Top Secret [redacted] CIA Statute
CIA Statute [redacted]

25X1

C05434076

25X1

[redacted]

[redacted]

Space Station Module (Cosmos 929-Type)

10. This type spacecraft is about the size of a Salyut space station with a total mass (fully loaded) of about 19,000 kg. On the basis of Soviet statements and our observations of the spacecraft of this type launched since 1977, it appears this type craft will have multiple missions, probably including space station resupply. In addition, it probably will have some military missions either as part of a modular space station or orbiting independently. [redacted]

11. The space station modules have demonstrated some unusual capabilities:

[redacted]

— A large solar-powered electrical system.

— A propulsion system capable of performing a large number of orbital maneuvers.

— A dense recoverable segment, which could be used to protect cosmonauts from exposure to excessive radiation that would be experienced in high-inclination orbits.

[redacted]

12. Space station resupply is another likely mission of the spacecraft. Cosmos 1443, the third space station module launched, was the first one used by cosmonauts, and it was also used as a large resupply vehicle for Salyut 7 in 1983. According to the Soviets, Cosmos 1443 delivered 3,000 kg of equipment and supplies to Salyut 7 and returned 350 kg of material in its recoverable segment. Soviet statements also claim this craft can return up to 500 kg to Earth. The current Progress resupply vehicle can deliver about 1,300 kg to space stations. The Progress can refuel space stations, whereas space station modules have not demonstrated a refueling capability. The recoverable segment could accommodate and return to Earth up to three cosmonauts. [redacted]

13. The Soviets have also referred to this new type of spacecraft as an interorbital space tug. Cosmos 1443 was repeatedly used to change the altitude of the Salyut 7 complex and maintain its attitude. Cosmos 1267, which was launched and docked with Salyut 6 in 1981, was used for even more maneuvering and carried over 5 metric tons of fuel. However, this type of spacecraft is not capable of performing the large maneuvers—taking payloads to geosynchronous orbit and returning them to low earth orbit—that are intended for NASA's Orbital Transfer Vehicle (OTV). Rather, it is better suited for more limited or localized maneuvering and perhaps assembly of large complexes. [redacted]

14. We postulate several possible military uses for these spacecraft:

— *Ocean Surveillance Platform.* The module could be used as a platform for conducting visual and photographic reconnaissance of ports and naval units at sea, [redacted]

— *Reconnaissance.* If properly outfitted, the module could be used to supply imagery or ELINT reconnaissance on an ad hoc basis against targets of opportunity to supplement coverage regularly provided by other satellites. This could be particularly useful if coverage of a target or area is needed as soon as possible and the module were to pass over the area before other reconnaissance satellites. [redacted]

— *High-Inclination Missions.* High-inclination orbits are valuable for military reconnaissance because they allow access to nearly all the Earth's surface. [redacted]

[redacted]

— *Military Research.* [redacted] cosmonauts on board space station modules could perform a variety of applied research for military customers. [redacted] It is also likely that autonomous flights, [redacted] will perform such research. [redacted]

— *Space Weapons Component Research and Development.* An example of such research could be weapons component testing. [redacted]

Developmental and Future Projects

15. Soviet leaders perceive that their future manned space program will satisfy a number of military, political, economic, and scientific goals. The Soviet space program generates enthusiasm in the socialist countries and projects the Soviet image of world leadership in space. The program is based on reusable and common components that offer substantial flexibility and cost savings. This is consistent with Soviet design practices that stress innovation through modification, avoiding completely novel concepts whenever possible. The Soviets have not reacted publicly to the recent announcement of the US space station project. However, in light of this, we may see future efforts intended to reinforce the desired image of Soviet preeminence in the manned space field. [redacted]

Modular Space Station

16. The next major objective in the Soviet manned space program is a modular space station, which will be a transitional element in the development of a larger space base. A Salyut-type station with modules based on the Cosmos 929-type spacecraft is expected to be assembled into components of a modular space complex probably beginning in 1986. Statements by Soviet scientists and cosmonauts suggest:

