Table 4.1.

Hegemonic Stability Theory and the Space Weaponization Regime, 1955-1974

To test the hegemonic stability theory for the period from 1955-1974, it is important to focus on years in which the space weaponization regime expanded. These years are 1963, 1967, and 1972. For hegemonic stability theory to hold true from 1955-1974, the relative power of the US must increase as the regime grows.[211]

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[209]Dusan J. Djonovich, ed., *United Nations Resolutions (Series I: Resolutions Adopted by the General Assembly), Volume IX* (Dobbs Ferry, New York: Oceana Publications, 1974), 24, 26.

[210]US Department of State, "Treaty on Principles Governing the Activities of Space in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies"; US Department of State, "Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water."

[211]See Chapter 3 for details on how hegemonic stability theory is tested in this thesis.

Table 4.2[212] Comparison of Annual Defence Spending for the Soviet Union and the United States US = 100		
Year	**Soviet Union**	**United States**
1955	73	100
1963	90	100
1967	69	100
1972	115	100

Table 4.3 Comparison of Annual GDP for the Soviet Union and the United States US = 100		
Year	**Soviet Union**	**United States**
1955	36	100
1963	39	100
1967	41	100
1972	42	100

Tables 4.2 and 4.3 summarize the strength of the US power base in relation to the Soviet Union. Table 4.2 indicates that US defence spending declined from 1955-1972. In particular, the level of Soviet military spending increased dramatically, even though Soviet spending appeared to drop from 1963-1967. Table 4.3 shows that US economic power also declined from 1955-1972, although not by much. Regardless, the overall trend during this period was for a drop in overall US power, suggesting that hegemonic stability theory cannot explain the growth of the space weaponization regime.

While it is clear that hegemonic stability theory cannot explain the growth of the space weaponization regime, some phenomena in this period require further analysis. In particular, it is noteworthy that the Soviets initially resisted American attempts to advance the norm of freedom of space. The drop in Soviet military spending from 1963 to 1967 is also interesting.

[212]The data from tables 4.2 and 4.3 is taken from tables 3.1 and 3.2.

Furthermore, since the Sputnik crisis occurred early in this period, I will briefly discuss Krasner's theory that states do not carry out activities corresponding with their interests until a "cataclysmic" event takes place. Finally, I will examine if Keohane's theory can explain the evolution of the space weaponization regime from 1955-1974.

Soviet Resistance to Satellite Overflight

As stated earlier in this chapter, the Soviets resisted American attempts to promote a right of satellite overflight until 1963, when the Soviet Union decided that it could benefit from satellite reconnaissance. Initial Soviet resistance to satellite reconnaissance is consistent with hegemonic stability theory, since the theory predicts that rising powers will attempt to thwart development of regimes during periods of hegemonic decline. It is not clear whether the Soviet Union would have been able to win this challenge if they continued to oppose satellite reconnaissance. Regardless, the Soviet Union decided to drop its challenge even though US relative power was decreasing, which does not support hegemonic stability theory.

Decline in Soviet Military Spending and the Outer Space Treaty

Relative Soviet military spending dropped significantly from 1963 to 1967. Some people may thus argue that the Soviet Union accepted the OST because their relative power base was not strong enough to resist US demands for such a treaty. However, the discrepancy in relative military spending between 1963 and 1967 may be exaggerated. Estimates in Soviet military spending vary widely from year to year and the drop from 1963-1967 was sudden and short. It began in 1966 (see full table in chapter 3 for details) and ended in 1968. In 1970, Soviet relative military spending surpassed 1963 levels and continued to grow until 1977.

Even assuming that the 1967 estimate is correct, hegemonic stability theory cannot account for the Soviet Union's acceptance of the OST in 1967. The main reason for this is that

the Soviet Union had already accepted the OST's main principles, norms, and rules in 1963 when they voted in support of GA Resolution 1884 and GA Resolution 1962. The only new items in the OST were rules to refrain from weaponizing the moon. If the Soviet Union assented to the new rules because of weakness, they would not have continued to accept them once their power base began to increase in 1968.

The Sputnik Crisis as a Cataclysmic Event

If there is any cataclysmic event potentially affecting the space weapon regime, the Sputnik crisis would have to be it. No other event regarding outer space seemed to produce as much fear, doubt, cynicism, and unwanted political attention as the launch of the Sputnik satellites. Nonetheless, US behavior regarding the space weaponization regime did not change much after the Sputnik launches. The Eisenhower administration had already planned to develop a norm of satellite overflight before the crisis and continued its policy afterward. Furthermore, Eisenhower did not change his military space policy. He thought space weapons had little military utility and did not develop or deploy them.

Keohane's Theory and the Space Weaponization Regime

From 1955-1974, the US was one of the two major players shaping the space weaponization regime. In terms of regime maintenance from 1963-1974, it is likely that states would have supported the multilateral treaties relevant to the space weaponization regime without US support, since only the US and Soviet Union appeared interested in space weapons considered in this study during that period. However, despite being a hegemon in decline, the US still had a lot of influence over the regime from 1963-1974. This period thus does not provide a good test for Keohane's theory that regimes can survive "after hegemony," since it is difficult to isolate hegemonic control over regime maintenance from non-hegemonic influence.

Conclusion

In 1955, the US began to implement a policy of promoting the idea of freedom of space through creation of a scientific satellite. Before the US could launch the satellite, the Soviet Union orbited the Sputnik satellites, causing near panic in the US. Despite America's unpromising second-place start to the opening of the space age, the Eisenhower administration did not choose to weaponize space. It continued its efforts to allow unrestrained free passage of satellites. This campaign continued during the Kennedy and Johnson administrations.

Notwithstanding declining American hegemony, the Soviet Union accepted the norm of freedom of space in 1963. Kennedy and Johnson administrations also enacted arms control agreements developing principles, norms, and rules limiting potential for space weaponization. Nixon further expanded the regime. The end result was a strong yet thin, ambiguous regime that cannot be explained by hegemonic stability theory.

Although the US and Soviet Union formed, maintained, and broadened the space weaponization regime, both countries researched, developed, and tested space weapons from 1955-1974. The US even deployed two ASAT systems, though they had highly limited capabilities.

Chapter 5: Stagnation and Uncertainty (Ford to Reagan, 1974-1989)

First, chapter 5 will first discuss space-weapon related activities that took place between 1974 and 1989. In particular, I will discuss the inability of the space weaponization regime to grow during this period and the failure of Reagan's efforts to circumvent certain regime rules. Second, the chapter will discuss the evolution of the space weaponization regime from 1974-1989. Third, chapter 5 will examine if hegemonic stability theory can explain events affecting the space weaponization regime during this era.

Space Weapon Related Activities, 1974-1989

The Resumption of Soviet ASAT Testing

The Soviets resumed ASAT testing in 1976. Between February 16, 1976, and June 18, 1982, the Soviet Union conducted 13 ASAT intercepts using hot-metal-kill warheads.[213] In 1977, the US officially announced that the Soviet ASAT had become "operational"[214] (although in 1985, the Defence Intelligence Agency reported that the system was operational in 1971).[215] By 1982, the Soviets had improved the system enough to intercept satellites anywhere between 160-1,600 kilometers.[216] The Soviet Union did not perform any other ASAT intercept tests after 1982 and it is not clear how many ASATs the Soviets had.

The Ford Administration and the Development of a New ASAT

Upon becoming President, Gerald Ford created a position of Military Technology Advisor to provide himself a source of scientific advice. In 1975, Rob Smith held the position

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[213]Stares, *The Militarization of Space*, 143-145, 262.

