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TOP SECRET

NIE 11-8-68
3 October 1968

NATIONAL INTELLIGENCE ESTIMATE

NUMBER 11-8-68

Soviet Strategic Attack Forces

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Submitted by

DIRECTOR OF CENTRAL INTELLIGENCE

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3 October 1968

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THE DIRECTOR OF CENTRAL INTELLIGENCE

WASHINGTON, D. C. 20505

Office of the Director

3 October 1968

MEMORANDUM FOR: Recipients of NIE 11-8-68

SUBJECT : Extreme Sensitivity of NIE 11-8-68, "Soviet Strategic Attack Forces"

1. Dissemination of NIE 11-8-68 must be carefully limited because of the extreme sensitivity of the information therein.

2. In this connection, I wish to stress that there be absolutely no reproduction of this Estimate, and that no revelation of its existence be made to unauthorized persons.

Richard Helms
Director

CONTENTS

SOVIET STRATEGIC ATTACK FORCES

THE PROBLEM

To estimate the strength and capabilities of Soviet strategic attack forces through mid-1970 and to estimate general trends in those forces over the next 10 years.

CONCLUSIONS

A. The primary objectives of Soviet strategic policy have been to achieve a more formidable deterrent and to narrow and eventually to overcome the US lead in capabilities for intercontinental attack. Toward this end the Soviets have built strategic forces, both offensive and defensive, which provide a large assured destruction capability and important damage-limiting capabilities as well. While they have only begun to narrow the gap in submarine-launched ballistic missiles and remain inferior in heavy bombers, the Soviets will shortly overcome the US lead in numbers of ICBM launchers. Current programs will bring further improvements in the USSR's strategic position, already the most favorable of the postwar period. But the Soviets face in the future a strategic situation changed and complicated by projected improvements in US forces—Poseidon, Minuteman III, and the anti-ballistic missile system—that threaten to erode their relative position.

B. In deciding upon the future size and composition of their strategic forces the Soviets are almost certainly exploring a number of alternatives. They are evidently interested in strategic arms control as an option that could conserve economic resources and protect their improved strategic position. In the absence of an arms control agreement, we believe that they will continue the arms competition with the US, seeking to maintain and if possible improve their relative strategic position. In any case, they will probably give increased attention to

qualitative improvements, particularly those designed to enhance survivability and capacity to penetrate defenses.

C. *Intercontinental Ballistic Missiles (ICBMs).* The great improvement in the USSR's strategic position results primarily from the rapid and extensive ICBM deployment of the past few years. The Soviet ICBM force now has about 900 operational launchers and our evidence on construction activity indicates that it will surpass the US force in numbers by 1970. The Soviets have begun deployment of a small solid-propellant ICBM, they probably are developing a new large liquid-propellant system, and they probably will develop a mobile ICBM system. In addition, they are flight-testing multiple reentry vehicles (MRVs).

D. We believe that for the period of this estimate the Soviet force goal will lie somewhere between 1,100 and 1,500 ICBM launchers.[1] If it lies near the low side, the Soviet ICBM force would probably peak at a higher level until older launchers were phased out. Such a force would probably embody considerable qualitative improvements including better accuracy, more sophisticated reentry vehicles such as MRVs and multiple independently-targeted reentry vehicles (MIRVs), and possibly penetration aids. A force toward the higher side of our estimate would also include qualitative improvements, and it would rely in part upon larger numbers to attain improved capabilities.

E. *Space Weapons.* At the time of our last estimate the Soviets were conducting extensive flight tests which we believed related to development of a fractional orbit bombardment system (FOBS). Developments since that time have lowered our confidence that we understand the intended purpose of the system under test; the Soviets may be trying to develop a FOBS, a depressed trajectory intercontinental ballistic missile, or perhaps a dual system which could perform both missions. Until our evidence is more conclusive, we are unable to make a confident estimate as to the type of system being developed, when it could reach initial operational capability (IOC), or how it may be deployed. We continue to believe it unlikely that the Soviets will develop a multiple orbit bombardment system.

[1] For the position of Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, and Maj. Gen. Wesley C. Franklin, for the Assistant Chief of Staff, Intelligence, Department of the Army, see their footnote to paragraph 33.

F. *Medium-Range Ballistic Missile/Intermediate-Range Ballistic Missile (MRBM/IRBM).* There has been little change in the size of the MRBM/IRBM force, which still stands at about 700 launchers. We estimate that new MRBMs and IRBMs will supersede present systems within the next 10 years. The Soviets will continue to maintain massive strategic forces against Eurasia, but the introduction of improved missiles may result in some decrease in numbers. We believe that the Soviets are developing and will deploy, in both a fixed and a mobile configuration, a new solid-propellant MRBM (designated SS-14) of about 1,500 n.m. range which could reach IOC in a year or two. We estimate that they will also develop a solid-propellant IRBM with a range of about 3,000-3,500 n.m., and that it will reach IOC in 1970-1971. It will probably be deployed in both fixed and mobile launchers and with its extended range will provide more flexible coverage of Eurasian targets.

G. *Submarine-Launched Missiles.* The Soviets have clearly embarked upon a high priority program to improve and expand their ballistic missile submarine force. Six, possibly 7, of the 16-tube Y-class submarines have now come down the ways and there is evidence suggesting that the production of this class will be stepped up soon. We believe that the Soviets are building toward a ballistic missile submarine force that will confront the US with a threat roughly comparable to that which the Polaris force presents the USSR. They could reach that position by the mid-1970's, when they will probably have some 65-80 ballistic missile submarines, of which 35-50 will be Y-class types.

H. *Long-Range Aviation.* Attrition and retirement of older models will gradually reduce the Soviet heavy bomber force. The medium-bomber force will probably also decline as Badgers are phased out, but at a slower rate than we estimated last year. The introduction of a new air-to-surface missile into the Badger force suggests that the Soviets intend to extend the useful life of some of those aircraft for a few more years. We still believe that the Soviets are unlikely to introduce a follow-on heavy bomber; they may introduce a follow-on medium if the Blinder does not satisfy their future requirements.[2]

[2] For the position of Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, see his footnotes to Section VI.

DISCUSSION

I. TRENDS IN POLICY AND DOCTRINE

1. The most important issues of Soviet military policy concern the strategic balance between the US and the USSR. The goals of Soviet strategic weapons programs were set at a time when the US enjoyed such a superiority in intercontinental delivery systems as to put the USSR at a political and psychological disadvantage. The aim of Soviet strategic policy, therefore, has been to achieve a more formidable deterrent and to narrow and eventually to overcome the US lead. Toward this end, the Soviets have built strategic forces, both offensive and defensive, which provide a large assured destruction capability and important damage-limiting capabilities as well, and they have substantially reduced the US lead in numbers of intercontinental delivery vehicles.

2. The great improvement in the USSR's strategic position results from the buildup of Soviet strategic forces begun by Khrushchev several years ago. The new leaders have made some decisions as to the size and composition of their strategic forces, but they have generally followed the strategic policies and programs that they inherited. In the future, however, they face a strategic situation significantly changed from that which led to present Soviet policies. Projected improvements in US strategic forces—Poseidon, Minuteman III, and the antiballistic missile (ABM) system—threaten to erode their relative position. Now the Soviet leaders are confronted with the necessity for new decisions on the future size and composition of their strategic forces. Other military requirements and the growing needs of the general economy are among the factors which the leaders must consider in making these decisions.

3. Under the collective leadership, military expenditures have continued to rise, primarily as the result of the continuing development and large-scale deployment of strategic weapons, which account for about half of the total military expenditures. The requirements of these programs for scarce high-quality resources of the sort needed to sustain economic growth have aggravated the impact of defense spending on the economy. Now, events in the Far East and in Europe have posed new military requirements which probably will result in a substantial increase in the strength of Soviet theater forces. Thus the perennial problem of resource allocation promises to sharpen. Economic considerations almost certainly were among the principal reasons for the Soviet decision to discuss arms control with the US.

4. Nevertheless, the economic considerations contributing to the Soviet decision are probably no more compelling than the strategic considerations. Considering US plans for improvements in its strategic forces, the Soviets probably

recognize that a considerable sustained effort would be necessary to maintain the relative position they have now achieved. They may also be concerned lest the end of the Vietnam War enable the US to divert additional resources to its strategic forces. Finally, they may reason that further increments to their strategic forces would have little effect on the relationship between the US and the USSR so long as the US maintained its large, second-strike assured destruction capability. If these arguments were to prevail in the USSR, the Soviets would probably seek an agreement that preserved their present strategic relationship with the US.

5. It is too early to assess the full implications of the Czech crisis for Soviet policy toward arms control. The Soviets still have the same basic economic and military incentives; indeed, it is possible that the new military requirements generated by the Czech crisis have added to those incentives. Moreover, the present Soviet line seems to be that the Czech crisis is an internal Communist Bloc affair that should have no effect on the USSR's relations with the US. It is possible, therefore, that the Soviets will seek to proceed with arms control talks. At a minimum, however, the Czech crisis has delayed the opening of talks with the US and has dampened the prospects of any real progress toward strategic arms control in the near term.

6. In any case, the Soviet leaders cannot base their strategic planning on the possibility of strategic arms control and will almost certainly explore other alternatives. At a minimum, they might consider a policy of deterrence aimed only at maintaining a large assured destruction capability. Or they might consider a try for strategic superiority of such an order that it could be translated into significant political gain. We consider it highly unlikely that the Soviets will select either of these courses of action. The first, that of unilateral deescalation, would involve a decision to sacrifice the hard-won gains of recent years. The second would involve economic sacrifices that are probably unacceptable to the present leadership and would almost certainly provoke a strong US reaction. We believe, therefore, that in the absence of a strategic arms control agreement, the USSR will continue the arms competition with the US with the object of maintaining and if possible improving its relative strategic position.