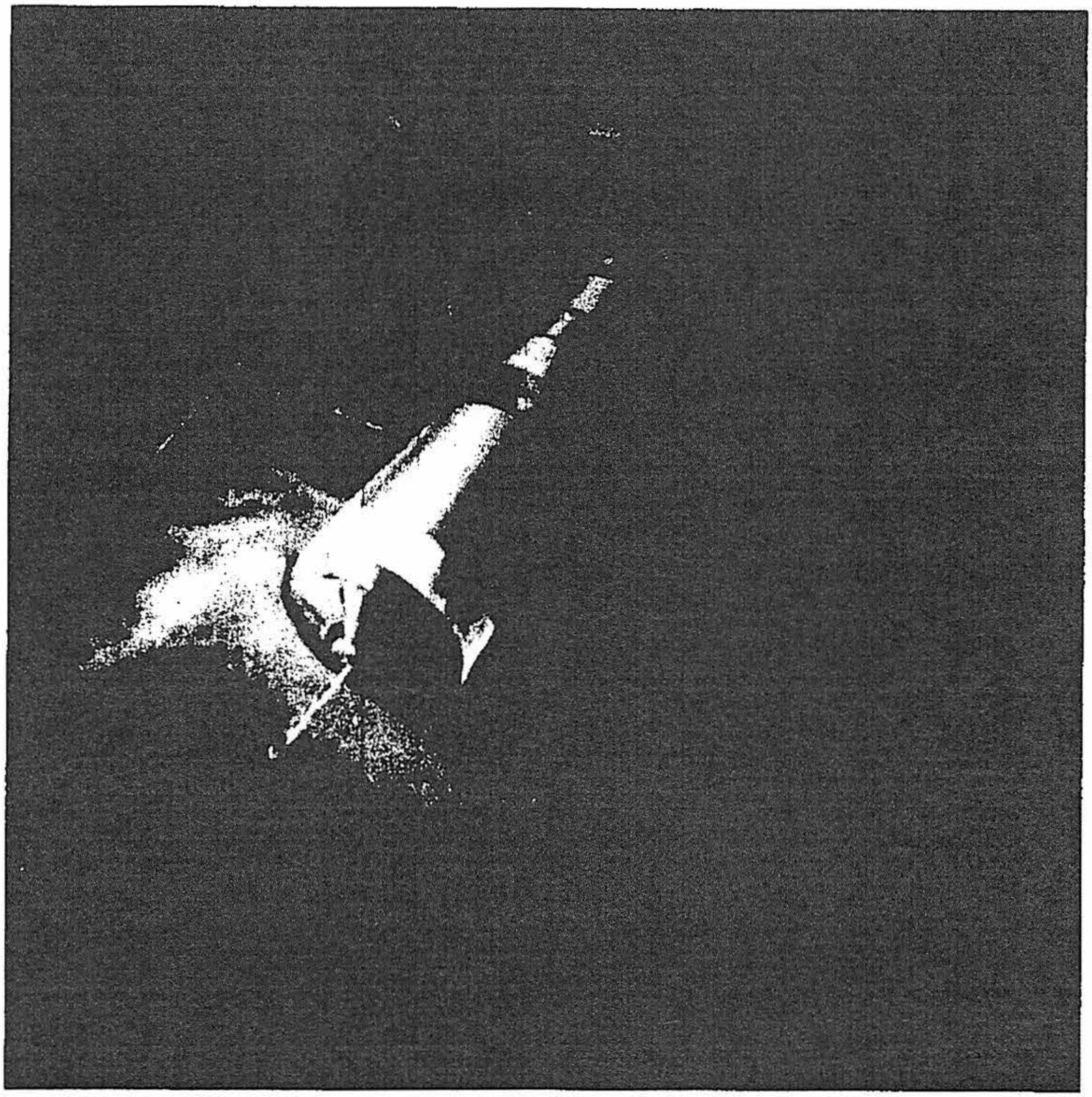
— Construction is expected to start in 1986, with Salyut 8 as a primary component. This estimated date of construction is two years later than that projected in NIE 11-1-83 due to the extension of the Salyut-7 mission and Soviet statements that Salyut 8 would not be launched until Salyut 7 deorbited.

— A "cactus"-type arrangement may be used; this could imply space station modules attached to midsection multiple docking adapters to form limbs. Figure V-3 shows a Soviet artist's concept of a modular space station.

— A crew of three to 12 persons will occupy the completed station. [redacted]

17. A modular space station will probably be used for a variety of missions. For example, the core module could provide the living area (eating, sleeping, recreation) and some support systems for the station. Other modules will probably be used for mission activities. A Dutch newspaper article, written in 1984 as a result of conversations the author reportedly had in Moscow with cosmonauts and space experts, described a modular station. The article stated that the Soviets are building four modules: one each for astronomical, biological, and technological (materials processing) research, and one for Earth observations. Some modules may also operate detached for a time from the main station for materials processing and any other operations requiring isolation from vibrations, or for safety and security reasons. The Earth observations mentioned could include both Earth resources and military reconnaissance. We also expect the Soviets to

Figure V-3
Soviet Concept of Modular Space Station



Unclassified
307711 12-85

continue experimental development of new sensors and other hardware for unmanned military satellites. A module could also include provisions for testing of components for space-based laser weapons, such as pointing and tracking subsystems. [redacted]

Large Space Station

18. In the early-to-middle 1990s, Soviet experience with a modular space station probably will be sufficient to begin the construction of a large space station using the modular space stations as components. A Soviet concept for a large space station is shown in figure V-4. We expect the assembly of a large space station to take place over several years, with initial crew sizes ranging from 12 to 20 persons, and with SL-W launches to deliver the large payloads. (Some Soviet scientists have discussed the development of a very large space base in the 1990s, with provisions for crews of 20 to 100 persons.) The reusable space shuttle orbiter or the space plane would resupply and transfer crews to the space station. The uses of such a large space station would include the maintenance, repair, and control of satellites in orbit; military R&D, including directed-energy weapon development; scientific and industrial work in a zero-g environment; the stocking of fuel and supplies for lunar or planetary expeditions; construction of large space structures; and the reception of international visiting parties, including Third World cosmonauts. Another role could be as a spaceborne command post. In the longer term, a large manned space base would permit the assembly of interplanetary and other spacecraft that would be free of the design constraints imposed by atmospheric aerodynamics flow. [redacted]

Space Transportation System

19. A major national space project called *Buran* (Snowstorm) is under way with the goal of developing a reusable space system, including a heavy-lift launch vehicle and a space shuttle orbiter. [redacted]

