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The Soviet Space Program

National Intelligence Estimate
Volume II—The Estimate

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NIE 11-1-83

THE SOVIET SPACE PROGRAM

VOLUME II—THE ESTIMATE

Information available as of 19 July 1983 was used in the preparation of this Estimate.

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THE NATIONAL FOREIGN INTELLIGENCE BOARD CONCURS, EXCEPT AS NOTED IN THE TEXT.

The following intelligence organizations participated in the preparation of the Estimate:

The Central Intelligence Agency, the Defense Intelligence Agency, the National Security Agency, and the intelligence organization of the Department of State.

Also Participating:

The Assistant Chief of Staff for Intelligence, Department of the Army

The Director of Naval Intelligence, Department of the Navy

The Assistant Chief of Staff, Intelligence, Department of the Air Force

The Director of Intelligence, Headquarters, Marine Corps

CONTENTS

SCOPE NOTE

This Estimate describes current Soviet space capabilities, identifies elements of the space program in various stages of development, and estimates how these will affect future Soviet capabilities in space through the 1980s and into the 1990s in the absence of space-related arms control agreements. Volume I presents the Key Judgments and a summary of how expected Soviet space developments will affect political, military, and economic competition as well as Soviet prestige. Volume II provides a more detailed discussion of the missions and capabilities of the Soviet space program. CIA Statute

For purposes of this Estimate, we have judged the likelihood of various Soviet space developments as ranging from very low to very high. These judgments, stated in terms of probability of occurrence, would be:

Very low = less than 10 percent

Low = 10 to 40 percent

Moderate = 40 to 60 percent

High = 60 to 90 percent

Very high = more than 90 percent. (U)

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CHAPTER I

SOVIET VIEWS OF SPACE

1. Despite their large and comprehensive space program, we believe that Soviet leaders perceive that overall US leadership in space could continue. Thus, the Soviet space program is viewed by the leadership as an important part of the overall competition with the United States. The space program is viewed by the Soviet leadership as an instrument of policy, the essential goals of which remain the same both in peace and war. Soviet foreign policy goals include the expansion of Soviet influence, the eclipsing of the United States as a superpower, and, as First Deputy Premier Andrei Gromyko recently pointed out, the control of the direction of international relations. Domestic policy goals include the maintenance and improvement of centralized political control over the state as well as the economic and scientific growth of the Soviet Union. The space program contributes directly to each of these goals. It is, therefore, viewed by the Soviets as contributing significantly to the correlation of forces, which include, but are not limited to, military, diplomatic, economic, scientific, and prestige factors. The use of space for these objectives is important, but it is also difficult and costly. Accordingly, the Soviets have adopted a design philosophy that reduces the risks and costs of operating in the space environment CIA

Military Factors

2. The military factor is viewed as the most important element in the correlation of forces and the Soviet space program is predominantly military in nature. More than 70 percent of Soviet space missions are for military purposes only, with another 20 percent serving a dual military-civil function. Soviet interest in the military aspects of space is as old as space flight itself. Throughout the late 1950s and early 1960s Soviet writings discussed an interest in and requirements for space defense. The organization responsible for antiballistic missile (ABM)/space defense (PRO/PKO) was established in the mid-1960s. It was subordinate to the then existing Soviet air defense forces (PVO Strany) with one of its responsibilities defined as the destruction of enemy military space systems. This ABM/space defense organization became subordinate to Soviet air defense forces (Voyska PVO) when the reorganization of Soviet air and air defense forces took place in 1980. CIA Statute

3. There is very little direct knowledge of Soviet military policy for the use of space. Such a policy almost certainly exists, however, and we believe its general outlines can be extrapolated from Soviet military writings and teachings as well as current trends in the Soviet space program. CIA Statute

4. Soviet military thinkers do not consider space to be a demilitarized zone with an international status analogous to that of Antarctica. From the Soviet military perspective, space is viewed as an extension of theaters of operations rather than as a separate arena of conflict. They have claimed that war cannot be waged exclusively in space, and any major conflict on Earth cannot be conducted without involving space systems. One of their most authoritative writers, Marshal Sokolovskiy, has noted that "the concept of a theater of military operations may include the entire territory of a belligerent or coalition, whole continents, large bodies of water, and extensive regions of the atmosphere, including space." Soviet military precepts, such as the importance of surprise, the necessity of confusing the enemy, and the use of overwhelming force to secure military objectives, are also likely to apply to Soviet military operations in space during a war CIA

