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NATIONAL INTELLIGENCE ESTIMATE

Number 11-8-63

(Supersedes NIE 11-8-62 and the Memorandum to Holders thereof)

Soviet Capabilities for Strategic Attack

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Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE
Concurred in by the
UNITED STATES INTELLIGENCE BOARD
As indicated overleaf
18 OCTOBER 1963

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The following intelligence organizations participated in the preparation of this estimate:

The Central Intelligence Agency and the intelligence organizations of the Departments of State, Defense, the Army, the Navy, the Air Force, AEC, and NSA.

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Assistant Chief of Staff, Intelligence, USAF

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The Assistant Director, Federal Bureau of Investigation, the subject being outside of his jurisdiction.

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THE DIRECTOR OF CENTRAL INTELLIGENCE

WASHINGTON 25, D.C.

18 October 1963

MEMORANDUM FOR: Recipients of NIE 11-8-63

SUBJECT : Extreme Sensitivity of NIE 11-8-63, "Soviet Capabilities for Strategic Attack"

1. In accordance with the wishes of the President, dissemination of NIE 11-8-63 has been 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.

JOHN A. McCONE
Director

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NATIONAL INTELLIGENCE ESTIMATE

Number 11-8-63

Soviet Capabilities for Strategic Attack

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SOVIET CAPABILITIES FOR STRATEGIC ATTACK

THE PROBLEM

To estimate probable trends in the strength and deployment of Soviet weapon systems suitable for strategic attack, and in Soviet capabilities for such attack, projecting forward for about six years.*

SUMMARY AND CONCLUSIONS

Trends in Strategic Attack Forces to Mid-1965

1. The Soviet leaders look upon long range strike forces as a major element of their strategic position, intended to support their political objectives, to deter the West from resort to military action, and to fight a war should one occur. The available evidence supports the view that they are attempting to build forces which they regard as appropriate to these objectives rather than forces with which they could launch a deliberate attack on the West and count on reducing retaliation to levels that would be in any sense tolerable. (Paragraph 34)

2. Current Soviet military doctrine holds that a general war could begin with little or no warning, stresses the critical importance of the initial period in determining its outcome, and asserts that enormous advantages accrue to the side striking the first blow. However, the official doctrine also holds that the initial nuclear exchange might not determine the outcome, and that in any event large theater forces are necessary to prosecute a general war successfully. These views, when related to the strategic capabilities now deployed and programmed by the West, impose high and complex requirements upon the Soviet military establishment. Among the chief constraints in meeting these requirements are cost and skilled manpower. The Soviet strategic posture has also been heavily influenced by a concentration on the Eurasian theater, and by an apparent lag in military thinking on the implications of advanced weapons. Soviet military policy and doctrine have been considerably modified in recent years, and the process of change is continuing. However, for the immediate future, Soviet forces for long range attack will be characterized by capabilities against Eurasia far exceeding those against North America. (Paragraphs 35–37)

3. *ICBM Forces.* Evidence acquired during the past year has led us to modify our estimates as to the size and composition of the Soviet ICBM force in the near term. The most important single development was the interruption of the deployment program during the summer and fall of 1962. The primary reasons for this interruption appear to have been technical, including a probable

* The weapon systems considered are ground-launched missiles with ranges of 600 nautical miles or more, submarine-launched missiles, heavy and medium bombers, air-to-surface missiles, and advanced delivery and supporting systems such as orbital and suborbital vehicles.

modification to the second-generation SS–7 ICBM system and persisting difficulties in development of the SS–8. Whatever the reason, however, it is clear that 1962 was a year of reappraisal, in which Soviet planners apparently made important new decisions with respect to their ICBM program. Some of these, for example curtailment of SS–8 deployment, are already evident. For the near term, the result is a somewhat smaller force than previously estimated. (Paragraphs 39–40)

4. We have now identified a total of 18 ICBM complexes, all of which were begun before December 1961. The complexes now contain a total of about 220 launchers in various stages of construction. We estimate that 105–120 ICBM launchers, including about 20 hard silos, were operational as of 1 October 1963.[1] An additional 15 launchers were probably operational at Tyuratam.

5. Of the three Soviet ICBM systems now in the field, the SS–7 has been the most successful in development and is the most widely deployed. Deployment of the large, first generation SS–6 was limited to four launchers at one complex. Deployment of the SS–8 had extended to four complexes before the program was interrupted. However, SS–8 deployment has now been curtailed, and it is believed that expansion of the ICBM force over the next year or so will be primarily in terms of the SS–7.

6. We estimate the number of Soviet ICBM launchers operational in mid-1964 at 205–235, and in mid-1965 at 250–350 (these totals include some 20–25 launchers at Tyuratam).[2] The force in this period will consist almost entirely of second-generation ICBMs; a few new type ICBMs could be operational by about mid-1965. We now believe that the SS–8, which we previously considered might be a very large missile, is comparable to the SS–7 in payload capacity.[3] At present, both of these ICBMs probably carry [ ] warheads; initial deployment of [ ] warheads with these ICBMs could begin in 1964. If new nosecones are developed, improved second generation missiles armed with higher yield warheads [ ] could enter service by 1965, and the few SS–6's in the field could be retrofitted to carry [ ] Thus, it is probable that the great bulk of the Soviet ICBM force through mid-1965 will carry warheads in the 3–6 MT range. By mid-1965, the accuracy of the bulk of the force can probably be improved to about 1.0 n.m. CEP; if new guidance systems are introduced, some portion could achieve CEP's of 0.5–1.0 n.m.

7. The Soviet ICBM force represents a formidable nuclear delivery capability, but cannot maintain a constant readiness state approaching its US counterpart, and is vulnerable since about 80–85 percent of the present force is in soft sites. Successive modifications of soft sites have probably brought some improvement in reaction time, but procedures are still relatively slow, cumbersome, and complicated. We estimate that by mid-1965, about one-third of the ICBMs will be in hard silos, enhancing both the survivability and the reaction time of the force.

8. *MRBM/IRBM Forces.* We have now identified about 675 launch positions for the 1,050 n.m. (SS–4) MRBMs and 2,200 n.m. (SS–5) IRBMs, of which almost 600 are soft and the remainder are deployed in hard silos.

[1] The Assistant Chief of Staff Intelligence, USAF, estimates that 145–160 ICBM launchers were operational as of 1 October 1963. See his footnote on page 15 at paragraph 60.

[2] The Assistant Chief of Staff Intelligence, USAF, estimates 215–250 operational ICBM launchers by mid-1964, and 300–350 by mid-1965. See footnote, page 15.

[3] The Director, Defense Intelligence Agency and the Assistant Chief of Staff, Intelligence, USAF, believe that a confident selection between possible SS–8 delivery capabilities cannot be made at this time. In their opinion, available evidence and analysis do not permit excluding the possibility that the SS–8 may carry a nosecone of 10,000 lbs or a little more. [

]

Considering the target coverage and geographic disposition of the force, together with evidence of a cessation or slowdown in site construction, we believe that deployment of MRBMs and IRBMs in the USSR is about complete. We therefore estimate that by mid-1964 this force will have levelled off at about 700–750 launch positions, including 90–110 in hard silos. Soviet MRBMs and IRBMs can presently carry warheads with maximum yields of 2–3 MT.

9. We continue to have difficulty in understanding the Soviet rationale for building such a massive capability to attack European targets. One factor influencing Soviet decisions was undoubtedly the strategic emphasis on Europe, and the concept of a hostage Europe probably played a part. Soviet planning to strike a wide variety of targets, including some in support of the theater forces, may also have exerted an upward pressure on the size of the force, particularly if most of these missiles were to be equipped with kiloton warheads. Finally, a contributing military factor may have been a desire to attain survivability through numbers. (Paragraph 65)

10. We now believe that virtually all MRBM and IRBM launch sites are primary firing positions, i.e., positions which are manned and equipped to participate in an initial salvo. There has been much evidence that the Soviets intend to provide a substantial refire capability for this force, and our evidence on missile production indicates that, by mid-1965, each soft site could have a second-salvo missile available. The same operational deficiencies which characterize the Soviet ICBM force—vulnerability, slow reaction time, and cumbersome procedures—appear in Soviet MRBM and IRBM forces. These have been alleviated somewhat by deployment of a part of the force in hard silos. A further improvement may be made by introduction of an improved missile system. We believe that a new MRBM could be operational in small numbers by mid-1965. (Paragraphs 68–73)

11. *Submarine Missile Forces.* Current Soviet submarine missile forces are the outgrowth of decisions taken in the middle 1950's to develop quickly a fairly extensive but unsophisticated capability. The USSR now has about 50 ballistic missile submarines, including 11 of the nuclear-powered H class; all are equipped with short range (350 n.m.) missiles capable of delivering warheads of [ ] The mission originally envisaged for these submarines probably included participation in initial strategic attacks. However, they have now evidently been assigned to second-strike roles, partly because of the growth in numbers of ground-launched systems, but probably also because of Soviet recognition of their limitations. Although this force represents a considerable potential threat, its operational effectiveness is limited by the small number of missiles per submarine (2 or 3), the short range of the missiles, the need to surface before launching, the operational limitations of the diesel-powered units, and the unreliability of some nuclear powered units. These shortcomings probably account for the continued absence of essential operational training cruises to likely combat areas. (Paragraphs 74–76)

12. There is evidence that the Soviets recognize these deficiencies and that improved missiles and submarines will become operational in the near future. Development is far advanced on a new 700 n.m. ballistic missile designed for submerged launching. This missile will almost certainly be incorporated in any new class of ballistic missile submarine which appears in the near future; it could possibly be retrofitted into existing types as well. While we have no direct evidence, it seems probable that at least one new submarine class (either nuclear or diesel-powered) is under development to employ the new missile and that the first units could enter service in the near future. It is likely that new designs will incorporate more than the three missile tubes carried by the older classes. We estimate that by mid-1965 the Soviet force of ballistic missile submarines will have grown to a total of 55–65, including some 15–20 nuclear-powered submarines. (Paragraphs 86–87, 88–89)

13. In addition to ballistic missile submarines, the USSR now has operational some 19 submarines capable of surface launching 300 n.m. cruise missiles. Six of these are nuclear-powered E class, each equipped with six launchers; the rest are diesel-powered units equipped with two or four launchers each. This system was designed primarily for low altitude (1,000–3,000 feet) attack on ships at sea, but it can also be employed against land targets. We believe that the Soviets may now be placing additional emphasis on the cruise missile submarine program. We estimate that by mid-1965 this force will have grown to 25–30 submarines, including 10–12 nuclear-powered. (Paragraphs 82–85, 88–89)

14. Thus, we believe that in the near future the Soviets will bring into service submarine weapon systems better suited to attacks on Eurasian and North American land targets as well as Western naval forces at sea. Further, we continue to believe that by the mid-1960's at least some Soviet missile submarines will be engaging in routine patrols in open ocean areas. (Paragraphs 75, 90–93)

15. *Long Range Bomber Forces.* Continued investment in improving Long Range Aviation indicates that the USSR plans to maintain sizable bomber forces for at least the near term. Improvements over the past few years include introduction of a new medium bomber, introduction of air-to-surface missiles, and improved aerial refueling capabilities. Maritime reconnaissance is a secondary role of Long Range Aviation, and the use of both heavy and medium bombers in this role has been increasing. (Paragraph 94)

16. We estimate that Long Range Aviation comprises about 180–205 heavy bombers and tankers and 940–975 medium bombers and tankers. The heavy bomber force includes 95–105 BISON jet bombers and 85–100 BEAR turbo prop bombers. Of the medium bombers, about 40–50 are BLINDER, with supersonic dash capability, and the remainder are BADGERs. There are an additional 360–370 BADGERs and 10–20 BLINDERs in Naval Aviation. BLINDER is the only bomber known to be in current production, but there are indications that there may be some new production of BEAR in addition to modification. Although research and development on heavy aircraft is under way, no replacement for BEAR or BISON is in sight, and we consider it highly unlikely that a new heavy bomber could enter inventory before 1966. We estimate that in mid-1965 Long Range Aviation will comprise 170–200 heavy bombers and tankers and 825–925 medium bombers and tankers.*

17. Soviet Long Range Aviation, by reason of its equipment, basing, and deployment, is much better suited for Eurasian operations than for intercontinental attack. The capabilities of the BISON and BADGER aircraft which make up the bulk of the force are restricted by their limited range. The emphasis on aerial refueling and Arctic training of the past several years reflect Soviet efforts to overcome this limitation on capabilities for intercontinental attack. (Paragraphs 99–104)

18. In view of the training patterns of recent years, the capacity of the principal Arctic staging bases, and the range capabilities of Soviet bombers, we believe that an aircraft attack against the US (except Alaska) would involve heavy bombers almost exclusively. Considering the requirements for Arctic staging and refueling, and allowing for non-combat attrition, we estimate that, by committing their entire heavy bomber force to this mission, the Soviets could put 90–115 of these aircraft over the US on two-way missions. The scale of an initial intercontinental attack could be increased by the use of refueled BADGERs on two-way missions. Considering all operational factors, we estimate that

* The Assistant Chief of Staff Intelligence, USAF, estimates the medium bomber/tanker force level for mid-1965 at 925–1025 aircraft. He considers the heavy bomber/tanker force will remain at approximately 200 aircraft although the BEAR/BISON mix may vary somewhat. Introduction of a longer endurance aircraft based on the BEAR could begin in late 1964 or early 1965. See his footnote to Page 23, paragraph 98 of the Discussion.

the Soviets could put up to 150 of these medium bombers over target areas in Greenland, Canada, Alaska and portions of northwestern US. Initial attacks would probably be mounted in successive waves and extend over a considerable number of hours.*

Trends in Strategic Attack Forces, 1966–1969

19. No well-defined strategic concept appears to have governed the long range strike forces which the Soviets have deployed to date, but a number of characteristics can be discerned in the building of these forces. Research and development programs have been vigorous. In contrast, the scale and pace of deployment programs have been uneven. This behavior has reflected, in part, technical problems and economic constraints, but it also suggests that the USSR is willing to tolerate a condition of limited intercontinental capabilities and considerable vulnerability over a long period of time. (Paragraph 125)

20. Perhaps the most consistent patterns apparent in Soviet policy toward long range strike forces over the past several years are to be found in the increased allocation of resources to this mission, the numerical expansion of these forces, the improvement of various weapon systems for long range attack, emphasis on high yield weapons, and continuing interest in diversified capabilities. During this period, emphasis has shifted from weapon systems best suited for Eurasian use to intercontinental systems. Our estimates for the next two years suggest, in the main, a continuation of these broad trends. The forces which we project for mid-1965 are stronger, both numerically and qualitatively, but they represent no substantial change in the overall strategic posture of the USSR *vis-a-vis* the West. (Paragraphs 126–128)

21. The prospects for the later 1960's are far less clear. We believe that the desire for an effective deterrent will remain one of the primary concerns of Soviet policy. None of the evidence available to us suggests, however, that the USSR contemplates forces designed to neutralize US strike forces in a single blow, nor do the Soviets appear to be seeking to match the US in numbers of delivery vehicles. Other programs, particularly strategic defense and space, will continue to compete with strategic attack programs, not only for resources but for scarce skills and quality materials. In general, we believe that the USSR would have great economic difficulty in pursuing a policy which called for antimissile defenses of major cities, competition with the US in space, and the higher sides of our estimates for long range strike forces which appear below. (Paragraphs 130–135)

22. Soviet long-range strike forces could also be heavily affected by political factors. In the present and prospective strategic situation which confronts the USSR, there is much which argues for a policy of safeguarding national security through some fairly moderate level of military strength or even, more radically, through international agreements to limit or reverse the arms race. Moreover, Khrushchev's advocacy of higher priority for certain civilian economic programs appears to be growing stronger. These political and military considerations suggest, not that the Soviets will cut back on their strategic programs, but rather that they are unlikely to undertake large-scale programs on a crash basis. Indeed, current trends in development and deployment indicate that in the absence of an arms limitation agreement, the Soviets will continue improving their capabilities, but at a moderate pace. In framing the estimates which follow, we have attempted to take into consideration the vari-

* The Assistant Chief of Staff Intelligence, USAF, considers this paragraph seriously underestimates the manned aircraft threat to the continental United States. In the event war should eventuate and the USSR attacks the United States with nuclear weapons, he believes this will be an all-out effort aimed at putting a maximum number of weapons on US targets. He would therefore estimate that the number of aircraft, including BADGERS on one-way missions, could exceed 500. See his footnote to Page 22, 23, Paragraph 102 of the Discussion.