20. The SL-W is expected to be launched into space in 1986. [redacted] The Soviet shuttle will probably first go into orbit in 1987, when construction of a suitable launchpad is completed. [redacted]

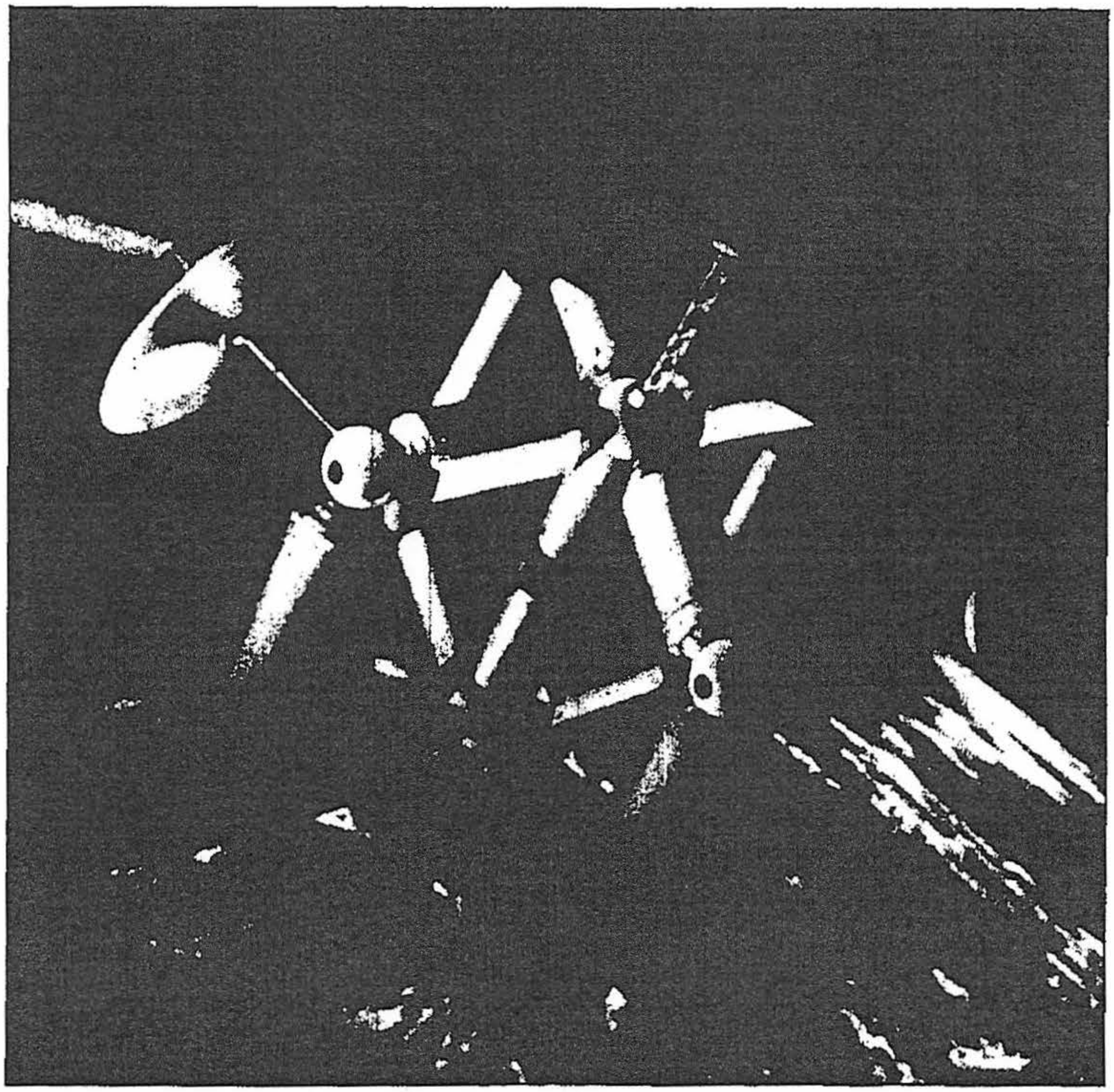
21. The Soviet space shuttle orbiter prototype is nearly identical to the US shuttle orbiter in size, configuration, and layout details (see figure V-5). Major design features of the US orbiter probably were adopted in order to minimize risk, cost, and development time. The major difference between the Soviet and US space shuttle orbiters—the aft fuselage section—is the result of a difference in their respective launch configurations. The US system consists of an orbiter with three main rocket engines, an external fuel tank, and two solid-propellant, strap-on booster rockets. In contrast, the Soviet shuttle orbiter does not carry the main engines. These are mounted on the base of the core component. [redacted] This will enable the Soviets to test landing performance without aircraft-assisted drop tests. The capabilities of the US and Soviet space shuttle systems are compared in figure V-6. [redacted]

22. [redacted]

