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83. *Future Comsat Systems* 25X1
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25X1 The Soviets have an active program for future geostationary comsat systems. They have stated their intention to establish, by 1982, geostationary comsat networks, which they call Gals, Volna, Luch and Luch-P. We do not know what the Soviets will call the individual satellites that occupy each network position or how many satellites will occupy each position. The frequencies (7 GHz uplink/8 GHz downlink) to be used in their Gals network are internationally recognized as the ones to be used for military comsats. Satellites in the Gals network will have global and regional beams. In addition, the Soviets have indicated that two of these will be equipped with spot beam capabilities directed at regions in the North Atlantic and North Pacific, suggesting naval roles.

84. According to Soviet announcements, the Volna network is to provide communication services to civil aircraft and ships beginning in 1980. The Soviets have indicated that the Volna network is intended to be only a national system and not a competitor of the International Maritime Satellite System (INMARSAT). If the geostationary Volna network is also applied to VIP and military aircraft and naval ships, it could provide greater versatility and reliability than the Statsionar and Molniya networks now being used in a limited role for these purposes.

85. Although, according to the Soviets, both Luch and Luch-P networks are planned for operation in 1981, each appears to have a different mission plan. The Luch network is apparently intended as an international telecommunications system. The Luch-P network on the other hand appears intended for government services.

86. The Soviets are currently five years behind their announced schedule with their Statsionar network, and we see little likelihood of their reaching their planned operational dates for their Gals, Volna, Luch, and Luch-P comsat networks. The completed networks of these systems probably will be available by the mid-1980s. As these systems become available, we expect the Molniya 3 system and, eventually, some

of the current satellites in the Statsionar network to be phased out. The Soviets are expected to retain the Molniya 1 system because of the large investment in related ground communications equipment.

87. By the late 1980s, the Soviets will have the necessary technologies to develop advanced communication satellites, which will be able to achieve data rates of "gigabits" (billions of bits of information) per second. Such satellites will require use of wide bandwidths and high frequencies, and will allow greater user access, highly directional beams, less congestion of the currently used frequency spectrum, and more effective use of spread spectrum signals having low probability of intercept and antijam protection. These advanced systems will not be operationally available before the 1990s. Table 5 summarizes the current and prospective Soviet comsat systems.

Navigation Satellites

88. The Soviets began the development of their NAVSAT systems in the mid-1960s in order to provide their naval forces with accurate and timely navigation signals. Their first-generation system, 25X1 25X1 was recently phased out of service. The Soviets now appear to be relying on their second- and third-generation systems, which were introduced in late 1974 and late 1976, respectively. These two systems use a better Earth model, 25X1 25X1

89. The second-generation system, which consists of six satellites in near-Earth orbits, 25X1 25X1 In 1978 the Soviets announced that a satellite in the third-generation system (four satellites in near-Earth orbit) had the purpose of providing navigation support to their maritime and fishing fleet. All of the satellites in this network appear identical. 25X1 25X1

Table 5

Current and Prospective Soviet Comsat Systems

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Satellite Network	No. of Satellites in Network	Orbit		Principal Users
Current:				
Molniya 1	8	Semisynchronous		
Molniya 3	4	Semisynchronous		
Statsionar	11 [a]	Geosynchronous		
MPCS	16-24	1,500-km circular		
SPCS	3	800-km circular		
Future:				
Gals	4 [a]	Geosynchronous	7,000/8,000	Military
Volna	7 [a]	Geosynchronous	1,500/1,600 [b]	Civil aircraft and ships
Luch	4 [a]	Geosynchronous	11,000/14,000	MOC
Luch-P	4 [a]	Geosynchronous	11,000/14,000	Military

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[a] These figures reflect the number of geostationary orbital positions as indicated in Soviet filings with the IFRB (International Frequency Registration Board). We do not know how many satellites will actually be used. Currently five of the 11 orbital positions in the Statsionar network are occupied.

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90. We believe the Soviets will continuously maintain their established networks of naval support satellites with replacement satellites as required. Evolutionary improvements to the satellite systems are expected.

91. We also believe there is a moderate chance that the Soviets will elect to develop an advanced navigation system similar to the US Global Positioning System (GPS), which will be continuously available for precision navigation by highly mobile air, ground, and sea-based platforms. The Soviets could elect to incorporate the necessary GPS-type subsystems on their existing high-altitude space systems such as Molniya or a future geosynchronous system such as Volna. They could probably have an operational system available in the late 1980s.

Radar Support

92. The Soviets have been using radar support satellites (RADSATs) since the early 1960s to calibrate their ABM engagement radars, which we call Try Adds, at the Sary Shagan Missile Test Center and at Moscow. In 1974 the Soviets began launching RADSATs which had been designed to support research and development activities on other radar systems at Sary Shagan in addition to the Try Add calibration mission. 25X1
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[redacted]

93. 25X1
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[redacted]

94. We believe the Soviets will continue using RADSATs to calibrate their ABM radars. They will probably continue to integrate additional subsystems into these satellites as required for support of developmental activities at Sary Shagan, and for performing command system checkout activities.

Geodetic Satellites

95. In 1968, the Soviets began launching geodetic satellites to determine locations on the Earth's surface precisely. The tracking data can also be used to construct gravitational models which include variances in specific zones. 25X1
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[redacted] The Soviets may have also equipped these satellites with laser corner reflectors (as they did on Salyut 4), which could result in errors as small as plus/minus 1 meter. The Soviets may eventually add laser reflectors to some of their other satellite systems; this could eliminate the need for a separate geodetic program.

Meteorological Satellites

96. Soviet "Meteor" satellites are used to collect, on a global basis, information required by meteorologists to describe and forecast weather. The Soviets keep six to 10 of these spacecraft active in orbit during a given year to serve general national as well as military purposes. On a daily basis, three to five satellites are normally active. 25X1
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[redacted]

97. The Soviets have announced that it is their intention to develop a three-tier meteorological satellite system consisting of a low-altitude manned space station, a medium-altitude satellite system (the current Meteor series), and a system of geostationary satellites. It is clear the Soviets are actively pursuing their manned program and developing sensors appropriate for collecting meteorological data. They are also pursuing development of a geostationary meteorological satellite called the Geostationary Operational Meteorological Satellite. The launch of this system, originally scheduled for 1978 in support of the Global Atmospheric Research Program, has been delayed because of

technical problems with the satellite—it is reportedly scheduled for launch in 1980.

III. CURRENT AND PROSPECTIVE USES OF SPACE SYSTEMS FOR INTELLIGENCE AND MILITARY SUPPORT

98. In this section we consider the ways in which Soviet space systems contribute to military preparations during peacetime and to national decisionmaking and to the conduct of military operations during periods of crises and conflicts.