ous factors—strategic, economic, military, political, and technical—which could influence the size and composition of Soviet long range strike forces deployed by mid-1969. (Paragraphs 136–138)

23. *The ICBM Force.* Our analysis of Soviet programming to date, and of the possible impact of new systems as well as other factors, indicates that by mid-1969 the USSR probably will have acquired a force of some 400–700 operational ICBM launchers.[1] [2] Currently operational systems will still make up the largest part of the force, but it will probably also include significant numbers of follow-on or improved ICBMs. In general, any new ICBM systems to be deployed in quantity during the 1960's would need to be under development already or to begin development shortly. (Paragraphs 139–141, 151, 155, 164)

24. We believe that the Soviets are most certainly engaged in both improvement of existing ICBM systems and development of new systems, as well as to a continuing space effort. However, the available evidence does not indicate the specific nature of planned improvements to existing ICBMs or of follow-on systems. Our views on the Soviet need to correct current deficiencies, on tendencies in Soviet missile design, and on Soviet technical capabilities heavily affect our judgments about likely new and improved systems.

a. *Very Large ICBMs.* We continue to believe that the Soviets are developing a large vehicle (with a million or more pounds of thrust), which could be used as a space booster, as a "global" rocket, or as a carrier for warheads yielding up to 100 MT. If test firings begin within the next few months, such a large vehicle could probably have an initial operational capability as an ICBM in the period mid-1965 to mid-1966. Initial deployed sites would probably be soft, but the Soviets might find it feasible to incorporate hardening at some stage in the program. (Paragraph 144)

b. *Standard-Size Follow-on ICBMs.* We believe the Soviets would consider the primary qualitative improvements needed in the bulk of the ICBM force to be increased survivability, shorter reaction time, higher accuracy, and decreased logistic and personnel support. These requirements can probably be met almost as well, and at much lower cost, by improvement to the SS–7 as by a follow-on system in its general weight class. Improved SS–7's may be deployed in new configurations, possibly including semi-hard or single-silo hard sites. (Paragraphs 145–146)

c. *Smaller Follow-on ICBMs.* Soviet development of an ICBM system similar to the US Minuteman would run counter to trends thus far discernible in Soviet long range missile systems, and Soviet technology necessary for large grain solid propellants is weak. However, some of the operational attributes of the Minuteman concept would reduce the main deficiency in the Soviet force—namely its vulnerability to US attack—and might also reduce maintenance requirements. A new missile somewhat smaller than SS–7 and using improved propellants could reach operational status during the period. We believe it likely that such a new smaller missile would be deployed in hard sites. We believe that test firings of such a new smaller missile would not start for about a year and that operational launchers would not exist at deployed sites until 1966–1967. Should the Soviets elect to deploy a new missile in soft or semi-hard sites, test firings could begin in the near future, with an initial operational

[1] The Assistant Chief of Naval Operations (Intelligence), Department of the Navy, believes the force level is likely to be toward the low side (400) of the estimate presented here. See his footnote to paragraph 153, page 33, of the Discussion.

[2] The Assistant Chief of Staff Intelligence, USAF, considers the Soviet ICBM force by mid-1969 could range from 600 to as high as 1,000 operational ICBM launchers, depending on whether a new, small, easily-deployed system is introduced in the 1965–1966 period. See his footnote to the Table on page 33, paragraph 153 of the Discussion.

capability occurring in about mid-1965. (Paragraphs 147–148)

25. We believe that deployment of currently operational missiles in soft launch sites will cease by the mid-1960s. The low side of our estimate for 1969 (400 launchers) assumes that, in addition to deployment of a few very large ICBMs which begin to enter operational inventory in mid-1966, the Soviets will at about the same time introduce either a new, somewhat smaller ICBM or an improved SS–7, possibly in single-launcher hard sites. A moderate buildup of this sort, with emphasis on hardening, would in our view be consistent with a Soviet effort to maintain and improve the credibility of its deterrent. The reasons why the Soviet force might develop in this manner include such economic considerations as the need to devote more resources to the civilian economy or to antimissile and space programs as well as political factors. (Paragraph 151)

26. The high side of our estimate for mid-1969 (700 launchers), takes into account the possibility that the deployment of soft launchers, perhaps including some semi-hardened sites, is carried somewhat further than in the preceding alternative; that a very large system is introduced somewhat earlier than 1966; and that over 200 launchers of a new type—an improved SS–7 or a new, somewhat smaller hard system, possibly in single silo sites—are deployed. Such a buildup might reflect not only a Soviet concern for deterrence, but also an effort to put the USSR in a somewhat better position to undertake a preemptive attack if a Western strike appeared imminent and unavoidable. (Paragraph 152)

27. Although the force levels indicated by the upper and lower limits of the range are derived from technical and strategic considerations, other force compositions and force levels within this general range are equally possible. The Soviets would recognize that forces within this range fell far short of those required for a preemptive attack which might reduce devastation of the USSR to an acceptable level, but in any case, the force would include a protected component capable of devastating retaliatory blows if it survived. (Paragraph 153)

28. *MRBM and IRBM Forces.* We believe that Soviet MRBM/IRBM force levels will remain fairly constant in the 1966–1969 period at about 700–750 launchers. The developments which we can foresee in Western forces are not likely to add to potential Soviet MRBM/IRBM targets in a major way, although we do not exclude the possibility that a general strengthening of NATO forces would result in some incremental expansion. Improvements in Soviet MRBM/IRBM capabilities in this period are more likely to be qualitative than quantitative. The Soviets may be developing a new MRBM, and it is possible that they also contemplate a new IRBM. If two separate systems are developed, the IRBM would probably phase in a year or so after the MRBM, i.e., in about 1966–1967. It is also possible that the Soviets have elected to work toward a single follow-on system which could cover all MRBM and IRBM ranges. In either event, follow-on systems are likely to feature hard or possibly mobile deployment. If, as we estimate, the size of the force remains fairly stable, improved systems will be deployed to supersede present systems, and may have largely replaced currently operational MRBMs by 1969. (Paragraphs 154–158)

29. *Submarine Missile Forces.* We think that the Soviets will continue to consider missile submarines an important adjunct to their ground-launched missile capabilities, and we expect the requirement for capabilities to attack surface naval formations to continue. Thus we estimate continued construction of both ballistic missile and cruise missile submarines in this period. Although we have no

specific evidence, we believe that longer range submarine-launched ballistic missile systems could become operational in about the 1966–1967 period. We do not anticipate significant technical changes in the cruise missile submarine force. (Paragraphs 159–163)

30. The size of Soviet missile submarine forces will depend upon a number of factors including the availability of militarily competitive but less expensive delivery systems (especially hardened ICBMs), construction capabilities, and allocation of nuclear submarines to other naval missions. Considering all factors, including estimated construction programs and the possibilities for improved systems, we believe that by 1969 the Soviets will have 65–80 ballistic missile submarines operational, of which 25–35 will be nuclear-powered. At that time, we estimate a cruise missile submarine force of 40–60 of which 20–30 will be nuclear-powered. (Paragraph 164)

31. *Long Range Bombers.* We estimate that by 1969 Long Range Aviation will have gradually declined in total strength to about 130–175 heavy bombers and tankers and 400–650 medium bombers and tankers. We believe that it will still consist of aircraft types now in service: BISONs, BEARs, BADGERs, and BLINDERs, with the last of these comprising about half of the medium bomber force. Considering the types and quantities of missile delivery systems they are likely to have, as well as the probable continued availability of existing heavy bomber types, we think it unlikely that the Soviets will bring any follow-on heavy bomber to operational service in the period of this estimate. However, the Soviets have the technical capability of developing and producing new, high-performance military aircraft of intercontinental range for operational use in the 1966–1969 period, should they come to consider this necessary or worthwhile. In the later 1960s they would probably employ bomber forces in follow-on, rather than initial attacks, and for increasingly specialized missions.* (Paragraphs 165–166)

32. *Space Weapons.* On the basis of evidence presently available, we are unable to determine the existence of Soviet plans or programs for the military use of space. However, we believe that the USSR almost certainly is investigating the feasibility of space systems for military support and offensive and defensive weapons. For accomplishing military missions, we think that during the 1966–1969 period, orbital weapons will not compare favorably with ICBMs in terms of cost and effectiveness. Based on these considerations as we now understand them, it would appear unlikely that the Soviets will during this decade deploy orbital bombardment systems of military significance. Moreover, we believe that the USSR would probably recognize that a Soviet deployment of nuclear weapons in space would produce an unfavorable reaction in other countries and strong US counteractions. Further, if the Soviets enter into a formal obligation to refrain from orbiting nuclear weapons, this will constitute still another factor inhibiting such deployment. (Paragraphs 168–171)

33. We recognize, however, that the Soviets might reach different conclusions as to cost and effectiveness, and in some future phase of East-West relations, political inhibitions might lose their effectiveness. Moreover, considering the pace of developments in the weapons field in general, it is extremely haz-

* The Assistant Chief of Staff Intelligence, USAF, disagrees with this paragraph since he thinks that the Soviets will continue to consider manned strategic aircraft an important adjunct to their ground launched missile capabilities. He estimates that the USSR will introduce a follow-on heavy bomber. He further estimates the heavy bomber force will remain at about 200 or somewhat larger, depending on the timing of an expected follow-on bomber, and that by mid-1969 the medium bomber/tanker force probably still will include about 900 aircraft. See his footnote to the Table on page 36 and to paragraph 167.

ardous to estimate Soviet decisions for a period many years ahead. For these reasons, a firm estimate as to whether the Soviets will deploy an orbital bombardment system within the 1966–1969 period cannot be made at this time. (Paragraphs 172–173)

DISCUSSION

I. SOVIET POLICY TOWARD STRATEGIC ATTACK FORCES

34. The Soviet leaders look upon long range strike forces as a major element of their strategic position, intended to support their political objectives, to deter the West from resort to military action, and to fight a war should one occur. The available evidence supports the view that they are attempting to build forces which they regard as appropriate to these objectives, rather than aiming at forces which they could launch a deliberate attack on the West and count on reducing retaliation to levels that would be in any sense tolerable.

35. Soviet policy toward long range strike forces is heavily affected by the Soviet view of the character of future war. This Soviet view has become increasingly complicated in the last several years as the result of a continuing debate over the implications of modern weaponry for military doctrine. This debate persists, and may lead to further important changes, but at the present state it has produced several official conclusions which bear on long range capabilities:

(a) General war might begin in a variety of ways, including circumstances which provided very short warning times.

(b) The initial period is of critical importance and might determine the outcome.

(c) Enormous advantages accrue to the side striking the first blow.

(d) But the initial nuclear exchange might not determine the outcome, and in any event large ground campaigns would follow.

36. These propositions, when related to the strategic capabilities now deployed and programmed by the West, impose high and complex requirements upon Soviet long range strike forces. Among the chief constraints in meeting these requirements are cost and skilled manpower, which pose distinct problems to Soviet decision-makers. One of these problems is the proper balance of expenditure among military needs, the space program, and the civil economy. Another is the proper allocation of military funds among the various force components. This problem is made particularly acute by the insistence of the military leadership that all arms of service, including large theater forces, are necessary to prosecute a general war successfully and to provide the USSR with flexibility in a variety of possible circumstances.

37. Two other main factors have been involved in the past decisions which have determined present Soviet capabilities for long range attack. One is a concentration on the Eurasian theater, which is traceable to traditional Soviet preoccupation with this area as well as to the higher costs and greater technical complexity of intercontinental weapon systems. The other is an apparent lag in military thinking, which seems to have been relatively slow in working out some of the more sophisticated implications of advanced weapons. Both these factors are now changing, but for the immediate future Soviet forces for long range attack will be characterized by capabilities against Eurasia far exceeding those against North America, and by a considerable deficiency in certain performance characteristics—chiefly survivability and reaction times—relative to corresponding US forces.

38. A continuing Soviet emphasis on high yield weapons for long range striking forces was indicated by the 1961–1962 nuclear test series. The USSR's nuclear testing program has provided it with a wide variety of weapons for strategic delivery, with yields up to 100 MT. As new weapons enter the inventory they will progressively improve the total nuclear delivery capabilities of the strategic striking forces.

II. INTERCONTINENTAL BALLISTIC MISSILE FORCES, 1963–1965

39. The Soviet ICBM program continues to be marked by change, innovation, and shift in emphasis. New aspects of the Soviet ICBM program include: (a) an interruption of the Soviet launcher construction program during the summer and fall of 1962; (b) further evidence that SS–8 has approximately the same delivery capability as the SS–7; (c) apparent curtailment of SS–8 deployment; (d) continued starts of soft sites and a continued low ratio of hard to soft sites.

40. Activity at the Tyuratam test range leads us to believe that new or modified systems are now under development and could reach flight test stage in the near future. Construction of operational launch sites for a new ICBM system could begin even before the first test firing, as was the case in other Soviet missile programs, but it is unlikely that more than a few missiles of new types could be operational before mid-1965.

A. Deployed ICBM Complexes, Sites, and Launchers

41. We have now identified a total of 18 ICBM complexes, all of which were begun before December 1961. We doubt that there are additional complexes, although we do not exclude the possibility that one or two unidentified complexes may exist. Any unidentified complexes which do exist probably have not progressed to the point of having more than a few additional launchers as yet.[1]

42. The 18 complexes now contain a total of about 220 identified launchers in various stages of construction, of which about 145 are soft and about 75 [2] are hard. We cannot determine any "typical" number of launchers which each complex will ultimately contain.

43. We believe that about 100–115 of the identified ICBM launchers, including about 20 in hard silos were operational on 1 October 1963.

B. ICBM Systems Deployed [1]

44. Soviet ICBM development and deployment has emphasized a high degree of concurrency between system testing at the range and construction of operational sites in the field. The USSR has in the past five years developed three different ICBMs of the liquid-fueled type, together with the ground support equipment for each. At least some deployment has been undertaken for all three, with construction of deployment facilities beginning fairly early in the R&D phase. It now appears that in 1962 there were slippages and modifications in the deployment program for both of the second generation ICBM systems. The growth of operational forces has evidently been delayed once again, though not as seriously as was the case in 1958 when the SS–6 program was cut back. Thus concurrent programming, practiced successfully by the USSR in some other missile programs, has not resulted in a smooth and uninterrupted build-up in ICBM capabilities.

SS–6 Program

45. The first generation SS–6 was deployed only in limited numbers, i.e., about four launchers. In addition there are two at Tyuratam. The SS–6 is believed to be equipped with [ ] warheads at present.[2]

SS–7 Program

46. The SS–7 is the most successful Soviet ICBM in development, and it is the most widely deployed. Thirty-six of the last 38 test firings of this missile have been generally successful. Although the SS–7 is much smaller than the SS–6, it is comparable to the

[1] For the view of Assistant Chief of Staff, Intelligence, USAF, see footnote to Table at page 13, paragraph 55.

[2] We have identified 25 hard sites, each containing at least two and probably three launch silos.

[1] For details of estimated characteristics and performance, see Annex A, Table 4.

[2] For the estimated maximum yields of Soviet long range delivery systems, see Annex A, Table 6.

US Titan in size and probably carries a warhead of [ ] at present. The currently operational Soviet force consists almost entirely of SS–7s. The SS–7 is deployed in both soft and hard (probably silo-type) configurations. We believe that the rate of SS–7 launch site initiation, and hence of launcher activation, has been uneven, and that an interruption occurred during 1962.

47. Although some uncertainty remains, we now believe that each of the hard SS–7 sites probably contains three launch silos, rather than two as previously estimated. We cannot definitely determine the degree of hardening, but on the basis of present evidence and analysis we believe these sites can probably withstand overpressures up to 100–300 psi. We estimate construction time for hard sites at 22–24 months.

48. We believe the SS–7's maximum nuclear payload will probably be increased [ ] with initial deployment of the higher yield warhead beginning in 1964.

SS–8 Program [1]

49. In earlier estimates we were unable to determine whether the SS–8 was a very large missile or a relatively small one. Among the reasons for believing that the SS–8 might be very large was our judgment that the Soviets would want a missile delivery vehicle for a 100 megaton warhead and a new space booster. The case for a very large SS–8 has been weakened by the continued failure of the Soviets to use the SS–8 as a booster in the space program. Although there are still insufficient data to definitely determine the size of the SS–8 nosecone, the data available indicate that even if large, the SS–8 could carry to ICBM range a nosecone of only about 10,000 lbs. or somewhat more [ ] Such a booster would increase Soviet space payload capabilities only moderately, if at all, as compared with the SS–6 booster.