Space Tug

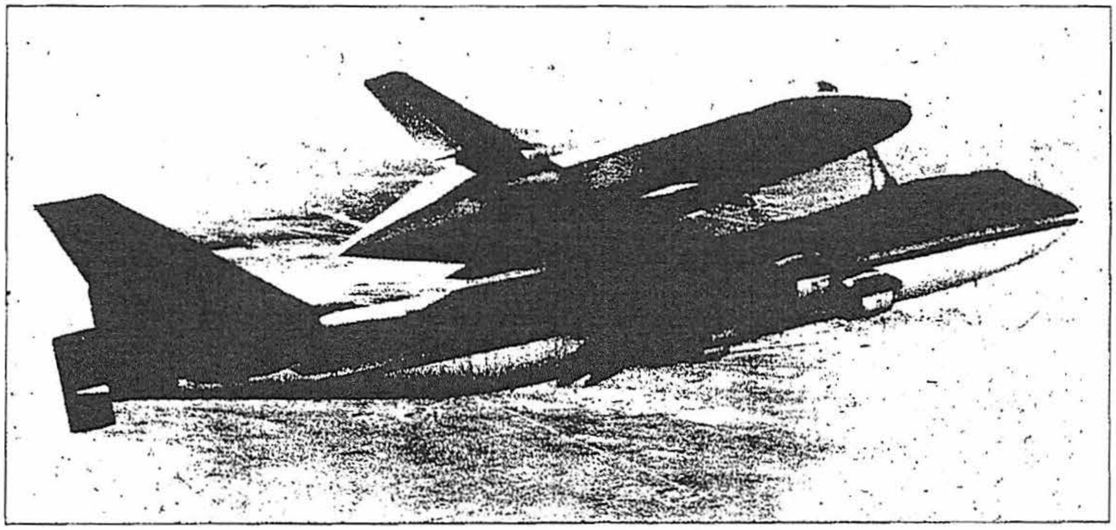
23. Comments by the Soviets in open literature and classified writings on their capability to retrieve disabled satellites and return them to low-Earth orbit or

Figure V-4
Soviet Concept of Future Large Space Base



Unclassified
307712 12-85

Figure V-5
US and Soviet Shuttle Orbiters



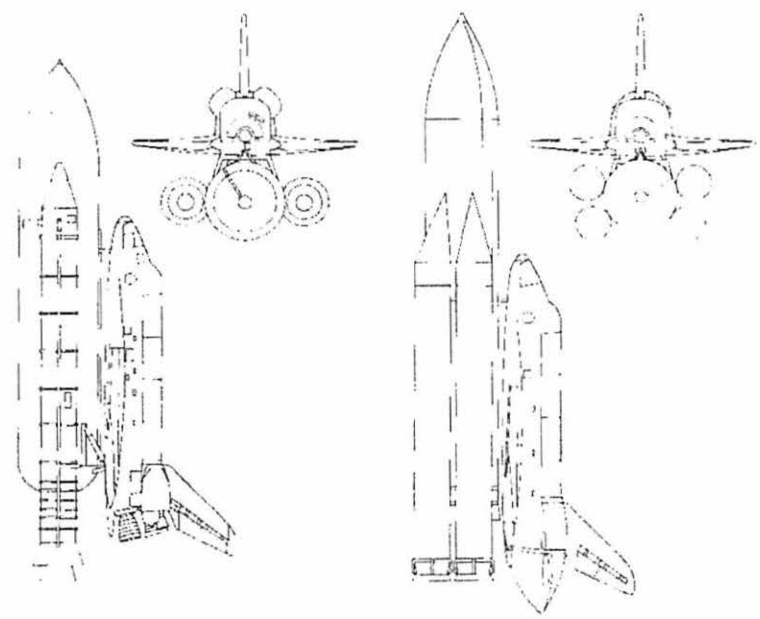
25X1 [redacted]

CIA Statute [redacted]

707213 12-85

Figure V-6
Characteristics of US and Soviet Shuttle Orbiters

	US	Soviet



	US	Soviet
Total height (m)	56	60
System liftoff weight (kg)	2,043,000	2,500,000
Liftoff thrust (kN)	29,822	36,000
Payload to 185 kilometers (kg)	29,500	[redacted]

[redacted]

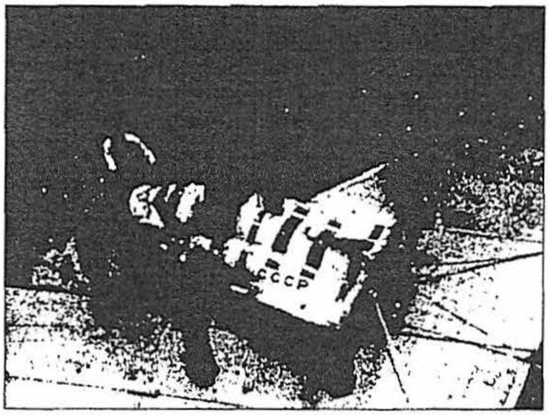
307714 12-85 TCS 808348/85

to Earth for repair imply that they are developing an orbit-to-orbit transfer vehicle (space tug) that would work in concert with their space shuttle. Several Soviet statements and writings have indicated they would use a space tug to assemble space stations or other large structures in space. A space tug also would assist in the placement of satellites into orbit and the transfer of satellites between high and low orbits for servicing and would increase the operational life of Soviet satellites. There is a moderate probability that the Soviets will have a space tug in the early 1990s, after their shuttle orbiter becomes operational. [redacted]