99. We have not assessed the contributions of Soviet space systems during conflicts involving nuclear strikes within the Soviet Union. All of the Soviet space systems rely on unhardened ground-based facilities for launching additional satellites, tracking and controlling satellites, and for receiving data from, or communicating through, satellites. Nuclear strikes on the Soviet Union could destroy these ground facilities, rendering virtually all of the satellites useless.

100. It is possible that the Soviets could continue to make use of their communications satellites for a short period after their ground-based control sites had been destroyed. Some of these satellites could probably remain viable for several days or even weeks in the absence of command sites to monitor them and could be used by the large number of transportable satellite communications terminals the Soviets have deployed in recent years. Although unhardened, the terminals have some degree of survivability due to their mobility.

101. Table 6 lists the functions to which Soviet space systems would contribute in peacetime, crisis, and conflict. It summarizes the overall capability of Soviet space systems and the degree of Soviet dependence on them for each function. We emphasize that the rankings of capability reflect our assessments of Soviet space systems only and not the total Soviet capability to perform a particular function. In assessing the Soviets' "dependence" on their space systems, primary consideration was given to the availability of nonspace substitutes for the function performed. Three categories of dependence—high, moderate, and low—were used in the assessments. An assessment of high dependence was made when a system performed a function for which there was no practical or satisfactory substitute. When a substitute was available but was not as convenient or did not perform the function as well, the dependence was rated as moderate. Rankings of low dependence were used when the available substitutes were at least equally practical or adequate.

Assessing Technical Characteristics/ Performance of Weapons

102. Analysis of the technical characteristics and performance of weapon systems is primarily a peacetime function since it is generally a long-term effort. In general, the USSR has not emphasized development of satellite collection systems for the purpose of performing detailed weapon system assessments. 25X [redacted] 25X1 Only their military Salyut space station and second-generation high-resolution photoreconnaissance satellites have cameras with resolutions adequate to contribute to detailed analysis of weapon systems. But they have not flown a military space station since Salyut 5, which was deorbited in August 1977. 25X1 [redacted] 25X1

103. 25X1 [redacted] 25X1 In deciding on future space programs the Soviets will almost certainly have to

Table 6

Capabilities of Soviet Space Systems and Soviet Dependence on Them

Functions Supported by Space Systems		Peacetime 1980	Peacetime 1990	Crisis and Limited Conflict 1980	Crisis and Limited Conflict 1990
Detailed technical intelligence analysis	Capability	Poor	Poor-Fair	Poor	Poor-Fair
	Dependence *	Low	Low	Low	Low
Calibrating radars	Capability	Excellent	Excellent	Excellent	Excellent
	Dependence	High	High	High	High
Monitoring compliance with treaties	Capability	Fair	Fair-Good	Fair	Fair-Good
	Dependence	Low-Moderate	Low-Moderate	Low-Moderate	Low-Moderate
Mapping, charting, geodesy	Capability	Excellent	Excellent	Excellent	Excellent
	Dependence	High	High	High	High
Observing and forecasting weather conditions	Capability	Good-Excellent	Excellent	Good-Excellent	Excellent
	Dependence	Low-Moderate	Low-Moderate	High	High
Maintaining order-of-battle and targeting data	Capability	Good	Good-Excellent	Good	Good-Excellent
	Dependence	High	High	High	High
Providing indications and warning	Capability	Fair	Good-Excellent	Fair	Good-Excellent
	Dependence	Low-Moderate	Moderate	Low-Moderate	Moderate
Targeting of antiship weapons	Capability	Not peacetime functions		Fair-Good	Good
	Dependence			Low-Moderate	High
Navigation support to naval combatants	Capability	Excellent	Excellent	Excellent	Excellent
	Dependence	Low	Low	Moderate	High
Military command and control communications	Capability	Good	Excellent	Good	Excellent
	Dependence	Low-Moderate	Moderate	Low-Moderate	Moderate

* Dependence: High (no practical or satisfactory substitute).
Moderate (substitutes available but are not as convenient or do not perform mission as well).
Low (substitutes available that are at least equally practical or adequate).

balance the payoff between improvements to current systems and the costly development of new systems against the availability of information from other sources.

104. Thus, we rate as poor the overall capability of current Soviet space systems to provide technical data on weapon systems, but we judge current Soviet dependence on satellite systems for such use to be low. By 1990 the resolution of Soviet photoreconnaissance satellites will give them a good-to-excellent capability for the weapons assessment function, but for this purpose the expected improvements in the Soviets' ELINT and infrared satellite systems probably will not significantly increase their current capability. And we do not project Soviet satellite systems dedicated to telemetry or communications intercept before the late 1980s. Throughout the 1980s the overall Soviet capability for weapon assessments will probably remain relatively poor. We expect Soviet dependence on satellite systems for this function to remain low, primarily because of the availability of information from other sources.

Calibration of ABM Radars

105. To ensure the most effective operation of their ABM system deployed in defense of Moscow, the Soviets must regularly calibrate their ABM radars. 25X1 25X1 [redacted]

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25X1 the Soviets use their radar support satellites (RADSATs) to calibrate the ABM engagement radars. Because there is no other practical way for them to accomplish this task, the Soviets are highly dependent on these satellites and will remain so. We rate overall RADSAT capability for this purpose as excellent.

Monitoring Compliance With Treaties and Agreements

106. There are many provisions in current and prospective treaties and agreements that require monitoring to determine compliance. Soviet space systems contribute to monitoring many of the provisions of current and prospective arms limitations agreements. For example:

Interim Agreement Limiting Strategic Offensive Arms

— Prohibits construction of additional ICBM launchers.

— Limits the number of SLBM launchers.

— Limits the number of modern ballistic missile submarines.

SALT II Agreement

— Places aggregate limits on ICBMs, SLBMs, and strategic cruise missiles.

— Places qualitative limits on strategic missiles.

ABM Treaty

— Limits ABM deployment areas.

— Limits number of ABM launchers.

— Limits power-aperture product of certain phased-array radars.

Outer Space Treaty

— Prohibits placing in orbit objects carrying nuclear weapons or any other kind of weapons of mass destruction.

Limited Test Ban Treaty

— Prohibits nuclear explosions in the atmosphere, in outer space, and under water.

Seabed Arms Control Treaty

— Prohibits deployment of nuclear weapons and any other weapons of mass destruction on seabeds and the ocean floor beyond the 12-mile limit.