50. Considering all the technical and deployment evidence now available, we estimate that the SS–8 is a relatively small missile, i.e., one with about the same payload capacity as the SS–7, capable of carrying a nosecone of about 4,500 lbs. and a warhead [ ] [2]

51. Renewed firings of the SS–8 at Tyuratam in 1963 [ ] lead us to believe that an initial operating capability could have occurred in about mid-1963. We judge that the Soviets have decided to curtail deployment of the SS–8 and that, if any new sites are started in the future, they will probably be in limited numbers at existing complexes.

C. Estimated Force Levels Through mid-1965

52. Our estimate of the number and type of operational ICBM launchers through mid-1965 takes account of a variety of factors including the apparent trends in composition of the force, and the probable timing of deployment of follow-on systems. The estimate reflects a range of uncertainty regarding the scale and pace of deployment activity, and consequently regarding the Soviet strength in operational launchers, which increases as we project into the future.

53. *Soft Launchers.* SS–6 deployment is complete, and the SS–8 soft site program has probably been curtailed. Thus, expansion of the ICBM force for the next year or so will be primarily in terms of the SS–7. The high

[1] The Assistant Chief of Staff, Intelligence, USAF does not concur in the analysis contained in paragraphs 49 thru 51. He considers that the evidence can also be interpreted to show that the SS–8 is relatively large, capable of delivering a nosecone within the probable weight limits of 10,000 to 18,000 pounds to ICBM ranges. He believes that although strong arguments can be made for either a large or a small missile, the available evidence is so anomalous and subject to interpretation that a firm judgment is not possible at this time.

[2] The Director, Defense Intelligence Agency, believes that a confident selection between possible SS–8 delivery capabilities cannot be made at this time; available evidence and analysis do not permit excluding the possibility that the SS–8 may carry a nosecone of 10,000 lbs. or a little more.

side of the estimate assumes that soft sites will be initiated at a fast pace through mid-1964, and that there will be no delays or slippages in their construction. The low side of the estimate assumes that almost all of the soft launchers programmed for second generation missiles are already under construction.

54. *Hard Launchers.* We believe that hard launchers now constitute only about 15 percent of the operational launchers in the field but that they comprise nearly half of the launchers now under construction. Since hard launch sites require 22 to 24 months for completion, launchers to be operational in mid-1965 must have already been under construction by mid-1963. The estimate is based on the probability that each hard site contains three, rather than two launch silos.

55. The table below summarizes our estimate of Soviet ICBM force to mid-1965:

ESTIMATED SOVIET OPERATIONAL ICBM LAUNCHERS
MID-61 to MID-65

	MID-1961	MID-1962	MID-1963	1 OCT-1963	MID-1964	MID-1965*
Soft Launchers						
1st Generation	4	4	4	4	4	4
2nd Generation	0	30	70–75	80–95	140–160	150–225
Hard Launchers						
2nd Generation	0	0	15	20	40–50	75–90
TOTAL DEPLOYED LAUNCHERS (rounded)	4	35	90–95	105–120	185–215	230–320
Tyuratam Test Range						
Soft	5	9	9	9	11	15
Hard	0	0	6	6	9	9
GRAND TOTAL (rounded)	10	45	105–110	120–135	205–235	250–350

* A new ICBM, perhaps capable of carrying very high yield warheads, could begin to enter inventory by mid-1965, and the force may include a few improved second generation missiles in semi-hardened sites.

* The Assistant Chief of Staff, Intelligence, USAF considers the estimate of current ICBM strength unrealistically low for two reasons:

1. The majority estimate makes insufficient allowance for the existence of of unidentified launchers. How large the factor for "unidentified" launchers should be is debatable, but in view of the deficiencies in available intelligence, the Assistant Chief of Staff, Intelligence, USAF considers that the absolute minimum figure for such launchers should be 10 percent. Since some 220 launchers have been identified, of which about 100–115 are judged to be operational, a minimum of 11 operational launchers should be added to this total to compensate for unidentified launchers. The actual number of such launchers may well prove to be several times this many.

2. The majority estimate does not consider that some launchers nearing a full operational status would have an emergency combat capability and could support missile firings if the need arose. The ACS/I, USAF believes some 20 launchers fall into this category.

Both of the above comments exclude 15 probable launchers estimated to be operational at TTMTR. On the basis of the foregoing, the Assistant Chief of Staff, Intelligence, USAF believes the minimum number of launchers which should be estimated as operational on 1 October 1963 is 145–160, and he would project this as follows:

1 Oct 1963	Mid-1964	Mid-1965
145–160	215–250	300–350

D. Operational Characteristics of the 1963–1965 Force [1]

56. About 80–85 percent of the 1963 operational Soviet ICBM force is in soft sites. System characteristics and operational procedures at these sites make it a slow reaction force. Soviet soft site deployment concepts adversely affect both reliability and reaction time because of horizontal storage and checkout with subsequent movement to launchers. We estimate that roughly one-third of the ICBMs will be in hard silos by mid-1965, enhancing both survivability and reaction time.

57. *Reaction Time.* At the great preponderance of ICBM soft sites, an alert can be maintained indefinitely with the missiles and nosecones mated in the ready buildings near the launchers, propellants and ground support equipment at hand, and duty crews nearby. This is readiness condition 3,[2] and it appears to be the most likely normal state of readiness capable of being maintained by the force. From this state of readiness, the bulk of the force would require three or four hours to fire. From the highest state of readiness, with missiles erected and fueled, some 5 to 15 minutes would probably be required for launch. This state of readiness can be maintained for a number of hours, depending on weather conditions and other factors. At the hard sites, readiness condition 2 is most likely normal, with a reaction time of about half an hour. In general, therefore, the Strategic Rocket Troops are not believed to be able to maintain a constant readiness state approaching US systems, but there is evidence of Soviet concern for this deficiency. Some improvement in reducing reaction times for initial firings has probably been achieved by the successive modification of SS–7 soft sites.

58. *Simultaneity.* It appears that a missile from each launcher at an individual site could be fired within 5–10 minutes. Theoretically, the entire force could be launched within about 10 minutes. We believe, however, that even under the most favorable conditions and with a time to fire given sufficiently in advance, such portion of the deployed missile force as the Soviets could bring to Readiness Condition I probably could be launched in a salvo extending some 15 to 30 minutes from launch of the first missile. Lack of direct evidence as to the reliability of Soviet deployed missiles makes it impossible to estimate with confidence what portion of the total deployed force actually could participate in this salvo.

59. *Refire.* One additional missile is probably assigned to each soft ICBM launcher, providing a refire capability in about 10 hours for SS–7 and about 16 hours for SS–6. It is unlikely that hard launchers have a refire capability.

60. *Reliability and accuracy.* Soviet SS–6 and SS–7 ICBM systems have apparently had excellent reliability and accuracy records under test range conditions. However, the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects. We believe that the reliability of Soviet ICBMs would be considerably reduced under operational conditions. Operational accuracies can probably be improved so that by mid-1965 the bulk of the force could achieve CEP's of about 1 n.m. with a standard product improvement program; assuming improved guidance systems are introduced, some portion of the force could probably achieve CEP's in the 0.5–1.0 n.m. range at that time. We believe that there would be a considerable time lag before these improvements could be incorporated into existing deployed sites.

61. *Warheads.* The bulk of the Soviet ICBM force through mid-1965 will carry warheads in the 3 to 6 MT range. By 1965, the

[1] For detailed estimates of ICBM characteristics and performance, see Annex A, Table 1.

[2] For descriptions of Soviet missile readiness conditions, see Annex A, Glossary of Missile Terms.

SS–7 and SS–8 [1] might be modified to make them capable of delivering significantly larger nosecones, possibly with warhead yields [ ]. Such an increased payload capability could be achieved by employing the missiles at somewhat reduced ranges. The SS–6 is capable of being equipped with [ ] warheads for delivery to ranges of about 4,500 n.m. We believe that the Soviets would first have to test fire appropriately modified nosecones for any of these missiles.

III. MEDIUM AND INTERMEDIATE RANGE BALLISTIC MISSILE FORCES, 1963–1965

62. About 675 launch positions for 1,050 n.m. (SS–4) MRBMs and 2,200 n.m. (SS–5) IRBMs have now been identified. Of these, almost 600 are soft positions deployed four to a site. We estimate that there are about 80 hard silos, deployed two to a site, but there is some evidence to raise the possibility that there are three launch silos per hard site.[2] Virtually all of the soft sites and most of the hard sites are operational at present.

A. Development and Deployment

63. The massive capability for attack on Eurasian targets which present Soviet MRBM and IRBM forces represent has been developed by the USSR in several overlapping stages:

(a) Beginning in 1957, a 650 n.m. (SS–3) MRBM was probably deployed in modest numbers, initially employing a field-type configuration without fixed sites. This system probably also occupied some early fixed sites. [ ] it has probably been phased out of the operational inventory in favor of the SS–4.

(b) The construction of fixed, soft sites for the 1,050 n.m. SS–4 was undertaken at an intensive pace from late 1958 to about mid-1961, when about 350 launch positions were available. Since then this deployment has proceeded more slowly and has been supplemented by the construction of hard SS–4 silos, which now comprise slightly less than 10 percent of the total of about 575 identified MRBM launch positions. Very few MRBM sites have been started since the spring of 1962.

(c) In 1961, a less extensive program to deploy IRBMs in both soft and hard positions was undertaken. In this program, greater emphasis was placed on hardening, and about 40 percent of the nearly 90 identified IRBM launch positions are hard silos. This program, too, is evidently now slackening. Deployment of hard silo slowed and may have ceased early this year.

64. More than 90 percent of the MRBM and IRBM force is deployed in a broad belt in western USSR, stretching from the Baltic to the Black Sea. Other sites provide the USSR with potential coverage of other targets of particular importance in Europe, North Africa, and Middle and Far Eastern areas, and isolated sites can attack key installations in Greenland and Alaska.

65. We continue to have difficulty in understanding the Soviet rationale for building nuclear delivery capabilities of this magnitude against European target areas. One factor influencing Soviet decisions was undoubtedly their strategic emphasis upon Europe, evident from the size of the medium bomber program and the theater forces, and reflected in many Soviet military writings. The concept of holding Europe hostage while Soviet capabilities against the US were small probably played a part. The apparent Soviet intention (revealed in classified documents) to strike a wide variety of targets may also have exerted an upward pressure on the size of the force, particularly if the USSR planned to equip most of these missiles with kiloton warheads.

[1] For differing views as to the warhead delivery capability of the SS–8, see the footnotes of the Director, Defense Intelligence Agency, and of the Assistant Chief of Staff, Intelligence, USAF, page 12.

[2] If MRBM and IRBM hard sites in fact contain three launch silos, there are about 40 more hard launchers.

Finally, contributing military factors may have included attaining survivability through numbers and meeting requirements for support of theater forces as well as for strategic attack.

66. Considering the target coverage and geographic disposition of the present MRBM and IRBM forces, together with the evidence of slowdown or cessation in new site construction, we now believe with greater assurance than in our last estimate that the USSR has about completed the expansion of its SS–4 and SS–5 forces for employment against Western targets. We anticipate no important further increase in primary soft launch positions although we expect to identify a few additional sites with the passage of time. All hard sites that we know about will be operational by mid-1964. We think, however, that from time to time the Soviets may construct positions in additional locations to cover new targets or to supplement existing coverage.

67. We estimate as follows the number of operational launch positions for SS–4 and SS–5 missiles in the USSR through mid-1965:

	MID-1963	1 OCT-1963	MID-1964	MID-1965
1050 n.m. SS–4				
Soft	540–550	550–560	550–560	550–560
Hard Silo *	40–50	40–50	40–50	40–50
2000 n.m. SS–5				
Soft	60–70	65–75	70–80	70–80
Hard Silo *	20–30	40–50	50–60	50–60
TOTAL SOFT	600–620	610–635	610–640	610–640
TOTAL HARD *	60–80	80–100	90–110	90–110
GRAND TOTAL	660–700	690–735	700–750	700–750

* These estimates assume two launch silos per hard site.

68. In addition to the foregoing systems, the Soviets began in December 1962 to test fire a new missile to ranges of about 1,000 n.m. at Kapustin Yar. The pace of the testing program has been slow, with only about five firings to date. We know little about the new missile, except that it has unusual propulsion characteristics which could indicate either a liquid or a solid-fueled system. The new vehicle may form part of a follow-on development program for either MRBMs, IRBMs or both. It may be for ground or submarine launching, or both.

69. If a normal development cycle is followed with good success, a follow-on system of MRBM range could probably be operational in small numbers by mid-1965. Such a system might be designed to have better accuracy than existing MRBM/IRBM systems (perhaps about 0.5 n.m.). In such a new system, the Soviets are also likely to be seeking simplified maintenance, reduced manning requirements, survivability, and fast reaction time. An improved liquid-fueled system might be designed for long service in a high readiness condition in hard silos, or for greater flexibility and security of deployment in a mobile configuration. A solid fueled system would be well suited to silo or submarine deployment, but its weight might make it impractical for road-mobile use in the USSR and East Europe. In any event, we think it likely that a follow-on system entering service in about 1965 would begin to replace the older SS–4, rather than adding to the gross size of the MRBM/IRBM force.

B. Operational Characteristics of the 1963–1965 Force*

70. Documentary evidence on the original Soviet concept for deployment of MRBMs revealed that the USSR once contemplated a system of alternate sites to increase survivability. This concept apparently was not pursued extensively, and we believe that virtually all MRBM and IRBM launch positions, including those of soft sites, are primary positions manned and equipped to participate in an initial salvo.

71. There are probably exceptions to the general rule that soft sites are fully equipped. These sites would resemble those constructions in Cuba and fit the description of alter-

* For detailed estimates of characteristics and performance, see Annex A, Table 1.

nate MRBM launch positions in classified Soviet documents of 1960 and 1961, which indicated that MRBM units were to move to such sites for protection under certain conditions, usually after firing a first salvo from the primary site. It seems likely that some such sites will be constructed by the Soviets to improve the chances of survival of the MRBM force.

72. Firing procedures appear to be largely manual. We believe that even under the most favorable conditions and with a time to fire given sufficiently in advance, the bulk of the force could probably be launched in a salvo extending over a period of some 15–30 minutes from the time the first missile is launched. Reaction times are long, but are probably better for hard silos than for soft positions. We cannot definitely determine the degree of hardening at hard MRBM/IRBM sites, but on the basis of present evidence and analysis we believe these sites can probably withstand overpressures up to 100–300 psi.

73. There has been much evidence that the Soviets intend to provide a substantial refire capability for their MRBM/IRBM force. Based in part on information from classified Soviet documents, we believe that the soft sites are intended to be supplied with two missiles for each launcher. It is highly unlikely that hard silos are intended to have a refire capability. We now have fairly good evidence on Soviet production of MRBMs and IRBMs, which leads us to believe that a full second salvo is probably available to all IRBM soft positions, but not yet to all MRBM soft positions. This evidence also indicates that production is continuing despite the cutback in deployment of new sites, and we believe that by mid-1965 each soft MRBM position could have a second-salvo missile available to it.

IV. SUBMARINE-LAUNCHED MISSILE FORCES, 1963–1965

74. Current Soviet submarine-launched missile forces are the outgrowth of decisions taken in about 1954–1955 to develop quickly a fairly extensive but unsophisticated capability. The USSR now possesses a considerable number of diesel-powered submarines and a much smaller force of nuclear-powered submarines equipped with missiles. The majority of these are designed to carry ballistic missiles suitable for employment against land targets; the remainder are equipped with cruise missiles, which were evidently designed primarily for use against surface ships but can also be employed against land targets.

75. Both public and classified Soviet statements indicate that the initial mission of the ballistic missile submarines was "to carry out strikes deep in enemy territory and to support ground force operations." The advent of ground-launched systems in operationally significant numbers, together with limitations in the capabilities of the submarine systems, evidently led the Soviets in the late 1950's to reconsider the role of the submarine missile force. Information from Soviet classified military writings as well as the operational practices of the force indicates that it is probably not now assigned the mission of participating in initial strategic attacks. Evidence indicates that both ballistic and cruise missile subs are to disperse and protect themselves in the event of war, and then to participate to the extent feasible in attacking Western targets. At about the time this concept was defined for the existing forces, however, the Soviets also initiated the development of more advanced missile submarine systems. We believe that in the near future these programs will give a new dimension to Soviet missile submarine forces, by bringing into service weapon systems better suited to attacks on Eurasian and North American land targets and Western naval forces at sea.