[214]This announcement was made by Secretary of Defense Harold Brown. See Ibid., 183.

[215]Mowthorpe, *The Militarization and Weaponization of Space*, 124; Defence Intelligence Agency, "Chapter III, Strategic Defence and Space Systems," in *Soviet Military Power (1985)*, available from Federation of American Scientists, http://www.fas.org/irp/dia/product/smp_85_ch3.htm

[216]Grego, "A History of US and Soviet ASAT Programs."

and initiated a study panel (chaired by Solomon Buchsbaum) to analyze satellite protection.[217] Spurred on by the resumption of Soviet ASAT testing, by late 1976 the Buchsbaum Panel produced a report on satellite protection and ASATs.[218] Like the Eimer Panel, the Buchsbaum Panel report held that developing an ASAT system would not deter the Soviets from using ASATs.[219] Nonetheless, the report stated that the development of a US ASAT program could act as a "bargaining chip" to help the US produce a satisfactory ASAT arms control agreement.[220]

The Buchsbaum Panel report was presented to the NSC in December 1976, along with a policy option to develop an ASAT weapon.[221] Afterward, Lieutenant General Brent Scowcroft, Deputy Secretary of State, briefed the President.[222] In response, Ford signed National Security Decision Memorandum (NSDM) 345 on January 18, 1977, two days before Jimmy Carter took office.[223] NSDM 345 directed the Department of Defense to develop an ASAT system.[224] The document also called for a study of arms control options but did not include a proposal to begin ASAT negotiations with the Soviets.[225]

Carter Military Space Policy

On May 11, 1978, President Carter signed Presidential Directive (PD)/NSC-37.[226] Consistent with the OST, PD/NSC-37 rejects claims over sovereignty of outer space or celestial bodies.[227] The document also suggests that the US still believed in the principle of freedom of space. According to the preamble of PD/NSC-37 (parts of which are still classified), the US

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[217]Stares, *The Militarization of Space*, 169.
[218]Ibid., 170.
[219]Ibid.
[220]Ibid.
[221]Ibid., 171.
[222]Ibid.
[223]Ibid.
[224]Ibid.
[225]Ibid.
[226]National Aeronautics and Space Administration, "Presidential Directive/NSC-37, 'National Space Policy'" (May 11, 1978), available from http://www.jimmycarterlibrary.org/documents/pddirectives/pd37.pdf
[227]Ibid., article 1.

intends to use space to advance its interests and maintain the "freedom of space for all activities which enhance the security and welfare of mankind."[228] The US would reject limitations on the "fundamental right to acquire data from space" and holds that "space systems of any nation . . . have the right of passage through and operations in space without interference."[229] PD/NSC-37 further states that the US "will maintain a national intelligence space program."[230]

PD/NSC-37 also suggests that the Carter administration had not changed US policy concerning the "peaceful" use of space. The document states that space will be used for peaceful purposes.[231] Peaceful purposes "allow for military and intelligence-related activities in pursuit of national security and other goals."[232] The document also holds that the US will "pursue activities in space in support of its right of self-defense."[233]

A government press release announced after the signing of PD/NSC-37 sheds some light on what is contained in the classified sections of the document. In particular, the press release states that "the United States seeks verifiable comprehensive limits on antisatellite capabilities."[234] However, the document further stated that "in the absence of such an agreement, the United States will vigorously pursue development of its own capabilities."[235]

The Carter administration was clearly more interested in developing an effective ASAT arms control agreement than deploying ASATs. During defence budget hearings in 1978, Harold Brown, US Secretary of Defence, stated:

> I think that the preferable situation, even though we would be foregoing the ability to knock out some Soviet military capabilities, would be for neither

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[228]Ibid., preamble, article 1.
[229]Ibid., article 1.
[230]Ibid.
[231]Ibid.
[232]Ibid.
[233]Ibid.
[234]Stares, *The Militarization of Space*, 185. PRM/NSC-23 of September 23, 1977, also stated that the US would seek a comprehensive limit on ASAT capabilities. See Stares, *The Militarization of Space*, 184.
[235]Ibid., 185-186.

> country to have an ability to knock out the other's satellites. However, as you say, the Soviets have some slight capability now. How good it is is not so clear, but it certainly can threaten some of our satellites. Under those circumstances, I think we have no choice but to provide some kind of deterrent by moving ahead at least with R&D and if we cannot reach an agreement with them that satisfies us as to its verifiability, then have a deployed capability of our own.[236]

This statement indicates that the Carter administration viewed ASAT talks as the primary means of protecting US satellites, although Carter intended to continue development of an ASAT system to hedge against potential failure of the negotiations or a robust Soviet drive to deploy ASAT weapons. As the Buchsbaum Panel had originally recommended to Ford, Carter was also attempting to use the development of an ASAT as a bargaining chip during ASAT negotiations with the Soviets. The strategy of carrying out ASAT negotiations with the Soviet Union while actively attempting to develop an ASAT became known as Carter's "two-track" approach.

The US-Soviet ASAT Negotiations

Although the Carter administration sought "comprehensive" limits on ASATs, it was not clear exactly what a "comprehensive" arms control ASAT agreement would entail. Nonetheless, Carter decided to initiate formal ASAT discussions with the Soviets by March 1978.[237] This resulted in ASAT talks on June 8-16, 1978, January 16-23, 1979, and April 23-June 17, 1979.[238]

As the talks progressed, the US refined its negotiating strategy. In the short-term, the US would attempt to finalize a no-use agreement and possibly a moratorium on ASAT testing.[239] In the long-term, the US would attempt to negotiate a more comprehensive agreement banning certain specific hardware.[240]

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[236]Ibid., 184.
[237]Ibid., 195.
[238]Ibid., 196.
[239]Ibid., 198; Aviation Week and Space Technology, "Antisatellite Talks," 110 (23 April, 1979), 15, downloaded from Lexis Nexis Academic online database.
[240]Stares, *The Militarization of Space*, 198; Aviation Week and Space Technology, "Antisatellite Talks."

During the talks, the US and Soviet Union outlined their negotiating positions. The US initially argued that it wanted a comprehensive ban on dedicated ASAT systems.[241] In response, the Soviet Union made it clear that they were not willing to dismantle their existing ASAT system. This was unacceptable to the US.[242] The US also proposed a short-term ASAT test moratorium, which the Soviet Union refused.[243] Nonetheless, the Soviets did not carry out any ASAT tests during the negotiations.

The US and Soviet Union were both interested in discussing an agreement banning the use of ASATs on space systems. The US wanted this nonuse arrangement to extend to both US and allied satellites.[244] However, the Soviets were only willing to extend the agreement to US satellites.[245] Furthermore, the Soviet Union stated that it would circumvent a nonuse agreement if "exceptionally objectionable" satellite activities infringed upon their national sovereignty.[246] It is unclear exactly what the Soviets meant by "exceptionally objectionable" activities.[247]

The third round of ASAT talks ended with the expectation that a fourth round would begin in August 1979.[248] However, the Strategic Arms Limitation (SALT) II ratification debate (Carter's top arms control priority) in the US delayed the start of the next ASAT negotiation. The possibility of any future talks during the Carter administration effectively ended with the Soviet invasion of Afghanistan in December 1979.

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[241]John Wertheimer, "The Antisatellite Negotiations," in Albert Carnesale, and Richard N. Haass, eds., *Superpower Arms Control: Setting the Record Straight*, (Cambridge, Massachusetts: Ballinger Publishing Company, 1987), 145.