7. For several years, the Soviets have given the highest priority to the effort to overcome the US lead in numbers of intercontinental delivery vehicles, particularly in intercontinental ballistic missiles (ICBMs). By 1970, the Soviets will probably surpass the US force in numbers of ICBM launchers but they will remain inferior in submarine-launched ballistic missiles and heavy bombers. To maintain an assured destruction capability in the strategic situation that is emerging, qualitative improvements, particularly those related to sur-

vivability and capacity to penetrate defenses, become more important. There will undoubtedly be pressures for a continuing enlargement of the ICBM force, and it may continue to grow. But having attained rough numerical parity with the US in ICBMs, the Soviets will probably give increased attention to other options designed to enhance the survivability and effectiveness of their strategic attack forces.

II. INTERCONTINENTAL BALLISTIC MISSILES

A. Recent Deployment Activities

8. The growth in the Soviet ICBM force continues at about the same pace as in previous years, but there have been several significant developments within the structure of the force. After a sharp decline in the first half of 1967, construction starts of silos for the SS-9 ICBM increased during the past year to the rate observed earlier in the program, suggesting that deployment of that system will continue at least for a while. The actual construction time required to bring most of the SS-9 groups to operational status, however, now appears to be at least 2-3 months longer than was the case last year, suggesting that there is less pressure to complete the sites rapidly. In the SS-11 program there has been a decrease in the number of construction starts of silos when compared to last year and this program may be approaching its planned level. Deployment of sites for the small, solid-propellant SS-13 began in the summer of 1967 at one ICBM complex, but has proceeded at a very slow rate. The pattern of construction starts of the 22 silos we have detected suggests that this initial activity involves 3, possibly 4, groups of about 10 launchers each.

B. Current Deployment

9. We estimate the present strength of the Soviet ICBM force to be about 900 operational launchers. Of these, some 500 are for the small SS-11 and about 150 are for the large SS-9. Both of these systems are deployed in dispersed, single silos. Older systems, which are deployed in soft sites or triple-silo hard sites, account for the remainder.

10. *Single-Silo Deployment.* In addition to the operational force, about 130 launchers for the SS-11 and about 70 for the SS-9 have been detected in varying stages of construction. We expect that all of those will be completed by mid-1970. Although the SS-13 is still in the flight test phase, 20 of the launchers for that system could be completed by mid-1969.

11. We have some doubts about the future of the SS-13 program.

We believe that construction started in July 1967 and we have detected 22 silos under construction there since that time. This deployment pattern is highly unusual when compared to earlier programs. Deployment of all the presently operational systems was undertaken simultaneously at several complexes and proceeded rapidly, concurrently with their development. It may be that as the Soviet ICBM force approaches parity with the US force there is less urgency in deployment. In these circumstances, the Soviets may have decided upon a modest initial deployment while development was still underway.

12. It is possible, however, that technical reasons have led the Soviets to modify their plans for the SS-13. In terms of our estimate of its performance characteristics it offers little, if any, advantage over the SS-11 in most respects. For this reason, the Soviets may have decided to limit field deployment of the system to just a few sites. Or they may have found that modifications were required to improve the missile's performance, possibly modifications that necessitated changes in the launch facility; they may be waiting until the problem is resolved before proceeding further with deployment in the field. It is also possible that the Soviets intend that future deployment of the SS-13 will be in a mobile configuration rather than in fixed sites; On the other hand, the apparent slow rate of construction starts for the SS-13 may be based upon political considerations. Soviet decisions as to future ICBM deployment and force levels may have been postponed until the possibility of strategic arms control has been explored in talks with the US.

13. The 197 SS-7 and 23 SS-8 second-generation launchers remain operational, but we believe that the 4 first-generation SS-6 launchers have been phased out of the force. We believe that the SS-7 launchers will be retained in the force at least through mid-1970, but that phase-out of the SS-8 launchers will have begun by that time.

C. Force Levels and Composition to Mid-1970

14. Our estimate of the Soviet ICBM force over the next two years is based on observed launchers and launcher construction, the estimated time to bring launch groups to operational status, the filling out of launch groups already started, and the amount of silo construction material observed at ICBM complexes. Our photographic coverage has been such that we are virtually certain that there are no ICBM complexes other than the 25 which we have identified. We allow for the possibility that a few SS-9 and SS-11 silos are under construction, but have not yet been identified.

ESTIMATED OPERATIONAL ICBM LAUNCHERS

	1 September 1968	Mid-1969	Mid-1970
Soft			
SS-7	128	128	128
SS-8	14	14	0–14
Subtotal	142	142	128–142
Hard (Triple Silo)[a]			
SS-7	69	69	69
SS-8	9	9	0–9
Subtotal	78	78	69–78
Hard (Single Silo)[a]			
Large (SS-9)[b]	156	198–222	228–240
Small (SS-11)[b]	520	620–650	680–720
Small (SS-13)	0	0–20	30–50
Subtotal	676	818–892	938–1,010
TOTAL[c]	896	1,038–1,112	1,135–1,230

[a] The silos in the triple silo sites are so close to each other that they represent one aiming point per site. Single silos are located at least 3 miles apart and represent separate aiming points. We believe that all hardened ICBM launchers deployed in the field are designed to remain completely operable when exposed to overpressures on the order of 200-400 psi.

[b] It is possible that the Soviets could fit SS-9 and SS-11 silos for emergency launch at some stage in the fitting out period after they are externally complete. In the case of the SS-11, the launch control facility for the group would have to be complete and operational. Such a procedure would provide a launch capability up to three months earlier than otherwise. We think it unlikely they would do this unless they foresaw a crisis situation in that period.

[c] In addition to the ICBM launchers shown above, each SS-9 and SS-11 complex contains 1 additional silo and control facility [redacted] in the complex. These sites are believed to be crew training facilities. There are now 6 such sites at the SS-9 complexes and 9 at SS-11 complexes with 1 additional SS-11 site expected soon. Additionally, the Soviets have about 45 completed launchers and about 15 others under construction at Tyuratam and Plesetsk which we associate with ICBM development. We believe that most of them, as well as the training silos at the SS-9 and SS-11 complexes, could be readied to fire at the US. We are unable to make any valid estimate of the time required to ready them, their reaction times, or the availability of missiles for them.

D. Operational Capabilities of the Force [3]

15. From the history of Soviet ICBM flight testing, analysis of the current state-of-the-art, and evidence on the joint strategic exercises conducted by the Soviets in July 1967 and June of this year, we now estimate that the overall ICBM force has a somewhat higher reliability rate than we have estimated

[3] See TABLE I for our estimate of characteristics and performance data for Soviet ICBMs.

previously. The one exception is the SS-8 which now appears to be less reliable than we had estimated.

16. Continuing analysis leads us now to estimate that the SS-9 has a circular error probability (CEP) of about 0.5 nautical miles (n.m.) using radio-inertial guidance and about 0.75 with inertial guidance alone. Thus, it is the most accurate ICBM in the Soviet inventory. With this accuracy and its large payload, the SS-9 is suitable for attacking hard targets. The rest of the missiles in the force have CEPs of 1.0 n.m. or greater. The SS-11 with its lesser accuracy, and its lighter payload would probably be used against relatively soft targets.

17. We believe that Soviet soft ICBM launchers have a refire capability and that on the average two missiles are available for each such launcher. We believe that the Soviets do not plan to refire from hard launchers.

18. In assessing the feasibility of developing an initial strike counterforce capability, Soviet planners might consider an attempt to achieve a nuclear pin-down of US missile forces. This tactic might offer advantage as part of a deliberate surprise or preemptive attack on the US. Considering the manifold uncertainties involved in such an attack, however, we believe that the Soviet leaders could have no assurance that the USSR would not receive unacceptable damage in return. Nevertheless, in an effort to optimize their damage-limiting capability under the various circumstances in which a nuclear war might erupt, the Soviets may include this tactic in their planning for the employment of their strategic forces.

E. ICBM Research and Development

New Systems

19. The solid-propellant SS-13 is the only new ICBM that we have identified in flight tests. There have now been 9 firings of the SS-13 to 3,100 n.m. and 3 to 4,700 n.m., and we expect it to be tested to longer ranges before being deployed. The SS-13's reliability during the test program has been somewhat low, possibly because of Soviet inexperience with solid-propellant technology, but we believe that the system will be about 65 percent reliable by the time it is deployed. We estimate that the SS-13 will be capable of carrying a reentry vehicle (RV) weighing about to about 5,500 n.m. when it is ready to become operational; it will probably achieve initial operational capability (IOC) in fixed sites about mid-1969 or shortly thereafter. The IOC of the SS-13 in a mobile mode probably will come somewhat later.