5. The Soviets view space systems as an integral part of their overall offensive and defensive force. Classified Soviet military teachings require that in conflict the combat readiness of military assets in space be comparable with that of those forces it is called on to support. Soviet writers also acknowledge the need for a "correct relationship between active equipment in orbit and standby equipment on the

ground." This includes the maintenance of sufficient reserve equipment, both in orbit and on the ground, presumably to augment or replace space-related equipment. Thus, with regard to readiness, support, and reserves, the Soviets view their assets in space the same as the rest of their armed forces. CIA

6. Short of direct US-Soviet conflict, it seems unlikely the Soviet leadership would risk physical destruction of US satellites, whereas they could perceive nondestructive interference as a somewhat less risky option. We do not believe that any antisatellite (ASAT) activities would be undertaken merely for warning or demonstration purposes. We believe there is a high likelihood that, during a NATO-Warsaw Pact conventional conflict, the Soviets would attempt to interfere with selected US space systems that provide important support, using both nondestructive and destructive means. In such a conflict Soviet leaders may perceive an operational advantage if both sides experience significant satellite losses because of greater US dependence on space systems, particularly photoreconnaissance assets that have a direct bearing on the tactical situation. In addition, Soviet satellites can be more quickly replaced if space-launch facilities remain intact. The decision to launch ASAT interceptors against satellites during the early part of a conventional NATO-Warsaw Pact conflict would be affected by Soviet uncertainties with regard to US responses, including the likelihood of attacks against existing Soviet space-launch sites. If a general war were under way in which the massive use of nuclear weapons appeared imminent, the likelihood of attempted interference with all US space systems is very high, using all available means. CIA

7. Soviet writings are useful guides to Soviet procedures, intentions, and requirements. But they are not adequate in themselves to understand the Soviet space threat, which depends on capabilities as well as intentions. For example, current Soviet ASAT capabilities are limited and fall short of meeting the apparent requirement to be able to deny enemy use of space in time of war. The Soviets are devoting substantial resources to the development of high-energy lasers with potential ASAT advantages over the current interceptor. These advantages include faster response times and a multishot capability, thus contributing to the requirement for speed and surprise. CIA

Diplomatic Factors

8. The Soviet's view of space in the framework of international diplomacy is in large measure determined by their adversary relationship with the United States. Soviet perceptions of an overall US lead in space heighten the competition. The Soviets have gone to great lengths to characterize their space program as "peaceful and scientific," in contrast to that of the United States, which they have termed aggressive and militaristic. The key elements of Moscow's "peace offensive" in space are two arms control proposals: a multilateral treaty to ban all weapons from space and a call for the resumption of bilateral ASAT talks with the United States. The ban on space weapons would include limitations on the US shuttle and new US ASAT developments such as the programed air-launched miniature vehicle (ALMV). Ultimately, the objective of Soviet diplomatic initiatives and propaganda, related to space, is to slow down or halt US space programs. Even if the Soviets are unsuccessful in this objective, they derive political benefits from arguing that they are peacemakers whose efforts are blocked by US intransigence. Soviet diplomatic initiatives also serve to isolate the United States in international political forums. CIA Statute

9. Soviet officials acknowledge the right of free passage through space. However, they claim certain space activities are illegal and reserve the right to take appropriate actions. Illegal activities, in their assertions, include space-based intelligence gathering that is for other than treaty verification as well as direct-broadcast satellites that could interfere with their control of the flow of information to their populace. In their presentation to the UN General Assembly in 1972 of a proposed convention dealing with direct-broadcast satellites they expressed the view that a state has the right to use any means to counteract such activities not only within its own territory but also in outer space. (U)

10. Soviet leaders have consistently shown a preoccupation with potential US space threats. They argue that the United States is preparing for space war. They cite as evidence substantial increases in US spending for military space programs, the establishment of a new US Air Force Space Command, a Presidential Directive on national space policy that they claim directs the Pentagon to prepare for the

conduct of military operations in space, the substantial US investment in laser weapons research, the development of the ALMV, and the military potential of the US space shuttle. Their concern over US intentions and technological capabilities, an awareness of the limitations of their own space systems, and a desire to limit their costs have been the basis for persistent Soviet efforts to negotiate mutual restraints on space activities, particularly when equal restraints tend to give them a disproportionate advantage. For example, in bilateral discussions on ASAT limits in the late 1970s, the Soviets expressed interest in a ban on new ASAT developments, but were reluctant to discuss existing systems. They were willing to forgo new developments of their own in exchange for curtailment of the US ALMV. This would have left them with the only operational ASAT. CIA

Economic Factors

11. The Soviet leadership views the space program as already providing substantial benefits to the Soviet economy with the potential to provide other benefits. The most important economic benefit is the acquisition of agricultural and geological information for the Soviet Union. Obtaining economic intelligence on harvest prospects and resource developments in other countries may provide the USSR with some advance knowledge of international market trends. 25X1