[242]Ibid.

[243]It is not surprising that the Soviet Union decided to turn down the proposal for a short-term ASAT moratorium. The US ASAT under development during the Carter administration would not be ready for testing for several years, meaning that a short-term ASAT moratorium would only affect the Soviet Union. See Ibid., 145.

[244]Ibid.

[245]In particular, the Soviet Union wanted to ensure that it had freedom of action against China. See Ibid., 145.

[246]Ibid., 146.

[247]Some observers thought "exceptionally objectionable" activities involved a desire to target broadcasting satellites used for transmitting propaganda. However, the only example the Soviets gave was delivering poison gas via satellite. See Ibid.

[248]Stares, *The Militarization of Space*, 199.

Reagan's Military Space Policy

Reagan released two major documents outlining national space policy, National Security Decision Directive (NSDD) 42 and a Presidential Directive. He signed the first document on July 4, 1982, and the second document on January 5, 1987.[249] Both documents were written after a review of national space policy and outline the central strategic objectives of US space programs under the Reagan administration.

NSDD-42 is similar to Carter's space policy in many respects. It states that one of the main American goals in outer space is to maintain "freedom of space for all activities that enhance the security and welfare of mankind."[250] The US rejects "any limitations on the fundamental right to acquire data from space."[251] Space systems have "the right of passage through the operations in space without interference."[252] "Purposeful interference with space systems shall be viewed as infringement upon sovereign rights."[253] The US will use outer space for peaceful purposes while continuing to "pursue activities in space in support of its right of self-defense."[254] Finally, the US "rejects any claims to sovereignty by any nation over outer space or celestial bodies."[255]

NSDD-42 also differs from Carter's space policy in many ways. It does not make any reference to ASATs or ASAT arms control in the unclassified portion of the document. While it

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[249]National Aeronautics and Space Administration, "National Security Decision Directive Number 42, 'National Space Policy'" (July 4, 1982), available from http://www.hq.nasa.gov/office/pao/History/nsdd-42.html; National Aeronautics and Space Administration, "Presidential Directive on National Space Policy" (February 11, 1988), available from http://www.hq.nasa.gov/office/pao/History/policy88.html

[250]National Aeronautics and Space Administration, "National Security Decision Directive Number 42," section 1.

[251]Ibid., article 1.

[252]Ibid.

[253]Ibid.

[254]Ibid., articles 2, 3.

[255]Ibid., article 2.

is possible that such statements may be included in classified sections of NSDD-42, no reports have emerged stating that NSDD-42 discusses ASATs.

While NSDD-42 does not appear to mention ASAT arms control, article 3 of NSDD-42 discusses "space arms control options." Article 3 states that:

> The United States will continue to study space arms control options. The United States will consider verifiable and equitable arms control measures that would ban or otherwise limit testing and deployment of specific weapons systems should those measures be compatible with United States national security. The United States will oppose arms control concepts or legal regimes that seek general prohibitions on the military or intelligence use of space.[256]

This passage is very unambiguous. It is not clear what "space arms control," measures "compatible with United States national security," or "general prohibitions on the military or intelligence use of space" entail. At the very least, article 3 suggests that the Reagan administration had not decided to commit itself to arms control negotiations devoted exclusively to a particular type of space weapon (such as the US-Soviet ASAT talks during the Carter presidency).

The fact sheet for the 1987 Presidential Directive (the actual policy statement is classified) reiterates everything in NSDD-42 (almost word for word) concerning freedom of space, limitation on the right to acquire data from space, right of non-interference, peaceful purposes in space, and rejection of national appropriation over outer space and celestial bodies.[257] The Presidential Directive also provides an ambiguous statement concerning arms control, stating that the US will consider arms control measures regarding activities in outer

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[256]Ibid., article 3.

[257]Among other things, the Presidential Directive states: one of the central American objectives in space is to maintain "freedom of space for all activities that enhance the security and welfare of mankind;" the US "rejects any limitations on the fundamental right of sovereign nations to acquire data from space;" space systems have "the right of passage through and operations in space without interference;" "Purposeful interference with space systems shall be viewed as an infringement upon sovereign rights;" the US will use outer space for peaceful purposes while continuing to "pursue activities in space in support of its inherent right of self-defense and its defense commitment to its allies;" and the US "rejects any claims to sovereignty by any nation over outer space or celestial bodies." See National Aeronautics and Space Administration, "Presidential Directive on National Space Policy."

space if they are "equitable, effectively verifiable, and enhance the security of the United States and its allies."[258]

Besides restating many of the ideas in NSDD-42, the Presidential Directive contains significant new material.[259] In marked contrast to the space policy of every other US administration during the space age, the Presidential Directive holds that the US would deploy ASATs. The document states that "DOD [Department of Defense] will develop and deploy a robust and comprehensive ASAT capability with programs as required and with initial operational capability at the earliest possible date."[260] The Presidential Directive also states that "The DOD will develop, operate, and maintain enduring space systems to ensure its freedom of action in space. This requires an integrated combination of antisatellite, survivability, and surveillance capabilities."[261]

Other clauses in the Presidential Directive could allow the Reagan administration to have considerable leeway concerning potential future deployment of other space weapons. Under a heading entitled "Force Application," the document states that the "DoD will, consistent will [*sic*] treaty obligations, conduct research, development, and planning to be prepared to acquire and deploy space weapons systems for strategic defense should national security conditions dictate."[262] The Presidential Directive also states that:

> Space activities will contribute to national security objectives by (1) deterring, or if necessary defending against enemy attack; (2) assuring that forces of hostile

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[258]Ibid.

[259]Among other things, the Presidential Directive says that the United States should strive to lead in space through establishing "preeminence in key areas of space activity critical to achieving our national security, scientific, technical, economic, and foreign policy goals." It also has several passages concerning the civil and commercial space sectors, suggesting that they were becoming increasingly important for the US. See Ibid.

[260]Ibid.

[261]Ibid.

[262]Ibid.

nations cannot prevent our own use of space; (3) negating, if necessary, hostile space systems.[263]

These statements concerning force application and contribution of space activities to national security objectives suggest (at the very least) that Reagan believed space weapons could become important for military operations. This is significant, since previous American presidential administrations thought that space weapons considered in this study had relatively little military utility.

ASAT Initiatives in the Reagan Administration

In 1978, the Air Force began to develop the Air-Launched Miniature Vehicle (ALMV), the major ASAT program during the Carter administration. The ALMV consisted of a satellite kill vehicle and boosters to direct it toward the target. The kill vehicle was called the Miniature Homing Vehicle (MHV), which incorporated state-of-the-art technology and was designed specifically for the ASAT mission.[264] It was about the size of a juice can (12 by 13 inches), weighed 30 pounds, and was launched from an airborne F-15.[265]

Upon launch, a Short-Range Attack Missile and an Altair III booster would bring the MHV to a maximum range of 650 kilometers.[266] After arriving in the vicinity of the target, the MHV's heat-seeking sensors would home in on the satellite.[267] The MHV would then ram the satellite at 27,800-46,300 kilometers an hour, ensuring destruction.[268] No conventional or nuclear explosion would be required to destroy the target.

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[263]The Presidential Directive also lists a fourth way in which space activities will help protect the US: "(4) enhancing operations of United States and Allied forces." This point is not tantamount to supporting weaponization *per se* since unarmed satellites can (and do) enhance military operations. See Ibid.