20. There is evidence that the Soviets have a mobile strategic missile launcher under development We have detected a transporter-erector-launcher (TEL)

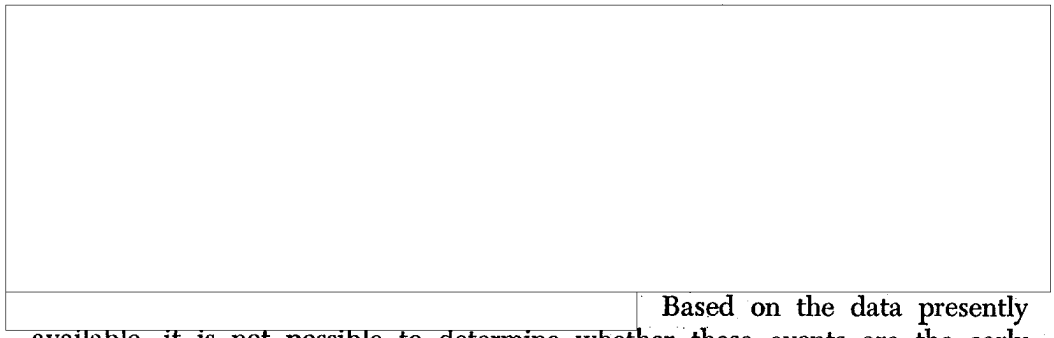
The TEL is like, if not identical to, the Scrooge TEL which the Soviets first displayed in 1965 and which they claimed contained a small size, solid-propellant, self-contained ICBM. Our analysis of the TEL indicates that it is too small for the Savage which we believe to be the prototype for the SS-13. It could contain a full range ICBM, however, and this may, in fact, be the case. We believe it more likely that the missile will be two of the three stages of the SS-13 in which case it would have a range of about 3,000-3,500 n.m. A missile of this range would fit the Soviet definition of an ICBM: i.e., a missile with a range of over 5,000 km (2,750 n.m.). It would be at the upper range limit of our definition of an intermediate range ballistic missile (IRBM) and at the lower limit of our ICBM definition. However, a missile with a range on the order of 3,000 n.m. would have to be deployed above the Arctic Circle in the Soviet northeast if it were to provide any significant coverage of US targets. The logistic and operating problems posed by such deployment would be formidable. We think it is highly unlikely that the Soviets would develop a system for attack on the US which would pose so many problems and such great expense. We consider, therefore, that the chances are better than even that the missile under development is an extended range IRBM for use against Eurasian targets; this subject is addressed in the later section dealing with Soviet medium and intermediate range ballistic missile (MRBM/IRBM) forces.

21. If this missile system is, in fact, an extended range IRBM, it would indicate that all three stages of the SS-13 will be undergoing test in mobile systems since we have good evidence that the mobile SS-14 uses two stages of the SS-13. Assuming these test programs are successful, the development of a mobile version of the SS-13 ICBM would require little more than adaptation to a suitable TEL and we estimate that such development will occur.

22.

The type and status of some construction indicates that the Soviets are developing a large, liquid-propellant ICBM which we believe could be ready for deployment in the 1970-1972 period. It will probably have greater accuracy and possibly a larger payload than the SS-9, and may be the best candidate for carrying a new sophisticated reentry system. It will probably be deployed in hard silos, and may be suitable for retrofit into SS-9 silos.

23. Another R&D program which may relate to a new weapon system is underway at the Plesetsk Missile and Space Center. The limited amount of data gained does not allow us to understand clearly what type of system is undergoing test.



Based on the data presently available, it is not possible to determine whether these events are the early tests of a space weapon system or a ballistic missile system.

Future ICBM Development

24. In addition to the ICBM systems now under development, the Soviets may undertake development of other advanced ICBM systems. They will probably seek to improve the quality of their existing force by modification of the SS-11, and they may replace it with a new, small, liquid-propellant ICBM system. They may also develop a small solid-propellant system as a follow-on to the SS-13, particularly if that system fails to measure up to their expectations; this system may be developed for mobile deployment.

Reentry Vehicles

25. Soviet ICBM tests observed during the past year continue to show RVs with low ballistic coefficients and large radar cross sections. There is no evidence to show that the Soviets are trying to develop RVs with higher ballistic coefficients, which are more accurate and less vulnerable to detection and interception. On the other hand, the current Soviet RVs lend themselves to simpler design and packaging of nuclear weapons and may be more adaptable to hardening.

26. The Soviets are aware of the potential use of radiation kill mechanisms and the development of RVs hardened to withstand some nuclear effects is almost certainly within their capabilities. With a program of underground nuclear testing, the Soviets could investigate the response of various materials to X-rays at various energy levels in a simulated exoatmospheric environment and conduct development tests of new hardened warheads.

27. The Soviets will almost certainly take steps to reduce the vulnerability of their RVs, especially in light of the US decision to initiate ABM deployment. We believe that they could have exoatmospheric penetration aids (for use above 300,000 feet) a year or so after initiation of flight testing. A terminal decoy program, effective down to very low altitudes, including a suitable RV, would probably require two to three years of flight testing. We believe that the Soviets would test penetration aids to ICBM ranges and we would probably detect flight testing a year or two before IOC.

28. We now have evidence indicating that the Soviets are working toward some form of advanced reentry system. On 23 August and 11 September, ICBMs launched from Tyuratam into the Kamchatka Peninsula three objects reentering the atmosphere at the end of the flight and telemetry indicates that all survived to impact. The system tested consisted of an SS-9 first and second stage with a 12,500 pound class payload consisting of three RVs which impacted at a range of approximately 3,400 n.m. Although these events are indicative of multiple reentry vehicle (MRV) testing, it is too early in the test program to assess the ultimate operational configuration. The evidence, however, is not incompatible with tests leading to a multiple independently-targeted reentry vehicle (MIRV) capability. We do not believe these tests involved penetration aids.

29. We believe that the Soviets could achieve an operational MRV employing three RVs in a modified SS-9 payload by late 1969. This RV system, as now observed, would degrade the overall accuracy and reliability of the SS-9 system; the SS-9 equipped with three warheads may still be effective against a single hard target. If this is a program aimed at MIRV development, we estimate that the Soviets could achieve IOC with a MIRV system suitable for attack against soft targets by 1970. A MIRV system capable of attacking hard targets such as Minuteman silos could probably not reach IOC until 1972.

Accuracy

30. The Soviets still do not have an active flight test program for the type of RV (i.e., one with a high ballistic coefficient) considered essential for very high accuracy without terminal guidance. In spite of their trend toward low-ballistic-coefficient RVs, the Soviets may seek very high accuracies for some future ICBM system. Considering their present state-of-the-art, and the techniques and probable development times required, we believe that, if they elected to do so, the Soviets could have a new ICBM system with a CEP of 0.5 n.m. if introduced about 1970 and 0.25 n.m. if introduced about 1972. To achieve CEPs on this order the Soviets would have to improve their guidance systems, probably introduce midcourse corrections, and design new RVs for either faster reentry or limited terminal guidance. We believe that we would detect efforts to improve accuracy during the flight test phase.

F. Force Levels and Composition 1971-1978

31. We believe that for the past few years rough numerical parity with the US has been the minimum objective of Soviet ICBM deployment programs. The momentum of current programs will carry the Soviet force past this goal within the next year. As we have noted above, the Soviets now have about

900 ICBM launchers operational and about 200 under construction; we estimate that in mid-1970 the Soviets could have as many as 1,230 operational launchers. We estimate that the 220 older launchers in the force will be phased out during the period of this estimate, but that most of them probably will be kept in service at least through mid-1970.

32. For the 1971-1978 period, the Soviets will have the option of stabilizing their ICBM force at a numerical level about equal to that of the present US force, or of going for a substantially larger number. The force goal they set will depend on their assessment of the force needed to meet their strategic planning requirements, and upon their judgment as to the best means of compensating for programed qualitative improvements in US strategic forces. It will also be influenced by their assessment of the risk of stimulating a large new missile deployment in the US. Moreover, the Soviet decision will be made not in isolation but in the context of Soviet strategic forces as a whole, both offensive and defensive.

33. We estimate, therefore, that for the period of this estimate the Soviet force goal will lie somewhere between 1,100 and 1,500 ICBM launchers.[4] Forces toward either the low or the high side of our estimate would have certain common features. When the phase-out of older systems is completed, they would be composed almost entirely of hard, dispersed single-silos, but they could include some mobile launchers. Launchers for the SS-9 and the SS-11 would make up the bulk of either force, but the higher option would mean the construction of 400-500 new launchers for one or more new ICBM systems, including a large liquid-fueled ICBM, and possibly a new, small system with either solid or liquid propellants. A force toward the low side would probably embody considerable qualitative improvements including better accuracy, more sophisticated RVs such as MRVs and MIRVs, and possibly penetration aids; it could also include a new large, liquid-fueled ICBM. A force toward the high side would also include qualitative improvements, and it would rely in part upon larger numbers to attain improved capabilities.

III. MILITARY APPLICATIONS IN SPACE

34. Throughout the period of this estimate the Soviets will experiment with a variety of space systems which could be used for military purposes. New

[4] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, and Maj. Gen. Wesley C. Franklin, for the Assistant Chief of Staff for Intelligence, Department of the Army, would delete the first sentence and substitute the following:

We believe that for the period of this estimate the Soviet force goal will lie somewhere between 1,200 and 1,500 ICBM launchers providing the USSR operationally deploys a sizable number of ICBMs with MRVs. Otherwise, and particularly in view of the number of targets in the US and the planned US ABM capability, the Soviet Union probably will have considerably more than 1,500 launchers by the late 1970's. A program which added only 100 launchers per year beyond those already identified would exceed 1,800 by 1978.

military space applications will be introduced as Soviet technology advances and as requirements for such systems are developed. The high priority evident in the reconnaissance satellite program will probably be extended to other selected military support systems which Soviet leaders consider essential; these will probably include systems for improved communications, weather observation, and navigation. There has already been a significant increase in the use of applied satellites in recent years; military entities are using the Molniya communication satellites and are almost certainly receiving some benefits from weather and navigation satellites.

35. At the time of our last estimate, the Soviets were conducting an intensive flight test program of a vehicle which we have designated the SS-X-6. In the initial tests, the SS-X-6 was fired into Kamchatka on a flight profile with a low apogee of 120 n.m. suggesting to us at that time the development of a depressed trajectory ICBM. (The normal apogee for this range is about 400-500 n.m.). In two of these tests, the RV was retrofired and did not follow a true ballistic course. Beginning in September 1966, the Soviets began flight testing the system in the fractional orbit bombardment system (FOBS) mode. During the period of most intense test activity, from July through October 1967, there were seven fractional orbit tests of the system, all of which were evaluated as successful. These tests were fired in an easterly direction, giving them the advantage of the earth's rotation to achieve orbital velocities. The SS-X-6 system launched on such a trajectory could be brought down in the US after it had flown several orbits. The accuracy of the system, however, would be greatly degraded from that of a FOBS and we consider it unlikely that the Soviets would use the SS-X-6 in that mode.