107. Foreign activities in all the above areas, as well as in virtually all the numerous other provisions in treaties and agreements, were important to the Soviets and were the object of Soviet intelligence collection before the establishment of formal limitations and prohibitions. The Soviets' photographic and ELINT satellite reconnaissance systems can provide them with data useful in monitoring compliance with provisions that limit fixed weapon and radar systems to certain numbers or certain areas, or both. These satellites are in general not adequate for monitoring compliance with qualitative limitations on strategic weapons. The agreements themselves have not likely stimulated any major new Soviet requirements for space systems. To the extent that the Soviets rely on space systems for the compliance monitoring function, the monitoring requirement would exist during crisis and limited conflict, as well as in peacetime. Clearly, in a crisis and limited conflict situation the priority for monitoring certain arms limitations agreements would be reduced by the competing demands for indications and warning (I&W) and order-of-battle data.

108. On the basis of the capabilities and limitations discussed in section II and of the wide range of required compliance monitoring tasks, we rate as fair the current Soviet satellite capability for this mission. This rating could improve somewhat with the launch of the USSR's next manned military space station, depending on the number and type of sensors it carries. Soviet development of real-time imaging and high-altitude ELINT satellite systems in the late 1980s, as discussed in section II, could increase the USSR's capability from fair to good for this compliance monitoring task.

109. We judge Soviet overall dependence on satellite systems for this monitoring task to be low to moderate. Satellite data are probably of value to the Soviets primarily for confirming compliance monitoring information obtained from nonsatellite sources. Considering the continued availability to the Soviets of nonsatellite information, we do not expect a significant change in their dependence on satellite systems to monitor the types of arms limitation agreements currently in effect.

Mapping, Charting, Geodesy

110. Accurate maps, charts, and Earth gravitational models are required for a variety of military missions, including the precise targeting of ballistic missiles. The collection and analysis of necessary data call for a long-term effort, which is considered a peacetime function.

111. Like the United States, the USSR has become highly dependent on satellite systems to support its mapping, charting, and geodetic efforts. All of the Soviets' photoreconnaissance satellites supply photography useful to mapmakers. Their photographic-geophysical spacecraft, in particular, appear to collect basic mapping and geophysical data on worldwide ocean and land surfaces. In addition to a low-resolution camera system, these satellites also apparently have an infrared sensor that may be used to determine ocean temperature gradients and currents. The Soviets' geodetic satellites are used to collect data in support of their efforts in geodesy and gravimetry. The data collected allow the establishment of an accurate geodetic grid of the Earth's surface, and thereby reduce errors in the delivery of some weapons.

112. We rate as excellent the overall capability of Soviet satellite systems to collect required data for mapping, charting, and geodesy. Satellites are the only practical means available to collect such data worldwide. The Soviets have been collecting these data for more than 15 years, and the collection and analytical results are, to some degree, cumulative. However, the fact they continue to launch satellites for collection of such data shows they want to refine what they already have available. We expect continued use of satellites for these purposes through the 1980s and, therefore, continued high dependence.

Observing and Forecasting Weather Conditions

113. Knowing and being able to forecast weather conditions is important to support a variety of military activities, including the scheduling and routing of aircraft and ships; planning and executing force movements; planning exercises; scheduling tests that involve use of equipment sensitive to weather conditions, such as optical devices and lasers; planning for spacecraft recovery operations; and selection of cloud-free target areas for photoreconnaissance satellites. In addition, if the Soviets attempt to use their launch detection satellites to collect technical infrared data on foreign ballistic missile launches, weather information during the missile launch could be an important consideration for proper interpretation of the infrared data.

114. The Soviet meteorological satellites clearly are used in support of a wide variety of military activities in addition to being used for observing and forecasting weather conditions for civil purposes. Additional data on weather over Soviet territory and peripheral areas are provided by ground sensors, balloons, and aerial reconnaissance. During peacetime, moreover, worldwide weather data are exchanged by the developed countries. Generally, however, this information is less useful than Soviet-acquired data for open ocean and underdeveloped areas and is not always timely.

115. We rate as good to excellent the current overall capability of the Soviets' meteorological satellite system. We believe their capability will be somewhat improved in the early 1980s with the advent of a geosynchronous meteorological satellite system. Their dependence on satellite systems for meteorological purposes during peacetime is judged to be in the low-to-moderate range. We believe that their dependence would increase to high during any conflict situation that halted the worldwide weather exchange.

Maintaining Order of Battle and Targeting Data

116. Effective targeting of offensive weapon systems requires maintenance of targeting data on important foreign fixed military installations (missile silos/shelters, airfields, ports, bases, nuclear storage sites, command and control bunkers, etc.), industrial facilities (weapon production plants, oil refineries, steel mills, etc.), and other facilities essential to waging and surviving nuclear warfare. These are all large, fixed installations and facilities, and new ones require years to build. Maintaining this targeting data is a continuous peacetime function as well as a function performed during crisis and conflict situations.

117. A similar function is the maintenance of orders of battle on the location, number, type, and status of foreign land- and sea-based weapons and forces of all types as part of the process of assessing the capabilities of foreign military forces. Many of the relevant items (such as surface-to-air missile systems, aircraft, ships, radar systems, and forces) are mobile, and their location and status require frequent updating. Maintaining orders of battle in peacetime, crises, and conflicts is necessary for both targeting and contingency battle management planning purposes.

118. Table 7 is a listing of major systems on which the Soviets almost certainly keep current orders of battle, and the satellite systems that aid them in this effort. Their photoreconnaissance satellites provide valuable order-of-battle information on land-based systems and forces. These satellites are particularly useful against those systems that do not use radars, or use radar frequencies outside the coverage of Soviet ELINT satellites, or practice emission control. The Soviets' low-resolution photoreconnaissance system, which appears to have been phased out, performed the search mission, but its resolution was insufficient to identify the types and status of relatively small weapons and military equipment. For such identification, the medium-resolution system, which may be assuming the search function, is probably adequate, and the high-resolution systems certainly are adequate. The Soviet military space station of the early-to-middle 1980s, which will almost certainly carry both low- and high-resolution cameras, also will add to the Soviet search and identification capability.