25X1

25X1 CIA

12. The space program is also viewed as aiding in the development and control of vast regions in the Soviet Union. For example, communications satellites have permitted remote areas to be interconnected without the expense of laying cables through difficult terrain. Telephone and television service has been expanded to cover most of the country. These developments have thus facilitated centralized control by the political leadership in Moscow. CIA Statute

13. The Soviet Union has marketed telecommunications and space launch services to other countries on a limited scale, and we expect them to become a competitor in these fields. The provision of such services on a larger scale could provide a source of hard currency and would also provide a measure of influence and leverage over purchasing states. CIA

14. Another possible economic benefit could be realized from manufacturing and materials processing in the gravity-free environment of space. Experiments by the Soviets with the manufacture of materials for semiconductors, superconductors, and special alloys on their Salyut space stations already are well advanced. Where feasible, a variety of items may be manufactured in space and returned to Earth on a regular basis once the Soviet space shuttle and space base become operational. The Soviets have publicly declared that they will have one module of their space station dedicated to manufacturing research. CIA Statute

15. The Soviets have expressed interest over the longer term in space-based solar power stations. Apart from the potential advantages of providing energy to aid in the development of the Soviet Union's more remote and isolated areas, the long-term attractions of such stations may include the leverage and influence that might accrue to the Soviet Union from the sales of such energy or equipment to other countries. CIA

Scientific Factors

16. In line with a long tradition of research in basic sciences, Soviet scientists have conducted some pure research in space. We expect they will continue to support the study of basic geophysical, solar, and astronomical sciences. However, scientific research over the past few years has increasingly concentrated on applied tasks that directly support the military services and the national economy. We expect this policy will continue at least through the period of this Estimate. CIA Statute

Prestige Factors

17. One of the greatest perceived benefits to the Soviet Union from its space program is the contribution to its status as a superpower. The Soviets have compiled and publicized an impressive array of space records, including the first satellite, the first man to orbit the Earth, the first automatic resupply spacecraft, the first spacecraft refueling, the first woman in space, and the largest total man-days in space. They

have also gained substantial international recognition from such projects as unmanned expeditions to Venus; the hosting of cosmonauts from Third World countries (as well as France) on their Salyut space stations; and their COSPAS satellite, which, in a joint program with the United States, France, and Canada, has located emergency signals from ships and aircraft in distress. (U)

18. The Soviet space program is viewed by the leadership as an important part of the overall competition with the United States. If the Soviet Union were to establish itself as the unquestioned leader in the exploration and uses of space, it would significantly enhance its status and influence as a superpower, which currently is almost wholly dependent on its military capabilities. The Soviets desire such a position of leadership and are working toward this goal. One of the motivations of the expensive Soviet manned space program, which includes the nationally declared goal of a large and permanently manned space station, is to regain recognition as a leader in space that they lost with the successful US Moon landings and shuttle flights. CIA Statute

19. The Soviets have expressed interest in other projects that would substantially enhance their prestige if successfully put into effect. These include a manned mission to Mars or the possible establishment of a lunar base by the late 1990s. CIA

20. Domestically, the leadership perceives the space program as a source of national pride for the Soviet people and a source of legitimacy for its own political regime. Soviet achievements in space are heavily publicized and are always identified with the Communist Party, which is depicted as the guiding force behind all such achievements. Cosmonauts, who invariably are members of the party, are idealized and turned into heroes not as individuals but as representatives of the party and the Soviet people. Yuri Gagarin, the first man to orbit the Earth, is perhaps the best example of this kind of apotheosis. CIA Statute

Design Philosophy

21. Soviet procurement and design philosophy is not directly related to any policy goals but is essential to an understanding of the Soviet space program as a whole. Technically, space is a difficult environment in which operations are costly and hazardous. To minimize risks, the Soviets have adopted a relatively cautious design and engineering philosophy in the procurement of their space systems. Wherever possible, they innovate through modification rather than force the state of the art with high-risk, novel designs. They also tend to use systems that offer substantial flexibility and cost savings. This is most evident in the manned space station project but is also apparent in others. Early photoreconnaissance satellites, for example, were modified manned vehicles. CIA

22. To diminish the chances of malfunction, Soviet satellite types, with two exceptions, are designed for one mission only and are built as simply and as ruggedly as possible. Another method possibly adopted by the Soviets that would ensure against the consequences of malfunction or loss is to maintain some inactive satellites in on-orbit storage. CIA

23. The Soviets also tend to augment space systems without retiring old ones so that they are, in effect, steadily increasing their backup capabilities. For instance, the advent of high-altitude communications satellites (comsats) has not led to the abandonment of older communications systems; even expensive landlines continue to be maintained and improved. CIA