36. In order to attack the US on an initial orbit, a vehicle would have to be launched on a northerly or southerly azimuth, depriving it of the advantage of the earth's rotation. We continue to believe that if the SS-X-6 were to be used as a FOBS, it would have to be modified by improving the launch vehicle or reducing the payload weight if it were to achieve the necessary velocity. If the Soviets chose to reduce the weight, the modification would probably be relatively simple. If, on the other hand, they elected to improve the SS-9 launch vehicle, the modification would take somewhat longer. A third alternative would be for them to go for an entirely new launch system; in this case, we would expect to see a series of tests extending over a year or two.

37. Testing of the SS-X-6 stopped at the end of October 1967 and was not resumed until April of this year when another fractional orbit test was flown. This test was virtually identical to the earlier orbital flights. This test was followed, however, by two additional tests which again flew a depressed trajectory profile, but to a longer range than the early flights. In these two instances, the system was flown on a ballistic course, having an apogee of only about 300

n.m., into the Pacific (a normal ICBM apogee for this range would be about 700 n.m.). Late in the flights, the deboost stage and the RV were reoriented and the deboost stage ignited, causing the RV to impact in an area some 7,400 n.m. from Tyuratam while the second stage continued on its ballistic course and impacted about 400 n.m. farther down the track. These two tests and the early tests suggest development of a depressed trajectory ICBM with a retrofired RV which would restore some of the accuracy lost by flying the lower trajectory. On 2 October, however, the system was again tested in the fractional orbit mode. In none of the tests have we detected the modifications we considered necessary to the system if it were intended to be a FOBS designed to attack the US over either the North or South Pole.

38. Last year we estimated that the SS-X-6 was being developed as a FOBS and that it would be deployed.

lowered our confidence that we understand the vehicle and its intended purpose. The Soviets may be trying to develop a weapon which could perform as a depressed trajectory ICBM, or a FOBS, or perhaps a dual system capable of performing either of these missions. Either of these systems could serve to degrade US early warning and the value of US antimissile defenses. It is also possible that the Soviets are developing some system whose purpose is not yet clear.

39. The Soviets have probably tested the SS-X-6 sufficiently to deploy it as a depressed trajectory ICBM should they choose to do so.

However, they have evidently not made the modifications judged necessary to deploy it as a FOBS and we would expect to detect tests of any modification prior to any deployment of the system. While we believe that the chances are better than even that the SS-X-6 will be deployed, until our evidence is more conclusive, we are unable to make a confident estimate as to what type of system is being developed, when it will reach IOC, and how and in what numbers it may be deployed.

40. The Soviets are working with hardware and space technology which could be used as the basis for developing a multiple orbit bombardment system (MOBS). But such a system would also require the development of several new components, including a long-life power source and an attitude reference system. For the foreseeable future, we think that a MOBS would not compare favorably with ICBMs in terms of effectiveness, reliability, vulnerability, average life, and susceptibility to loss of control from accident or countermeasures. The Soviet leaders would almost certainly recognize that the deployment of a nuclear-armed orbital bombardment system in violation of the outer space treaty would entail serious political consequences. They would also have to be concerned that it would give a strong new stimulus to US military programs. In view of

these factors, and the much greater costs of such orbital weapons, we believe that the Soviets are unlikely to deploy a MOBS in space during the period of this estimate. However, Soviet technology applicable to this field will improve in the normal course of continued development of nuclear technology and space projects. In the unlikely event the USSR were to embark on such a course of development, we believe that we could identify a MOBS sometime during the test program of the complete system, which would probably extend over at least a year.

IV. MEDIUM AND INTERMEDIATE RANGE BALLISTIC MISSILES

A. Force Levels and Composition [5]

41. The Soviet medium-range ballistic missile and intermediate-range ballistic missile (MRBM/IRBM) force continues to pose the principal strategic threat to targets in Europe. About 90 percent of the force is deployed in a wide belt extending from the Gulf of Finland to the Black Sea. The remainder is deployed mainly in the Far East, with a few sites scattered in the Caucasus and in south-central Siberia. One IRBM site on the Chukotsk Peninsula is probably targeted against Alaska, or possibly the Pacific Northwest.

42. The force consists of launch sites for the 1,020 n.m. SS-4 MRBM and the 2,200 n.m. SS-5 IRBM which we estimate to be deployed as follows:

TYPE	SOFT	HARD [a]	TOTAL
MRBM	496–520	84	580–604
IRBM	50	51	101
Total Launchers	546–570	135	681–705

[a] We estimate that these hard sites have been designed to remain completely operable when exposed to over-pressures on the order of 200-400 psi.

43. We have observed no change in the number of IRBM launchers during the past year, but several changes in the MRBM element have caused a slight reduction in our estimate. The reduction in our estimate of the number of MRBM launchers resulting from the conversion of those sites was partially offset by the construction of SS-4 launchers at an existing MRBM site in the Soviet Far East. The construction of these pads, the first of this type to be built since 1964, suggests that they are part of the general Soviet buildup along the Sino-Soviet border.

[5] For our estimate of the characteristics and performance data for Soviet MRBMs/IRBMs, see TABLE II.

44. The Soviets are also deploying a new land-mobile missile system (which we have designated Scaleboard) at three Strategic Rocket Forces (SRF) missile installations near the Chinese border. The Soviets have claimed that units of this type are subordinate to the SRF and have stated that the missile involved has a range of "thousands of kilometers." We cannot exclude the possibility that this system is an MRBM but the missile that we presently associate with this system has an estimated range of only about 500 n.m.

45. Previously we have credited only soft MRBM/IRBM sites with a refire capability. Now, however, it appears that hard IRBM sites may also have that capacity. we believe that the time required to ready the silos for refire would preclude their reuse in conjunction with an initial strike. We still think it unlikely that hard MRBM sites have a refire capability.

46. The situation regarding the fixed field positions located at or near MRBM complexes remains unclear. The original purpose of these sites was probably for training or, possibly, for use as alternate launch sites. lead us to believe, on balance, that these positions do not figure prominently in overall Soviet strategic planning.

47. We estimate that the MRBM/IRBM force will hold at about its present size and makeup through mid-1970. By that time, any new missiles in this category are likely to have entered service only in small numbers, and their introduction will probably be accompanied by a phaseout of some of the older missiles.

B. Future Systems

48. Last year we considered the possibility that the might be developed both as a replacement for the SS-4 and as a naval missile

for the new class of submarine. we now believe it unlikely that it will be used as a land-based system.

49. Evidence accumulated over the past year leads us to believe that the Soviets have embarked on a program directed toward the development of a family of solid-propellant missiles for medium, intermediate, and intercontinental ranges. In this program, we believe that they will employ a modular concept of missile construction wherein various staging combinations are arranged to allow the missiles to fly their intended ranges. We have discussed the SS-13, which is a three stage ICBM. We believe that a new MRBM (designated the SS-14), which is now undergoing flight tests, is made up basically of the upper two stages of the SS-13. It is being tested to 1,050 n.m., but we estimate that its operational range will be about 1,500 n.m. Flight tests of the system are currently being launched from a soft pad at Kapustin Yar, but three new silos under construction there will probably be used to test the missiles when they are completed. Further, modifications at Kapustin Yar of the prototype silos for SS-4 field deployment suggest that the Soviets may be considering the retrofit of the SS-14 into SS-4 silos in the field. We have not yet detected the initiation of construction in the field of any new hard MRBM sites, nor any modification of any currently deployed hard sites.

50. Since May 1965, the Soviets have been displaying a mobile transport-erect-launch vehicle which, they claim, contains a solid-propellant missile. In November 1967 the missile for this system (designated Scamp) was displayed for the first time and has been evaluated as a two-stage solid-propellant missile compatible with our estimate of the SS-14. In light of the site construction and modification activity at Kapustin Yar and the relationship of the SS-14 to the Scamp, we believe that deployment of the SS-14 will be both in fixed sites and in a mobile configuration. IOC could be achieved in a mobile configuration by about mid-1969 if the flight test program is stepped up; by late 1969 in a fixed mode if the SS-4 site modification is not too extensive; by mid-1970 in new sites if construction starts soon.

51. We believe that the Soviets have a requirement for a new IRBM; one with a range of about 3,000 n.m. would give them more flexible coverage of targets in Eurasia than does the SS-5 which they now have in their inventory. Such a missile could not be tested to full range on the Kapustin Yar range but it could be launched from Plesetsk for test shots of 3,100 n.m. to Kamchatka. If, as we believe, the Soviets employ a modular concept for developing their new solid-propellant missiles, a missile composed of the first and third stages of the Savage would fit the TEL photographed in an erected position at Plesetsk as discussed above (paragraph 20). We estimate that such a missile would have a range of about 3,000 n.m. No flight tests of this system have yet been identified, but the fact that the launcher was erected on a pad suggests that flight tests of whatever type missile is carried in the TEL will begin

soon. The same missile may also be tested from an adjacent site at Plesetsk where three silos were started, but where work has, at least temporarily, been held up. The new missile will probably reach IOC in 1970-1971, and we believe that it will be deployed in both fixed and mobile configurations.