119. The Soviets' ELINT satellites can provide order-of-battle data on land- and sea-based radar systems, even those that have been camouflaged or concealed from the view of photoreconnaissance satel-

Table 7

Summary of Soviet Satellite Uses for Collecting Order-of-Battle Information

	Photographic Satellites			ELINT Satellites		Radar Satellites	
	Low-Resolution	Medium-Resolution	High-Resolution	Second-Generation	Third-Generation	EORSAT	RORSAT
Surface-to-air missile systems							
Monitor radar enviornment	–	–	–	X	X	–	–
Locate new deployment	X	X	–	–	X	–	–
Identify system	–	–	X	–	X	–	–
Determine status at known locations	–	X	X	–	–	–	–
Early warning/ground-controlled-intercept radars							
Monitor radar environment	–	–	–	X	X	–	–
Locate new deployment	X	X	–	–	X	–	–
Identify system	–	–	X	–	X	–	–
Determine status at known locations	–	X	X	–	–	–	–
Aircraft							
Determine numbers at airfields	X	X	X	–	–	–	–
Determine types of airfields	–	X	X	–	–	–	–
Identify armaments	–	–	X	–	–	–	–
Ballistic missiles							
Locate new deployment	X	X	–	–	–	–	–
Identify system	–	X	X	–	–	–	
Determine status at known locations	X	X	X	–	–	–	–
Surface ships (combatants)							
Determine numbers in port and identify	X	X	X	–	–	–	–
Locate at sea	–	–	–	–	X	X	X
Identify radar types	–	–	–	X	X	X	–
Monitor radar environment	–	–	–	X	X	X	–
Submarines							
Determine numbers and types in port	X	X	X	–	–	–	–
Ground forces							
Locate	X	X	–	–	X	–	–
Determine composition	–	–	X	–	X	–	–
Determine status	–	X	X	X	X	–	–

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lites or are mobile. Their second-generation ELINT satellite system provides useful data for determining the status of radar systems. Their third-generation ELINT system adds to knowledge of status and also provides location of active radars. The measurements of radar signal parameters made by these satellites are, in general, adequate to define radar type.

120. On the basis of the capabilities and limitations of these satellite systems as discussed in section II, we rate as good their current overall capability in peacetime. When the Soviet radar and ELINT ocean reconnaissance satellites become fully operational in the early 1980s, we believe the capability will improve somewhat to between good and excellent. Development of real-time imaging systems in the late 1980s and high-altitude ELINT collection systems in the mid-1980s could add significantly to the timeliness of information and somewhat increase Soviet capability.

121. We believe the Soviets are highly dependent on their satellite systems for maintenance of targeting lists and orders of battle. In denied areas such as China and for mobile forces such as ships, there is no other way to acquire the required large amounts of information on a frequent basis.

Providing Indications and Warning

122. Providing indications of foreign preparations for attack on the USSR or its allies and providing warning that an attack has been launched are almost certainly the functions of highest priority for all Soviet collectors of information. The indications and warning (I&W) function is essential during peacetime to prevent an enemy from obtaining the advantage of surprise. During periods of crisis and limited conflict, I&W information is required to provide strategic warning of the imminence of hostilities or escalation of a conflict and to provide tactical warning of an attack in progress. Timely, reliable I&W information allows decisionmakers to take appropriate action, ranging from increasing the readiness of forces to invoking contingency plans, such as launching a preemptive attack or launching an attack upon receipt of a tactical warning.

123. Information from satellite systems would almost certainly be combined with information from other sources as a basis for action by decisionmakers. We doubt that the Soviets would become completely dependent on satellite systems for I&W information. Optimum satellite systems for I&W would be those that could perform continuous worldwide surveillance and pass data in real time to a central I&W authority. None of the Soviet systems qualify on both counts, but several have the potential to contribute I&W information:

— Soviet photoreconnaissance satellites can provide useful information on force status within their coverage. Photography is usually not recovered for 25X1 days, although the Soviets could recover the film in as little 25X1 if requirements so dictate.

— The Soviets' ELINT reconnaissance satellites are capable of providing radar activity levels and, in some cases, accurate radar locations, contributing to the determination of force disposition and composition. 25X1
25X1

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— When operational, probably by the mid-1980s, the Soviets' launch detection satellite (LDS) system will provide them with about 30 minutes' warning of the launch of US ICBMs.

— The Soviets' radar and ELINT ocean reconnaissance satellites will, when fully operational in the early 1980s, provide them the capability to report ship movements within their coverage in real time to Soviet ships in the vicinity, and will also be able to store the data for later transmission to Moscow.

— The Soviets' manned military space station may carry a photoreconnaissance system in which the film is automatically processed for transmission to Moscow within hours. Cosmonauts could conceivably perform preliminary analysis of photography and other sensor data for specific purposes of I&W. These observations could be relayed instantaneously to Moscow if relay satellites or ships with comsat relay capabilities are used.

— If the Soviets develop satellites capable of collecting COMINT by the late 1980s, such satellites could also be used to provide indications and warning.

124. The data from these individual Soviet space systems in combination with other information is used by the Soviet General Staff in producing I&W assessments. 25X1
25X1
[redacted]

125. On the basis of the individual satellite system capabilities and limitations discussed in section II, we rate as only fair their current overall capability to contribute to the Soviets' I&W task. The launch detection satellites, radar and ELINT ocean reconnaissance satellites, and military space stations will add to their capabilities, so that by the early-to-middle 1980s their capability will be fair to good. Development of the real-time imaging and high-altitude ELINT collection systems and expansion of their launch detection system capabilities, as discussed in section II, would add significantly to the Soviets' capabilities and could result in good-to-excellent capability by the late 1980s or early 1990s. We believe Soviet dependence on satellite systems for the I&W function is currently low to moderate, but may increase somewhat by the late 1980s.

Targeting of Antiship Weapons

126. The use of satellite-derived data to target antiship weapons is primarily a combat function, but such data are used in peacetime for test and training purposes and to contribute to ocean reconnaissance. The Soviets have deployed antiship cruise missiles on long-range aircraft, surface ships, and submarines. They seek to employ such weapons from beyond the target's visual/radio horizon so that the launch platform can stand off as far as possible to avoid detection, achieve surprise, and avoid countermeasures. For over-the-horizon attacks, antiship cruise missiles require accurate, timely, and unambiguous targeting data. In supplying data directly to a cruise missile platform, satellites effectively become part of the weapon system. In part for this purpose, the Soviets have developed their two ocean reconnaissance satellites—RORSAT and EORSAT—to supply sea-based missile platforms with such data in real time. We have no evidence that they have equipped airborne cruise missile platforms to receive such data from satellites.

127. In a combat engagement, Soviet ships and submarines with long-range antiship cruise missiles (such as the SS-N-3A and SS-N-12) would establish approximate enemy force location, disposition, and identification by means such as reconnaissance aircraft, tattletale ships, radio direction finding, or human sources. Accurate final position information would then be provided in real time by EORSAT, or RORSAT, or a nonspace system. Once launched, the cruise missile would maintain line of sight to the launch platform until the target had been selected and the lockon/dive initiated.