[264]For more details concerning the technology used for the ALMV and the MHV, see Globalsecurity.org, "Air-Launched Miniature Vehicle," April 27, 2005, available from http://www.globalsecurity.org/space/systems/almv.htm

[265]Ibid.; Hays, *Struggling Towards Space Doctrine*, 388; Stares, *The Militarization of Space*, 207.

[266]Globalsecurity.org, "Air-Launched Miniature Vehicle."

[267]Stares, *The Militarization of Space*, 206.

[268]Globalsecurity.org, "Air-Launched Miniature Vehicle."

The Reagan administration inherited the ALMV program and continued developing the system. It was first tested on January 21, 1984, and again on November 13, 1984.[269] On September 13, 1985, the ALMV successfully carried out its first intercept test against a satellite.[270] No further intercept tests of the ALMV occurred, largely due to Congressional resistance to development, testing, and deployment of an ASAT system.

The US Congress began passing legislation restricting testing of ASAT systems in 1983. In that year, a conference committee approved an amendment to the FY 1984 Defence Authorization Bill barring testing of ASATs unless two conditions were met: first, Reagan would need to certify that the US was "endeavoring to negotiate in good faith with the Soviet Union a mutual and verifiable ban on anti-satellite weapons;" second, he needed to show that the tests were necessary to prevent "clear and irrevocable harm" to US security.[271]

The requirement to "negotiate in good faith" would be satisfied if the Reagan administration was merely considering opening talks on ASAT issues.[272] Given this constraint, the amendment would be unable to stop the Reagan administration from continuing ASAT testing.

This weak amendment was followed by more stringent prohibitions on ASAT testing. In 1984, a Congress conference committee agreed on a provision to prohibit more than two successful ASAT missile tests during FY 1985.[273] In 1985, the FY 1986 defense appropriations bill banned testing of US ASAT missiles, provided the Soviet Union continued to abstain from

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[269]Bhupendra Jasani, "The Military Use of Outer Space," in *World Armaments and Disarmament: SIPRI Yearbook 1986* (Oxford: Oxford University Press, 1986), 132.

[270]Ibid., 132-133.

[271]Mary Cohn, *et al*, eds., *Congressional Quarterly Almanac, 98th Congress, 1st Session, 1983 (Volume 39)*, (Washington, D.C.: Congressional Quarterly Inc., 1984), 188.

[272]Ibid.

[273]The conferees stated that a successful test required the ASAT missile engine and guidance system to work properly. The missile would also have to intercept the target satellite. See Mary Cohn, *et al*, eds., *Congressional Quarterly Almanac, 98th Congress, 2nd Session, 1984 (Volume 40)*, (Washington, D.C.: Congressional Quarterly Inc., 1985), 54.

testing its ASAT system.[274] Conference committees upheld the ban on ASAT tests for FY 1987 and FY 1988.[275]

Congressional bans on testing severely hampered the development of the ALMV program. The fourth and fifth tests of the ASAT system required the ALMV to lock onto heat of distant stars instead of satellites.[276] The ALMV system was also becoming very expensive. Initially, the ALMV development program was supposed to cost $500 million.[277] By 1985, the program was expected to cost $5.3 billion.[278]

In 1988, the Reagan administration cancelled the ALMV after the Air Force suggested ending further program development.[279] The termination of the ALMV program was partly a result of testing restrictions and cost growth.[280] However, it was also because the Reagan administration thought that the technological capabilities of the system were limited.[281]

The ALMV was not the only ASAT initiative during the Reagan presidency. The Reagan administration considered using ABM technologies under development for the ASAT role. On February 6, 1987, Reagan ordered the US to evaluate the potential for development of advanced ASAT weapons based on technologies for ABM systems.[282] A committee chaired by Frank Kendall, Assistant Deputy Director for Research and Engineering for Defensive Systems, stated

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[274]Mary Cohn, *et al*, eds., *Congressional Quarterly Almanac, 99th Congress, 1st Session, 1985 (Volume 41)*, (Washington, D.C.: Congressional Quarterly Inc., 1986), 118.

[275]Mary Cohn, *et al*, eds., Congressional Quarterly Almanac, 99th Congress, 2nd Session, 1986 (Volume 42), (Washington, D.C.: Congressional Quarterly Inc., 1987), 483; Christine C. Lawrence, *et al*, eds., Congressional Quarterly Almanac, 100th Congress, 1st Session, 1987 (Volume 43), (Washington, D.C.: Congressional Quarterly Inc., 1988), 221.

[276]Hays, *Struggling Towards Space Doctrine*, 395.

[277]Globalsecurity.org, "Air-Launched Miniature Vehicle."

[278]Ibid.

[279]The Air Force did not like the ALMV program. See Hays, *Struggling Towards Space Doctrine*, 397-400.

[280]Ibid., 397.

[281]Ibid; Dwayne Day, "Blunt Arrows: the Limited Utility of ASATs," *The Space Review* (June 6, 2005), available from http://www.thespacereview.com/article/388/1

[282]John Pike, "Military Use of Outer Space," in *SIPRI Yearbook 1989: World Armaments and Disarmament* (Oxford: Oxford University Press, 1989), 70.

that the Exoatmospheric Reentry-Vehicle Interception System (a ground-based anti-missile missile) and the Ground-Based Free Electron Laser (a ground-based anti-missile laser) were the most promising ABM systems under development that could be used in an ASAT role.[283] Both systems were never deployed.

The Strategic Defense Initiative

In a speech on March 23, 1983, Reagan called upon "the scientific community in our country, those who gave us nuclear weapons . . . to give us the means of rendering these nuclear weapons impotent and obsolete."[284] Reagan then proposed "a long-term research and development program to begin to achieve our ultimate goal of eliminating the threat posed by strategic nuclear missiles."[285] Reagan said that "This could pave the way for arms control measures to eliminate the [nuclear] weapons themselves . . . Our only purpose – one all people share – is to search for ways to reduce the danger of nuclear war."[286]

The research and development program of which Reagan spoke quickly became known as the "Strategic Defense Initiative" (SDI). While Reagan did not mention space in his speech, given Reagan's emphasis on rendering nuclear weapons "impotent and obsolete," it was widely understood that SDI was an ABM research and development program.

The "Broad" and "Restrictive" Interpretations of the Anti-Ballistic Missile Treaty

On October 6, 1985, Robert McFarlane, Reagan's National Security Advisor, said that the ABMT could be broadly interpreted in order to permit testing and development of SDI-related technologies.[287] The differences between the "broad" and "restrictive" versions are

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[283]Ibid.

[284]Ronald Reagan, "Address to the Nation on Defense and National Security, March 23, 1983," available from http://www.learnworld.com/org/TX.002=1983.03.23.Reagan.html

[285]Ibid.

[286]Ibid.

[287]Francis Fitzgerald, *Way out There in the Blue: Reagan, Star Wars, and the End of the Cold War* (New York: Simon & Schuster, 2000), 290.

significant, since each affects the scope of the ABMT and the space weaponization regime. Furthermore, the Soviet Union and many US allies were bitterly opposed to the broad interpretation.[288]

The broad and restrictive interpretations focus heavily on articles 2 and 5 of the ABMT, as well as Agreed Statement D (a joint statement announced by both the US and the Soviet Union on the day the ABMT was signed).[289] As mentioned in chapter 4, article 2 of the ABMT defines "ABM system." ABM systems "currently" consist of ABM missiles, ABM launchers, and ABM radars. Article 5 prohibits development, testing, and deployment of space-based ABM systems and components.