C. Future Force Levels and Composition

52. We expect that by the mid-1970's all SS-4 and SS-5s will be replaced by new systems. We estimate that by that time the force will be deployed largely in hard fixed sites, but that a substantial portion will be deployed in a mobile mode. The mobile element will provide the Soviets with a strike force which will be difficult to target against and which can be redeployed readily in response to changing areas of tension.

53. We do not believe that old systems will be replaced by new systems one for one. As the survivability and capability of the force are increased by the introduction of new systems, there will probably be some reduction in the total size of the force. The reduction is not likely to be great, however, since the Soviets will probably see new requirements as the result of a threat from a hostile China, with its emerging strategic capabilities. For these reasons, we estimate that the strength of the MRBM/IRBM force will fall somewhere within a general range of 500-700 launchers throughout the period of this estimate.

V. MISSILE SUBMARINE FORCES

54. The Soviet ballistic missile submarine force comprises 38 submarines—10 of them nuclear-powered—which are equipped with a total of more than 100 missile tubes. The USSR also has 60 cruise-missile submarines, more than half of which are nuclear-powered. We believe that the ballistic missile submarine force would be used against land targets and that the cruise-missile submarine force has the primary mission of countering naval forces, particularly aircraft carrier task forces. Cruise-missile submarines could be used against land targets in the US, but we believe that such use is unlikely considering the size of the ICBM force and the introduction of the new class of ballistic missile submarine.[6]

A. Ballistic Missile Submarines

55. The Soviets have clearly embarked upon a high priority program to improve and expand their ballistic missile submarine force. Since the launching of the first unit of the Y-class submarine in August or September 1966, at least 5, possibly 6, more units have come down the ways. Construction of this submarine began at Severodvinsk, the largest yard in the USSR, and may begin soon at Komsomolsk. Severodvinsk will probably produce this new class at the rate of 4-6 units per year; an additional 2 units per year may be built at Komsomolsk.

[6] Cruise-missile submarines will be discussed in detail in NIE 11-14-68.

56. We believe that the SS-N-6 is the missile carried by the Y-class. It is a single stage liquid-propellant missile which we estimate is capable of delivering a warhead to some 1,500 n.m. The test program for this missile has involved at least 15 firings, 13 from Kapustin Yar, and 2 or 3 from the White Sea area. Considering the success of the test program, we believe the missile is ready to go operational.

57. Elsewhere in the ballistic missile submarine force, conversion programs are continuing. The Soviets are converting the H-I-class, which is equipped with the 350 n.m. SS-N-4 missile, to carry the 700 n.m. SS-N-5. This program will probably be completed by the end of 1969. The program for converting the G-class from the SS-N-4 to the SS-N-5 is also well along, and we expect that the entire force of G-class submarines will have been converted by about 1972 or 1973.

B. Strength and Composition of the Force to 1970

58. Our estimate of the strength and composition of the Soviet ballistic missile submarine force through mid-1970 is as follows:

ESTIMATED OPERATIONAL BALLISTIC MISSILE SUBMARINES [a]

	Number of Launchers Per Unit	1 September 1968	Mid-1969	Mid-1970
Class				
Nuclear-Powered				
H-I	3	1	1–0	0
H-II	3	7	7–8	8
Y	16	1	4–5	8–13 [b]
Diesel-Powered				
G-I [c]	3	16	13–11	9–7
G-II	3	6	9–11	13–15
Z-Conversion	2	6	6	6
TOTAL Ballistic		37 [d]	40–41	44–49

[a] In addition to the ballistic missile submarines, the Soviets have 5 E-I-class, 28 E-II-class, 15 J-class, and 12 W-class Conversion submarines which are equipped with the SS-N-3 cruise missile. We expect 1 more J-class unit to become operational by next year and that the cruise-missile force will then level off.

[b] The low side of this range reflects an annual production rate of 4 units per year at Severodvinsk. The high side reflects the production rate of 6 at Severodvinsk and an additional 2 at Komsomolsk.

[c] There is one less submarine in this class than we carried last year. One was lost at sea in March 1968.

[d] In addition to these submarines, there is one H-I-class submarine which has six launch tubes and is possibly being modified to carry a new missile. This submarine probably is a test bed and we do not believe that it will become the pattern for a future conversion of the H-class or the model for a new class.

C. Operational Capabilities of the Force

59. During the past year the number of ballistic missile submarine out-of-area patrols has continued at about the same level as noted last year. In 1967, about 11 such patrols were carried out in the North Atlantic and about 4 in the Pacific. About 8 North Atlantic and 2 Pacific patrols have been observed as of September 1968. This frequency of patrols is not sufficient to maintain even 1 ballistic missile submarine continuously on station.

60. When the Y-class becomes operational in some numbers, we expect the Soviets to establish a continuous on-station pattern for ballistic missile submarines, probably in areas within missile range of US targets. Because of the lack of forward bases and the operational limitations of the force, however, the Soviets probably could keep no more than about 30 percent of their nuclear-powered ballistic missile submarines continuously on station in potential missile launch areas off the US. We believe that by the mid-1970's that will be the normal operating pattern. While we believe the patrol mode of operation discussed above is the likely one the Soviets will carry out, they may instead put only a few submarines on patrol and keep the majority of the force in home waters, to be deployed in large numbers in time of tension.

61. Diesel-powered submarines have considerably less endurance than nuclear-powered ones. For this reason we believe that diesel-powered G-class submarines operating in the Atlantic would probably be targeted primarily against Europe and island bases. Those operating in the Pacific would probably be used against targets in Asia, and in the Pacific Ocean. Patrol patterns by G-class submarines in 1967 and 1968 suggest that a few may now be committed against targets in the US northwest, perhaps as an interim measure until more nuclear-powered ballistic missile submarines become available.

62. During the summer of 1967, the Soviets experimented in the central Atlantic with what appeared to be a unique concept of submarine support and replenishment in the open ocean with a variety of auxiliary and support vessels. Classes of submarines sighted in company with one or more of the ships included the cruise-missile E-II, the torpedo attack N, and the torpedo attack F. The E-II cruise-missile submarine operating with this support group evidently remained at sea for about six months. Should the concept be put into regular practice, it would greatly increase the patrol areas which submarines could cover and also serve, to some extent at least, as a substitute for distant land-based submarine support facilities. It might also permit more of the force to be continuously on patrol and would further complicate US problems of antisubmarine defense.

D. Future Force Levels and Composition

63. We believe that the Soviets are building toward a ballistic missile submarine force that will confront the continental US with a threat roughly com-

parable to that which the Polaris force presents to the USSR. The Soviets might define such comparability in terms of numbers of Polaris-type submarines, in terms of numbers of submarine missile launchers, or in terms of launchers that could be maintained continuously on station. Depending on how they define comparability, we believe that the Soviets would see a force of from 35 to 50 of the new submarines, together with their H-class units, as meeting these requirements. If production of the Y-class proceeds as we estimate it will, the Soviets will have a ballistic missile submarine force by the mid-1970's comparable to that of the US.

64. We estimate the number of Soviet ballistic missile submarines in mid-1973 at 50-70, of which 20-40 will be of the new type. By mid-1978 we expect the ballistic missile fleet to be composed of 65-80 submarines, including about 35-50 of the new class. All Z-conversion models will probably be phased out by 1973. The Soviets may develop a new submarine-launched ballistic missile, having a greater range and possibly a more sophisticated RV system, sometime in the early to mid-1970's.

VI. LONG RANGE AVIATION [7]

65. Long Range Aviation (LRA) is composed of about 200 heavy bomber/tankers and something over 700 mediums. The pattern of training flights noted over the past year supports our long held belief that the heavy bombers have the primary mission of intercontinental attack and that the mediums would be used mainly for attacks in Eurasia.[8] In early February, the Soviets initiated very realistic long-range training flights by heavy bombers to points off the Alaskan, Northwest Canadian, Greenland, Labrador, and Newfoundland coasts. In some instances the aircraft flew directly from their home bases, in others they staged through Arctic bases. On these missions some aircraft engaged in aerial refueling, both outbound and inbound, as well as low-altitude approaches to delay radar detection. Training activity during the past year for the Badger and Blinder medium-bombers continued to reflect an orientation toward Eurasian operations, but the aircraft retain the capability to attack some targets in the US on one-way missions. Blinder units normally operate only from their home

[7] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, considers that this section does not adequately address present and future capabilities of Soviet LRA and seriously underestimates the manned aircraft threat to the US. He believes this threat involves more than 400 aircraft—including about 300 medium bombers on range missions—and that a threat of this magnitude will continue well into the future. His specific disagreements with this section of the estimate are explained in footnotes to the appropriate paragraphs below.

[8] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, continues to believe that in an all-out nuclear assault against North American targets the Soviets would utilize several hundred medium bombers, even though this would mean range missions for most of the mediums.

bases and have never been noted deploying to Arctic bases. The little Arctic training carried out by Badgers represents a very minor part of the overall training of that force.

A. Recent Developments in Long-Range Aviation

66. The reequipment of a sizable portion of LRA's European-based Badger force with the new 120 n.m. air-to-surface missile (ASM), which we have designated Kelt (AS-5), is continuing. We estimate that about 200 aircraft have now been modified to carry the Kelt and that as many as 300 will be so modified by 1969, at which time we expect the program to be complete. The acquisition of this ASM should extend the useful life of a portion of the Badger force, though it somewhat reduces the performance of the aircraft.

B. Bomber Production

67. The Bear continues in production at Kuybyshev at a rate of about 1 aircraft per month, with virtually all the production going to reconnaissance units of Soviet Naval Aviation. We expect that the naval requirement for Bears will be satisfied by late this year or early next, and that series production will cease at that time. We expect, however, that a program will continue at Kuybyshev for a few years, probably in order to effect some qualitative improvements or modifications to the current aircraft.[9] Production of the Blinder is still underway at Kazan at the rate of 3 to 4 aircraft per month. We are uncertain how long this will continue. The low production rate and the modification of LRA Badgers to carry ASMs, and thus prolong their useful life, suggest that Soviet requirements for additional Blinders are limited.