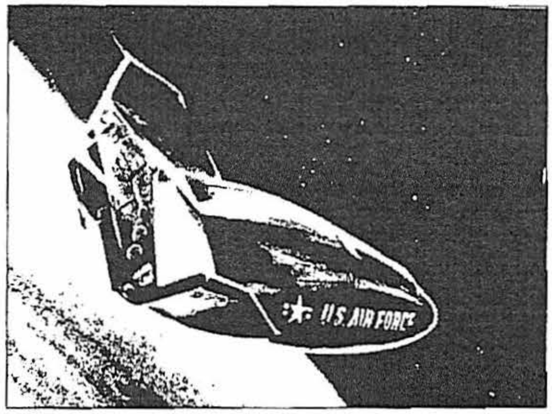
Spaceplane

24. In 1962, about the same time scientists in the United States were considering a space bomber, noted Soviet aircraft designer Artem Mikoyan publicly proclaimed the need for a *kosmolyot* (spaceplane) so that the Soviet Air Force could have an operational capability in space. Classified Soviet military articles also have expressed the need for an "orbital aircraft" capable of inspecting hostile spacecraft and conducting antisatellite operations. These classified writings also address other missions, such as targeting of strate-

Figure V-7
Comparison of Subscale Soviet Spaceplane to US SV-5D Lifting Body



Cosmos 1445 on deck of recovery ship



SV-5D lifting body (1966-67)

Unclassified
307715 12 85

gic weapons, poststrike assessment, retargeting, and even orbital bombardment. [redacted]

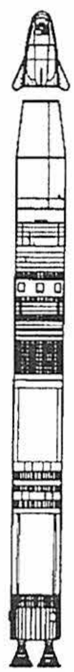
25. A program to develop a military orbital aircraft began in 1969. The vehicle was to be produced by the Mikoyan Design Bureau with assistance from the Bereznyak Design Bureau. The operational vehicle reportedly would weigh about 12,000 to 18,000 kg, carry a one-man crew, be launched by an expendable launch vehicle, and be used for reconnaissance and inspection missions. Large orbital plane changes reportedly would be accomplished through a combination of aerodynamic and propulsive forces (synergetic plane changes). The program apparently was motivated in part by the US X-20 Dyna Soar program and may actually have employed classified Dyna Soar documents in the development process. [redacted]

26. [redacted] The configuration of the Soviet spaceplane bears a strong similarity to the US Air Force X-23A, which was designed to assess the performance of a lifting body during hypersonic reentry, including aerodynamic maneuverability, and the integrity of structure and heat protection systems. [redacted]

27. We estimate a moderate likelihood that a full-scale version of the spaceplane will be launched in 1987, but could be launched as early as late 1986. On the basis of program timing and estimated payload, we judge that the SL-X-16 is the best candidate for the launch vehicle, although the SL-13 is also a possibility (see figure V-8). We note, however, that the Soviets deny the subscale vehicle will be developed into a full-scale spaceplane. [redacted]

28. A small manned spaceplane carrying a two- to four-man crew could have several advantages over the shuttle orbiter. It would have a shorter turnaround time, would be much lower in cost, would be more maneuverable, and could be launched quickly. We postulate the spaceplane might be launched from the ground or be docked to a permanently orbiting space station, using the station as home port between reconnaissance missions. If launched from the ground, the spaceplane could overfly the United States and return to the Soviet Union within 100 minutes of launch. This could be useful in crisis or wartime situations. In whatever role, the flights would be relatively short in

Figure V-8
SL-X-16 Launch Vehicle
With a Spaceplane Payload



Height (m)	56
Weight (kg)	570,000
Payload to 185 km (kg)	15,000-16,000

CIA Statute [redacted]

307716 12-85

duration, probably no longer than 48 hours. Its missions are likely to include cosmonaut ferry, rescue from space stations, reconnaissance, and satellite inspection. It also could be used for poststrike assessment and targeting. An ASAT weapons platform also is a possibility, although this is considered unlikely because it would provide very little increase in capability over their current orbital interceptor. On the basis of estimates of the maneuvering capability of the vehicle, we judge that there would be insufficient fuel on board to enable the spaceplane to attack multiple targets in different planes, thus it would not provide a unique ASAT capability for the Soviets. Additionally, because the spaceplane would be manned, we do not expect the SL-X-16 to have an ability to launch it as quickly as the SL-11 with an ASAT payload. An alternative view holds that there is a moderate probability that the spaceplane would be used in an ASAT role. After satellite inspection, the crew could report its findings and, if so directed, destroy the satellite under investigation.[5] CIA Statute [redacted]

[5] *The holder of this view is the Director, Defense Intelligence Agency.* (U)

CHAPTER VI

SPACE WARFARE PROGRAMS

1. This chapter describes current Soviet capabilities to attack space systems and estimates future antisatellite (ASAT) and satellite defense systems, as well as other possible space warfare programs, including ballistic missile defense. For weapons based in space, ASAT applications are less demanding, so we expect that any early deployments of such space weapons would be for ASAT purposes. [redacted]

2. Current Soviet systems with potential antisatellite capabilities include the dedicated nonnuclear orbital interceptor, ground-based high-energy lasers with potential ASAT capabilities at a test range, nuclear-armed Galosh ABM interceptors that may have an ASAT mission, and the technological capability to conduct electronic warfare against space systems. (For alternative views on the ASAT role of the Galosh ABM interceptor, see paragraph 19.) [redacted] Tables VI-1 and VI-2 describe the Soviet systems with the potential for destroying or otherwise intentionally interfering with US satellite systems. [redacted]