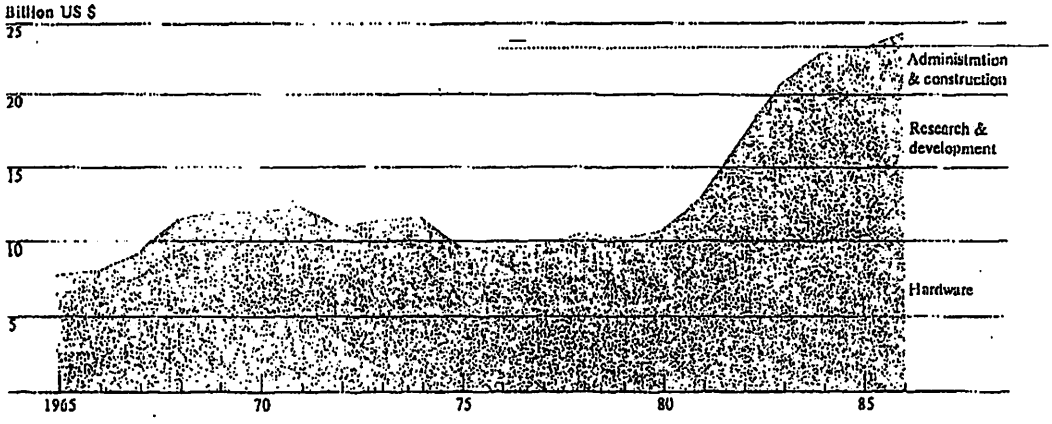
24. The cost of space vehicles is high, but the Soviets have realized substantial savings by applying concepts and technology developed elsewhere. They have, for example, used the US Dyna Soar program and shuttle orbiter as models for their own space plane and shuttle. Partly by choice and partly by necessity, the Soviets have realized some savings from economies of scale in the production of their space equipment. Their high launch rates and relatively short vehicle lifetimes have elicited regular production lines of both launch vehicles and spacecraft. As a byproduct, space launches are much more routine in the Soviet Union than they are in the United States. CIA Statute

CHAPTER II

THE SOVIET EFFORT IN SPACE

1. By all measures, the Soviet level of effort devoted to space in the 1980s is increasing significantly over the activities noted in the 1970s. (See figure II-1.) The continued allocation of substantial resources indicates that the space program enjoys considerable support among the Soviet leaders. There is no indication that the space program will receive any less emphasis under Andropov's leadership. The dollar cost equivalent of the Soviet space program in 1983 is estimated at about $20 billion, as compared with about $13 billion for US Government space expenditures plus several billion dollars in additional US commercial investments in space. The European Space Agency (ESA), France, and Japan have developed modest space programs, but they are not competitive on a scale with the USSR; each program amounts to less than $1 billion annually. The Soviet investment is reflected in part in the wide range of new systems that we have identified in development, which stands in contrast to the 1970s, when most of the new spacecraft were updated modifications of previous systems. Seventeen new Soviet space systems that have been

Figure II-1
Dollar Costs of the Soviet Space Program[a]



[a] These dollar estimates represent what it would cost to replicate Soviet development and procurement of space systems in the United States and then launch and operate the systems as the Soviets would. We have more confidence in our estimates of hardware cost than our estimates for research, development, administration, and other support costs. Data are in constant 1981 US dollars. Because our cost estimates cover only those existing or planned programs for which we have evidence, they may underestimate overall program costs.

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identified in various stages of development are likely to undergo testing in the next 10 years. (See figure II-2.) Estimated total Soviet space costs have doubled from $10 billion in 1978 to the projected $20 billion in 1983 for an average annual increase of 15 percent. After 1983, growth in space expenditures is expected to be less rapid, perhaps averaging about 6 percent a year through 1986. CIA Statute

2. Steady growth also is reflected in the design bureaus, production facilities, launch complexes, control sites, space support ships, cosmonaut training facilities, and other elements of the space support infrastructure. (See table II-1.) Altogether, the growth rate for the Soviet space program will exceed the growth rate of Soviet military spending in the 1980s. We believe that the military space components will account for an increasing share of Soviet military-related expenditures. (See figure II-3.) CIA

3. Within the Soviet space program, manned space missions and communications systems account for most of the growth in expenditures. By 1986 manned space activities, which are heavily military oriented, will account for about one-fourth of Soviet space expenditures. In part, this reflects the publicly stated Soviet objective of establishing a continuously manned space station. Soviet space officials also acknowledge that