C. Force Levels and Composition to Mid-1970

68. The strength of the heavy-bomber/tanker force declined slightly during the past year with the phase-out of five Bisons. The total number of medium bomber/tankers remained relatively stable with a slight reduction in the number of Badgers being partially offset by the introduction of additional Blinders. We believe that the Soviets will retain their heavy-bomber/tanker force at close to the present level for the next few years. The medium force will probably decline somewhat, but, because of the ASM reequipment program now underway in a portion of the Badger force, we estimate that larger numbers of that aircraft will be retained in the force for the next several years than we had previously estimated.

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[9] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, considers that the adapting of the Bear to varying roles indicates that the Soviets intend a long service life for this aircraft. He believes production will continue at Kuybyshev either for a qualitatively improved version of the Bear for delivery of a new longer range ASM, or alternatively for a follow-on bomber.

69. Our estimate of the strength and composition of LRA through mid-1970 is as follows:

	1 September 1968	Mid-1969	Mid-1970
Heavy Bombers/Tankers			
Bison	90	80–90	75–85
Bear	115	110–115	105–110
Medium Bombers/Tankers			
Badger	580	500–550	450–500
Blinder	160	175–200	175–225

D. Operational Capabilities of the Force

70. We have seen nothing during the past year to indicate any significant change in the operational capabilities of LRA. We continue to believe that an aircraft attack against the US would be carried out almost exclusively by heavy bombers, and that the Soviets would commit virtually their entire force of heavy bombers and tankers to that mission.[10] The number of aircraft which could reach US defenses would vary depending upon the extent to which aerial refueling was employed and how many aircraft were staged through Arctic bases.[11]

71. We believe that if medium bombers were to be used in an initial attack against North America, a few squadrons of Badgers might be assigned to targets in Alaska, Canada, Greenland, and Iceland on two-way missions. We have detected no Arctic deployments nor any aerial refueling on the part of operational Blinders, although the aircraft have refueling probes. We think it unlikely that any of those aircraft would be used against North American targets. The Soviets could, if they elected to do so, increase the weight of an attack against the US by utilizing a portion of the medium-bomber force on range (one-way) missions. Considering training patterns, base utilization, and air refueling limitations, as well as the size of the ICBM and submarine missile forces, we believe such use of the medium bomber is most unlikely.[12]

72. We have no evidence suggesting that LRA continuously maintains a portion of its force on ground or airborne alert (i.e., with a reaction time of 15

[10] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, believes that in a nuclear assault against the US, the Soviets would not only commit virtually their entire force of heavy bombers and tankers, but would also seek to maximize the weight of the attack by launching a large number of medium bombers most of which would be on range missions.

[11] See TABLE VI for the noncombat attrition factors which we estimate would apply in such an attack.

[12] For the position of Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, see his footnote to paragraph 70.

minutes or less). We believe that if LRA were to establish a ground alert status on a continual basis, it would be detected. The entire command, or elements thereof, however, can be placed in increased stages of readiness whenever the situation dictates, and such posture could be maintained during periods of tension. The likelihood of detection on a timely basis would vary, depending on the nature of the Soviet effort.

E. New Aircraft Development

73. We have no evidence indicating that a follow-on heavy bomber is under development in the USSR. For this reason, and considering the growth in their ballistic missile capabilities, we continue to believe it unlikely that the Soviets will introduce a follow-on heavy bomber into LRA during the period of this estimate.[13] If, however, they were to undertake development of a new heavy bomber, we believe that we would detect the program some three to four years before the new aircraft became operational.

74. The Soviets initially experienced difficulties in bringing the Blinder to operational status. These problems appear to have been solved, however, and the Soviets may see no need to introduce a follow-on medium bomber into the force. But if they do see a need for one, they may exploit the technology gained in the development of their variable-geometry-wing fighters and develop a new supersonic-dash medium bomber having better speed, altitude, and radius than the Blinder; such an aircraft could be introduced in 1972-1975. An alternative possibility would be a supersonic cruise medium bomber, based on the Soviet supersonic transport development, having a radius somewhat less than the Blinder; it could become operational later than the dash model.

F. New Air-to-Surface Missile Development[14]

75. The testing of an ASM [redacted] which we discussed last year, is continuing. [redacted] We estimate that the missile has a range of about 350 n.m. and a cruise speed of about Mach 3; it almost certainly has not reached IOC.

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[13] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, disagrees with this judgment. See his footnote to paragraph 67.

[14] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, would insert an additional paragraph as follows:

Soviet development of a longer range ASM is technologically feasible and its operational employment would appreciably increase the effectiveness of LRA. There currently is no evidence such an ASM is under test, but the Soviets could develop an ASM with a range on the order of 600 n.m. by 1972-1974.

[redacted]

G. Future Force Levels

76. The heavy bombers in LRA are aging and attrition is beginning to take effect. We continue to estimate that over the next 5 years or so the number of Bear ASM carriers will remain relatively constant, but that overall heavy bomber strength will decline because of attrition of the older Bear and Bison free-fall bombers. We estimate that by mid-1973 the heavy-bomber force will number some 90-105 Bears and 60-75 Bisons; by mid-1978 the force will probably consist of some 30-50 Bears and 20-40 Bisons. We estimate a medium force of some 250-325 Badgers and 175-225 Blinders for mid-1973; by mid-1978 the force will probably comprise 50-150 Badgers and 135-210 Blinders.[16]

VII. COMMAND AND CONTROL

77. Supreme authority over the Soviet Armed Forces is vested in the Politburo as a whole, or at least in certain key members of the Politburo. In peacetime the political authorities exercise control through the Defense Council, presumably a political-military organ chaired by Party Secretary Brezhnev, and thence through the Ministry of Defense. In the event of war the channel would run through the Supreme High Command, which would also include political as well as military leaders and would have wide powers in the direction of the war effort.

78. During the past several years, some elements within the military have emphasized the critical importance of surprise attack and fast reaction in a modern nuclear environment and have stressed the need for a permanent political-military command organ—apparently similar to the wartime Supreme High Command—to operate in peacetime. Although we do not know for certain whether such an organ has been created, it probably is represented by or serves the above-mentioned Defense Council. One Soviet military writer in late 1966 stated that the third stage in the revolution in military affairs had just begun; the three stages were defined as: (a) the use of nuclear weapons; (b) the advent of missilery; and (c) the integrated automation of command and control of troops. Beginning in late 1966 the Soviet General Staff, which will be resubordinated to the Supreme High Command in wartime, established command and control radio communications with the major field commands of the Strategic Missile

[16] Maj. Gen. Jammie M. Philpott, the Acting Assistant Chief of Staff, Intelligence, USAF, notes that the strength of the heavy bomber force has not changed appreciably over the past several years and he believes it is unlikely to do so during the period of this estimate. In his view this force will continue to number about 200 aircraft in operational units, using a follow-on system to support the force level in the mid- and late 1970's. He notes that the medium-bomber force has declined only slightly in recent years and that the capabilities of this force have been increasing. He estimates that by mid-1978, the Soviets will still have 400-600 medium bombers in LRA.

Troops, LRA, and the Navy, thereby by-passing the Moscow headquarters of these forces. These communications facilities are tested regularly and indicate that the Soviets are moving toward a highly integrated command structure for their strategic attack forces.

79. There have been indications that high Soviet military leaders have not been satisfied with the alert status of the Soviet Armed Forces, especially the SRF. We believe that during the past year, steps have been taken to partially rectify the problem by permitting commanders of SRF elements down to regiment (complex) level to increase the readiness posture of their forces in event of a surprise enemy attack anywhere in the Soviet Union.

80. It thus appears that the Soviets have decentralized to some extent the authority to increase the readiness posture of individual strategic strike force units, while at the same time centralizing at the General Staff level the authority to conduct strategic offensive warfare. A reflection of this more centralized command and control system was evident in major Soviet joint armed forces exercises of July 1967 and June 1968 in which ICBMs were launched from operational complexes and large numbers of heavy bombers flew simulated strike missions to the Arctic within the same time frame. The newly established General Staff communications direct to field commands were employed in these exercises.

ANNEX

GLOSSARY OF MISSILE TERMS

(Pages 28 & 29 Blanks)

GLOSSARY OF MISSILE TERMS

Initial Operational Capability (IOC)—Date the first operational unit is trained and equipped with a few missiles and launchers.

MAXIMUM OPERATIONAL RANGE (N.M.)

Air-to-Surface Systems—Slant range between launching aircraft and target at the time of missile launch.

Surface-to-Surface Systems—Maximum range under operational conditions with warhead weight indicated. In the case of ballistic missiles the maximum range figures disregard the effect of the earth's rotation.

ACCURACY

Circular Error Probability (CEP)—The radius of a circle centered on the intended target, within which 50 percent of the arriving missile warheads are expected to fall.

FRACTIONAL ORBIT BOMBARDMENT SYSTEM (FOBS)

FOBS is used to designate a system deployed on the ground, targeted prior to launch, and launched with intent to attack. Its operational and control requirements would be like those for an ICBM except for the need for a vehicle to place a warhead into an orbital trajectory and deorbit it on target. Such a vehicle would be targeted to attack prior to completion of the initial orbit.

MULTIPLE ORBIT BOMBARDMENT SYSTEM (MOBS)

MOBS is used to designate a system that could be developed and stored on the ground or deployed in space, could be launched into orbit with no immediate commitment to attack, targeted after launch, or retargeted as necessary. It would require command and control links between ground control centers and orbiting vehicles; hence it would be much more complex than either an ICBM or a FOBS.