3. Voyska PVO's antisatellite mission was established in 1964, for the purpose of "destroying space systems used by the enemy for military purposes," according to the 1965 *Soviet Dictionary of Basic Military Terms*. Open references to this VPVO mission, as well as the Soviet military use of space in general, were dropped from Soviet publications after the 1967 Outer Space Treaty was adopted. [redacted]

Soviet Knowledge of US Space Systems

4. [redacted]

Soviet Space-Tracking and ASAT-Targeting Capabilities

5. Targeting a satellite for an ASAT weapon requires tracking information for predicting target positions and for identification of active targets. The Soviets' capability to acquire such information for ASAT targeting purposes is very good for low- and medium-altitude satellites but is limited for high-altitude satellites. The Soviets have Hen House, Dog House, and Cat House radars that perform space surveillance of objects in orbits up to approximately 3,000 km. The primary means the Soviets have to accurately track and catalogue objects in orbits beyond 3,000 km is a network of tracking cameras. However, Soviet deep-space tracking cameras provide only limited coverage of the geosynchronous belt (about 40,000 km) and are constrained by weather and film-processing times. Supplementing both the radar and optical track data on foreign satellites is the Soviets' network of ground-based signals intelligence facilities. [redacted]

6. [redacted]

Table VI-1
Current Soviet Systems With Potential Antisatellite Capabilities

Systems	Status	Maximum Attack Altitude (*kilometers*)
Current nonnuclear orbital interceptor	Operational since at least 1971. [redacted]	3,800 to 8,700 [a]
Ground-based high-energy lasers [b]	Saryshagan Complex D, [redacted] may be capable of limited ASAT role in clear weather against unprotected satellites passing near Saryshagan. [redacted]	1975 technology 200 to 300 structural damage [c] 500 to 700 vulnerable component damage [c] Upgraded technology 400 to 1,000 structural damage [c] 500 to 3,500 vulnerable component damage [c]
	Saryshagan R&D Complex also may be capable of a limited ASAT role in clear weather against unprotected satellites passing near Saryshagan. [redacted]	100 to 400 structural damage [c] 500 to 3,000 vulnerable component damage [c]
Galosh ABM interceptors with nuclear warhead	Information suggests ASAT role for some Galosh launchers. [d]	1,000
Electronic interference	Assessed to have technological capability to attempt to interfere with satellites, perhaps since early 1960s.	[redacted]

[redacted]

This table i[redacted]

[redacted]

7. The primary Soviet space tracking network is backed up by a number of other radar, optical, and SIGINT sensors that monitor new foreign launches [redacted] These additional sensors, which have primary missions such as ballistic missile early warning, also contribute to the maintenance of the Soviet catalogue of space objects. However, these secondary sensors may not be available for tracking during times of conflict. [redacted]

8. Soviet low-altitude tracking capabilities depend heavily on the altitude and inclination of the target satellites. In addition, targeting accuracies are a function of time from last observation and duration of tracking. All low-altitude noncooperative satellites orbiting over the USSR or within Soviet radar coverage [redacted]

9. [redacted]

Table VI-2
Possible Future Soviet Systems With Potential Antisatellite Capabilities

Systems	Status	Maximum Attack Altitude (*kilometers*)
Nonnuclear orbital interceptor (developmental system, modification of current system)	Five flight tests, all failed; could be operational three years after testing resumes [redacted]	[redacted]
Nonnuclear direct-ascent interceptor	[redacted] the Soviets have the technological capability to deploy such a system by the early-to-middle 1990s. Low-to-moderate likelihood of development.	
High-energy lasers		
Ground-based	The Soviets could begin testing [redacted] in the late 1980s to early 1990s.[c]	1,000 to 3,500[d]
Airborne	Probably still in R&D; [redacted] Deployment of a few units possible by the early 1990s.	1,000
Space-based	Probably still in R&D; could launch megawatt-class prototype in the early 1990s.	[redacted]
Radiofrequency weapons (including electromagnetic pulse)	R&D of relevant technologies under way; [redacted] ASAT application. Very low likelihood of any capability now and only moderate through the early 1990s.[c]	
Particle beam weapons	[redacted] capability for ASAT role unlikely before mid-to-late 1990s.	
Hypervelocity kinetic-energy weapons		
Space-based short-range system	In laboratory R&D since the mid-1960s. [redacted]	
Space-based long-range system	[redacted] Very low probability of testing a prototype within the next 10 years.	
ICBMs	Modification required. We believe such a role is unlikely.	[i]
Space launch vehicles in a direct-ascent profile	No evidence of ASAT role.[j]	40,000
Space mines	[redacted] Very low probability of deployment.	40,000
Spaceplane	Moderate probability of development. Unlikely to have ASAT role.[k]	

[redacted]

[redacted] Most likely application is a weapon for close-in self-defense, although the potential exists to use such a weapon offensively aboard satellites that maneuver to attack targets at close range.

[redacted]

[i] Currently, SS-18s could reach 9,000 km [redacted]

[j] Space launch vehicles, such as the SL-6 and SL-12, could be fitted with nuclear warheads, but we believe this is unlikely because of the relatively low launch rates.

[k] For alternative view, see chapter V, paragraph 28.