Agreed Statement D further clarifies restrictions on ABMs outlined in the ABMT. It states:

> In order to insure fulfillment of the obligation not to deploy ABM systems and their components except as provided in Article III of the Treaty, the Parties agree that in the event ABM systems based on other physical principles and including components capable of substituting for ABM interceptor missiles, ABM launchers, or ABM radars are created in the future, specific limitations on such systems and their components would be subject to discussion in accordance with Article XIII[290] and agreement in accordance with Article XIV[291] of the Treaty.[292]

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[288]See Ibid., 290-291; 301-302.

[289]The following examination of the text of the ABMT is provided to show readers how the language of the ABMT was used to justify both the broad and restrictive interpretations. The discussion is not meant to be exhaustive. For a more thorough analysis of the arguments for the broad and restrictive interpretations, see Mark T. Clark, "The ABM Treaty Interpretation Dispute: Partial Analyses and the Forgotten Context," *Global Affairs* 2 (Summer 1987): 58-79; Lakoff and York, *A Shield in Space?*, 180-198.

[290]Article 13 requires the US and Soviet Union to create a Standing Consultative Commission, which examines matters relevant to the ABMT and acts as a medium to exchange information concerning compliance with the ABMT. See Federation of American Scientists, "Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missile Systems," article 13.

[291]Article 14 states that the US and Soviet Union can make amendments to the ABMT. It also states that US and Soviet Union will review the ABMT every five years. See Ibid., article 14.

[292]Federation of American Scientists, "Agreed Statements, Common Understandings, and Unilateral Statements Regarding the Treaty Between the United States of America and the Union of Soviet Socialist Republics on the Limitation of Anti-Ballistic Missiles," available from http://www.fas.org/nuke/control/abmt/text/abm3.htm, statement D.

The ABMT and Agreed Statement D (as well as any other joint statements given by the US and Soviet Union) do not provide a definition of "other physical principles."

The broad interpretation holds that the phrase "currently consisting of" in article 2 of the ABMT refers solely to 1972-class ABM technology (ABM interceptors, launchers, and radars).[293] All future ABM technology is based on other physical principles.[294] Since Agreed Statement D only discusses deployment of ABMs, testing and development of ABM technology based on other physical principles is permitted under the ABMT, including future space-based systems.[295] Only deployment of systems based on other physical principles would be forbidden.[296]

The restrictive interpretation views the text of the ABMT differently. "Currently consisting of" in article 2 is a functional definition that includes future ABM systems and components.[297] Agreed Statement D is linked to article 5, suggesting that testing, development, and deployment of space-based systems based on other physical principles is prohibited.[298]

Congressional Response to the Broad Interpretation

Congress was not amused by Reagan's attempt to broaden the scope of the ABMT. In particular, legislators were alarmed by the fact that Reagan had not asked for Congressional support of the broad interpretation. When the ABMT was presented to Congress for ratification in 1972, Nixon administration officials informed Congress that it would adhere to the restrictive version of the Treaty.[299] Many legislators believed that Reagan's attempt to unilaterally change the interpretation of the ABMT violated the separation of powers between the executive and

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[293]Clark, "The ABM Treaty Interpretation Dispute," 64.
[294]Ibid.
[295]Ibid.
[296]Ibid.
[297]Ibid.
[298]Ibid.
[299]Lakoff and York, *A Shield in Space?*, 182-185.

legislative branches of the US government.[300] Furthermore, legislators were concerned that unilateral interpretations of treaties by the executive branch would mean that no foreign states could trust any US treaty commitment.[301]

Shortly after McFarlane stated that the Reagan administration would implement a broad interpretation of the ABMT, the Reagan administration faced a firestorm of criticism from Congress.[302] In response, 8 days after announcing support for the broad interpretation, McFarlane made another announcement concerning the ABMT.[303] He said that although the broad interpretation was "fully justified," the SDI program would adhere to the restrictive interpretation of the treaty.[304] The Reagan administration mounted no more serious challenges to the ABMT until 1987.

In 1987, two major incidents suggested that the Reagan administration planned to implement the broad interpretation of the ABMT. The first event occurred on February 6, 1987, when the Washington Post published a portion of minutes of a meeting on February 3, 1987, between Reagan and his advisors.[305] The minutes suggested that Reagan planned to go ahead with testing and deployment of futuristic SDI technologies without consulting the Soviet Union.[306]

The second incident happened on February 10, 1987. On that day, during a meeting with senior officials, Reagan decided he would direct the Department of Defense to produce a list of tests it would carry out under the broad interpretation of the ABMT.[307] Reagan also said that he

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[300]Fitzgerald, *Way out There in the Blue*, 291.
[301]Ibid.
[302]Ibid., 290-291.
[303]Ibid., 292.
[304]Ibid.
[305]Ibid., 390.
[306]Ibid., 390-392.
[307]Ibid., 392.

would make a final decision concerning the broad interpretation only after talking to Congress and US allies, but would not consult with the Soviet Union.[308]

These incidents provoked loud cries of protest from Congress.[309] In particular, the administration's newfound interest in enacting the broad interpretation angered Sam Nunn, Chairman of the Senate Committee on Armed Services. For over a year, Nunn and his staff had been analyzing the Reagan administration's arguments for the broad interpretation and the ABMT negotiating record.[310] On March 11, 12, and 13, 1987, Nunn delivered brilliant speeches in the Senate excoriating the broad interpretation.[311] Nunn's speeches caused such a stir in Washington that they ended any possibility for the Reagan administration to adhere to the broad interpretation without having Congress drastically cut SDI funding.[312]

Nunn wanted to convince Reagan to officially declare support for the restrictive interpretation of the ABMT.[313] Reagan would do nothing of the sort. In response, Nunn and Senator Carl Levin sponsored an amendment to the FY 1988 Defense Appropriations Bill, which passed and was approved in a conference committee.[314] For the remainder of Reagan's presidency, the amendment prohibited funds for any SDI tests that did not adhere to the restrictive interpretation.[315] The amendment also prevented the Reagan administration from stating that a test had surpassed the limits of the restrictive but not the broad interpretation.[316]

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[308]Ibid.

[309]The Soviet Union and US allies were also alarmed. Within a few days of the President's meeting on February 10, 1987, the Soviet Union, Canada, West Germany, Japan, and the United Kingdom made formal protests to the US. See Ibid.

[310]Ibid., 398.

[311]Ibid., 399.

[312]Ibid., 400.

[313]Ibid., 401.

[314]Ibid.

[315]Ibid.

[316]Ibid.

Arms Control Under the Reagan Administration

The Reagan administration did not believe in opening negotiations exclusively devoted to specific space weapons. Instead, space weapons were linked with other issues during comprehensive arms control negotiations in the United Nations and major bilateral summit meetings. No arms control initiatives emerged during the Reagan administration that established any new principles, norms, rules, or decision-making procedures concerning space weapons considered in this thesis.

The Reagan administration was particularly hostile toward ASAT arms control. Reagan did not continue Carter's policy of attempting to negotiate an ASAT treaty with the Soviet Union.[317] On March 31, 1984, in the covering letter for a report to Congress on March 31, 1984, Reagan stated that:

> no arrangements or agreements beyond those already governing military activities in outer space have been found to date that are judged to be in the overall interest of the United States and its Allies. The factors that impede the identification of effective ASAT arms control measures include significant difficulties of verification, diverse sources of threats to U.S. and Allied satellites, and threats posed by Soviet targeting and reconnaissance satellites that undermine conventional and nuclear deterrence.[318]

The Soviet Union made several attempts to promote space weapon arms control during the Reagan administration. Most notably, on August 20, 1981, Andrei A. Gromyko, Soviet Foreign Minister, presented a "Draft Treaty on the Prohibition of the Stationing of Weapons of Any Kind in Outer Space to the UN General Assembly."[319] The resolution had many conceptual

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[317]In August 1983, the US Arms Control Disarmament Agency sent two proposals to the White House. One was to negotiate a US-Soviet bilateral treaty allowing possession of only one ASAT system. The other was to initiate multilateral negotiations calling upon states not to interfere with satellites. Both ideas were rejected. See Flora Lewis, "A Lock for Pandora," *The New York Times* (August 30, 1983), A21, downloaded from Lexis Nexis Academic online database.