DEPRESSED TRAJECTORY ICBM (DICBM)

DICBM is used to designate an ICBM system which is launched on a trajectory having a much lower apogee than one launched on a normal ICBM trajectory.

REENTRY VEHICLES AND WARHEADS

Reentry Vehicle (RV)—That part of a missile designed to reenter the earth's atmosphere in the terminal portion of its trajectory.

Multiple RVs (MRVs)—A payload package consisting of two or more RVs. The individual RVs are dispersed (but not independently-targeted or maneuvered) during the free flight or terminal portion of the trajectory in order to confuse enemy radars, to aid penetration, and/or to increase kill area.

Multiple Independently-targeted RV (MIRV)—A payload consisting of two or more RVs each of which is independently targeted.

Maneuverable RV (MaRV)—An RV which has the capability to maneuver during free flight or reentry.

Warhead Weight—The weight of the explosive device and its associated fuzing and firing mechanism.

RV Weight—RV weight includes that of the warhead, necessary shielding and structure, and internal penetration aids that may be present, and any other necessary or desired components.

Payload Weight—The weight of that part of the missile above the last booster stage.

Retrofire—A technique whereby the RV is deorbited or is deboosted out of a normal ballistic trajectory.

RANGE CLASSES

Medium-Range Ballistic Missile (MRBM)

About 600 to 1,500 n.m.

Intermediate-Range Ballistic Missile (IRBM)

About 1,500 to 3,000 n.m.

Intercontinental Ballistic Missile (ICBM)

Over 3,000 n.m.

RELIABILITIES

Weapon System—The percentage of the alert missiles that will successfully detonate within 3.5 CEPs of their targets. This is the product of launch, in-flight, and warhead reliabilities.

Alert Rate—The percentage of the operational missile force that is maintained at normal readiness condition.

Force—The percentage of the operational missile force that will successfully detonate in the target area. This is the product of Alert Rate and Weapon System reliability.

Reaction Time—Time required to proceed from a readiness condition to launch.

Refire Time—Time required to launch a second missile from the same pad or launcher.

TABLE I

SOVIET ICBM SYSTEMS

Characteristics and Performance [a]

	SS–7 [b]		SS–8		SS–9 [b]	SS–11	SS–13	Large Follow-on
IOC	1962		1963		1966	1966	1969	1970–1972
Maximum Operational Range-NRE-(nm)	6,500/5,500		6,000		6,500/5,000	5,500	About 5,500	6,500
Reentry Vehicle Weight (lbs)	3,500±500 4,200±500		3,500±500 ..		10,000±1,000 12,500±1,000	1,500±300 ..	About 1,000 ..	10,000–15,000 ..
Warhead Weight (lbs)	2,800±400 3,300±400		2,800±400 ..		8,000±1,000 10,000±1,000	1,100±300 ..	About 750	8,000–12,000
Warhead Yield (MT)	[redacted]							
Accuracy (CEP-nm)	1.0–1.25		1.0		About 0.5 (Radio Inertial) About 0.75 (Inertial)	1.0–1.5	1.0–1.5 [c]	About 0.5 with IOC in 1970 Improve to 0.25 by 1972 [d] About 0.25 with IOC in 1972
Deployment	Soft/Hard		Soft/Hard		Hard	Hard	Hard; probably future mobile	Hard
Reliability (%)								
Weapon System [e]	80		65		75	85	65 [c]	–?–
Alert Rate [f]	85–95		85–95		90–95	90–95	90–95	–?–
Force [f g]	70–75		55–60		70–75	75–80	55–60	About 65–70
Improvement	..		..		..	..	70–75/IOC+1 yr	70–75/IOC+2 yrs
Time to Fire	*Soft*	*Hard*	*Soft*	*Hard*				
From Normal Readiness Condition	1–3 hrs	5–15 min	1–3 hrs	30–45 min	3–5 min	½–3 min	½–2 min [h]	About 1 min
From Peak Readiness Condition	3–5 min	3–5 min	5–10 min	5–10 min	3–5 min	½–3 min	½–2 min [h]	About 1 min
Hold Time (at Peak Readiness)	Many Hours	Days	About 1 hr		Unlimited	Unlimited	Unlimited	Unlimited
Refire Time (Soft Sites)	2–4 hrs	..	2–4 hrs	..	..	..	..	..

	SS–7 [b]	SS–8	SS–9 [b]	SS–11	SS–13	Large Follow-on
Configuration	Two Stage	Two Stage	Two Stage	Two Stage	Three Stage	Three Stage
Approximate Gross Lift-off Weight (lbs)	325,000	165,000	430,000	100,000	100,000	500,000
Guidance	Inertial	Radio Inertial	Radio Inertial & Inertial	Inertial (Possible Radio Inertial)	Inertial	Radio Inertial
Propellant	Storable Liquid	Nonstorable Liquid	Storable Liquid	Storable Liquid	Solid	Storable Liquid

[a] This table does not include the mobile system apparently under development at Plesetsk. For our views on that system see paragraphs 20 and 51.

[b] These ICBMs have two operational RVs of different weights with different maximum ranges.

[c] Reliability and accuracy would be somewhat degraded in a mobile configuration.

[d] Would require new guidance components, including midcourse correction, and a new RV.

[e] Weapon system reliability is the product of launch, inflight, and warhead reliability.

[f] A spread of reliabilities is given for alert rate and force reliability. The low side indicates a day-to-day posture, and the high side reflects a generated alert condition in time of international tension. It is estimated that storable-liquid propellant missiles could be held in a generated alert condition for about two weeks. Solid-propellant missiles probably could be held for about 30 days.

[g] Force reliability is the percentage of the operational missile force that, in the absence of countermeasures, will successfully detonate within 3.5 CEPs of the intended targets. It is the product of alert rate and weapon system reliability.

[h] For a mobile version it probably would require about 30 minutes after arrival at the launch site for the system to reach peak readiness; thereafter the missile probably could fire in about one minute.

TABLE II

SOVIET MRBM/IRBM SYSTEMS

Estimated Characteristics and Performance

	SS–4 (MRBM)		SS–5 (IRBM)		SS–14 (MRBM)		Follow-on IRBM	
IOC	Late 1958		Late 1961		1969–1970		1970–1971	
Maximum Range (nm)	1,020		2,200		About 1,500		3,000–3,500	
Guidance	Inertial		Inertial		Inertial		Inertial	
CEP (nm)	1.25		1.0		0.5–1.0 (Hard) 1.0–1.5 (Mobile)		About 0.75 (Hard) About 1.25 (Mobile)	
Reentry Vehicle Weight (lbs)	3,300		3,500		About 1,000		About 1,000	
Warhead Weight (lbs)	2,000		2,800		About 750		About 750	
Warhead Yield (MT)	[redacted]							
Gross Lift-off Weight (lbs)	88,000		About 200,000		About 35,000		About 90,000	
Configuration	Single Stage		Single Stage		Two Stage		Probable Two Stage	
Propellant	Storable Liquid		Storable Liquid		Solid		Solid	
Reliability (%)	..		..		*Hard*	*Mobile*	*Hard*	*Mobile*
Weapon System [a]	80		80		65	60	65	60
Alert Rate [b]	85–95		85–95		90–95	80–90	90–95	80–90
Force [a c]	70–75		70–75		55–60	50–55	55–60	50–55
Improvement/Year					70–75/ IOC+1 yr	60–65/ IOC+1 yr	70–75/ IOC+1 yr	60–65/ IOC+1 yr
Time to Fire	*Soft*	*Hard*	*Soft*	*Hard*	*Hard*	*Mobile*	*Hard*	*Mobile*
From Normal Readiness Condition	1–3 hrs	5–15 min	1–3 hrs	5–15 min	About 1 min	[d]	About 1 min	[d]
From Peak Readiness Condition	3–5 min	3–5 min	3–5 min	3–5 min	About 1 min	About 1 min	About 1 min	About 1 min
Refire Time	2–4 hrs	..	2–4 hrs	..	..	..	..	..
Hold Time at Peak Readiness	*Soft* Many hrs	*Hard* Days	*Soft* Many hrs	*Hard* Days	*Hard* Unlimited	*Mobile* About 1 day	*Hard* Unlimited	*Mobile* About 1 day

[a] Weapon system reliability is the product of launch, inflight, and warhead reliability.

[b] A spread of reliabilities is given for alert rate and force reliability. The low side indicates a day-to-day posture, and the high side reflects a generated alert condition in time of international tension. It is estimated that liquid-propellant missiles could be held in a generated alert condition for about two weeks. Solid-propellant missiles probably could be held for about 30 days.

[c] Force reliability is the percentage of the operational missile force that, in the absence of countermeasures, will successfully detonate within 3.5 CEPs of the intended targets. It is the product of alert rate and weapon system reliability.

[d] It probably would require about 30 minutes after arrival at the launch site for the system to reach peak readiness; thereafter the missile probably could fire in about one minute.