This table [redacted]

25X1 [redacted]

CIA Statute [redacted]

307717 12 85 TCS 808349/85

25X1 [redacted] 25X1 CIA Statute

10. During periods of heightened US-USSR tension, ASAT targeting data would most likely be derived only from the dedicated space-tracking sensors. Radar data would be limited primarily to low-altitude coverage at inclinations greater than 30°. Tracking in the geosynchronous belt by optical sensors in the USSR would be limited 25X1 [redacted] 25X1 25X1 CIA Statute

Orbital Interceptor

11. The Soviet nonnuclear orbital interceptor has been operational since 1971. Since 1968, 15 tests of the orbital interceptor have been conducted, and we assess nine as successful, the last success having occurred in March 1981. The most recent test, in June 1982, was

[redacted]

the first failure of the operational interceptor since 1977. During the period 1976-81, five tests of a developmental version of an ASAT interceptor incorporating a probable passive electro-optical sensor were conducted; we assess all five as failures. [redacted]

12. The Soviet ASAT orbital interceptor system includes ground-based target-tracking radars to establish a projected intercept point, two launchpads at the Tyuratam Missile Test Center, and a ground-control facility near Moscow. These ground facilities are not hardened against nuclear strikes, suggesting that the system would most likely be used before a nuclear attack on the Soviet Union. [redacted]

13. [redacted] Both one- and two-revolution intercepts have been successfully demonstrated. [redacted] The time required for an engagement using the one-revolution profile is about one and a half hours [redacted] But the one-revolution profile reduces the amount of time available to employ evasive maneuvers or other countermeasures to prevent satellite destruction. Because the Soviet interceptor itself is destroyed when the warhead is fired at the

25X1

target, a separate interceptor must be launched for each target satellite. If the interceptor is unsuccessful in encountering the target, it cannot conduct a second attempt or pursue an alternative target [redacted]

14. [redacted] Orbital interceptors [redacted] probably could be moved from the support areas at Tyuratam to the pad in one hour and launched within another one to two hours. [redacted] we judge that at least three, and most likely four, orbital ASAT interceptors could be launched from each of two pads at Tyuratam during the first 24 hours of ASAT operations. [redacted] as many as five orbital interceptors could be launched from each pad in the first 24 hours. The ability to successfully employ these weapons is a function of target accessibility, launchpad refurbishment requirements, competing requirements for EORSAT/RORSAT launch, and other factors such as Tyuratam's survivability. [redacted]

15. The orbital interceptor system presents a significant threat to [redacted] US intelligence and military support satellites. Operational constraints, reliability, and the number of interceptors available would affect the overall capabilities of the force. Although satellite intercepts have only been demonstrated at altitudes [redacted] up to 1,600 km, the maximum altitude capability [redacted] Low-orbiting intelligence satellites are high-priority targets for the orbital interceptor. Geosynchronous satellites are too high, and satellites in highly elliptical, semisynchronous orbits pass

through the interceptor's engagement altitudes at velocities that are too fast for the interceptor to engage successfully. [redacted]

16. We judge there is a very low probability that the Soviets will develop a new version of the ASAT orbital interceptor, either a low-altitude version or one designed to attack satellites in semisynchronous or geosynchronous orbit. Even though we presume that a requirement to attack high-altitude satellites has existed for a long time, we have no evidence of a program to develop a high-altitude ASAT orbital interceptor. The new sensor that was tested on the developmental version of the orbital interceptor has a short acquisition range (under 30 kilometers) and would be unlikely to be used to attack geosynchronous targets. Finally, other technologies, specifically directed-energy and electronic warfare, may offer better prospects for solving the problem of attacking high-altitude targets. [redacted]

Direct-Ascent Interceptors

17. [redacted] Four [redacted] ests of the Galosh ABM interceptor between 1970 and 1978 were probably ASAT related. [redacted] the need for direct-ascent interceptors for use against satellites as well as reentry vehicles. [redacted] in 1969 half of the 16 Galosh launchers at one of the Moscow ABM complexes had an ASAT mission. [redacted]

18. Nuclear bursts in space could affect some Soviet satellites and ground-based electronics systems. To use the Galosh in an ASAT role, the Soviets would probably use dedicated interceptors with a low-yield nuclear warhead (several kilotons) [redacted] We estimate that a low-yield exoatmospheric burst would have minimal, if any, effect on ground-based radars or communications. Also, it would be highly unlikely that unprotected Soviet satellites would be damaged because of the limited lethal radius of such low-yield detonations. To avoid these problems altogether, the Soviets could develop a nonnuclear warhead, but such a system would be more complex. [redacted]

19. We judge that [redacted] Galosh test launchers [redacted] have the capability to carry out ASAT attacks, and, [redacted] we judge that they probably have a wartime ASAT mission. We doubt that the Soviets currently plan to use any Galosh launchers at Moscow in an ASAT role: [redacted] we believe they would be reluctant [redacted] An alternative view holds that there is no evidence on which to judge the Soviet intentions regarding the ABM or ASAT role for the [redacted] Galosh launchers [redacted] Another alternative view holds that the evidence for an ASAT role for some Galosh interceptors remains highly ambiguous. Although it is feasible that the four Galosh tests in the 1970s may have had an ASAT application, an equally plausible explanation is that the tests were designed to simulate the intercept of an RV with a lofted trajectory or with an impact area to the rear of the Galosh launchsite. Even if these tests were for an ASAT role, the holders of this view believe it is highly unlikely that the Soviets would choose to rely on a system [redacted] Furthermore, an ASAT mission would require exploding nuclear warheads at altitudes that would risk disabling Soviet satellites and ground-based communications—a risk the Intelligence Community previously judged the Soviets would be unlikely to take [redacted] This view holds that there is insufficient evidence for a reassessment of the likelihood of an ASAT role for the Galosh system, which the Intelligence Community previously judged to be unlikely.[10] According to an additional alternative view [redacted]