128. Because of the limited swath widths, the small numbers of satellites and limited numbers of ships equipped to receive their data in real time, and susceptibility to countermeasures, the EORSAT and RORSAT do not currently add significantly to the threat posed to naval forces operating in broad ocean areas. These satellites would contribute significantly, however, to the threat posed against large ships operating in the confined waters of the ocean approaches to the Soviet Union (as in the Northwest Pacific and the Norwegian and Barents Seas). This is primarily due to satellite orbital geometry, which results in frequent access to these areas. The access to other potentially critical areas, such as the Mediterranean Sea, Persian Gulf, and Indian Ocean is much less frequent.

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[redacted]

130. In addition to equipping more combatants to receive targeting data, the Soviets are expected to make future improvements in the satellites and in the operational use of these space systems. Both the EORSAT and RORSAT initially supported the Soviet Navy in its defense of the open-ocean approaches to the Soviet Union. However, with Soviet naval presence in the Indian Ocean increasing and the general trend

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toward global operations, we believe the Soviets will expand the coverage provided by their ocean reconnaissance satellites. By launching additional satellites, the Soviets could increase their coverage at the low and middle latitudes and substantially improve timeliness (revisit times) at the higher latitudes. The rapid launch capability of the booster (same as orbital interceptor) used to orbit the EORSAT and RORSAT could allow the Soviets to exercise this option during periods of increased tension.

131. On the basis of the capabilities and limitations discussed in section II, we assess as fair to good the capability of the current EORSAT and RORSAT to assist in targeting antiship cruise missiles during periods of crisis or limited conflict. During the period of this Estimate, we expect that improvements in these satellites and the method of system deployment will improve this capability to good during periods of crisis or limited conflict. Currently, the Soviets can use Bear D aircraft and Hormone helicopters for over-the-horizon targeting of antiship cruise missiles. In areas distant from the USSR, however, the Soviets are more dependent on satellites for these purposes. We judge that, overall, Soviet dependence on satellites for targeting of cruise missiles is currently low to moderate. In the future, as the areas of Soviet naval operations extend farther from the USSR, we expect Soviet dependence on satellites for this function to increase, reaching a high level in the late 1980s.

Navigation Support to Naval Combatants

132. Accurate navigational data are required by a broad range of naval combatants, particularly submarines equipped with ballistic missiles. Satellites can supply such data almost anywhere in the world with little or no restrictions due to weather, lighting, or ionospheric conditions. The provision of such data is required in peacetime, as well as in a crisis or wartime.

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[redacted]

25X1

[redacted]

136. We rate as excellent the overall capability of Soviet satellites to provide accurate and timely position-fix data to naval combatants. Inasmuch as other navigational systems (such as celestial navigation, bottom contour navigation, and radio navigation systems) are available to their ballistic missile submarines, the Soviets' dependence on NAVSATs is considered low during periods of peacetime and crisis. In conflict situations, the substitutes for satellite navigation would not be as convenient and in some cases not as reliable as satellite means of navigation. Thus, we rate the Soviets' dependence in conflict as moderate. Increased accuracy requirements for their submarine-launched ballistic missiles in the late 1980s could increase their dependence during wartime to a high level. This would be particularly true if the accuracy of position fixes provided by their satellites is substantially better than that provided by other navigation aids. While a system like the US Global Positioning Satellite could be available in the late 1980s, Soviet use of such a GPS-type system to correct the in-flight performance of SLBMs is considered an unlikely development. If the Soviets develop alternatives to satellite navigation systems, such as terminal guidance for their SLBMs, their dependence in the late 1980s could remain moderate.

Military Command and Control Communications

137. The command and control of strategic and conventional forces is a critical function that must be performed under the full range of conditions from peacetime through general nuclear war. Like the

United States, the USSR has recognized the significant contributions and values of communications satellites for this function.

138. Command and control communications via satellites began to be used by the Soviet military establishment in the late 1960s. Since then, the Soviets have generally developed comsat capabilities as a redundant means to communicate with their military commands. The expansion in comsat users has been evolutionary, with priority given to high-level commands, particularly those associated with nuclear-capable forces. In recent years we have witnessed a large growth in the number of mobile terminals, including airborne and train-borne command posts. Additionally, two large command and control surface ships have been equipped to use high-altitude comsats. 25X1
25X1 Thus, Soviet use of comsats has evolved from incountry operations to supporting high-level Soviet leaders, naval combatants, and military advisory groups in areas quite distant from the Soviet landmass.

139. Communications satellites offer the Soviets several advantages over landlines and radio communications. Soviet comsats now 25X1
25 handle the large volumes of information needed for modern battle management. The large capacity of satellite links and the use of mobile terminals also offer increased centralization and flexibility in the command and control of a variety of forces. While the capacity of their individual satellites is small in comparison with US comsats, the Soviets could augment their total capability by converting all of their comsats to military use in a wartime or crisis situation. They have recently demonstrated many advances that increase the security and capacity of their satellite communications. 25X1
25X1
Soviet comsats suffer from relatively short lifetimes, with few exceeding two years.

140. We expect that in the 1980s the Soviets will begin to deploy geosynchronous comsats using higher frequencies, with increased capacity and improved lifetimes. However, we do not expect the Soviets will achieve all of the target dates they have announced for their future comsat systems (the Gals network, for example, was scheduled for operation in July 1979, but is still not in operation). When they have successfully deployed the Gals, Luch-P, and Volna networks, we expect that they will phase out the Molniya 3 and possibly some of the Statsionar comsats. When their announced programs are completed in the mid-1980s, it is likely that access to reliable, high-capacity satellites will be extended on a global basis to a greater variety of ground force, airborne, and naval users.

141. The demonstrated usage and improvements seen in the late 1970s cause us to rate as good the overall capability of current Soviet high-altitude comsats to support forces and personnel deployed anywhere in the world. We expect this capability to be excellent by the mid-1980s. Because of the currently available redundant means of military communications, we assess the USSR's current dependence on comsats as low to moderate. By the mid-1980s, the expected growth in comsat usage and capacity will result in increased dependence by the military. This will be the case especially if automated data support systems for command and control are put into use as we anticipate, because the Soviets will be unable to maintain redundant ground-based systems with the capabilities (high capacity) expected in future satellite systems. Therefore, we expect their dependence on high-altitude comsats will increase to a moderate level.

Summary of Crisis and Conflict Management Capabilities

142. The previous sections point out that space systems make an important contribution to the Soviets' overall capability to manage crisis and conflict situations. The type of information required for effective, timely decisionmaking in a crisis or limited conflict could be political, economic, military, or all three, depending on the situation. Soviet satellite systems in general can aid in fulfilling all of these requirements. Data collected by satellites allow military assessments and provide information such as the location, disposition, composition, and status of land- and sea-based forces and of weather conditions. The value and utility of the information for managing a crisis or local conflict are primarily a function of its timeliness relative to the pace at which the situation is changing.