Figure II-2
Major New Soviet Space Systems in Development

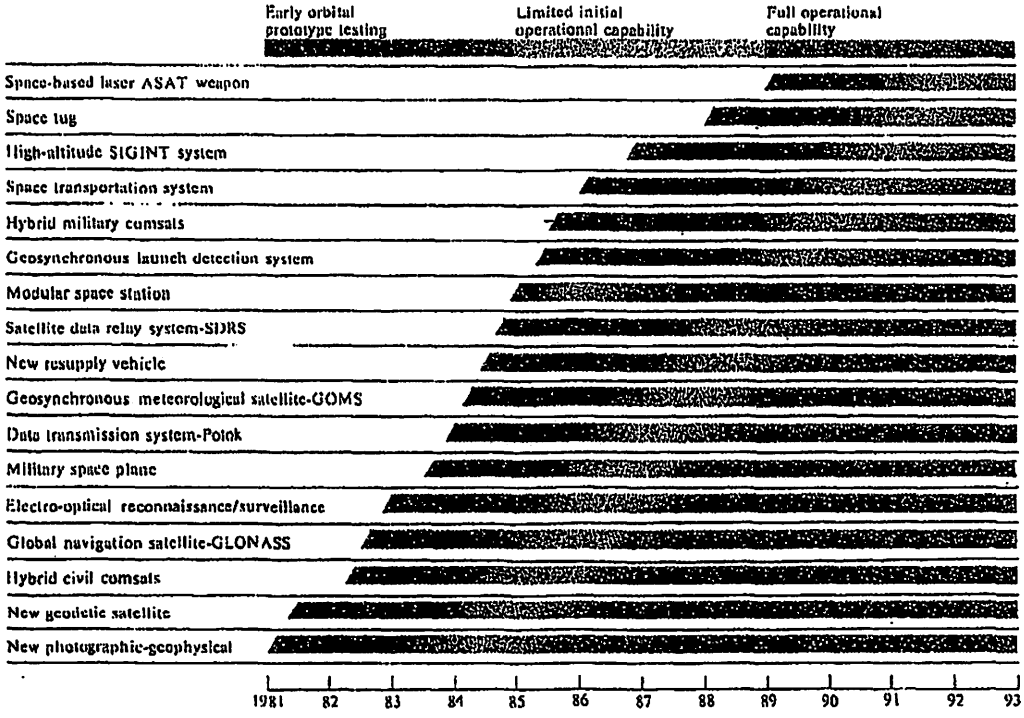

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Table II-1
Growth of Infrastructure of Soviet Space Program

	1975	1980	1985
Design bureaus, plants, and institutes *(million square meters of floorspace)*	1,730	2,080	2,390
Space control sites	23	25	27
Space control ships	10	11 [a]	14
Launch site pads	16	17	23
Tyuratam	6	8	12
Plesetsk	6	7	9
Kapustin Yar	4	2	2

[a] Three older ships were retired and four new ships added in the 1976-77 period.

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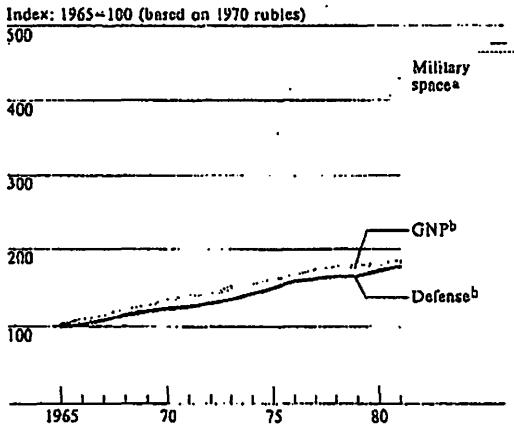
Figure II-3
Relative Rates of Growth: Soviet GNP, Military Spending, and Military Space Hardware



[a] This category only includes ruble costs for space that we identify exclusively as military hardware. If civilian space procurement was included, the relative growth rate for space hardware would be lower than shown here.

[b] Soviet GNP was approximately 300 million rubles (1970 prices) in 1965. About 13 to 14 percent of that was devoted to defense; in turn, 1 to 2 percent of defense was allocated to military space hardware in 1965. By 1981 the share going to military space hardware had risen to 3 to 4 percent of defense spending.