[318]Stares, *The Militarization of Space*, 233.

[319]Hays, *Struggling Towards Space Doctrine*, 389.

problems.[320] Even so, the US did not reply with its own ASAT proposal. On August 20, 1983, the Soviet Union presented another draft resolution at the UN.[321] This draft resolution was more comprehensive and precise than the first treaty.[322] The US nonetheless responded by stating that space weapon arms control would be hard to verify.[323]

Pulse Energy Weapon Research

Funding for PEWs remained low during the Ford administration.[324] The possible roles of PEWs in space nonetheless started attracting more attention in the later stages of Ford's presidency.[325] By the beginning of the Carter administration, the appropriate level of funding for PEW research was being increasingly debated.[326] The debate concerned both total funding allocations for PEW research and the comparative value of funding certain weapons systems over others.[327]

The Carter administration was skeptical about the short and medium-term potential of PEW technology.[328] The administration thought that conventional weapons would remain more cost-effective for a long time.[329] Funding for PEW programs thus remained relatively low during the Carter administration, although debate concerning appropriate funding levels and roles for PEWs remained lively.[330]

The announcement of Reagan's SDI initiative further increased interest in PEW research. Several different types of PEWs were researched during the Reagan administration and funding

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[320]For an outline of the problems with this draft resolution, see Ibid.
[321]Ibid., 390.
[322]Ibid.
[323]Ibid.
[324]Stares, *The Militarization of Space*, 213.
[325]Ibid.
[326]Ibid.
[327]Ibid.
[328]Ibid.
[329]Ibid., 213-214.
[330]Ibid., 214.

for PEWs absorbed a large portion of the generous SDI budget.[331] For example, in FY 1984, $467.9 million was authorized for high-energy laser research.[332] This level of funding was roughly one quarter of all money the US had spent on high-energy laser weapons prior to 1983.[333]

Despite high levels of funding, by the end of the Reagan administration, PEWs still appeared to be a long way away from achieving the level of technical sophistication required for deployment. PEW efforts remained confined to research and some preliminary testing.

The Space Weaponization Regime, 1974-1989

The space weaponization regime continued to be strong from 1974-1989. Both Carter's attempts to negotiate an ASAT treaty with the Soviet Union and Reagan's attempts to reduce the prohibitions specified in the ABMT failed. The regime remained thin in scope and exceptionally ambiguous.

Strength of the Space Weaponization Regime

The space weaponization regime remained strong from 1974-1989. By the end of the Reagan administration, 100 states had ratified or acceded to the OST, while 118 states had ratified or acceded to the LTBT.[334] The US and Soviet Union also adhered to the major principles, norms, and rules of the space weaponization regime (see Table 4.1).

Hegemonic Stability Theory and the Space Weaponization Regime, 1974-1989

To test hegemonic stability theory from 1974-1989, the failure of US-Soviet ASAT talks and the inability of the Reagan administration to implement the broad interpretation of the

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[331]From 1984 to 1989, Congress authorized about $1.58 billion dollars in SDI funding. See Lakoff and York, *A Shield in Space?*, 294.

[332]Bhupendra Jasani, "The Military Use of Outer Space," in *World Armaments and Disarmament: SIPRI Yearbook 1984* (Oxford: Oxford University Press, 1984), 361-362.

[333]The US had spent about $2 billion on high-energy lasers before 1983. See Ibid., 361.

[334]US Department of State, "Treaty on Principles Governing the Activities of Space in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies"; US Department of State, "Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space, and Under Water."

ABMT will be examined. The ASAT talks are important because they could have expanded the space weaponization regime, while the ABMT interpretation debate is significant because adopting the broad interpretation would have contracted the regime.

Table 5.1[335]
Comparison of Annual Defence Spending for the Soviet Union and the United States
US = 100

Year	Soviet Union	United States
1955	73	100
1978	149	100
1979	147	100
1985	112	100
1987	111	100
1988	113	100
1989	41	100

Table 5.2
Comparison of Annual GDP for the Soviet Union and the United States
US = 100

Year	Soviet Union	United States
1955	36	100
1978	42	100
1979	41	100
1985	39	100
1987	39	100
1988	38	100
1989	23	100

Tables 5.1 and 5.2 provide a snapshot of US relative power from 1974-1989. Data for 1955 is also provided, since that is the starting year of analysis in this study.[336] Table 5.1 shows that Soviet military spending vis-à-vis the US more than doubled from 1955 to 1979. From 1979 to 1988, Soviet military funding decreased, although it was still higher than in 1955. In 1989, Soviet military spending plummeted. Table 5.2 shows that Soviet GDP increased relative to the

[335]Data for tables 5.1 and 5.2 is taken from tables 3.1 and 3.2.

[336]For details concerning the importance of the starting year of analysis when testing hegemonic stability theory, see chapter 3.

US from 1955 to 1988, although not by much. Soviet economic power declined significantly from 1988-1989.

The ASAT Talks

At first glance, hegemonic stability theory may appear to explain the failure of the US to secure an agreement on US-Soviet ASAT talks. The Soviet Union was far more powerful relative to the US in 1978 and 1979 than in 1955, suggesting that Soviet power prevented the US from expanding the space weaponization regime through finalizing an ASAT treaty. However, hegemonic stability theory cannot explain why the Reagan administration refused to continue ASAT talks despite Soviet attempts to resume ASAT arms control negotiations. External pressure from the Soviet Union thus did not prevent the rise of an ASAT agreement – time constraints and Reagan's aversion to ASAT talks did.

US-Soviet ASAT talks consisted of only three talks over a one-year period. This was not enough time to reach an agreement on ASATs. Most arms control agreements are the product of several years of negotiations. The extra time required to finalize negotiations would (at the very least) have required the Reagan administration to continue ASAT talks.

The ABMT Interpretation Debate

As mentioned earlier in this chapter, the Reagan administration announced its support for the broad interpretation of the ABMT in 1985. The Soviet Union opposed this interpretation. This suggests that hegemonic stability theory cannot explain the US attack against the space weaponization regime, since external pressure from non-hegemons was not damaging the regime. Instead, the hegemon itself was attempting to nullify a portion of the regime.

Hegmonic stability theory also cannot explain why Reagan's attempt to implement the broad interpretation of the ABMT failed. Although the Soviet Union opposed the broad

interpretation, the Reagan administration appeared willing to proceed with the broad interpretation without consulting the Soviet Union. Soviet power could not stop Reagan. Rather, Congress passed legislation forcing Reagan to adhere to the restrictive version of the ABMT. This domestic political response explains the preservation of the ABMT-related portion of the space weaponization regime during the Reagan administration.

The Maintenance of the Space Weaponization Regime

Hegemonic stability theory is unable to explain why the space weaponization regime remained strong from 1974-1989. Soviet power relative to the US did not drop below 1955 levels until 1989. Hegemonic stability theory thus suggests that the regime should have weakened from 1974-1988 or possibly even collapsed.