143. The Soviets have used photoreconnaissance satellites intensively to aid the crisis and conflict monitoring task, by launching a number of satellites quickly and recovering the film in about half the usual time. They now have the capability to deorbit capsules from their second-generation high-resolution system as requirements dictate. The next manned military space station may provide the capability to transmit imagery to Moscow within a matter of hours after photographic

sessions. We believe, however, that they will continue to place reliance on unmanned photoreconnaissance satellites, which can be launched at appropriate times to ensure suitable lighting conditions in target areas. Projected Soviet development of a near-real-time sun-synchronous imagery system in the late 1980s would greatly increase the timeliness of photographic information.

144. The Soviet second- and third-generation ELINT satellite systems provide access to worldwide land and sea areas, with data delay times measured in hours. They can pass the ELINT data to Soviet ground sites within hours (sometimes minutes) of being collected. Projected development of a high-altitude ELINT collector for use in the late 1980s would add significantly to their capabilities. Such a system could be designed to have continuous access to large areas and pass collected data in real time.

145. Soviet radar and ELINT ocean reconnaissance satellites (RORSATs and EORSATs) have the capability to report data in real time to Soviet ships in the vicinity in addition to recording the locations of foreign ships in crisis or conflict areas for later (measured in hours and sometimes minutes) transmission to Moscow. Their current access to areas within their coverage ranges from minutes to days. The access to areas at high latitudes (such as the Norwegian and Barents Seas) is excellent, while access to areas near the equator is poor. The Soviets could improve the access timeliness by launching multiple satellites into orbits having different planes. Analysis of the use of their EORSATs, RORSATs, and ELINT satellites in past crisis, conflicts, and exercises simulating conflicts indicates that the Soviets coordinate individual collector tasking to make the most efficient use of satellite systems capabilities and ground control sites.

146. The timeliness of the worldwide meteorological information provided by Soviet Meteor satellites varies from near-real time to hours, depending on the area. The expected launch and operation of a geosynchronous meteorological satellite in the early 1980s could provide real-time information over a large area of the world (nearly one-third of the Earth is visible from geosynchronous orbit).

147. The USSR's naval support satellites can provide navigation data to its naval forces in the vicinity of a crisis or conflict. Their access time is measured in hours.

148. Soviet communications satellites can be used to relay all types of information to and from the affected areas—such as communications with Soviet agents, advisory groups, and military forces. This in turn is affected by whether the crisis or conflict area is within the view of the Soviets' high-altitude comsats, which serve as real-time relays, or only within that of their low-altitude "store/dump" comsats, which have timeliness measured in hours.

149. The Soviet launch detection satellites, when operational in the early 1980s, will provide the Soviets with continuous coverage of US ICBM fields for real-time warning that a crisis or conflict has escalated to the point that ICBMs have been launched.

150. On the basis of the capabilities and limitations of the Soviet satellite systems, we rate their current overall capability for crisis and limited conflict as fair to good. With expected increases in the operational availability of their radar and ELINT reconnaissance satellites and launch detection satellites in the early-to-middle 1980s, the Soviets' capability will improve to good. They could further improve their capability to good-to-excellent in the late 1980s with the introduction of a near-real-time imaging system and a high-altitude ELINT collection system.

151. We believe the Soviet dependence on satellite systems for crisis and limited conflict management to be moderate at present. By the late 1980s, we believe they may be highly dependent on satellite systems to monitor crisis and conflict situations. Soviet space systems, however, are dependent on a command and control infrastructure that is highly vulnerable, and therefore Soviet capabilities in a general nuclear conflict could be much reduced.

IV. CURRENT AND PROSPECTIVE USE OF SPACE SYSTEMS TO NEGATE THOSE OF OTHER NATIONS

152. This section addresses the evolution of Soviet attitudes toward foreign space activities, current and prospective spaceborne antisatellite (ASAT) systems, Soviet knowledge of foreign space systems, the USSR's dependence on its own space systems, and the likelihood of spaceborne ASAT use under differing world stress conditions. This discussion is limited to *spaceborne* antisatellite systems, whereas other interagency products address the full spectrum of Soviet antisatellite capabilities (both spaceborne and ground-based) and prospects for their use.

Soviet Attitudes Toward Space

153. At the beginning of the space era, Soviet authorities viewed space as an arena of East-West competition in peacetime and as a potential combat arena in wartime. In the early 1960s, Soviet media expressed concern about the potential US deployment of weapons in space, particularly orbital nuclear weapons. In 1963, the revised second edition of a key Soviet publication, "Military Strategy," contained admonitions about the need for defenses against a wide variety of satellite systems, including satellites used for reconnaissance, communications, navigation, and bombardment.

154. Over the years the Soviets' attitude toward foreign space operations has gradually changed from one of general hostility to one of qualified acceptance. Their record, however, has left some important areas of doubt as to the extent of their acceptance of certain uses of space as legitimate, especially with respect to space reconnaissance not related to treaty verification. Tolerance of space systems used for purposes such as reconnaissance, communications, navigation, and other military support functions became evident in the mid-1960s as the Soviets themselves began to employ such systems. The SALT I negotiating process from 1969 to 1972 culminated in the ABM Treaty and the Interim Agreement on Strategic Offensive Weapons, both of which acknowledge that both sides will use "national technical means (NTM) of verification." The Soviets stated that NTM included satellite systems, but the United States and the USSR have not attempted to identify which specific space systems are included. Soviet negotiators insisted on qualifying the agreement to use national technical means of verification with the phrase "in a manner consistent with generally recognized principles of international law." The agreements did not codify, however, nor did the Soviets specify in the negotiations, the uses of national means of verification that they would regard as consistent with principles of international law.

155. The Soviets still hold that certain space activities cannot be accepted as legitimate. For example, they have claimed a unilateral right to take active countermeasures against satellites for direct broadcasting to populations without the agreement of the target state's government. They hold that such broadcasting would be an illegal, hostile intrusion upon a state's sovereignty. In ASAT treaty negotiations Soviet representatives maintained that space systems that violate Soviet air space or territory, damage the environment, or violate a state's sovereignty in other ways such as direct broadcasting are hostile or illegal actions and should be excluded from the treaty's protection.

156. The Soviets' general acceptance over the years of most space activities has in large measure been due to their recognition that space is an increasingly attractive medium for them to accomplish crucial military-support functions, including reconnaissance, command and control communications, and navigational assistance. They appear to see substantial advantage in maintaining the benign environment in which space activities have been conducted for nearly two decades and from which they have reaped political, military, scientific, technological, and economic benefits.