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manned space vehicles are more expensive and involve higher risks than unmanned spacecraft, but they are willing to pay the premium to have cosmonauts in space directly involved in the development of new space systems. CIA Statute

4. Soviet communications satellites are increasing in numbers and sophistication. New comsat and data relay systems are being introduced and by 1986 will account for about 20 percent of Soviet space expenditures. CIA Statute

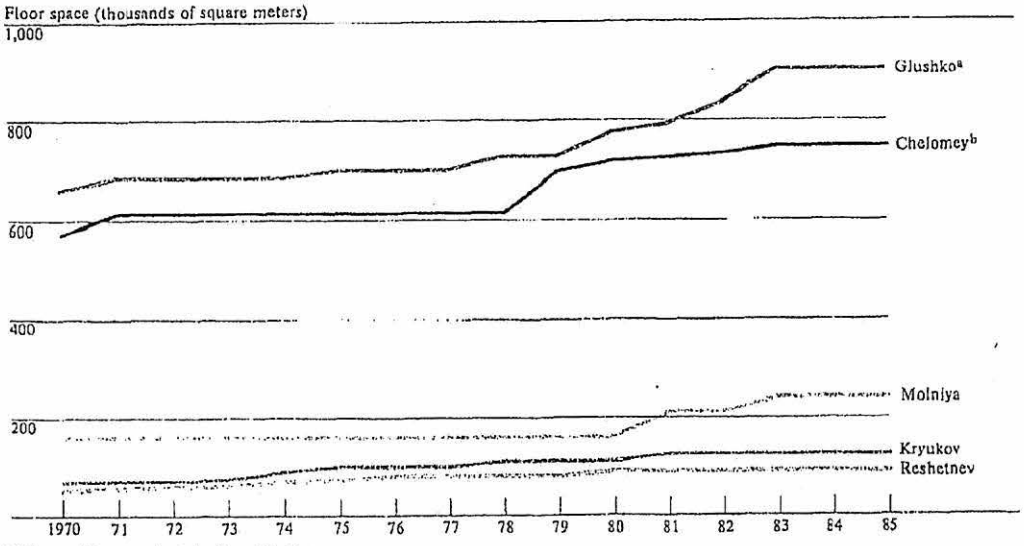
Design Bureaus

5. The Soviet space program benefits from a society that is geared toward marshaling its economic resources toward the achievement of a limited number of high-priority objectives. The personal attention of the Soviet leadership to the space effort imparts stability to the organization, funding, and staffing of developmental activities. Soviet space systems are developed within the context of a leadership commitment that is supported by a long-range planning process and a management style that places a premium on both schedule adherence and incremental follow-on improvements. As a result, the space design bureaus are continually working on new and modernized systems in different stages of development. At any one time, about 50 missiles and space systems are under development. These projects are assigned to a design bureau as soon as the basic and applied research and feasibility tests are completed. Competition is seldom involved, and most of the developmental missile and space systems eventually are produced. This process, instituted about 1960, tends to simplify early stages of development, but it probably inhibits the introduction of new technologies and may raise overall costs. CIA

6. The development and production of Soviet space systems is carried out at six main design bureaus, several of which have undergone significant expansion since the early 1970s. (See figure II-4.) On the basis of the capacities and identified developmental programs that we can associate with each design bureau, Chelomey,[1] the second largest of the design bureaus, appears

[1] For the purposes of this Estimate, design bureaus are referred to by the name of their director, except for the scientific production organization Molniya whose director is not known. CIA

Figure II-4
Growth of Major Soviet Space Design and Production Facilities[c]



[a] The total floorspace includes Plant 1 in Kuybyshev.
[b] Total floorspace includes design bureau and production facilities in Reutovo and Fili.
[c] Utkin not included since its main involvement is with missile production.

to have excess capacity and probably has some projects that we have not as yet identified. (See table II-2.) CIA

CIA

Space Launch Vehicles

7. The Soviet space program, like the US space program, initially relied on modified ballistic missiles to launch satellites. (See figure II-5.) Six of the eight current space launch vehicles (SLVs) are derivatives of IRBM (intermediate-range ballistic missile) or ICBM (intercontinental ballistic missile) boosters. However, the increased production of the Proton (SL-12/13), the development of a new medium-lift SLV and the introduction of a heavy-lift SLV will very likely result in decreased production of the SS-6-based SLVs (SL-3, -4, and -6) and possibly other smaller SLVs. (See figure II-6.) The medium-lift SL-X-16 will probably be a two-stage vehicle having a lift capability between that of the SL-4 and SL-12/13. Therefore, it should be suitable for launching the space plane; new, heavier photoreconnaissance and radar reconnaissance satellites; and possibly space station modules. If a third-stage booster is added, it also could launch communications, meteorological, and navigation satellites into geosynchronous or semisynchronous orbits. The first stage of the medium-lift vehicle will use conventional liquid propellants, while the upper stage or stages will use liquid oxygen and liquid hydrogen. The SL-X-16 should be ready for flight-testing in 1983 and should reach operational status by 1984. CIA

8. A heavy-lift launch vehicle (HLLV) is a critical component in several Soviet space systems. We expect the HLLV to be tested in 1986, but any serious delays in this program would adversely affect several other space systems. The HLLV is in the Saturn V class, and has been under development since about 1974. The