Keohane's Theory and the Space Weaponization Regime

The strength of the space weaponization regime from 1974-1989 provides support for Keohane's theory. Nonetheless, the US appeared to maintain a relatively large degree of influence over the space weaponization regime. As one of the two states interested in space weapons, the US could have easily violated parts of the space weaponization regime. In particular, US implementation of the broad interpretation of the ABMT would have severely weakened the regime. More important, it is highly unlikely that other states would have been able to prevent the US from a determined breakout of the space weaponization regime. This is amply demonstrated by Reagan's insistence on implementing the broad interpretation of the ABMT despite Soviet resistance. All of this suggests that the period from 1974-1989 does not provide a good test for Keohane's theory, since isolating the affect of hegemonic influence on regime maintenance from non-hegemonic influence remains difficult.

Conclusion

The two main features characterizing the period from 1974-1989 are stagnation and uncertainty. The space weaponization regime was stagnant because it had not changed since the ABMT entered into force in 1972. The future of the regime was uncertain, given that policy efforts concerning outer space varied markedly between the Ford, Carter, and Reagan administrations. During the Ford administration, the US laid the groundwork for a concerted effort to develop a technologically advanced ASAT. The Carter administration began to develop an ASAT system and negotiate an ASAT arms control treaty with the Soviets as part of the US "two-track" policy. Then Reagan initiated several developments that substantially broke with the reserved approach toward space weapons established by previous presidents.

First, Reagan was extremely hostile toward arms control of space weapons considered in this thesis. Second, as the 1987 space policy Presidential Directive implies, Reagan appeared to believe that space weapons could have significant military utility. Third, Reagan attempted to develop a technologically advanced ASAT for deployment instead of as a bargaining chip to use in ASAT talks. Fourth, Reagan tried to implement the broad interpretation of the ABMT.

Although Reagan showed greater interest in further weaponizing space than previous presidents, he was unable to weaken the space weaponization regime. Congressional resistance ultimately prevented Reagan from implementing the broad interpretation of the ABMT. However, Reagan may have prevented the space weaponization regime from expanding by refusing to continue US-Soviet ASAT negotiations. These developments cannot be explained by hegemonic stability theory.

Conclusion

The study has tested hegemonic stability theory by examining whether it can explain the evolution of the space weaponization regime during the Cold War. What follows is a summary of the thesis and a discussion of the implications of my findings.

Research Project and Essential Concepts

The space weaponization regime consists of the principles, norms, rules, and decision-making procedures related to the weaponization of outer space. Space weaponization is the deployment of space weapons. A space weapon is a weapon that travels in space.

Due to space constraints, it is not possible to examine every form of space weapon. The thesis examines both KEWs and PEWs insofar as they are designed to be used for ASAT or force application purposes. It also considers ABM systems that may destroy satellites and space-based weapons. Space-based weapons are well suited for ASAT and orbital bombardment attacks.

A brief literature review is useful in order to explain how to test hegemonic stability theory. Charles Kindleberger's *The World in Depression* argues that a hegemon is required to maintain open international trading systems. Stephen Krasner's "State Power and the Structure of International Trade" also holds that a hegemon is needed to maintain liberal international trading regimes. Additionally, Krasner believes that states do not act according to hegemonic stability until external events ("usually cataclysmic ones") compel them to do so. In *War and Change in World Politics*, Robert Gilpin argues that a hegemon creates regimes in the aftermath of a hegemonic war. As time passes and power of non-hegemon states increase in relation to the hegemon, non-hegemons will increasingly vie for control of the international system, which usually results in a hegemonic war. Gilpin's *US Power and the Multinational Corporation*

argues that the MNC has been central for American hegemonic expansion. As US relative power declines, foreign governments will increasingly make demands on American MNCs, reducing American control over them. This could potentially cause the international trading regime to fail.

In *After Hegemony: Cooperation and Discord in the World Political Economy*, Robert Keohane has developed a highly influential critique of hegemonic stability theory. He argues that regimes can be sustained during hegemonic decline, since regimes reduce transaction costs, lessen problems of market failure, facilitate information sharing, give private goods to members, create sunk costs, and are expensive to create.

The literature review suggests that there are two versions of hegemonic stability theory: the absolute and relative power strands. The former focuses on the effect of absolute hegemonic power on regimes, while the latter focuses on relative power. Since space weaponization is a security issue, I test the relative power version.

For the relative power variant of hegemonic stability theory to explain the evolution of the space weaponization regime, the regime must be established and remain strong during hegemonic ascendance. The regime also needs to weaken or collapse during hegemonic decline due to pressure from non-hegemons.

To support Krasner's belief that grave crisis shock states into complying with hegemonic stability theory, cataclysmic events must produce the requisite changes in state behavior. To support Keohane's critique of hegemonic stability theory, the space weaponization regime has to remain strong during periods of hegemonic decline.

The thesis uses the bipolar Cold War period to test hegemonic stability theory. The post-Cold War years provide a poor test for hegemonic stability theory against the space

weaponization regime, given that the period is characterized by a lack of powerful challengers to US hegemony. Additionally, hegemonic stability theory does not explain what happens to a regime in a period of renewed hegemony. The Cold War is an excellent focus for this study, since the Soviet Union was a serious challenger to US dominance.

Description of Space Weaponization-Related Developments, 1955-1989

In 1955, the US started pushing for the creation of the space weaponization regime. As an open society competing against a closed society, the US needed space intelligence capabilities far more than the Soviet Union. In 1955, the US began to develop a scientific satellite. Launching the satellite would help establish the principle of "freedom of space," which held that satellites should be able to pass through space without interference.

In 1957, the Soviet Union launched Sputnik I and Sputnik II, the first satellites. This Soviet success horrified the American public and compelled the Eisenhower administration to further define its military space policy. The policy held that space weapons considered in this thesis were not very useful. Consistent with this belief, the Eisenhower administration did not deploy or develop space weapons. Instead, Eisenhower continued to focus on development of reconnaissance satellites and the promotion of a legal regime to protect satellite overflight.

In 1962, the Soviet Union began its campaign against satellite overflight. However, in September 1963, the Soviet Union dropped its opposition to satellite reconnaissance. "Freedom in space" had thus become part of the space weaponization regime.

Worried by aggressive Soviet rhetoric regarding potential deployment of orbital bombardment nuclear weapons, the Kennedy administration deployed an ASAT system under Program 505 and another under Program 437. The Program 505 ASAT was operational from 1963-1967, while the Program 437 ASAT was deployed from in 1964-1975. Both systems were

developed with existing technology and used nuclear warheads to destroy their targets. The Soviet Union also tested FOBS missiles from 1966-1967 and placed them on alert in 1969.

Several important multilateral space-related arms control agreements were finalized during the Kennedy, Johnson, and Nixon administrations. The LTBT bans nuclear test explosions in outer space and GA Resolution 1884 prohibits states from placing weapons of mass destruction in orbit. GA Resolution 1962 upholds "freedom of space" and the use of space for "peaceful purposes." The OST formally codifies all rules enumerated in GA Resolution 1884 and GA Resolution 1962 while also banning weaponization of the moon. The US-Soviet ABMT prohibits development, testing, and deployment of space-based ABM systems and compels states to refrain from interfering with NTMV.

Between 1968 and 1982, the Soviet Union conducted 20 ASAT intercept tests. The ASAT destroyed targets with a hot-metal-kill warhead. By 1982, it could intercept targets between 160-1600 kilometers. According to the US, the ASAT became operational in 1977. The Soviets performed no more intercept tests after 1982.