157. It is also clear, however, that they recognize the importance the West places on satellite systems for supporting military activities. The Soviets' development of an antisatellite orbital interceptor system and their more recent efforts to modify it and to develop more advanced systems clearly show a desire to have the capability to negate foreign satellites, should the decisions be made that such action was necessary.

158. Overall, our assessment of the Soviets' attitudes and policies toward space activity suggests that some of their decisions on interference in space would not necessarily depend upon prior diplomatic undertakings. At least at higher levels of international stress, decisions on whether to interfere with US satellites would depend on Soviet political and military interests, Soviet capabilities, and the expected consequences of given actions.

Current and Prospective Spaceborne ASAT Systems

159. ***Orbital Interceptor.*** The Soviets have had an operational, nonnuclear orbital interceptor system since the early 1970s. This system can be used to intercept and destroy foreign satellites having orbital inclinations between about 40 degrees and 140 degrees. They have demonstrated successful engagements at altitudes ranging from about 160 to 1,600 kilometers. The system is probably capable of attacking satellites at altitudes up to about 3,800 to 8,700 km, depending upon the characteristics ascribed the interceptor and the orbital inclination of the target. The system uses ground-based target-tracking radars to establish a projected intercept point, two launch pads

at the Tyuratam Missile Test Range, and a ground control facility near Moscow. None of these ground facilities are hardened against nuclear detonations, indicating an intention to use the system before nuclear strikes on the Soviet Union.

160. The operational orbital interceptor uses an onboard radar sensor during the terminal portion of the engagement 25X1 [redacted] 25X1 The Soviets have successfully demonstrated both one- and two-revolution intercepts. The two-revolution intercept profile requires about 195 minutes to complete the engagement 25X1 [redacted] 25X1 one-revolution intercept profile 25X1 [redacted] 25X1 the time required for engagement is reduced to about 95 minutes, thereby reducing the amount of time available to the enemy to deduce that an attack is under way and to employ evasive maneuvers or other countermeasures to prevent satellite destruction. Because the Soviet interceptor itself is destroyed when the warhead is exploded to create the fragments that destroy the target, a separate interceptor must be launched against each target.

161. We do not know whether the Soviets routinely maintain orbital interceptors in a ready status within the Tyuratam support facilities. We believe they would do so in periods of crisis or limited conflict that they perceived might escalate to major confrontations. We believe that two orbital interceptors, if maintained in a ready status, could be moved from the support areas and launched within one or two hours of a decision to do so. And the minimum time between launches from the same launch pad may be as little as two to three hours. The support facilities could accommodate 10 to 12 launch vehicles with interceptors attached. A new building, under construction since mid-1978, could double the site's storage capacity for ASAT interceptors and boosters. However, all of these support facilities and the two launch pads are also used for Soviet radar and ELINT ocean reconnaissance satellites, making it unlikely that they would be devoted entirely to orbital interceptors.

162. The orbital interceptor system presents a significant threat to satellites using the near-Earth orbits characteristic of most US intelligence and many other military support systems. 25X1 [redacted] 25X1 We believe that the Soviets consider those satellites that provide intelligence or direct support (such as navigation) as the targets of highest priority.

163. The orbital interceptor has no capability against satellite systems in semisynchronous or geosynchronous orbit. Geosynchronous satellites are too high, and satellites in highly elliptical semisynchronous orbits pass through the interceptor's engagement altitudes at velocities too high for the interceptor to engage successfully. 25X1 [redacted] 25X1

164. The operational version of the orbital interceptor has been tested 13 times against targets since 1968. Although five of these tests were failures, we believe that subsequent tests achieved the desired objectives. Between December 1976 and May 1978, the Soviets conducted three tests of a developmental orbital interceptor 25X1 [redacted] 25X1 25X1 None of the targets were damaged in any of the tests. A fourth test of the developmental orbital interceptor occurred in April 1980 after a standdown of nearly two years. The test was an unsuccessful two-revolution attempt using the developmental version of the interceptor. The Soviet decision to resume testing after a standdown of nearly two years probably reflects a pressing technical need to renew testing of the troubled developmental interceptor (ASAT) system. If the Soviets were refraining from

testing for political as opposed to technical reasons, it now appears that they no longer feel constrained.

165. Unless the United States and the USSR agree to prohibit testing of antisatellite systems, we believe the Soviets will continue their testing activities and will stress the successful completion of their developmental orbital interceptor system using the new acquisition and homing sensor. We also believe that there is about an even chance that the Soviets would, after appropriate modifications, mate their orbital interceptor to a larger booster and test it against semisynchronous and geosynchronous target satellites. During the 1980s and 1990s, the Soviets likely will supplement the existing orbital interceptor and any other antisatellite system with new antisatellite systems—such as a dedicated direct-ascent interceptor or space-based lasers.

166. *Space-Based Laser.* There is evidence of a Soviet project to develop a space-based laser weapon that we believe may have an antisatellite application. Such a system would have significant advantages over the orbital interceptor in that it would have multishot and long-range capabilities, perhaps on the order of 1,000 km between weapon and target. It is also likely to have a greater capacity to overcome defensive measures, such as maneuvering and decoy deployment. Development of such a complicated satellite is technically difficult, and we are uncertain as to the approach the Soviets will take. They could forgo space tests with a smaller system and launch a 5-MW system, although this would be technically risky. They could have a prototype system for antisatellite testing by the late 1980s. They might first launch a laser system of somewhat lower power—several hundred kilowatts—but not before the mid-1980s. Another possible development program would initially call for an in-space feasibility demonstration using an even lower power laser—in the approximate range of 25 to 75 kW—as a test bed. If such a test bed could fit into an existing spacecraft, it might be launched in the early-to-middle 1980s.

167. *Space-Based Particle-Beam Weapons.* There are serious questions concerning the feasibility of space-based particle-beam weapons (PBWs). Critical technologies for the development of a space-based PBW are: space-qualified neutral-beam particle accelerators, precise pointing and tracking subsystems with submicroradian precision, and high-power, lightweight power supplies. The Soviets have broadly based research programs that are related to particle beam weapons development. These technologies, however, are in an early development stage and it would probably be the early-to-middle 1990s before they could test the practicality of a space-based PBW weapon.

168. *Radiofrequency-Damage Weapons.* The Soviets have been working on novel, high-power sources of radiofrequency radiation or electromagnetic pulse that could damage by destroying electronics or other spacecraft parts. By the early 1980s they could have this technology available for subsequent use on a spacecraft. However, we believe there is a low likelihood the Soviets will elect, within the next decade, to develop a space-based radiofrequency-damage antisatellite weapon, in part because a ground-based weapon would be less complex and probably more effective and in part because their current efforts appear to emphasize laser weapon systems.