A. Developments in Ballistic Missile Forces

76. As of October 1963, the USSR possesses about 50 operational submarines capable of surface-launching 350 n.m. liquid-fueled SS–N–4 ballistic missiles. This force includes 11 nuclear-powered H class and 31–33 diesel-

powered G class submarines, each of which is probably capable of launching its complement of three missiles within about 5–8 minutes after surfacing. Another 7 diesel-powered Z class submarines were converted to carry and launch two such missiles each. The 140–145 missiles of this force can carry warheads yielding [ ] at present, and we believe that maximum yields of [ ] could be introduced within the next year or so. Although this force represents a considerable potential threat, its operational effectiveness is limited by a number of factors: (a) the small number of missiles per submarine; (b) the short range of the missiles and the need to surface before launching; (c) the operational limitations of the diesel-powered units, which comprise the bulk of the total force; (d) the unreliability of the propulsion systems of some nuclear-powered units; and (e) the continued absence of essential operational training cruises to likely combat areas.

77. Development is far advanced on a new ballistic missile designed for submerged launching. Our evidence on this system (now designated SS–N–5) remains very fragmentary, and there are critical uncertainties as to its size and the submarine class or classes for which it is designed. However, we estimate that SS–N–5 has a range of 700±50 n.m.

78. Because the G and H classes of submarines were designed in 1954–55, it is probable that both were designed to employ the 350 n.m. SS–N–4 surface-launched missile. The unusual height of their sails suggests that these subs carry their missiles in tubes which do not penetrate down into the pressure hull of the ships, but we do not know that this is the case. If the 700 n.m. SS–N–5, is about the same diameter as the 350 n.m. missile, it would probably need to be longer in order to carry a payload in the megaton range. Even greater tube length would probably be required to accommodate ejection gear for submerged launching if this gear were attached to the missile at its base.

79. We are unaware of any submarine project which we can point to as a candidate for a new class designed to employ the SS–N–5 missile. We continue to believe that there are probably one or more new submarine classes at some stage of development. Assuming that development schedules have paralleled that of the SS–N–5, an initial Soviet operating capability with this weapon system (in either nuclear or diesel-powered subs or both) could exist in the near future.

80. The SARK was displayed in Moscow parades in November 1962 and May 1963, and the Soviets described it as a submerged-launch missile. We cannot determine whether the SARK, a missile 48 feet in length and apparently equipped with ejection gear at its base, is the 700 n.m. submerged launch missile. Some calculations suggest that a missile of SARK's size and configuration could have a range of about 1,000 n.m.

81. We have again examined the possibility of retrofitting 700 n.m. submerged-launch missiles into exisiting G and H class submarines. If the SARK is the 700 n.m. missile, retrofitting would require such extensive modification to these submarines as to make it seem quite impractical. The incorporation of any missile longer than the SS–N–4 would require changing the basic design of the submarines if their tubes do not extend into the pressure hull, and this would be an expensive and difficult change. However, there is enough uncertainty in the evidence regarding tube configurations and the size of the 700 n.m. missile to raise the possibility that at least some submarines of the G and H classes will be retrofitted with the new missile. As between the two, we think this possibility is somewhat greater for the H class because it is larger and nuclear powered.

B. Developments in Cruise Missile Forces

82. In addition to ballistic missile submarines, the USSR now has operational some 18 submarines capable of the surface-launching

of 300 n.m. SS–N–3 cruise missiles. Of these, 12 are converted diesel-powered W class submarines, about half of them equipped to carry four missiles each and the remainder two each. The other six are nuclear-powered E class submarines, which carry six such missiles.

83. A new diesel powered submarine was sighted recently and has been designated the J class. Analysis of available evidence indicates that it is probably a cruise missile submarine and may carry two pairs of missile tubes similar to those carried by the E class.

84. The Soviet policy decision to acquire a cruise missile submarine force was made in 1956 or before. These systems were designed primarily to attack carrier task forces and other surface naval vessels, but can also be employed against land targets. Their low altitude flight profile (1,000–3,000 feet) and Mach 1 speed would complicate defensive problems. However, for attacking targets at ranges beyond the radar horizon the effectiveness of the system is limited by the requirement for a forward observer, such as an aircraft, ship, or submarine, to provide target data to the launching submarine.

85. The Soviets could add flexibility to the SS–N–3 system by programming the missile for high altitude flight, thereby extending its range to about 450 n.m. Such a development would provide greater diversification in the system's capability to attack both land and sea targets. There is also a possibility that the Soviets will incorporate a terrain-clearance guidance system to permit flight at 1,000 feet altitude over rugged terrain. Such a capability could be incorporated into operational systems within the next year or so, and could enable Soviet cruise missile submarines to direct either high or low altitude attacks at inland targets.

C. Estimated Force Levels Through mid-1965

86. The USSR will continue to expand its missile submarine forces, and improved missiles and submarines will probably become operational in the near future, but there is much uncertainty as to the scope and direction of the Soviet missile submarine programs at present. We believe that construction of G class subs ended in 1962, but it is possible that there will be additional construction of a modified version or a successor diesel-powered ballistic missile class. By this means the Soviets could increase the size of their force of ballistic missile submarines even if there are continued limitations on their production of submarines with nuclear power.

87. Shipyard deliveries of nuclear submarines have been relatively constant at about 7–8 units per year since 1960, but we believe that this rate can be increased to some 10 or more per year. The Soviets have divided this output among ballistic missile, cruise missile, and torpedo attack classes, and we believe they will desire additional units of all three types in order to meet their varied operational requirements. It seems probable that, if a new nuclear powered ballistic missile class has in fact been developed to employ the 700 n.m. submerged-launch missile, the H class construction program is giving way to it.

88. With respect to cruise missile classes, we estimate continued construction of the nuclear-powered E class, and we believe that the appearance of the new J class means that additional diesel-powered units will also be built. We expect construction to be at least at the rates previously observed for building submarines of these general types, and it is possible that the Soviets may now be placing additional emphasis on the cruise missile program because of the capability of this weapon system for attacking both land and sea targets.

89. In the table below, the ranges arise not only from our uncertainty as to the scale and pace of introduction of additional missile submarines, but also from uncertainty as to whether new classes of ballistic missile subs

are in fact under construction to employ 700 n.m. submerged-launch ballistic missiles. We have no basis for estimating the exact number of missiles which new classes of ballistic missile submarines will carry, but we think it likely that such designs would incorporate more than the three missile tubes carried by the older classes. It is also possible that there will be some retrofitting of G and H class subs with 700 n.m. missile over the next year or so. We estimate as follows the size and composition of Soviet missile submarine forces to mid-1965:

ESTIMATED SOVIET OPERATIONAL MISSILE SUBMARINES, 1963–1965

	1 OCT 1963	MID-1964	MID-1965
Ballistic			
Nuclear			
H-class [a] and/or Successor [b] (3 or more tubes)	11	13–15	15–20
Diesel			
Z-class (2 tubes)	7	7	7
G-class [a] and/or Successor [b] (3 or more tubes)	31–33	32–35	34–38
TOTAL DIESEL	38–40	39–42	41–45
Cruise			
Nuclear, E-class (6 tubes)	6	8–9	10–12
Diesel, W-class (2 and 4 tubes)	12	12	12
J-class (4 tubes)	1	3–4	5–8
TOTAL DIESEL	13	15–16	17–20

[a] Some H and G class units possibly will be retrofitted with 700 n.m. submerged-launch missiles. G class, if retrofitted, may have two launch tubes.

[b] Successor classes would be equipped with 700 n.m. submerged-launch missiles.

D. Operational Capabilities

90. The pattern of submarine deployment indicates assignment of the bulk of the ballistic missile force to operations in the Atlantic and assignment of the preponderance of the cruise missile force to the Pacific area. At present, some 40 of the 50 operational ballistic missile submarines are part of the Northern Fleet, while the remainder are assigned to the Pacific Fleet. On the other hand, most of the cruise missile submarines (including all the nuclear-powered units) are with the Pacific Fleet.

91. Whereas the diesel-powered ballistic missile submarines could perform patrols of limited duration off the coasts of the continental US, the diesel-powered W-conversion cruise missile submarines would require regular replenishment at sea in order to perform extended anti-shipping patrols. All the nuclear-propelled subs possess adequate range for any operation, but engineering difficulties have plagued the H class since its introduction into the fleet. On at least five occasions in the past four years (the most recent known to us is October 1962) propulsion plant failures aboard nuclear submarines have necessitated their being towed back to base. The propulsion system aboard the nuclear H class is very noisy, and the normal operating depth limit of the submarine is estimated to be only about 800 feet, whereas the depth capability of the G class is estimated at about 900 feet.

92. A key missing ingredient in the development of operational capabilities continues to be the conduct of realistic patrols to potential launch areas. We know of no routine patrols off the US or even off Western Europe. However, routine patrols to these areas could begin at any time. We believe that by the mid-1960's at least some Soviet missile submarines will be engaging in routine patrols in open ocean areas.

93. According to Soviet classified documents, the main mission of cruise missile submarine forces is to aid in countering Western naval nuclear strike forces, particularly US carrier task forces. It is clear, however, that a capability exists to attack land targets, and recent missile improvements are enhancing this capability. We still do not understand the exact method of employment

of these cruise missiles. Soviet documents indicate that submarines and aircraft will be used to locate ship targets. Homing guidance against such targets is probably provided by active radar aboard the missile, perhaps supplemented by passive techniques. We do not know how the missile would be directed at any particular unit in a large task force.

V. LONG RANGE BOMBER FORCES, 1963–1965

94. Continued investment in improving Long Range Aviation (LRA) indicates that the USSR plans to maintain sizable bomber forces for at least the near term. Improvements over the past few years include introduction of a new medium bomber, introduction of air-to-surface missiles, and improved aerial refueling capability. Maritime reconnaissance is a secondary role of LRA, and maritime activity involving both heavy and medium bombers of LRA has increased during the past year or so.

A. Force Levels and Equipment

95. Soviet LRA, by reason of its equipment, basing, and deployment, is much better suited for Eurasian operations than for intercontinental attack. The bulk of the force is deployed in the Western USSR, the Ukraine, and the southern portion of the Soviet Far East. BLINDER is the only bomber known to be in production, but there are indications that there may be some new production of BEAR in addition to modification. The evidence also indicates a relatively stable number of medium bombers in inventory over the past two years or so. As of October 1963, LRA is estimated to comprise about 180–205 heavy and 940–975 medium bombers and tankers. The heavy bomber force includes about 95–105 BISON jet bombers and 85–100 BEAR turboprops. Of the medium bombers, about 40–50 are BLINDER, with supersonic dash capability, and the remainder are BADGER. There are additional 360–370 BADGERs and 10–20 BLINDERs in Naval Aviation.

96. Recent trends point to little change in the aircraft strength of LRA over the next two years. While we cannot exclude the possibility that Khrushchev will institute a drastic reduction in the numbers of BADGERs in LRA, we believe that a phase out in BADGER strength is more likely and that it will be compensated in part by the further introduction of BLINDERs.* This aircraft has appeared in two configurations: the BLINDER "A", a bomb carrier, and the BLINDER "B", a missile carrier. Although only the BLINDER "B" has been observed with a refueling probe, a refueling capability could be developed for BLINDER "A" at any time. The small-scale deployment of BLINDER and relatively low rate of production lead us to believe that a modest force will be deployed in the next two years.

97. Although research and development on heavy aircraft is under way, no replacement for BEAR or BISON is in sight. Notwithstanding Khrushchev's recent assertion that the USSR has no strategic bombers in production and continued indications of Soviet emphasis on missiles for strategic attack, there is considerable evidence to support continued Soviet research on large manned aircraft, although no follow-on bomber program can be identified. BOUNDER, a large, supersonic bomber design of medium range, is apparently being used as a test bed and we doubt that it will enter inventory as an operational bomber. In any event, the lack of advanced testing or production evidence leads us to consider it unlikely that a new heavy bomber could enter the operational inventory of Long Range Aviation before 1966. Further modification and improvement of existing heavy bomber types is possible, and perhaps even some new production of BEARs.

* For a differing view see Assistant Chief of Staff, Intelligence, USAF footnote to Table at page 22, paragraph 98.

98. We estimate as follows the probable composition of LRA through mid-1965:

ESTIMATED STRENGTH OF SOVIET LONG RANGE AVIATION, 1963–1965*

	1 Oct 1963	MID-1964	MID-1965
Bombers and Tankers			
Heavy			
BISON	95–105	95–105	90–100
BEAR	85–100	85–100	80–100
TOTAL	180–205	180–205	170–200
Medium			
BADGER	900–925	800–850	700–750
BLINDER	40–50	75–100	125–175
TOTAL	940–975	875–950	825–925

* The Assistant Chief of Staff, Intelligence, USAF sees no reason to expect reduction of the BADGER force in the 1963–65 period. He believes the medium bomber force will be quite stable in size, and might expand somewhat as the BADGER units attrit at a somewhat slower rate than BLINDERS are introduced into the force. Such a program would retain an established capability while re-equipment proceeds with new aircraft, a practice which has been noted before in Soviet aviation. The Assistant Chief of Staff, Intelligence, USAF estimates the near-term medium bomber strength of the USSR as follows:

	1 Oct 1963	Mid-1964	Mid-1965
BADGER	900–925	850–900	800–850
BLINDER	40–50	75–100	125–175
TOTAL	940–975	925–1000	925–1025

He further believes the heavy bomber force will remain at approximately 200 bombers in this period, although the BEAR/BISON mix may change somewhat. Introduction of a longer-endurance aircraft based on the BEAR could begin in late 1964 or early 1965.

99. The Soviets have provided the BEAR aircraft with a standoff capability through the introduction of the Kangaroo (AS–3), a supersonic cruise missile with a maximum range against land targets of 350 n.m.* The AS–3 was probably designed for use against land targets, but may have limited effectiveness against naval formations, with greatly reduced accuracy and range. A major modification program has been under way since 1959 to equip BEARs for delivery of the AS–3, and 40–60 BEARs have been so modified to date.

* For estimated characteristics and performance of these and other Soviet air-to-surface missiles, see Annex A, Table 4.

100. We believe that all LRA medium bombers equipped with anti-shipping ASMs have been transferred to Naval Aviation. Both BISON and BEAR heavy bombers have conducted reconnaissance over US carrier task forces, and some of these aircraft were specially equipped for the reconnaissance role. This use of long range bombers was advocated in classified Soviet military writings, in which naval officers urged the use of these aircraft, particularly the BEAR, for maritime reconnaissance. In view of the naval reconnaissance missions performed by BEAR aircraft we cannot exclude the possibility that some BEARs will be transferred to Naval Aviation. However, we believe that attack on land targets remains the primary mission of most BEAR aircraft, and have made no allowance for transfers in our estimate of the future composition of Long Range Aviation.

101. A new supersonic ASM, the KITCHEN (AS–4) is being developed for the BLINDER "B." Evidence on this missile is limited. It is either a boost glide or a sustained cruise missile. It was probably developed for use against land targets but some evidence indicates naval use as well. It could be operational by mid-1964.

B. Operational Capabilities [1] [2]

102. A major obstacle to the development of capabilities for intercontinental attack by LRA has been the limited range of the BISON

[1] For detailed estimates of the characteristics and performance of Soviet medium and heavy bomber weapon systems, see Annex A, Table 5, Annex B, maps.

[2] The Assistant Chief of Staff, Intelligence, USAF differs in part from the argument in paragraphs 107 through 115. He believes attention should be focused on how many bombers could reach targets in the United States if, as could be expected in wartime, the USSR made an all-out effort to augment its still-small ICBM capability with strategic bombers. Such an all-out effort would appear particularly likely in view of Soviet concern over the importance of the initial nuclear exchange.

(Footnote cont. on Page 23)

and BADGER aircraft which make up the bulk of the force. The emphasis on aerial refueling and Arctic training of the past several years reflect Soviet efforts to overcome this limitation. The USSR has not developed an aircraft specifically for use as a tanker. Instead, BISONs and BADGERSs are converted for use as tankers with their bomber counterparts. BLINDERs could possibly also refuel from these tankers, but because of their shorter range probably would not be used against the continental US, except Alaska.

103. Some BEARs are now being modified for in-flight refueling. This modification was probably undertaken because of the range penalty involved in carrying the AS–3 missile; and possibly to increase endurance for a reconnaissance mission. About 15 BEARs have been modified for probe and drogue refueling, and we believe that additional BEARs will be so modified. BEAR is probably refueled by a BISON tanker.