TABLE III

SOVIET BALLISTIC MISSILE SUBMARINES

Estimated Characteristics and Performance

	Dimensions		Depth		Speed			Armament		Patrol Capabilities		
	Length/ Beam (Feet)	Displacement (Tons) Surfaced/ Submerged	Normal Operating Depth Limit (Feet)[a]	Collapse Depth (Feet)	Maximum Surfaced	Maximum Snorkel	Submerged/ Speed/ Endurance (NM)	Torpedo	Missiles	Days on Station	Radius (NM)[b]	Patrol Duration (Days)[c]
Ballistic Missile Nuclear SSBN												
"H–I"	380/30	4,100 5,100	1,000	1,500	20	..	Max 22/*na*	32	3	0	8,600	60
										10	7,200	60
										20	5,800	60
"H–II"	380/30	4,100 5,100	1,000	1,500	20	..	Max 22/*na*	32	3	0	8,600	60
										10	7,200	60
										20	5,800	60
"Y"	425/38	7,200 8,700	1,300	2,000	20	..	About 25/*na*	32	16	0	8,600	60
										10	7,200	60
										20	5,800	60
Diesel SSB												
"G–I"	320/28	2,300 2,800	1,000	1,500	18	10.5	Max 16/12 Econ 3.0/250	26	3	0	3,600	60
										10	3,000	60
										20	2,400	60
"G–II"	320/28	2,300 2,800	1,000	1,500	18	10.5	Max 16/12 Econ 3.0/250	26	3	0	3,600	60
										10	3,000	60
										20	2,400	60
"Z–Conversion"	295/26	2,000 2,400	750	1,100	18	7.0	Max 15/15 Econ 3/250	26	2	0	3,600	60
										10	3,000	60
										20	2,400	60

[a] Normal operating depth limit is defined as the depth to which a submarine may proceed an unlimited number of times. During emergencies, a submarine may exceed this depth to an indeterminate point approaching collapse depth and still survive.

[b] Patrol radius is calculated assuming a speed of advance during transit of five knots for diesel submarines and 12 knots for nuclear submarines as has been determined from extensive evaluation of all information.

[c] Patrol duration is defined as the normal length of time that a submarine remains at sea without replenishment under combat conditions and is estimated on the basis of personnel endurance, general habitability, and the consumption of food, spare parts, and other consumables including fuel.

TABLE IV

SOVIET CRUISE MISSILE SUBMARINES

Estimated Characteristics and Performance

Class	E–I	E–II	J	W–Long Bin	W–Twin Cylinder
Type of Propulsion	Nuclear	Nuclear	Diesel	Diesel	Diesel
Type of Missile	SS–N–3	SS–N–3	SS–N–3	SS–N–3	SS–N–3
Speed (KTS)					
Maximum Surface	20	20	16	18	18
Maximum Snorkel	*na*	*na*	9	5.5	5.5
Maximum Submerged/Endurance (KTS/nm)	22/*na*	22/*na*	16/12	12/12	12/12
Economic Submerged/Endurance (KTS/nm)	..	..	3/250	2.5/150	2.5/150
Armament					
Torpedoes	32	32	26	12	14
Missiles	6	8	4	4	2
Patrol Duration (days)[a]	60	60	60	40	40
Days on Station/Distance (nm)	0/8,600	0/8,600	0/3,600	0/2,400	0/2,400
	10/7,200	10/7,200	10/3,000	10/1,800	10/1,800
	20/5,800	20/5,800	20/2,400	20/1,200	20/1,200

[a] Patrol duration is defined as the normal length of time that a submarine remains at sea without replenishment under combat conditions and is estimated on the basis of personnel endurance, general habitability, and the consumption of food, spare parts, and other consumables including fuel.

TABLE V

SOVIET SUBMARINE-LAUNCHED BALLISTIC MISSILE SYSTEMS [a]

Estimated Characteristics and Performance

	SS–N–4	SS–N–5	SS–N–6
IOC	1960	1963	1968
Maximum Operational Range (nm)	350	700	About 1,500
Warhead Weight (lbs)	2,200	1,500–2,500	
Warhead Yield (MT)			
CEP (nm)	1–2	1–2	
Type and Propulsion	Ballistic Storable	Ballistic Storable	Ballistic Storable
Launch Mode	Surfaced	Submerged	Submerged
Weapon System Reliability (%) (Rounded)	75	75	Unknown
Alert Rate (%)	95	95	Unknown
Force Reliability (%) (Rounded)[b]	70	70	About 60 (65 two yrs after IOC)
Guidance	Inertial	Inertial	Inertial
Salvo Time by Submarine Class (min)			
Z–Class (2 missiles)	4	..	..
G–I–Class (3 missiles)	8	..	..
G–II–Class (3 missiles)	..	8	..
H–I–Class (3 missiles)	8	..	..
H–II–Class (3 missiles)	..	8	..
Y–Class (16 missiles)	..	..	15–19
Reaction Time (min)[c]	20–40	15–30	15–30
(Includes Minutes on Surface Before Launch)	(3)	(None)	(None)

[a] We estimate that the SS–N–3 cruise-missile carried by Soviet cruise-missile submarines can deliver a warhead [redacted] If used against land targets, its estimated CEP would be 1–2 n.m. Although this missile has flown to a distance of 450 n.m. on a few occasions, the majority of the tests have been to considerably shorter distances and we believe its likely operational range is 250 n.m.

[b] Pertains only to submarines on patrol.

[c] Time required to proceed from a specified readiness condition to firing. For firing against land targets, time is taken to include the time from the moment of the release of the order to fire from the highest releasing authority to the launching of the first missile assuming: (1) the submarine is on alert; (2) targets have been selected; (3) the missile system includes continuous computation of firing data; and (4) the missiles have been checked and are ready for countdown. For surface-launched SLBMs, submarine time on surface is included in reaction time; for underwater launched missiles, submarine time to attain proper launch attitude is included.

TABLE VI

SOVIET LONG RANGE AVIATION BOMBER AND TANKER AIRCRAFT

Estimated Characteristics and Performance

	Bison	Bear	Badger	Blinder A [a]	Blinder B [a]
Combat Radius/Range (nm) (As a free fall bomber)					
a. 25,000 lb bombload	2,800/5,200	4,150/7,800	..	..	..
one refuel	3,950/7,300	..	..	..	..
b. 10,000 lb bombload	3,050/5,950	4,500/8,800	1,550/2,950	1,700/3,250	..
one refuel	4,150/7,900	..	2,200/4,150	2,300/4,350	..
c. 6,600 lb bombload	3,100/6,050	4,600/9,000	1,650/3,200	1,800/3,450	..
one refuel	4,200/8,100	..	2,300/4,400	2,350/4,500	..
d. 3,300 lb bombload	3,150/6,150	4,700/9,300	1,750/3,400	1,850/3,650	..
one refuel	4,250/8,250	..	2,400/4,600	2,450/4,650	..
e. With ASM					
1. One AS–3 (Bear B&C)	..	3,950/7,150	..	..	..
one refuel	..	5,050/9,200	..	..	..
2. One AS–4 (Blinder B Subsonic)	..	..	..	..	1,500/2,800
one refuel	..	..	..	..	2,100/3,900
3. Two AS–5	..	..	1,200/2,100	..	..
one refuel	..	..	1,900/3,250	..	..
f. 10,000 lb bombload (Supersonic-dash)	..	..	..	1,200/2,650	..
one refuel	..	..	..	1,750/3,700	..
6,600 lb bombload (Supersonic-dash)	..	..	..	1,300/2,850	..
one refuel	..	..	..	1,850/3,900	..
3,300 lb bombload (Supersonic-dash)	..	..	..	1,400/3,050	..
one refuel	..	..	..	1,950/4,050	..
One AS–4 (Supersonic-dash)	..	..	..	..	1,000/2,100
one refuel	..	..	..	..	1,500/3,150
Target Speed/Altitude (KTS/Feet)					
Subsonic	465/about 43,000	435/about 42,000	475/about 41,000	560/about 37,000	560/about 37,000
Supersonic	..	..	..	860/about 46,000	860/about 42,500
System Reliability (% aircraft reaching target areas in North America) [b]	79–85	79–85	76–85	79–85	79–85

[a] Blinder A is a bomber. Blinder B is a missile carrier equipped with one AS–4/Kitchen missile. Blinder aircraft missions are based on a Mach 1.5, 100 n.m. dash in and out of target area on radius mission and 100 n.m. dash in only on-range mission. The refueled radius/range data are based on the assumed use of a Badger tanker.

[b] This range is based on the following noncombat attrition rates: (1) 90 percent of the aircraft assigned to home base (AOB) would be in commission after a 5–10 day standdown prior to initial operations, and would become airborne at launch time; (2) 94 percent of the aircraft airborne would reach BRL directly from home base or from staging base; (3) 95 percent of the aircraft launched from home base would be launched from staging base; (4) 98 percent reliability should be applied to aircraft equipped for probe and drogue and requiring inflight refueling to accomplish their mission. A 95 percent reliability should be applied to aircraft employing wing-tip to wing-tip refueling.

TABLE VII

SOVIET LONG RANGE AVIATION AIR-TO-SURFACE MISSILE SYSTEMS

Estimated Characteristics and Performance [a]

	Kangaroo AS–3	Kitchen AS–4	Kelt AS–5
IOC	1960–1961	1967	1965
Maximum Range (nm)	350	250	120
Warhead Weight (lbs)	4,500–5,500	2,200	1,000–2,000
Warhead Yield (MT)	[redacted]		
Accuracy (CEP) nm	1–3	1–2	1–2
Speed (Mach)	1.8–2.0	3–4 at 80,000 feet	0.9–1.2
Overall Reliability (%)[b]	75	65	75
Improvement/Year	..	75/IOC+2 yrs	..
Carrier Aircraft/Number of Missiles	Bear B&C/1	Blinder B/1	Modified Badger/2
Launch Altitude (Feet)/Launch Speed (KTS)	36,000–39,000/420	40,000/up to about Mach 1–2	30,000–35,000/440
Guidance	Preprogramed autopilot with command override	Unknown	Unknown (possibly preprogramed autopilot with command override)

[a] The Soviets currently have in R&D a new ASM with an estimated range of about 350 n.m. and a speed of Mach 3. It has almost certainly not achieved IOC. We do not know which aircraft may be intended to carry it or when it may become operational.

[b] Does not include the reliability of the carrier aircraft.

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