169. *Manned Space Systems.* We believe, as stated earlier, that the Soviets are pursuing the development of manned reusable space systems that have potential ASAT applications. The Soviets have voiced concerns, in the negotiations to limit ASAT activities, about the potential use of the US Shuttle in an ASAT role, such as altering spacecraft orbits. These concerns could be based on their knowledge of the capabilities of the US Shuttle or on their own future mission plans.

170. It is conceivable that the Soviets might use their manned space stations to conduct feasibility testing of low-power laser systems and associated subsystems in the early 1980s. Having cosmonauts available for minor repairs and adjustments may be perceived as a way of ensuring steady progress and overcoming the many problems they have had in introducing unmanned, complex spacecraft like their RORSATs, EORSATs, and launch detection satellites. The Soviet goal of having continuously manned space stations may include such testing activities among its objectives, and might even include having such weapon systems as operational elements of future space stations for both defensive and offensive purposes. Operational, high-power (5 MW) versions of such weapon systems probably would not be available before the 1990s. However, we have no direct evidence that the Soviets are developing an antisatellite capability for their manned spacecraft.

Soviet Knowledge of Foreign Space Systems

171. A prerequisite of intelligent use of a spaceborne antisatellite system is, of course, identification of

those foreign satellite systems to be engaged. At any one time, there are well over 100 non-Soviet satellites active. We believe the Soviets' knowledge of all near-Earth and most high-altitude spacecraft is sufficient for identification and targeting purposes. Their knowledge is based on:

— A large number of authoritative, unclassified documents such as Congressional records and reports, and a wide variety of technical journals.

— Human sources.

— Information gathered from a sophisticated network of land- and sea-based SIGINT collectors, both conventional and covert.

— Orbit determination by their space surveillance network.

172. We do not know the full extent of Soviet knowledge of foreign space systems. Unclassified Soviet literature indicates a broad and, on occasion, detailed understanding 25X1

25X1 [redacted]

Soviet Dependence on Space Systems and Their Vulnerabilities

173. Any decision by the Soviets to interfere with or destroy a foreign satellite system would almost certainly be based in part on an evaluation of their own dependence on space systems and the vulnerability of the space systems to foreign antisatellite means. Their dependence on satellite systems for military support functions was discussed in section III and summarized in table 6 (following paragraph 101). Our estimates of their dependence range from low to high for specific functions, depending mainly on the availability of nonsatellite means to fulfill those functions. In general, their dependence will probably increase in the 1980s with the deployment of additional and more advanced space systems for which adequate nonspace alternatives will not be available.

174. The Soviets are undoubtedly aware of the US commitment to develop a nonnuclear orbital interceptor, and they are probably concerned with potential foreign development of ground-based systems for satellite destruction (such as lasers) and electronic warfare. Information is sparse on the vulnerability of Soviet space systems to various forms of foreign interference. We have no information that indicates the Soviets have a program to harden or otherwise improve the survivability of their spacecraft. However, certain features of Soviet space systems tend to offer them some inherent degree of protection:

— For various technological reasons, the Soviet Union has produced spacecraft that have thick skins and are pressurized with a controlled internal environment. This is in contrast to US systems, which are generally thin skinned and designed to work in the vacuum of the space environment. The Soviet practice of using thick skins results in a degree of protection that US space systems do not have, particularly against laser and nuclear radiation and electromagnetic pulse effects.

— The Soviets, having some 70 to 100 active military-related support satellites in orbit at any one time, plus the demonstrated ability to launch replacement satellites quickly, make effective foreign ASAT efforts difficult. The Soviets' greatly increasing use of the geostationary orbit also compounds the problems in designing ASAT systems against them.

— The Soviets' high-resolution photoreconnaissance satellites, ELINT and radar ocean reconnaissance satellites, Salyut space stations, Molniya communications satellites, launch detection satellites, and all their spacecraft in geostationary orbit have a maneuvering capability. This capability can be used to make corrections for drag effects of the atmosphere, to change the orbit for operational reasons, to deorbit the satellite, or to attempt to evade an ASAT weapon.

25X1 [redacted]

Prospects for Soviet Spaceborne ASAT Operational Use

175. We know of no instance where the USSR has intentionally interfered with a US space system. Soviet attitudes toward noninterference with US space systems result from an amalgam of political and other factors. Most important among them has been the impact that interference would have on Soviet-US relations. The USSR has explicitly recognized that physical interference with US national technical means being used to monitor the SALT agreements would be inconsistent with its obligation under these agreements. It has not made a commitment to extend this protection to all US satellites or satellite missions. Nevertheless, the Soviets undoubtedly perceive that an attack on any US satellite would contribute in a major way to a deterioration in US-Soviet relations.

176. Perhaps the most important of the other factors is the USSR's own dependence on space systems for a variety of military support functions, and its probable concern about potential US retaliation against Soviet satellites or retaliation in some other form. The Soviets presumably would expect any current US response to include something other than a physical attack by a nonnuclear interceptor since they know the United States does not now have that capability. They would also have to consider the level of US dependence on space systems for military support functions, the US ability to respond to a Soviet ASAT attack, and the likelihood of such a response. Each of these considerations is dynamic and will acquire different significance over time.

177. We know very little of the Soviets' operational doctrine for use of spaceborne ASAT systems. We do know that their current orbital interceptor uses ground-based facilities—target-tracking radars, launch pads, and control sites—that are not hardened against nuclear detonations, indicating an intention to employ the system before nuclear strikes on the USSR. 25X
25X1

178. Considering all of the above factors, we believe it highly unlikely that the Soviets will use spaceborne means to interfere with US satellites in peacetime, crises, or conflicts not involving direct engagements between US and Soviet forces. We believe the likelihood of Soviet interference would increase but would remain low even if US and Soviet forces were involved but not directly engaged in a limited conflict outside of Europe. In a conflict between US-Soviet forces, the likelihood of Soviet destruction of US satellites using spaceborne means would rise as the conflict escalated. The likelihood of such interference would probably be moderate as long as the Soviets' objectives in a US-Soviet conflict were limited and they believed they could limit the scope and intensity of the fighting. We believe there is a high likelihood that the Soviets would use spaceborne ASAT systems in a NATO–Warsaw Pact armed conflict. The likelihood of such use would be very high if the Soviets perceived that general nuclear war was imminent.

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ANNEX A

Soviet Information Denial Techniques

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ANNEX B

Major Gaps in Our Knowledge of the Soviet Space Program

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