104. Even with aerial refueling, the capabilities of LRA for intercontinental attack remain limited. Refueled BADGERs would be able to reach targets in the extreme northwestern portion of the continental US on two-way missions from Arctic bases, but they would have little flexibility of routing and tactics. However, BADGERs on two-way missions could provide coverage of many targets in Alaska, Canada, and Greenland. An operating manual for the BADGER indicates that the range of this aircraft is less than we have estimated. These data are presently under intensive study. The BISON would require both Arctic staging and inflight refueling to cover the bulk of US targets on two-way missions. Unrefueled BEARs could reach many targets in northeastern US directly from their home bases, but would probably stage through the Arctic when equipped with AS–3 or bomb loads of 25,000 lbs. or more, in order to gain extensive coverage of US targets. Refueled BEARs carrying AS–3 could reach many US targets directly from their home bases.

105. Training patterns and range capabilities of Soviet bombers indicate that aircraft attack against the US (except Alaska) would involve heavy bombers almost exclusively. We have previously estimated that the Soviets would commit their entire heavy bomber force to this mission as weapons carriers and tankers. Considering the requirements for Arctic staging, refueling, and non-combat attrition factors, the Soviets could put 90–115 heavy bombers over target areas in the United States on two-way missions. However, the increasing use of Soviet heavy bombers in maritime reconnaissance roles leads us to believe that a few such aircraft might be diverted to this mission.

106. The scale of the initial bomber attack could be increased should the Soviets choose to commit BADGER medium bombers to two-way intercontinental missions. Considering the probably use of less suitable Arctic airfields as staging bases, refueling, and non-combat attrition factors, we believe that up to 150 medium bombers could arrive over North American target areas on two-way missions. These bombers could attack Greenland, Canada, and Alaska, and portions of northwestern United States.

107. The Soviets could further increase the number of bombers arriving over North America should they resort to one-way unrefueled attacks with medium bombers. In order to conduct such attacks they would need to use BADGER crews which had not participated in Arctic training. With the growing Soviet ICBM and missile submarine forces this use

Considering all factors except combat attrition, the Assistant Chief of Staff, Intelligence, USAF estimates the USSR could put more than 300 bombers over North American targets on two-way missions and still leave several hundred medium bombers to attack targets in Eurasia.

Since the BADGER can carry a bomb with a yield four times as large as that of the warhead of an SS–7 missile, the Soviets might utilize BADGERS on one-way missions as part of the initial attacks, and in this case the number of bombers reaching the United States could exceed 500.

of the medium bomber force becomes increasingly unlikely.

108. We consider it probable that initial attacks would be mounted in successive waves and extend over a considerable number of hours.

VI. SPACE WEAPONS SYSTEMS

109. We examined in NIE 11–9–63* the military, economic, and political considerations involved in a Soviet decision on the orbiting of nuclear-armed satellites. At that time it appeared to us that, for the near term, the disadvantages to the USSR would outweigh the advantages, and we estimated that the chances that the Soviets would orbit a nuclear weapon during the next two years or so were less than even. The course of subsequent events, including the USSR's acceptance of a limited nuclear test ban and its cultivation of an atmosphere of relaxed international tensions, has strengthened this view. Gromyko's remarks before the UN in September 1963 suggest that the USSR may be willing to enter into a declaratory agreement with the US in which both sides undertake not to deploy nuclear weapons in space. Even if no formal agreement is reached, we think it unlikely that the Soviets will decide to orbit nuclear weapons in 1963–1965.

110. Should the Soviets nevertheless choose to place nuclear weapons in orbit during the next two years, we estimate that, using the SS–6 booster with suitable upper staging, they could assemble and launch a fractional or multi-orbit nuclear-armed satellite at any time without prior testing. The attainment of predictable reliability and accuracy, however, would require a series of tests extending over at least a year after an initial launching. With such testing, the USSR probably could deploy a small number of bombardment satellites with CEP's on the order of 5–10 n.m. and orbital lifetimes ranging up to several months. The nuclear payload could be [ ] if a combination of the SS–6 ICBM and a Venik upper stage were used for launching.

111. While we think that the Soviets are unlikely to orbit a nuclear weapon in the next two years, we believe that they will continue to investigate the feasibility of orbital bombardment systems, weighing the possible costs and effectiveness of such systems against those of alternative delivery systems. We have observed no test activity or other indications that the Soviets are working along these lines, but we would not necessarily detect and recognize such work prior to an initial launching. Even without any special efforts, their capabilities in this field will improve in the normal course of continued development of nuclear technology, ICBMs, and space projects.

VII. MAJOR SUPPORTING ELEMENTS

A. Command and Control

112. During the past two or three years the Soviet military high command structure has apparently been modified to speed the process of initiating or responding to strategic nuclear attack. The growth of nuclear and missile forces on both sides has almost certainly persuaded the Soviets to establish the command and control channels necessary for the swift initiation of military operations upon the decision of the political leadership. Our information does not permit a firm assessment of the flexibility of response and operational control which the Soviet high command could exercise over long range striking forces during the course of combat operations, but the general picture is one of less sophistication and precision than in comparable US forces.

113. Khrushchev's position in the military command structure corresponds roughly to that of the President of the US. We have information, some of it from classified docu-

* NIE 11–9–63, "Soviet Capabilities and Intentions to Orbit Nuclear Weapons," 15 July 1963, SECRET, RD. This estimate contains an examination of Soviet technical capabilities for orbital bombardment systems and the characteristics of various systems which the USSR might deploy in various time periods.

ments and some from public statements, about both a Supreme Military Council and a Supreme High Command; Khrushchev is chairman of the Council and Supreme High Commander. The Council, a body of high-level party, government and military officials, has existed since before World War II to provide a forum for discussion and decision on major issues of military policy. The Supreme High Command directed military operations during World War II with Stalin at its head, but was disbanded thereafter. Such information as we have suggests that steps have been taken in recent years to designate membership in the Supreme High Command and to develop procedures to permit the quick assumption by this body of top level control of military operations under Khrushchev should events so dictate.

114. At the present time, there is not, so far as we know, a single, unified military command for all elements of the Soviet long range striking forces. Coordination of operations among the three long range striking forces is the responsibility of the Ministry of Defense, whose General Staff is responsible for planning and probably targeting for the entire military establishment. Long Range Aviation is a major air command, missile-launching submarines and some medium bombers are assigned to Soviet fleets, and the missile forces have been designated a separate main component of the armed forces. Documentary information indicate that low-echelon units of missile forces, bombers, and submarines can be operationally controlled directly from Moscow.

115. We have no reason to suppose that there are any major weaknesses in the communications and control of long-range bombers or of Soviet missile submarines. Long Range Aviation has existed as a separate command throughout the post-war period, and missile submarines have been assigned to fleets for about five years. Thus, both bombers and missile submarines are attached to older commands which have had a number of years to develop and refine their communications and control arrangements. On the other hand, the Strategic Rocket Forces have new and pressing requirements in this field which are shared by neither bombers nor submarines. Classified Soviet documents have indicated that as recently as 1961, these requirements were not being met, and that serious shortcomings existed in communications, control, and data-processing within the Strategic Rocket Forces. These shortcomings probably stemmed both from the newness of the organization (announced in 1960) and the novelty of its command and control requirements. They were probably aggravated by the relatively rapid pace of missile deployment in 1961, and evidently by shortages of data-handling equipment at unit level. At that time the Soviets were dissatisfied with communications and control procedures as they affected the reaction time of missile units, and they have been attempting to speed them up through automation. We believe that these deficiencies have been largely overcome.

B. Long Range Reconnaissance

116. We believe that the USSR has devoted considerable effort to pinpointing potential targets for strategic attack in the US and elsewhere. The Soviets are probably able to achieve satisfactory target location data without employing overhead reconnaissance. High competence in geodetic mapping provides the USSR with an excellent base; we currently estimate that the Soviet geodetic error in location of US missile launch sites is on the order of 500–1,000 feet. By exploiting the wealth of open source material available in the US and adding refinements through clandestine operations, the USSR can probably locate Minuteman silos, for example, within a general range of 300 to 1,000 feet. Considering the combination of probable geodetic and target-location errors, we estimate that, in general, the USSR is able to locate US targets within a total error of less than half a mile.

117. Continuous and up-to-date information on the location and movement of key Western forces is a high priority Soviet requirement. In peacetime, this requirement is probably met in large part by the extensive Soviet direction-finding effort, which permits location of Western communications circuits and the units employing them. The Soviet direction-finding effort could retain a high degree of effectiveness under wartime or alert conditions in the absence of strict Western communications security measures and electronic emission control. The USSR supplements this effort by such means as the exploitation of open sources, clandestine observation, and signal intercept by a variety of means including trawlers.

118. Reconnaissance in support of Soviet long range striking forces could be further improved by the use of satellites employing electronic, optical and infrared sensors. We believe that in the past year the Soviets have employed the "Cosmos" satellites launched from Tyuratam on photographic missions. We cannot estimate detailed characteristics for this system, but the payload capability of these satellites (about 10,000 lbs.) provides a considerable potential for experimentation and growth.

119. In conducting any long range attack, the Soviets would desire to learn as rapidly as possible which targets had survived their initial strikes. We have no direct evidence on the Soviet approach to this problem. In theory, existing high-frequency back-scatter antennas located within the USSR could rapidly determine the general areas and yields of large nuclear explosions in the US. However, the Soviets could probably not be sure in advance whether this remote detection technique would be able to distinguish the exact locations and yields of a large number of nuclear warheads detonating over the US within a short period of time. In any event, the information obtained would probably not be precise enough to be used for retargeting ICBMs. It might assist in programming post-attack reconnaissance more effectively.

120. For more precise post-attack reconnaissance, the USSR would probably use manned aircraft which would have the advantage of being able to seek out and strike at targets missed in the first phase, or targets of uncertain location, without having to relay information to other attack components. The Soviets have developed a high-altitude, reconnaissance aircraft (MANDRAKE), similar to the U–2, which has an operating radius suitable for use against Eurasian targets. In addition, some of their present bombers could be employed in a reconnaissance role. Unmanned reconnaissance of targets in Eurasia might be performed by surface-to-surface aerodynamic vehicles. Such vehicles could become operational within the next two years. More comprehensive damage assessment could be achieved by employing reconnaissance satellites.

C. Electronic Warfare and Countermeasures

121. Soviet capabilities to disrupt Western strategic and tactical communications are considerable. The Soviets have developed a wide range of active and passive ECM equipment including improved chaff, radar, and communications jammers and various deceptive devices to counter Western defensive electronic systems, such as communications, air defense radar, and navigation aids. The USSR's present capability covers all the significant frequencies used by the West, from low frequencies up to 10,000 mc/s and possibly higher. Existing Soviet capabilities, however, are not likely to be effective against some of the more advanced US communications systems, such as those employing ionospheric and tropospheric scatter. The Soviets are continuing to enhance this capability, and equipment that will probably become available in the future will include such improvements as greater power and more sophistication.

122. *Airborne Systems.* The Soviets would probably employ some bombers in an ECM role. All units of Long Range Aviation are probably equipped and trained in the use of both mechanical and electronic ECM. All Soviet bombers can be equipped to carry chaff, and they have demonstrated capabilities for its employment under a wide variety of operational conditions. Air-to-surface missiles designed to home on radar transmitters, air-launched decoys to simulate bomber radar returns, and infrared decoy flares to counter heat-seeking air-to-air missiles could also be made available provided the Soviets see a requirement for them. Soviet aircraft are equipped with electronic jammers and have used them repeatedly in exercises. Future improvements could include broader band jammers, higher powered and more automatic equipment, and increased use of deception techniques.

123. *Countermeasures for Naval Use.* In recent years, the Soviets have given increased emphasis to development of shipboard ECM equipment, but such equipment is of only limited value to the long range striking forces. Because of the risk of detection, we doubt that Soviet submarines would employ active jamming, but passive intercept gear would be used to provide warning of Western radar and sonar search activity.

124. *Missile and Satellite Application.* The Soviets probably are continuing research on the reduction of radar cross-sections of missile nosecones, and may achieve significant results within the next five years. They have probably investigated various techniques for confusing radar, such as tankage vectoring and decoys to simulate missile nosecones. They may also develop active ECM, multiple warheads, etc., for inclusion in ballistic missile reentry systems.

VIII. TRENDS IN STRATEGIC ATTACK FORCES, 1966–1969

A. General Considerations

125. From the preceding analysis we can derive a number of characteristics which have marked the building of long range strike forces in the USSR:

(a) The USSR's research and development programs, as reflected in the expansion of test ranges and the development of successive weapon systems, have been vigorous.

(b) In contrast, the scale and pace of deployment programs have been uneven. Some systems, particularly those suited for attacking Eurasia, have been deployed steadily and in large numbers. Others, such as individual types of heavy bombers, ICBMs, and missile submarines, have often been produced and deployed in relatively small numbers.

(c) This behavior has reflected, in part, technical problems and economic constraints. But it also suggests that the USSR is willing to tolerate a condition of limited intercontinental capabilities and considerable vulnerability over long periods of time.

(d) Both doctrinal discussions and some features of weapons design, such as vulnerability and relatively slow reaction times, indicate that Soviet thinking about the complex problems of long range attack has been less sophisticated than that of the US.

(e) No well-defined strategic concept appears to have governed the forces deployed to date. The present composition of the force does not suggest that it was designed primarily for either preemption or retaliation.

(f) Present deployment and developmental efforts indicate that the USSR, despite the frequent public stress on surface-to-surface missiles, has retained diversified forces.

126. In NIE 11–8–62, we examined the ways in which the Soviets might employ their long range attack forces in time of war. We concluded in that estimate that the Soviet target concept is very broad and that, while Western nuclear delivery capabilities top the list, the USSR plans to strike at other military targets and at centers of communication, administration, and industry, making no special effort to minimize civilian casualties.

127. We estimated that, in a preemptive attack during the near term, the USSR would probably direct ICBMs and bombers against North America and MRBM/IRBMs, medium bombers, and missile submarines against Eurasian targets. We drew attention to the special difficulties of achieving simultaneity, locating US forces at sea, and attacking hard targets. We concluded that the Soviet long range strike forces would be inadequate to permit the USSR to launch initial attacks without expecting to receive devastating blows in return. In the same estimate, we noted the limitations on the USSR's ability to protect its long range strike forces against attack. We pointed out, however, that by virtue of hardening in the land-based missile force and improvements in the missile submarine force, the Soviets were reducing the vulnerability of a portion of the force in order to provide it with some prospect of survival and retaliation.

128. In the succeeding 15 months, the USSR has expanded its forces and has made improvements in the performance characteristics of various systems. There is evidence that questions of the character of general nuclear war and strategies for its conduct continue to be discussed. In none of these areas have changes appeared which substantially alter our appraisal of the USSR's near-term capabilities or indicate radically new approaches to questions of strategy. But if the outlook for the next two years is relatively unchanged, the prospects for the later 1960s are far less clear. A variety of factors could influence the numerical size, the mix of various systems, and the characteristics of individual weapon systems in the total force which will be deployed by mid-1969.

129. *Technical Factors.* Much will depend upon the specific successes achieved among the numerous R&D projects which now may be going forward. If, for example, the Soviets were to succeed in developing a new ICBM which could be dispersed and maintained at much less expense than current systems, they would probably concentrate on it in their deployment program. If not, present and improved versions of the SS–7 system would probably represent the bulk of ICBM capabilities added during the 1965–1969 period. We know that the USSR is developing a submerged launch submarine system of MRBM range, but because of uncertainties about such factors as the time of availability and the operational effectiveness of the submarine and its missile, we cannot predict how heavily the USSR will invest in such a system.

130. *Strategic Concepts.* We are confident that the desire for an effective deterrent is one of the primary concerns in Soviet policy toward long range striking forces. We expect this concern to be reflected in an increasing emphasis on survivability through hardening of ground-based missiles, expansion of the submarine force, and perhaps the advent of a mobile MRBM. We believe that the Soviets also attach a high deterrent value to very-high-yield warheads calculated to intimidate opponents by threatening cities, although they probably also see some military utility in these weapons for such purposes as attacks on key hardened installations. We believe that the concept of deterrence is probably advocated by those who, for more general reasons as well, wish to aim at fairly moderate-sized forces. We have no basis for estimating the force levels which might be associated in the Soviet mind with a satisfactory deterrent posture.