Table II-2
Soviet Design Bureaus for Major Space Systems [a]

Current Space Systems	Future Space Systems	Current Space Systems	Future Space Systems
Chelomey Design Bureau		**Reshetnev Design Bureau**	
ASAT orbital interceptor	Improved radar-reconnaissance and targeting satellite	MPCS communications satellite	High-altitude SIGINT satellite
Target vehicle	New resupply vehicle	SPCS communications satellite	Potok data relay satellite
ELINT ocean reconnaissance satellite	Large space station	Molniya communications satellite	Satellite data relay system
Radar ocean reconnaissance satellite	Improved Proton launch vehicle	Gorizont communications satellite	Hybrid military comsat
Salyut military space station		Ekran communications satellite	Hybrid civil comsat
SL-13 Proton launch vehicle		ELINT reconnaissance satellite	GLONASS (navigation) satellite
Glushko Design Bureau		Raduga communications satellite	
Photoreconnaissance satellite	NRT electro-optical reconnaissance and surveillance	Radar support, calibration satellite	
Photogeophysical satellite	Heavy-lift launch vehicle	Naval support satellite	
Earth resources photographic satellite	Space tug	Geodetic satellite	
Salyut space station	Space-based laser ASAT		
Biological satellite	SL-X-16 launch vehicle [b]	**Utkin Design Bureau**	
SL-3, SL-4, and SL-6 launch vehicles		Scientific satellite	Geosynchronous meteorological satellite (GOMS) [b]
SL-12 fourth-stage booster		SL-8 launch vehicle	
		SL-11, SL-14 launch vehicle	
Kryukov Design Bureau		Meteorological satellite	
Lunar, planetary missions	SLBM launch detection satellite	Intercosmos communications satellite	
Prognoz/Intershock	Lunar polar orbiter		
Launch detection satellite	Lunar far side sample return module	**Molniya Design Bureau**	
Astron space telescope	Mars soil sample return module	None	Space shuttle orbiter
	Jupiter probe		Space plane [b]

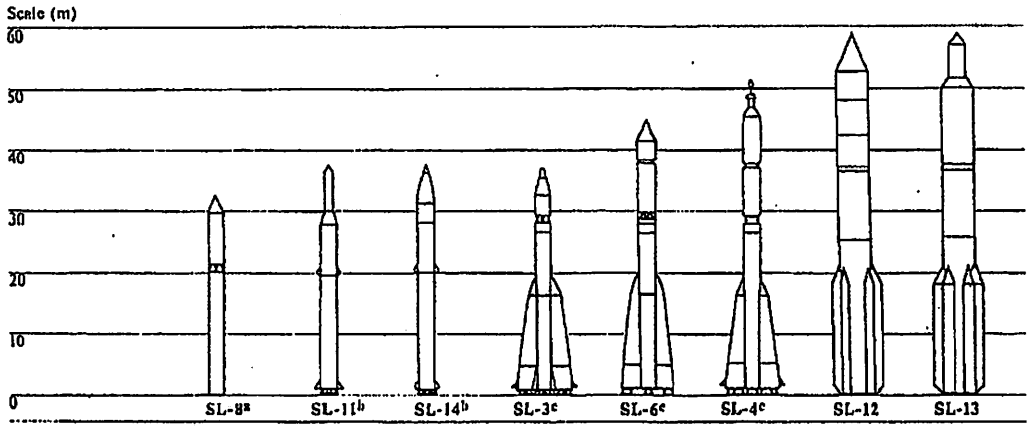
[a] In addition to those programs listed, projects to modify current systems also may be under way.
[b] Association with this design bureau is tenuous.

This table is ~~Secret~~ CIA

configuration of the launch and support facilities and the projected payloads for such a vehicle indicate there will be two or three variants of the new heavy-lift vehicle. One version closely resembles that used for the US space transportation system (STS), except that the main engines are attached to the main propellant tank, not the shuttle. This version provides a flexible heavy-lift launch capability that can be used for a variety of purposes in addition to launching a shuttle orbiter. It also will allow separate testing of the launch vehicle and the orbiter. Even though attached to the main launch vehicle, the engines probably will be recovered, reconditioned, and reused. The main engines are similar to those on the US shuttle and probably have been the pacing item in developing the Soviet STS. 25X1 the Soviets have been testing these liquid hydrogen engines 25X1 Both the SLV and orbiter are projected to have capabilities close to that of the US STS. CIA Statute