Spurned on by Soviet ASAT testing, Ford's Military Technology Advisor initiated a study panel chaired by Soloman Buchsbaum. The Buchsbaum Panel report held that developing an ASAT system would not deter the Soviets from doing the same but stated that a US ASAT could be a bargaining chip in arms control negotiations. Two days before Carter left office, the Ford administration directed the Department of Defense to develop an ASAT system and study ASAT arms control options.

The Carter administration implemented a "two-track" policy on ASAT development and arms control. The policy held that the US would pursue ASAT arms control measures while

attempting to develop an ASAT as a bargaining chip. Development of ASATs would also hedge against failure of negotiations or a full-scale Soviet attempt to develop ASATs.

The US and Soviet Union held three ASAT talks from 1978-1979. Despite some limited progress in the talks, they failed. No further negotiations were held, even though the Soviet Union wanted to continue talks. Reagan simply did not believe in ASAT negotiations. As stated in his space policy Presidential Directive, Reagan also wanted to deploy an ASAT system "at the earliest possible date."

The technologically sophisticated air-launched ALMV ASAT development program continued under the Reagan administration. The ALMV consisted of boosters and a non-nuclear kill vehicle called the MHV. It had a range of 650 kilometers. Although the system was cancelled in 1988, the Reagan administration considered using SDI-related ABM systems in an ASAT role.

Unlike other presidents, Reagan seemed to believe that space weapons would become useful for military purposes. The space policy Presidential Directive stated that space activities would contribute to national security by deterring or defending against enemy attack, preserving freedom of action in space, and negating hostile space systems "if necessary." Reagan also increased spending for space weapons, particularly PEWs.

To permit testing and deployment of SDI-related technologies, Reagan said that the ABMT would be broadly interpreted. The broad interpretation permitted development and testing of space-based strategic ABM systems, while the restrictive interpretation did not. Congress ultimately prevented Reagan from implementing the broad interpretation through legislative action.

The Space Weaponization Regime, 1955-1989

From 1955-1989, the space weaponization regime grew to 3 principles, 4 norms, and 8 rules.[337] No major decision-making procedures were established as part of the regime. While the space weaponization regime prohibits some significant space weaponization activities, it is nonetheless quite "thin" in the sense that it is composed of few principles, norms, rules, and decision-making procedures. Nonetheless, the regime is strong since it was widely supported by many states and the superpowers adhered to all of its principles, norms, rules, and decision-making procedures.

Hegemonic Stability Theory and the Space Weaponization Regime, 1955-1989

Hegemonic stability theory is incapable of explaining any major developments affecting the space weaponization regime. The Soviet Union decided to accept the LTBT, GA Resolution 1884, GA Resolution 1962, the ABMT, and drop its challenge to satellite overflight even though US relative power was decreasing. Furthermore, despite low relative Soviet military spending when the OST was finalized in 1967, the Soviet Union continued to accept the OST as its relative military spending began to increase. The US also did not return to the negotiating table over ASATs despite high Soviet relative power. Additionally, hegemonic stability theory cannot explain why the US itself (as opposed to an external challenger) attempted to harm the space weaponization regime through supporting the broad interpretation of the ABMT. Finally, Soviet pressure was unable to prevent Reagan from implementing the broad interpretation. Instead, Congress did.

[337]The principles, norms, rules, and decision-making procedures of the space weaponization regime are shown in table 4.1

The Sputnik Crisis as a Cataclysmic Event

The only space-weapon related crisis of sufficient gravity to be considered "cataclysmic" from 1955-1989 was the launch of the Sputnik satellites. Nonetheless, US behavior remained largely the same after the Sputnik launches. The Eisenhower administration continued its plans to develop a norm of satellite overflight and thought that space weapons were not useful. Therefore, the Sputnik crisis does not provide support for Krasner's belief that cataclysmic events produce changes in state behavior.

Keohane's Theory and the Space Weaponization Regime

Keohane's theory predicts that regimes should be able to survive during periods of hegemonic decline. The space weaponization regime survived as US power was in decline, providing support for Keohane's theory. However, the bipolar Cold War era does not provide a good test for Keohane's theory, since the US still wielded a great deal of power over the regime.

Implications of the Thesis

In this thesis, I have argued that hegemonic stability theory is utterly incapable of explaining the evolution of the space weaponization regime from 1955-1989. This does not mean that the hegemon had no effect on the space weaponization regime. The US was a significant actor in space. It researched, developed, tested, and at times deployed space weapons. The scope of the space weaponization regime was largely defined through negotiations in which the US and the Soviet Union were the major players. The US even attempted to damage the space weaponization regime by implementing a broad interpretation of the ABMT.

While it is clear that the US had a great deal of power over the space weaponization regime, US influence alone does not explain the evolution of the regime from 1955-1989.

Several other factors also affected the space weaponization regime. Four important elements are presidential preferences, the unique space environment, domestic politics, and the nature of arms control negotiations.

Presedential preferences affected US actions concerning the space weaponization regime. Eisenhower wanted to develop reconnaissance satellites to spy on the Soviet Union, so he directed the US to create a regime that would protect those satellites. Kennedy and Johnson deployed ASATs to guard against potential deployment of nuclear orbital bombardment systems. However, both Kennedy and Johnson favoured development of arms control mechanisms to contain this threat instead of robust development and deployment of ASATs. Nixon also favored arms control measures, cancelling program 437 and finalizing the ABMT. Ford called for development of an ASAT two days before the beginning of the Carter administration. Carter developed an ASAT while engaging in ASAT talks with the Soviets. Reagan then ended the negotiations. Unlike previous presidents, he also seemed interested in deploying technologically advanced space weapons and foregoing arms control talks.

The space environment also influences the space weaponization regime. Space is a very unique medium, more difficult to operate in than the land, sea, and air. Tremendous amounts of energy are required to send objects into outer space, place them in orbit, and maneuver. Additionally, since the earth rotates, maintaining an object in space over a given position of the earth requires continuously expending energy.[338] This makes it hard to place weapons or military fortifications in space. Finally, space is a harsh environment. Radiation, solar flares, space debris, and extreme heat caused by entering or leaving the atmosphere can all damage space vehicles.

[338]The exception is objects in geostationary orbit. In geostationary orbit, objects are stationary in relation to a given fixed point on the earth. Geostationary orbit is located about 36,000 kilometers above the earth and is widely used by satellites for several functions (particularly communications).

Relatively advanced technology is needed to cope with the difficulties associated with operating in space. Throughout the entire Cold War era, limitations inherent in the existing state of the art mitigated against the deployment of space weapons. Neither the Soviet Union nor the US deployed PEWs or orbital bombardment weapons during the Cold War. The moon was also never weaponized. Even the ALMV ASAT suffered from severe technological limitations.

Domestic politics had a significant affect on the space weaponization regime during the Reagan administration. Congress passed legislation restricting tests of the ALMV ASAT, which helped prevent the system from becoming technologically mature enough for deployment. Congress also prohibited Reagan from implementing the broad version of the ABMT.

The last important element is the nature of arms control negotiations. Arms control talks have not been analyzed much in this thesis. Nonetheless, given the importance of arms control agreements for establishing principles, norms, and rules of the space weaponization regime, further analysis of arms control would likely help explain the evolution of the regime.

These four factors could provide a good starting point for future analysis of the space weaponization regime. None of them are considered in hegemonic stability theory. Given the inherent simplicity of hegemonic stability theory, it is difficult to see how it could be modified to include some or all of these elements. This suggests that other theories will be needed to help explain the evolution of the space weaponization regime.

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