131. Various classified and public statements suggest that, as Soviet military leaders have begun to comprehend the gigantic difficulties of prosecuting a war in which the West strikes first, they have urged a preemptive strategy upon the political leadership. The military requirements of a fully effective preemptive strategy are themselves gigantic, although we are not certain that Soviet military thought fully appreciates these requirements yet. Arguments derived from

the concept of preemption may impart to Soviet programming during this period an upward pressure beyond levels which Soviet planners might associate with the concept of deterrence. On the other hand, evidence of current military programs and general political and economic trends in the USSR persuades us that Soviet policy in the latter half of the decade will not be governed by an all-out effort to achieve extensive capabilities for preemption against programmed Western strike forces.[1]

132. *Economic Constraints.* Expenditures on forces for strategic attack, plus those for strategic defense, have been the most active elements in Soviet military spending during 1958–1962, rising by some 115 and 70 percent respectively while total military expenditures increased by about 30 percent. These increases have greatly improved Soviet strategic capabilities, but they have been among the important causes of the general economic slowdown of recent years, and this slowdown has become a chief concern of the Soviet leadership.

133. While forces best suited for Eurasian use accounted for the bulk of spending on the long range attack mission in 1958, expenditures on intercontinental systems have shown more rapid growth and consumed well over half of total 1962 outlays on long range attack. With the MRBM/IRBM force levelling off and BLINDERS being produced at a relatively moderate rate, R&D and investment in weapon systems designed for the Eurasian theaters will decrease substantially in the future, although operating expenditures will remain high. Thus, the USSR has some new flexibility in the current period which will enable it to increase expenditures on supporting elements and systems for intercontinental attack, or reduce spending on total long range strike force, or choose some intermediate solution. We believe that because of other demands, both military and nonmilitary, the Soviets probably will not continue increasing total spending for long range attack at the 1958–1962 rate, which averaged about 20 percent annually. We expect some continued although more gradual rise in these allocations.[2]

134. *Effects of Other Programs.* Other programs compete with strategic attack forces, not only for resources in the broad sense, but also for scarce skills and quality materials necessary to all technologically advanced programs. Strategic defense is a major claimant in this competition. We believe that R&D spending on antimissile defense will continue at a high rate during the period of this estimate, whatever decisions are taken about ABM deployment. The economic demands of the Soviet space program are also substantial and draw on the same resources. In general, we believe that the USSR would have great economic difficulty in pursuing a policy which called for antimissile defenses of major cities, competition with the space program which the US has scheduled for this period, and the higher sides—both in numbers and performance characteristics—of our estimates for long range strike forces which appear in succeeding paragraphs.

[1] The Assistant Chief of Staff, Intelligence, USAF would reword the last two sentences as follows:

"Our evidence of current military thinking, even in view of general political and economic trends in the USSR, suggests that Soviet military policy in the latter half of the decade may be shaped to a considerable extent by further efforts to enhance pre-emptive attack capabilities. In any event, arguments derived from the concept of preemption probably will impart to Soviet programming during this period an upward pressure beyond levels which Soviet planners might associate with the concept of deterrence."

[2] The Assistant Chief of Staff, Intelligence, USAF considers it more likely that the rate of expenditure for strategic systems will continue to rise at least as rapidly in the coming years as it has since 1958, since these expenditures probably will include military space systems as well as follow-on missile and manned systems.

135. The present Soviet view of the likely character of future war also imposes on the USSR the requirement to maintain large theater forces. Expenditures on this mission, while they have declined somewhat in recent years, are still very large; in 1962, according to our estimates, they equalled about two-thirds of the combined expenditures on strategic attack and strategic defense. If the Soviets maintain theater forces at their present size and pursue the attempt to provide them with improved equipment and adequate supporting elements, these expenditures cannot be substantially reduced, although they can probably be held at about the present levels. We believe that the proper level of manpower and expenditures in the theater forces is likely to be a subject of continuing contention in the coming period, and it is possible that at some point substantial cuts will be made, thereby easing economic pressures somewhat.

136. *Political Factors.* In the present and prospective strategic situation confronting the USSR, there is much which argues for a policy of safeguarding national security through some fairly moderate level of military strength or even, more radically, through international agreements to limit or reverse the arms race. The experience of the past five years should show the Soviet leaders that their chief opponent is well able to match and overmatch them in numbers of long range delivery vehicles and is no less able than they to develop improved systems with superior performance characteristics. Similarly, Khrushchev has had occasion, in a series of crises, to observe the limits on the role which a long range strike force can play in furthering Soviet political objectives. At the same time, his advocacy of a higher priority for certain civilian economic programs appears to be growing stronger.

137. Our survey of current evidence on both development and deployment of systems for strategic attack suggests no radical change responsive to these considerations, but rather a general Soviet intention to continue improving their capabilities. The possibilities of a more substantial change in Soviet policy hinge in large part upon more general political changes, such as a new sense of the Soviet position in world affairs arising out of the Sino-Soviet conflict, or a new Soviet judgment about the value of strategic attack forces in supporting the USSR's political objectives.

138. In framing the estimates which follow, we have attempted to take into consideration all these factors, along with the specific evidence available concerning the various categories of long range weapon systems. These estimates are necessarily imprecise and are expressed in ranges meant to indicate the upper and lower limits outside which, in the absence of an arms control agreement, actual strength in the period 1966–1969 probably will not fall.

B. Intercontinental Ballistic Missile Forces

139. There is now available to us a considerable body of evidence from many sources, both on the general patterns of Soviet military policy and programs and on the development and deployment of long-range striking forces in recent years, from which it is possible to identify several broad trends likely to apply to the future growth of ICBM and other related forces. It appears quite likely that present Soviet programming calls for the acquisition of some hundreds of ICBM launchers for missiles with multimegaton warheads, though the specific size and composition of the force in the late 1960's could vary considerably within this general range. Efforts to improve survivability and readiness are evidently under way; the hardening of a portion of the land-based missile forces and the development of advanced submarine missile systems point to Soviet concern to have protected retaliatory capabilities.

140. None of the evidence available to us suggests, however, that the USSR contemplates forces designed to neutralize US strike

forces in an initial blow, nor do the Soviets appear to be seeking to match the US in numbers of intercontinental delivery vehicles. Soviet strategic attack programs place great emphasis on ICBMs, but these weapons are sharing available resources with other land-based and submarine systems, and we believe the USSR is investigating the feasibility of space weapons systems. Moreover, past Soviet investment in air defense and the vigor of ABM research suggest that the USSR may see its security best served by a combination of antimissile defenses and enormously destructive, though still numerically inferior, intercontinental strike forces. Our evidence thus leads us to believe that the Soviets see technological achievements in a variety of military fields, including ICBMs, as the best way of improving the USSR's strategic position relative to that of the US.

141. Program lead times and the general character of present Soviet missile and nuclear weapon technology will significantly affect the size and composition of the ICBM force for the 1966–1969 period. The major Soviet long-range missile programs which have been observed to date have required some 2½ to 3½ years from the initiation of construction of research and development launch facilities to achievement of an IOC, and at least two years more to achieve a significant force level, say 100 operational launchers. It is doubtful that the lower limit of these lead time ranges can be appreciably reduced. In general, therefore, any new ICBM systems to be deployed in quantity during the 1960's would need to be under development already or to begin development shortly.

Evidence of R&D Activities

142. Research and development activities at the Tyuratam missile test range, indicate that the Soviets will continue to improve and expand their ICBM force in the period beyond 1965. Current activity at Tyuratam almost certainly includes preparation for further space ventures and product improvement on existing ICBM systems as well as development on new weapons systems.

143. Since the available evidence is inconclusive concerning the specific nature of planned improvements to existing ICBMs or follow-on systems, we have based our estimates on these matters in large part on the Soviet need to correct deficiencies in the current force, tendencies in Soviet missile design, and Soviet technical capabilities.

Improved and Follow-on Systems

144. *Very Large ICBMs.* We continue to believe that the Soviets are developing a large vehicle (with a million or more pounds of thrust) which could be used as a space booster, as a "global rocket," or as a carrier for warheads yielding up to 100 MT. Assuming that test firings begin within the next few months, such a vehicle could probably have an initial operational capability in the period mid-1965 to mid-1966. If such a vehicle is employed as an ICBM, the initial deployed sites would probably be soft. To reduce the vulnerability of such a system and to maximize its contribution to strategic deterrence, the Soviets would probably wish to incorporate hardening at some stage in the program, but there are high costs and technical obstacles which might limit the degree of hardness practicable, or perhaps preclude hardening entirely.

145. *Standard-Size Follow-On ICBMs.* We believe that the Soviets would consider the primary qualitative improvements needed in the bulk of the ICBM force to be increased survivability, shorter reaction time, better accuracy, and decreased logistic and personnel support. A Soviet decision to develop and deploy a basically new ICBM in the SS–7 size class would depend largely on their view of the possibilities of meeting their operational requirements through product improvement on current systems. These requirements can probably be met almost as well and at much lower cost by product improvements to the SS–7 system as by a follow-on system of the same general type and weight.

146. Either a new ICBM system or product improvement to the SS–7 would probably include new launch site configurations improving force survivability and decreasing support requirements. New configurations may include semi-hard sites, or new single launcher SS–7 hard sites providing for much greater dispersal. Deployment sites of improved configuration could be under construction in the near future and become operational in the period mid-1965 to mid-1966.

147. Soviet development of an ICBM system as small as the US Minuteman would run counter to trends thus far discernible in Soviet long range missile systems and weapons designs. The Soviet chemical industry, particularly those elements which have to contribute to the development of large grain solid propellants, is one of the basic weaknesses of Soviet technology. Further, at present we have very little evidence on recent Soviet research and development to support an estimate that a solid or exotic fueled ICBM as small as Minuteman could become operational in the 1966–1969 time period. Nevertheless, some of the operational attributes of the Minuteman concept would reduce the main deficiency in the Soviet force—namely its vulnerability to US attack. The Soviets might find that a new system could go considerably further towards remedying this weakness than would an improved SS–7, and such a system might also reduce the high maintenance requirements associated with their present systems.

148. A new missile somewhat smaller than SS–7 using improved propellants could reach operational status in the period. We believe it likely that such a new smaller missile would be deployed in hard sites. We believe that a new, silo-launched, smaller missile would not start test firings for about a year and IOC would not occur until 1966–1967. Should the Soviets elect to deploy a new missile in soft or semi-hard sites, test firing could begin in the near future with an IOC in about mid-1965.

*Composition and Size of the ICBM Force 1966–1969**

149. Whether through product improvement, introduction of new missile systems, or both, the Soviets will increase the effectiveness of their ICBM force significantly during the period. Inasmuch as the USSR has concentrated primarily on liquid propulsion in the post-war period, while emphasizing development of efficient large nuclear warheads, the bulk of the Soviet long range attack forces operational prior to mid-1969 will consist of liquid-fueled missiles capable of delivering warheads from roughly 3 to 13 MT. We believe that total deliverable megatonnage will be increased by increased load-carrying characteristics of standard sized missiles and possibly by introduction of a very large ICBM. The accuracy of missiles added to the operational force during the period may be about 0.5–1.0 n.m. CEP. Decoys, other penetration aids, and warhead shielding could be incorporated at any time, with a sacrifice in payload, should the Soviets consider that they are required. Although there is evidence of Soviet interest in decoys, there is no known Soviet program to develop them.

150. We estimate that the deployment of currently operational missiles in soft launch sites will cease by the mid-1960's. The construction of sites for SS–7 may continue through the period, and may include improved hard or perhaps semi-hard configurations. A smaller system could become operational in the 1965–1967 period and could be deployed at a rapid rate. Very large ICBMs with warheads yielding up to 100 MT could enter inventory in 1965–1966, and would probably be deployed in relatively small numbers to supplement the force.

151. The low side of our estimate for 1969 (400 launchers) assumes that, in addition to deployment of a few very large ICBMs which

* The Assistant Chief of Staff, Intelligence, USAF disagrees in part with the analysis contained in paragraphs 158–162. See his footnote to Table on page 38.

begin to enter operational inventory in mid-1966, the Soviets will at about the same time introduce either a new, somewhat smaller ICBM or an improved SS–7, possibly in single-launcher hard sites. It further assumes that when the number of hard silos reaches a level of about 200 (about mid-1968) the Soviets will consider the resultant force, in conjunction with other strategic weapon systems, an adequate deterrent. The reasons why the Soviet force might develop in this manner include such economic considerations as the need to devote more resources to the civilian economy or to anti-missile and space programs as well as political factors.

152. The high side of our estimate for mid-1969 (700 launchers), takes into account the possibility that the deployment of soft launchers, perhaps including some semi-hardened sites, is carried somewhat further than in the preceding alternative; that a very large system is introduced somewhat earlier than 1966, and that over 200 launchers of a new type—an improved SS–7 or a new, somewhat smaller hard system, possibly in single silo sites—are deployed. Construction of such a force might reflect not only a Soviet concern for deterrence, but also an effort to put the USSR in a somewhat better position to undertake a preemptive attack if a Western strike appeared imminent and unavoidable.

153. Although the force levels indicated by the upper and lower limits of the range are derived from technical and strategic considerations, other force compositions and force levels within this general range are equally possible. Considering the probability of slippages in development and deployment programs for estimated new and improved ICBMs, we consider it unlikely that the operational force in 1969 will exceed 700 launchers. Considering the extent of present deployment activity and the Soviet requirement to maintain a credible deterrent, we doubt that the force will level off with fewer than 400 launchers. In both cases, the Soviets would recognize that the force fell far short of that required for a preemptive attack which might reduce devastation of the USSR to an acceptable level, but in either case, the force would include a protected component capable of devastating retaliatory blows if it survived.*

C. Medium and Intermediate Range Ballistic Missile Forces

154. As indicated in our near-term estimate, we believe that the SS–4 and SS–5 deployment programs have about run their course. By 1965, the operational force will probably have levelled off at some 700–750 launchers (some 15 percent of them hard), a full refire capability for soft launchers will probably be available, and an improved MRBM may have begun to enter the force. Beyond this point, the course of the program will depend, not only on the general factors described in preceding paragraphs, but also on Soviet technical possibilities in the MRBM/IRBM field and on trends in Western forces on the Eurasian periphery.

155. Among the technical possibilities, the most important is the Soviet option to proceed with development of a new IRBM having advantages over the SS–5 in accuracy, survivability, reaction time, maintenance, and sophistication of warhead design. If two separate systems are developed, the IRBM would probably phase in a year or so after the MRBM, i.e., in about 1966–1967. It is also possible that the Soviets have elected to work toward a single follow-on system which, by about the same time period, could cover all MRBM and IRBM ranges. In either event, follow-on systems are likely to feature hard or possibly mobile deployment.

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*The Assistant Chief of Naval Operations (Intelligence), Department of the Navy believes the force level is likely to be toward the low side (400) of the estimate presented here. In addition to the reasoning set forth in paragraph 160 and the last sentence of paragraph 162, he would add that a force level of 700, while adding appreciably to the cost of the program, would neither increase the Soviet deterrent posture commensurately nor even approach an acceptible capability for preemptive attack.

ESTIMATED SOVIET OPERATIONAL ICBM LAUNCHERS, 1966–1969 [1]

CONFIGURATION	MID-1966	MID-1967	MID-1968	MID-1969
Soft Launchers				
1st and 2nd Generation [2]	150–250	150–250	150–250	150–250
Very Large ICBM [3]	a few–20	10–30	20–40	25–50
Hard Launchers				
2nd Generation (three silos)	100–125	100–125	100–125	100–125
SS–7 (single launcher) or new smaller ICBMs	a few–25	50–100	100–175	100–250
Tyuratam	25	25	30	30
TOTAL (rounded)	275–450	325–525	400–600	400–700

[1] The Assistant Chief of Staff, Intelligence, USAF believes the lower side of the ICBM-spread in this Table is unrealistically low, and he considers that if the Soviets elect to focus on a new, small, more easily deployed system, the high side of the Table is too low.

The Assistant Chief of Staff, Intelligence, USAF forecasts two alternative Soviet ICBM force structures and considers that while the lower of these appears to be the more likely as of the present, the higher alternative could well be indicated by developments within the next two years.

Alternative I, which represents a force of 600–750 ICBMs by mid-1969, is based on projection of present evidence of site construction and launcher activation rates. It is quite similar in composition to the high side of the spreads shown in the Table above.