9. Additional upper stages and strap-on boosters, probably under development, may be used to develop

Figure II-5
Soviet Space Launch Vehicles, Payloads, and Launch Sites

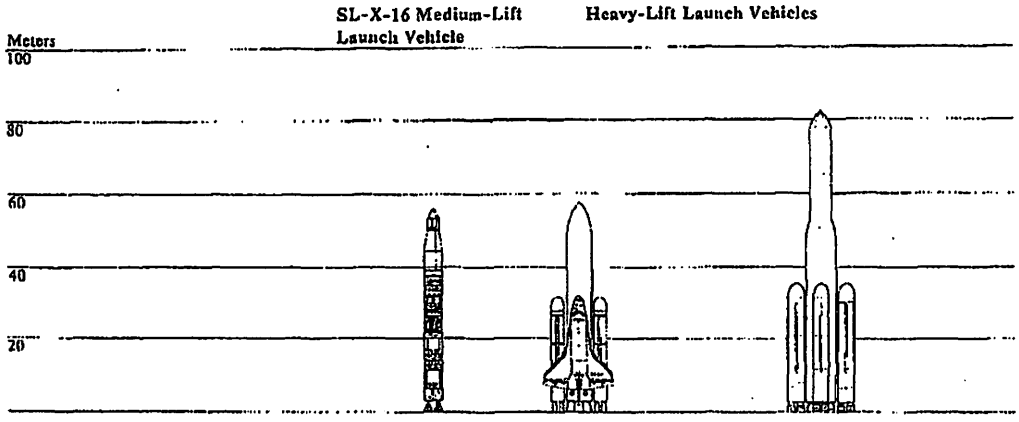


	SL-8[a]	SL-11[b]	SL-14[b]	SL-3[c]	SL-6[c]	SL-4[c]	SL-12	SL-13
Payload weight (kg) to 185-km orbit	1,600	4,000	5,000	5,900	7,000	7,000	18,000	19,000
Payloads	25X1 Naval support Ocean-ic ELINT (3rd gen.) Radar support ASAT target Scientific	ASAT intercept Radar recon. ELINT ocean recon.	ELINT (3rd gen.) Scientific Meteorological	ELINT (3rd gen.) Meteorological	Molniya Prognoz Launch detection	Soyuz Progress Photorecon.	Ekran Gorizont Raduga Vesna Mars Luna Astron	Salyut Cosmos 929-type
Launches in 1982	24	8	4	5	11	45	9	1
Launch sites								
Kapustin Yar 7C[e]	●							
Plesetsk 1[e]				●	●	●		
2				●	●	●		
3				●	●	●		
9[e]	●							
10	●							
27[e]			●					
Tyuratam A-1				●	●	●		
B-1				●	●	●		
G-1A/B		●						
G-3/4							●	●
U-1/2							●	●

[a] Derived from SS-5 IRBM
[b] Derived from SS-9 ICBM
[c] Derived from SS-6 ICBM
25X1
[e] These sites have two launch pads

● Site being refurbished, modified, or newly under construction.
● Active launch site

Figure II-6
New Soviet Space Launch Vehicles



			With 3 strap-ons	With 4 strap-ons
Lift-off weight (kg)	390,000	1,700,000	2,100,000	2,550,000
Lift-off thrust (lbs)	1,000,000	5,600,000	7,800,000	10,000,000
Payload to 185 kilometers (kg)	15,000	75,400*	119,000	148,000

Note: These configurations and characteristics are estimates.
* Shuttle payload 27,300 kg.

a variety of heavy-lift capabilities with a maximum lift-off thrust at least 20 percent greater than the Saturn V. An upper stage with liquid hydrogen and liquid oxygen propellants would enable this version to place approximately 17,000 kilograms (kg) into geosynchronous orbit. This type of vehicle could be used to launch payloads, such as large components of a space base and a space tug to transfer satellites between low and high orbits, and to launch exploratory missions to the Moon or to Mars or the other planets. We expect the first flight tests of the heavy-lift launch vehicle to take place as early as 1986. If these tests prove successful, the entire Soviet STS could be tested in 1986 or 1987. 25X1 the Soviets are probably constructing four shuttle orbiters. CIA CIA

10. The Proton launch vehicle, in both the SL-12 four-stage and SL-13 three-stage versions, will account for an increasing percentage of Soviet space launches. Proton production capacity has tripled, and the number of Proton launchpads has doubled (from two to four) since the late 1970s. The Proton probably will be used to launch most of the new communications satellites and perhaps the modular space station. The use of a single Proton to launch three experimental navigation satellites in 1982 demonstrated a new and highly efficient use of the SL-12. Accordingly, we expect the Proton launch rate to approach 16 launches per year within the next few years. The Soviets have indicated their willingness to launch foreign spacecraft on the Proton. The prices charged may be considerably lower than those of the US STS. For example, a price of $24 million was recently quoted for launching an Inmarsat (International Maritime Satellite Organization) satellite. CIA Statute