[9] *The holder of this view is the Director, Defense Intelligence Agency.* (U)

[10] *The holders of this view are the* [redacted] *and the Director, Bureau of Intelligence and Research, Department of State.* (U)

[redacted]

20. Although there is no evidence of a program to develop a new nonnuclear direct-ascent interceptor for use against low-altitude targets, with improvements to overcome the deficiencies of existing ASAT systems, the Soviets may pursue this approach. They have the technical ability to develop an advanced interceptor. [redacted] A direct-ascent interceptor would also assure the Soviets a means to attempt to counter low-altitude targets regardless of the outcome of their research in emerging technologies. We estimate a low-to-moderate probability for such a development, but, if the Soviets pursue this approach, an operational system could be available by the early-to-middle 1990s. Existing ICBMs and space boosters have the theoretical capability to be used against low-altitude satellites, but we doubt the Soviets would use them in such a role. [redacted]

21. ***High-Altitude Direct-Ascent Interceptors.*** Soviet space boosters—such as the SL-6, SL-12, and SL-14—or ICBMs could be used to launch nuclear warheads to perform a direct-ascent ASAT intercept of high-altitude targets in semisynchronous or geosynchronous orbit. The necessary modifications to guidance and control systems probably would require one to two years of development and testing. In addition, ICBMs probably would require high-energy upper stages to be added to increase the altitude achievable. We have no evidence of a Soviet program to develop such capabilities and judge that the likelihood of such developments is low because:

— Development of such systems probably is not a Soviet priority; they have had the technological capability to develop them for about a decade but apparently have chosen not to do so.

— One-on-one interceptor attacks probably would not appear to be an attractive option; the number of potential targets would require dedication of a sizable amount of resources to this mission.

— For some target satellite locations, the required interceptor flight times would be long enough for countermeasures to be implemented.

— For some logical targets, such as US early warning satellites or strategic communications satellites, an interceptor attack, if conducted before a ballistic missile attack on the United States, would provide a warning of Soviet intentions; if initiated simultaneously with a general attack, the targeted satellites probably would have time to fulfill their primary missions.

If, however, the Soviets judge it useful to demonstrate a capability to counter potential future US defensive deployments in space, they might conduct a high-altitude direct-ascent interceptor test. Given the relatively high probability of success in the near term, tests of an interceptor against a target satellite would demonstrate the potential vulnerability of high-altitude space-based assets. [redacted]

Electronic Warfare

22. We believe that the USSR now has the technological capability of using active electronic warfare (EW) to attempt to interfere with US space systems. Also, we believe that the Soviets intend to use active EW against both satellite and ground-based elements of space systems. Against high-altitude satellites, this currently may be their only ASAT capability. Compared with other ASAT techniques, an active ASAT EW program would have relatively low cost and would carry a relatively low risk of escalating a conflict. Further, such a role is consistent with ambitious EW programs existing throughout the Soviet military forces. [redacted]

23. We consider EW to be the most likely type of initial Soviet ASAT activity. The Soviets' concept of electronic warfare is quite broad and involves the integrated use of firepower, jamming, and deception to achieve particular military objectives. According to the Soviets, radioelectronic combat (REC) consists of exploitation, disruption, and destruction of the enemy's electronic means, active and passive electronic countermeasures (ECM), electronic protection (ECCM), and all countermeasures against the enemy's technical reconnaissance means. However, we have no evidence of Soviet equipment or organizations with an ASAT EW mission. [redacted]

[11] *The holder of this view is the Director, Bureau of Intelligence and Research, Department of State.* (U)

[redacted]

24. An alternative view contends that there is insufficient evidence at this time to support the judgment of Soviet intent to use active EW against satellites [redacted] Moreover, the holder of this view concludes that, if a Soviet active EW capability against satellites does exist, brute force jamming would be the most likely EW technique. On the basis of available evidence, it is difficult to judge with any confidence that a Soviet technological capability would include more complex forms of jamming.[14] [redacted]

25. An integral part of the Soviet concept of electronic warfare is the need to obtain technical and operational information on enemy systems before an actual conflict. Such reconnaissance of US space systems can be accomplished in peacetime through the use of open literature, human resources, and technical operations against some specific systems. The Soviets have gained considerable knowledge through their exploitation of the numerous technical articles and books written over the last several years [redacted] During peacetime there is no real incentive for the Soviets to interfere with US space systems on a broad scale. However, the Soviets could gain valuable knowledge of the technical characteristics and mission of specific systems by conducting limited probing operations [redacted]

[14] *The holder of this view is the Director, National Security Agency.* (U)

26. [redacted] it is probable that the Soviets have in fact attempted to probe some systems. [redacted]