Alternative II starts from the same base in mid-1965 as does Alternative I, but Alternative II includes a small, highly reliable ICBM, deployed in semihard or hard sites, which by mid-1969 would represent about half of the entire ICBM forces.

The Assistant Chief of Staff, Intelligence, USAF estimates the size of the Soviet ICBM force under these alternatives as follows:

	Mid-1966	Mid-1967	Mid-1968	Mid-1969
Alternative I	375–450	450–550	525–650	600–750
Alternative II	375–500	500–700	650–900	750–1000

[2] May include some semi-hardened sites.
[3] May include some hardening by 1969.

156. Assuming that the target system remains essentially unchanged and the new missiles are more effective, we believe the Soviets would feel under no pressure to expand their total MRBM/IRBM force in 1966–1969. Improved systems will probably supersede present systems, and may have largely replaced at least the SS–4 by 1969, when that system will have been in operational service for nearly 11 years. Thus the proportion of hard sites (and of mobile launchers if introduced) will probably increase as the period advances. The re-use of existing deployment and support areas by new missile systems is likely, but some redeployment can be expected as time passes.

157. The developments which we can foresee in Western forces within range are not likely to add to potential Soviet MRBM/IRBM targets in a major way—for example, additional Polaris forces and possible mobile or seaborne MRBMs in NATO will be essentially untargetable by ballistic missiles. We therefore believe it likely that Soviet MRBM/IRBM force levels will remain fairly constant in 1966–1969, but we do not exclude the possibility that a general strengthening of NATO forces would generate enough concern in the USSR to result in some incremental expansion. Assuming no arms control measures involving nuclear-free zones in Europe, it is possible that political and military develop-

ments in NATO and the Warsaw Pact will at some point lead the Soviets to move some MRBMs into the Satellites, but we believe the Soviets are highly unlikely to turn any over to Satellite control. The Soviets will continue to retain their capability, exercised in Cuba in 1962, to deploy these systems rapidly to remote areas.

158. We have also considered the possibility that the Soviets will come to view the Chinese as a threat requiring them to allocate a portion of their MRBM/IRBM capability to possible employment against China. The advent of a nuclear capability in the hands of a completely intransigent Chinese regime could conceivably bring this about. In general, however, we think that worsening Sino-Soviet relations over a long period would be more likely to influence Soviet ground force deployment in areas near China, and perhaps to motivate the Soviets to retain more bombers, such as BADGERs, capable of employing conventional as well as nuclear weapons.

D. Submarine-Launched Missile Forces

159. The combined ballistic missile force in mid-1965 is likely to be about 55–65 submarines, of which some 15–20 will probably be nuclear powered. A portion may be armed with 700 n.m. submerged-launch missiles. The number of missiles carried by this total force will be at least 160–190, and it may be considerably greater if new classes of submarines have more than three tubes each. Some submarines will probably be engaged in routine patrols in open oceans, including areas within missile range of US targets. The force will thus add an important element of survivability to Soviet strategic attack capabilities.

160. We think the Soviets will continue to consider missile submarines an important adjunct to their ground-launched missile capabilities, and we expect the requirement for capabilities to attack surface naval formations to continue. On the other hand, the growth of the force may be affected by the availability in the USSR of increasing quantities of militarily competitive but less expensive delivery systems, especially hardened ICBMs. Beyond these generalizations, our estimate for 1966–1969 depends in considerable measure on the technical possibilities for still further improvement in submarine missile systems.

161. Longer range missiles would have advantages over present systems, especially by allowing submarines to operate in broader ocean areas while remaining within range of potential targets. Although there is no evidence indicating its ultimate use, if the new ballistic missile now being tested at Kapustin Yar to a range of about 1,000 n.m. is intended for submarine use, it could probably be operational in limited numbers of submarines by 1966, or perhaps even slightly earlier. If an even longer range missile is developed, it would probably require a new submarine class designed specifically for it, and such a weapons system could become operational later in the period. In general, we think the the chances of such a development would be greater if the Soviets can develop at some reasonable cost a system with a larger number of missiles per submarine. We have no evidence of work on new submarine projects beyond those about to become operational, but limitations in our ability to acquire such evidence are such that new projects can reach operational status without confirmation of their existence.

162. Considering all factors, including estimated construction capabilities and programs and the possibilities for improved systems, we believe that the number of additional nuclear powered ballistic missile submarines added to the force in 1966–1969 could range from 10 to 15. This range is due in part to our uncertainty about future Soviet allocations of nuclear submarines to the missions of torpedo attack and anti-submarine warfare. We believe that construction of diesel-powered ballistic missile submarines will probably be terminated by the mid-1960's. Existing units, with

the possible exception of the older Z class conversions, are likely to remain in service throughout the decade.

163. We do not anticipate significant technical changes in the cruise missile submarine force in 1966–1969. A new missile with increased range could be developed but this would increase the problems of coordinating targeting and guidance. Conversion of additional numbers of aging W class submarines seems unlikely. Some of the newer Z and F class submarines, which are diesel-powered but of significantly greater range, could be converted to the SS–N–3 role in order to further enhance Soviet naval capabilities against Western naval surface forces and sea lines of communications. The number of nuclear-propelled units to be added to the forces in 1966–1969 may be in the range of 6 to 12.

164. On the basis of these considerations, we estimate as follows the trends in Soviet missile submarine forces in 1966–1969:

ESTIMATED SOVIET OPERATIONAL MISSILE SUBMARINES 1966–1969

	MID-1966	MID-1967	MID-1968	MID-1969
Ballistic				
Nuclear	17–24	19–28	21–32	23–36
Diesel	41–45	41–45	41–45	41–45
Cruise				
Nuclear	12–16	14–20	16–24	18–28
Diesel	20–25	20–30	20–30	20–30

E. Long-Range Bomber Forces*

165. With the growth and improvement of missile capabilities, the Soviets would probably plan in the later 1960's to employ bomber forces in the follow-on attacks after initial missile strikes had been delivered, or to supplement the retaliatory blow if the USSR were attacked first. Aircraft equipped with penetration aids and nuclear weapons would probably be used for increasingly specialized missions, such as armed reconnaissance (including maritime) and attacks on selected hard targets, as well as on targets of uncertain location.

166. We believe that if the USSR actively pursues R&D work and commits funds for production and deployment, new military aircraft capable of intercontinental ranges could be brought to operational use in the 1966–1969 period. The Soviets are technically capable of developing either long endurance aircraft (for reconnaissance and/or low altitude penetration) or high altitude aircraft with maximum speeds of about Mach 2–3 in this time period. Considering the types and quantities of missile delivery systems they are likely to have in 1966–1969, as well as the probable continued availability of existing heavy bomber types, we think it unlikely that the Soviets will bring any follow-on heavy bomber to operational service during the period of this estimate. The Soviets will continue to advance their state-of-the-art in large and high speed aircraft, and their work on advanced transports will provide a technological and production base which they could shift to military purposes should they come to consider this necessary or worthwhile. If this occurs, US intelligence is likely to obtain indications of development and production at least a year or so prior to the entry of a follow-on bomber into operational units.

167. Barring this possibility, the increasing age of the BISON and BEAR, and continued phase-out of BADGER, will produce a reduction in both the heavy and medium bomber components of Long Range Aviation. The output of BLINDERs will probably continue to be shared between Long Range and Naval Aviation. BLINDER production may continue through at least the mid-1960's. It is possible that the further development of Soviet missile capabilities, coupled with renewed force reductions, will produce a sharper decline in the strength of Long Range Aviation. However, on the basis of present trends, and

* The Assistant Chief of Staff, Intelligence, USAF, disagrees in part with the analysis presented in Paragraphs 174–176. For his views see footnote following Table on page 41.

considering normal attrition, we estimate as follows the strength of Long Range Aviation in 1966–1969:

ESTIMATED STRENGTH OF SOVIET LONG RANGE AVIATION* 1966–1969

Bombers and Tankers	MID-1966	MID-1967	MID-1968	MID-1969
Heavy				
BISON	85–100	80–95	75–95	70–90
BEAR	75–100	70–95	65–90	60–85
TOTAL	160–200	150–190	140–185	130–175
Medium				
BADGER	550–675	400–525	300–400	200–300
BLINDER	175–225	200–275	200–325	200–350
TOTAL	725–900	600–800	500–725	400–650

* The Assistant Chief of Staff, Intelligence, USAF, disagrees in part with the discussion in Paragraphs 174–176 and with this Table since he considers they represent an underestimation of the importance the Soviets will continue to give to manned strategic aircraft as an important adjunct to their ground launcher missile capabilities.

He estimates that the introduction of a follow-on heavy bomber, the continuation of both BEAR and BISON in service at or near present strengths, the continued production of BLINDER through 1969, and the retention of sizeable numbers of BADGER aircraft will result in composition of Long Range Aviation as follows:

Bombers and Tankers	MID-1966	MID-1967	MID-1968	MID-1969
Heavy				
BISON	100	95	90	85
BEAR	100	95	90	85
FOLLOW-ON	0–10	0–30	10–45	20–65
TOTAL	200–210	190–220	190–225	190–235
Medium				
BADGER	725–775	650–700	575–625	500–550
BLINDER	175–225	225–275	275–325	300–350
TOTAL	900–1000	875–975	850–950	800–900

While the evidence to date is not sufficient to enable identification of the specific type of follow-on heavy bomber on which the Soviets will concentrate, the Assistant Chief of Staff, Intelligence, USAF, considers that the follow-on bomber could be a long endurance aircraft developed from the BEAR which could be introduced by 1965, a supersonic-dash bomber using technology from the BOUNDER and introduced in 1966–67, or a nuclear powered bomber introduced about 1968. These uncertainties are reflected in the spread in the tabulation above.

F. Space Weapons Systems

168. On the basis of evidence presently available, we are unable to determine whether the Soviets now have plans or programs for the military use of space. The limitations of this evidence, however, are such that our chances of identifying such programs are poor. We believe that the USSR almost certainly is investigating the feasibility of space systems for military support and offensive and defensive weapons. Soviet decisions to develop military space systems will depend on their expected cost and effectiveness as compared with alternative systems, and on the USSR's estimate of the reaction of other countries. In this connection, the Soviets would probably recognize that any deployment of an orbital bombardment system would be an act of major international import which would greatly intensify East-West hostility, prejudice the option of detente tactics, and give a strong new stimulus to Western military programs.

169. Any orbital bombing system of real military significance would require satellite vehicles in some number, and would accordingly be extremely complex and expensive. Important developmental progress toward such a system within the decade would require a major Soviet effort to perfect hardware and to develop advanced techniques. In considering whether to pursue such an effort, the Soviet leadership would examine the likely political military aspects of orbital bombardment systems in relation to the mix of forces for long range attack they would hope to have in the late 1960's and beyond, and the cost effectiveness of the alternative systems open to them. We think that they would be likely to consider orbital bombing systems primarily as a means of supplementing their existing types of forces rather than visualizing such weapons as replacement or substitute systems. They would probably also consider them as one way of introducing additional complications into US defense planning. Finally, they would probably consider

them as a qualitative advance in weapon technology which could support Soviet claims to a parity or even superiority in total strategic capabilities.

170. There is a wide range of delivery techniques and types of orbital forces which might be sought by the Soviets, with considerable difference in developmental requirements, costs, and effectiveness. To provide a threat of retaliation against population centers, they might find a relatively small force of limited effectiveness sufficient. For preemptive employment against smaller or harder military targets, however, a large sophisticated force with short times to target, near-simultaneity of delivery, and an accuracy approaching that of ICBMs, would be necessary.

171. For accomplishing military missions, we think that during the 1966–1969 period, orbital bombardment systems will not compare favorably with ICBMs in terms of reaction time, average life, reliability, vulnerability, accuracy, or targeting flexibility. In addition to being less effective militarily, an orbital bombardment system will be considerably more costly that an equivalent delivery capability with ICBMs. Based on considerations of cost and effectiveness as we now understand them, therefore, it would appear unlikely that the Soviets will during this decade deploy orbital bombardment systems of military significance. Further, if the Soviets enter into a formal obligation to refrain from orbiting nuclear weapons, this will constitute a factor inhibiting such deployment.

172. We recognize, however, that the Soviets might reach different conclusions as to cost and effectiveness, and in some future phase of East-West relations, political considerations might lose their effectiveness. Moreover, considering the pace of developments in the weapons field in general, it is extremely hazardous to estimate Soviet decisions for a period of many years ahead. For these reasons, a firm estimate as to whether the Soviets will deploy an orbital bombardment system within the 1966–1969 period cannot be made at this time.

173. If the Soviets do proceed with an orbital system, we believe that they are more likely to seek a small force of limited effectiveness than a very large and sophisticated one. In any case, developmental testing of an orbital bombardment system should be observable to us at least a year or two prior to attainment of an accurate, reliable system.

ANNEX A

ANNEX A

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.)

Surface-to-Surface Systems—Maximum range under operational conditions with warhead weight indicated. For long-range ballistic missiles, the maximum range figures disregard the effect of the earth's rotation. In general, ballistic missiles can be fired to ranges as short as approximately one-third the maximum operational range without serious increase in CEP and to even shorter ranges with degraded accuracy.

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

Circular Error Probable (CEP)—The radius of a circle in which, statistically, one-half of the impacts will occur. Inherent missile accuracies are somewhat better than the accuracies specified in the tables, which take into consideration average operational factors. For naval systems firing on coastal targets, an accurate determination of the launching ship's position is necessary to achieve CEP's of the order indicated in the tables.

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

Ready Missile Rate—A ready missile is an in-commission missile with warhead mated, mounted on an in-commission launcher in a trained unit which is considered ready to be committed to launch. Ready missile rate is the percentage of missiles on launcher which are "ready missiles."

Reliability, on Launcher—The percentage of ready missiles which will successfully complete countdowns and leave their launchers at scheduled times or within 15–30 minutes thereafter.

Reliability, in Flight—The percentage of missiles launched which detonate as planned in the target area (i.e., within three CEP's of the aiming point).

Readiness Conditions—The following conditions of readiness apply to all ground launched ballistic missiles having ranges greater than 350 n.m.

Condition 4: Launch crews not on alert. Nosecone and missile checked but not mated. Missile guidance system not adjusted for particular target and missile not erected or fueled.

Condition 3: Launch crews in launch area and on alert. Missile and nosecone mated and checked, but in prelaunch storage building.

Condition 2: Launch crews on station. Missile with nosecone erected on launch pad. Propellant facilities in position, attached, and ready to start propellant loading. Guidance system set.

Condition 1: Launch crew on station, missile propellant loading completed. Guidance rechecked.

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

Refire Time—Time required to refire from the same pad or launcher.

Table 1

SOVIET LONG-RANGE GROUND LAUNCHED SURFACE-TO-SURFACE MISSILE SYSTEMS ESTIMATED CHARACTERISTICS AND PERFORMANCE

CHARACTERISTICS & PERFORMANCE	DESIGNATION SHYSTER SS-3 [a]	SANDAL SS-4 [b]	SS-5 [b]	SS-6 [c]	SS-7 [b]	SS-8 [1,2]
Initial Operational Capability	1956	Late 1958	Late 1961	1960	Early 1962	Mid-1963
Max. Operational Range (n.m.) (NRE)	630	1,020	2,200	6,000	6,000	6,000
Guidance	Radio inertial	Inertial	Inertial, possibly with radio assist [d]	Radio inertial	Inertial, possibly with radio assist [d]	Radio inertial
Accuracy (CEP) (n.m.)	1.0	1¼	1.0	2	1–2	1
Warhead Weight (lbs)	2,000	2,200	3,500	6,000	3,500	2,000–5,000
Gross Lift-Off Weight (lbs)	60,000	88,000	150,000	500,000	280,000	180,000
Configuration	Single Stage	Single Stage	Single Stage	Parallel	Tandem (2 stage)	Tandem (2 stage)
Propellants	Non-storable liquid	Storable liquid	Storable liquid	Non-storable liquid	Storable liquid	Non-storable liquid
Ready Missile Rate *	80%	80%	80%	80%	85%	?
Reliability on Launcher *	90%	90%	80%	85%	85%	?
Reliability in Flight	80%	85%	85%	85%	90%	?
Overall reliability [f]	55%	60%	55%	60%	65%	55–60%
Reaction Time from Readiness Condition 4.	8 hours	8 hours	More than 8 hours	More than 16 hours	More than 10 hours	8 hours
3	2½–5 hrs	2½–5 hrs	2–3 hrs	12 hours	3–4 hours	2–3 hours
2	¾–2 hrs	¾–2 hrs [f]	½ hr [f]	1–2 hrs	½ hr [f]	½ hr [f]
1	15 min	15 min	5–15 min	5–15 min	5–15 min	5–15 min
Hold Time Condition 1	1 hour	Many hours	Many hours	1 hour	Many hours	About 1 hour
Refire Time	4–6 hrs	2–3 hrs [e]	4–6 hrs [e]	16 hours	10 hours [e]	4–6 hrs [e]

* *These reliability rates may be high, since the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects.*

[1] The Assistant Chief of Staff, Intelligence, USAF believes that the SS-8 is as likely to be large as small. If large, some of its characteristics would differ from those shown.

It is unlikely that a large missile would have the extremely short reaction times listed; rather, it is likely that reaction times would more nearly approach those listed for the SS-6. In addition, the gross weight and warhead weight would probably be within the following limits:

Gross Weight..... 350,000 to 500,000 pounds
Warhead Weight..... 8,500 to 15,000 pounds
Nuclear Yield.....

[2] For the views of the Director, Defense Intelligence Agency as to the size of the SS-8, see his footnote, page 14.

[a] The SS-3 system has probably now been phased out in favor of the SS-4.

[b] The SS-4, SS-5, SS-7, and probably SS-8 are deployed in both soft and hard configurations.

[c] Early tests of the SS-6 indicated that a heavy nosecone weighing 13,000 to 15,000 lbs was delivered to about 4,500 n.m. Based on heat transfer techniques available at that time, the warhead was estimated to weigh 6,000 to 10,000 lbs. Based on present technology, the SS-6 probably can deliver a 10,000 to 12,000 lb. warhead to the same distance (4,500 n.m.) provided that a new nosecone were developed and flight tested. With a Venik upper stage, the SS-6 could deliver a 17,000 lb. warhead to 4,500 n.m. range, but because of the probable degradation of accuracy and reliability, we consider such a combination highly unlikely.

[d] A radio beam may be used to establish direction reference.

[e] Probably somewhat higher for missiles in the hard configuration.

[f] Would probably be the normal readiness condition for hard configuration.

[g] For the soft configuration of these systems.

TOP SECRET

TABLE 2

SOVIET SUBMARINE-LAUNCHED MISSILE SYSTEMS ESTIMATED CHARACTERISTICS AND PERFORMANCE

CHARACTERISTICS AND PERFORMANCE	DESIGNATION		
	SS-N-3 [a]	SS-N-4	SS-N-5 [b]
Initial Operational Capability	1961	1960 [c]	1963
Type	Surface-launch cruise	Surface-launch ballistic	Submerged-launch ballistic
Maximum Operational Range (n.m.)	300	350	700 [redacted]
Speed	Low-supersonic	N.A.	N.A.
Cruise Altitude (ft.)	1,000–2,000	N.A.	N.A.
Guidance	Inertial with active terminal homing	Inertial	Inertial
Accuracy (CEP)	150 ft. with terminal homing against ships; 2 nm against land targets	1–2 nm	1–2 nm
Warhead Weight (lbs.)	500–2,000 (HE or nuclear)	1,500–3,500 (nuclear)	Unknown: 1,500? (nuclear)
Propulsion	Turbojet	Stor. liquid	Stor. liquid
Reliability on launcher*	80%	80%	70–90%
Reliability in Flight	85%	90%	80%
Reaction Time	5 mins	5–8 mins. to launch 3 missiles	Unk.

* *These reliability rates may be high, since the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects.*

[a] An improvement of the SS-N-3 is expected to appear in the near future. It will probably incorporate higher speed, and a higher cruise altitude, thereby increasing range capability to about 450 n.m. It could be incorporated in current cruise missile submarines, with little or no modification of the submarine.

[b] Characteristics estimated for the SS-N-5 are tentative. It has been launched from a submerged submarine to ranges of about 700 n.m. and there are indications in telemetry that it employs liquid propellants. The reaction time probably will be comparable with that of the SS-N-4 system.

[c] An interim operational capability probably was achieved about 1958 with a missile of lesser range.

TABLE 3

SOVIET MISSILE SUBMARINES ESTIMATED CHARACTERISTICS AND PERFORMANCE

TYPE/CLASS [a]	DIMENSIONS			PERFORMANCE			ARMAMENT		PATROLS CAPABILITIES [b/c]			
	LENGTH/ BEAM (FEET)	DISPLACEMENT SURFACED/SUB-MERGED (TONS)	MAXI-MUM OPER-ATING DEPTH (FT)	SURFACED SPEED (KNOTS)	SNOR-KEL SPEED (KNOTS)	SUB-MERGED SPEED/ (KNOTS) ENDUR-ANCE (NM)	TOR-PE-DOS [d]	MISSILES/ TYPE	DAYS ON STA-TION	RADII (NM)	PATROL DURA-TION (DAYS)	ENDUR-ANCE FACTORS
Ballistic Missile												
Nuclear-Power H	365/32	5,000	5,900	800	Max 20	NA		20	3/SS-N-4	20	5,300	60	Sea
					Cruise 12-14	NA	12-14/-			10	6,600		
Diesel-Power G	320/28	2,350	2,800	900	Max 17.5	10.5	16/12	24	3/SS-N-4	20	4,400	60	Sea
					Cruise 8.3	6.0	2/100			10	4,700	53	Fuel
										1	4,850	46	Fuel
Z-Conversion	295/27	1,950	2,400	750	Max 18.4	7.0	15/15	24	2/SS-N-4	20	4,300	60	Sea
					Cruise 8.5	7.0	2.5/125			10	5,450	60	Sea
										1	6,150	58	Fuel
Cruise Missile													
Nuclear-Power E	370/32	5,100	6,000	800	Max 20	NA	18/-	16	6/SS-N-3	20	5,300	60	Sea
					Cruise 12-14	NA	12-14/-			10	6,600		
										1	7,800		
Diesel-Power													
W-Conversion (TWIN CYLINDER)	249/21	1,050	1,350	650	Max 18.5	6.8	13.5/13.5	12	2/SS-N-3	20	1,800	40	Sea
W-Conversion (LONG BIN)	275/21	1,150	1,500	650	Cruise 10	6.8	2/100	10	4/SS-N-3	10	2,600	39	Fuel
										1	3,000	34	Fuel
J (4 cylinder)	280/33	Unk	Unk	Unk	Unk	Unk	Unk	Unk		Unk	Unk	Unk	Unk

[a] These submarine types represent the bulk of the Soviet submarine missile forces. In addition, one Z class was converted to fire one SS–N–4, one W class was converted to fire one SS–N–3, and at least one modified G class diesel-powered submarine is capable of the submerged launch of the SS–N–5. These few variants probably all served as test-beds.

[b] The time on station and radii (distance to station) have been computed on the basis of various operational factors, principally those relating to "Sea endurance" and "Fuel endurance".

"Sea endurance" is defined as the total length of time that a submarine can remain at sea without replenishment under combat conditions and is estimated on the basis of personnel endurance, general habitability, food, spare parts, and consumables other than fuel. The H and E classes of nuclear propelled submarines are estimated to have a "Sea endurance" of 60 days. The G and Z-Con. classes of diesel powered submarines are estimated to have a "Sea endurance" of 60 days, while the W-Con. is estimated to have a "Sea endurance" of 40 days.

"Fuel endurance" is defined as the total length of time that a submarine can remain on patrol under combat operational conditions without refueling. For diesel-powered submarines, it is computed on the basis of fuel consumption resulting from an arbitrarily assumed average transit routine of 8 hours surface, 8 hours snorkel, and 8 hours submerged operations daily; fuel consumption on station is computed on the basis of a few hours of snorkel operations daily, sufficient only to maintain the state of charge of the main storage battery for submerged operation the remainder of the day.

The endurance and maximum operating radii of nuclear-powered submarines are limited by factors other than fuel. For the purposes of this table it has been arbitrarily assumed that Soviet nuclear-powered submarines would transit to station using the following criteria:

Speed of 7 kts in area where ASW opposition is anticipated (assumed to be about ⅓ of the time).

Speed of 13 kts in areas where ASW opposition is not expected (about ⅔ of the transit time).

[c] Selected distances from Soviet ports:

FROM–TO	ICELAND	NORTH WEST BRITISH ISLES	HALIFAX	BERMUDA OR NEW YORK	NORFOLK	GIBRALTAR	PANAMA
Kola Inlet.....	1,500	1,600	3,350	3,950	4,000	2,950	5,600

FROM–TO	SEATTLE	HONOLULU	MANILA	LOS ANGELES	SAN FRANCISCO	SINGAPORE	PANAMA
Petropavlovsk.....	3,200	2,750	3,100	3,600	3,400	4,200	6,500
Vladivostok.....	4,400	3,700	1,900	5,000	4,550	3,000	7,750

[d] Torpedo capacities are the maximum numbers which can be carried. Any combination of torpedoes/mines could be carried, substituting two mines for each torpedo.

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TABLE 4

SOVIET AIR-TO-SURFACE MISSILE SYSTEMS ESTIMATED CHARACTERISTICS AND PERFORMANCE

				KITCHEN AS-4 •	
	KENNEL AS-1	KIPPER AS-2	KANGAROO AS-3	IF DESIGNED FOR BOOST GUIDE FLIGHT PROFILE	IF DESIGNED FOR SUSTAINED CRUISE FLIGHT PROFILE
Initial Operational Capability	1956–1957	1960–1961	1960–1961	1964	1964
Max. Operational Range (n.m.)	55	100	350	425	260
Guidance					
Against Ships	Beam riding with semi-active homing	Mid-course inertial with active radar terminal homing	Inertial	Unknown	Unknown
Against well defined targets on land	Beam riding	Mid-course only	Intertial	Unknown	Unknown
Accuracy (CEP at Max. Range)					
Against Ships	150 feet	150 feet	[c]	Unknown	Unknown
Against land target	1 n.m.	1 to 2 n.m.	1 to 2 n.m.	1 to 2 n.m.	1 to 2 n.m.
Warhead					
Type	HE or nuclear	HE or nuclear	Nuclear	Nuclear	Nuclear
Weight (lbs.)	2,200	2,200	5,000	2,200 ±	2,200 ±
Speed (MACH No.)	0.8 to 0.9	1.6	1.5 to 2.0	6.5 at 105,000 feet altitude	3.0 at 80,000 feet altitude
Reliability on Launcher*	90%	80%	80%	Unknown	Unknown
Reliability in Flight	80%	70%	70%	Unknown	Unknown
Employment	Primarily anti ship; could be used against land targets	Primarily anti ship; could be used against land targets	Primarily against land targets	Unknown	Unknown
Carrier aircraft	BADGER B [b]	BADGER C	BEAR B	BLINDER B	BLINDER B
Number of missiles	2	1	1	1	1

* *These reliability rates may be high, since the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects.*

• Estimated characteristics are indicated for alternative flight profiles compatible with missile design and are deduced solely from limited photography.

[b] To launch AS-1, BADGER must be at an altitude under 20,000 feet, and at a speed below 215 knots.

[c] May have some limited capability against naval formations with greatly reduced accuracy and range.

TABLE 5

SOVIET MEDIUM AND HEAVY BOMBER WEAPON SYSTEMS

Estimated Performance Under an Optimum Mission Profile

(Calculated in accordance with US Mil-C-5011A Spec except that fuel reserves are reduced to permit a maximum of 30 minutes loiter at sea level, and aircraft operate at altitudes permitting maximum radius/range.)

	BADGER [2]*	BISON	BEAR [3]	BLINDER [4]
Combat Radius/range (nm) [1]				
a. 25,000-lb bombload,	—	2700/5100	4150/7800	—
one refuel	—	3650/6900	—	—
b. 10,000-lb bombload,	1800/3450	2900/5700	4500/8800	1350/2750
one refuel	2500/4750	3800/7500	—	1850/3750
c. 3,300 lb. bombload,	2000/3900	3000/6000	4700/9300	1550/3300
one refuel	2650/5200	3900/7800	—	2150/4400
d. With ASM				
i. 2xAS-1	1400/2500	—	—	—
one refuel	1950/3400	—	—	—
ii. 1xAS-2	1600/2950	—	—	—
one refuel	2250/4100	—	—	—
iii. 1xAS-3	—	—	3900/7300	—
one refuel	—	—	5200/——	—
iv. 1xAS-4	—	—	—	1200/2450
one refuel	—	—	—	1800/3600
Speed/Altitude (kts/ft)				
a. Maximum speed at optimum altitude, 10,000-lb bombload	555/14000	535/19000	500/25000	825/36000
b. Target speed/target altitude, 10,000-lb bombload	475/42000	460/43000	435/41500	690/42000
c. Launch speed/launch altitude with ASM				
i. 2xAS-1	250/300/ 10000/20000	—	—	—
ii. 1xAS-2	425-475/39000	—	—	—
iii. 1xAS-3	—	—	420/39000	—
iv. 1xAS-4	—	—	—	630/41000
Combat Ceiling (ft)				
a. 10,000-lb bombload or ASM(s)	47,000	46,000	41,000	52,500
System Accuracy (CEP)				
a. Bombing accuracy [5]				
i. From 40,000 ft.	2000-2100 ft.	2000-2100 ft.	2000-2100 ft.	2000-2100 ft.
ii. From 20,000 ft.	900-1400 ft.	900-1400 ft.	900-1400 ft.	900-1400 ft.
b. ASM accuracy				
i. AS-1	150 ft. vs. ships; 1 nm vs. coastal targets	—	—	—
ii. AS-2	150 ft. vs. ships; 1-2 nm vs. coastal targets			
iii. AS-3	—	—	1-2 nm vs. land targets	—
iv. AS-4	—	—	—	1-2 n.m. vs. land targets
System Reliability (%)				
a. Aircraft reaching target areas in North America unrefueled/ refueled	73/69	73/69	73/77	73/69
b. ASM reliability on launcher**/ in flight				
i. AS-1	90/80	—	—	—
ii. AS-2	80/70	—	—	—
iii. AS-3	—	—	80/70	—
iv. AS-4	—	—	—	?

* *Soviet operating manuals for the BADGER contain data which indicate that the range of the BADGER is less than we have estimated. These data are presently under intensive study.*

** *These reliability rates may be high, since the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability, and we have no reliable basis for estimating these effects.*

[1] The range and radius figures given in this table are maximum figures. They are applicable to the most up-to-date models of these aircraft, flying optimum mission profiles on direct routes. The use of older model aircraft, standard mission profiles, indirect routes, low-level penetration or other tactics designed to delay or evade detection and interception would reduce the effective range. The calculation of degration in range and radius resulting from sophisticated penetration tactics is a complex process which can best be accomplished for individual missions. As a rule-of-thumb for low-level operations of heavy bombers, the radius at optimum altitude will be decreased about 1.6 to 2 miles for every mile flown at sea level.

[2] BADGERs have been observed with 2 AS-1 missiles (55 n.m. range), KENNEL, or with 1 AS-2 missile (100 n.m. range), KIPPER.

[3] BEARs have been equipped to carry one AS-3 missile (350 n.m. range), KANGAROO, rather than a bombload. The AS-3 missile is estimated to weigh about 20,000 lbs. Some BEARs are being equipped for probe and drogue refueling.

[4] BLINDER A is a bomb carrier, which was observed without refueling probe; range and radius estimates assume a dash of 200 n.m. at M 1.2. A refueling capability could be developed for BLINDER A at any time. BLINDER B has aerial refueling equipment and carries one AS-4 KITCHEN; range and radius missions include 100 n.m. dash at M 1.1. Radius estimates for both versions include supersonic dash into and out of target area, while ranges include dash into area only.

[5] Bombing accuracies indicates are for visual bombing or radar bombing against well-defined targets with free-fall bombs. These figures are not applicable to drogue-retarded bombs, which would be much less accurate.

[6] Includes the following operational attrition rates, excluding combat attrition: (a) 90% of aircraft at home bases would be in commission after 5-10 day maintenance standdown prior to initial operations; (b) 90% of aircraft in commission at home bases would be launched from staging bases; (c) 90% of aircraft launched from staging bases or directly from home bases on unrefueled missions would arrive in target areas; (d) 85% of aircraft launched on refueled missions would arrive in target areas. Calculations for BEAR with ASM are based on refueled flights direct from home bases. All others assume arctic staging and refueling of BADGER, BISON, and BLINDER aircraft. It should be noted that without prior maintenance standdown, the in commission rate of heavy bombers at home bases would be about 70%, and for medium bombers about 60%.

TABLE 6

ANNEX B

(6 Maps)

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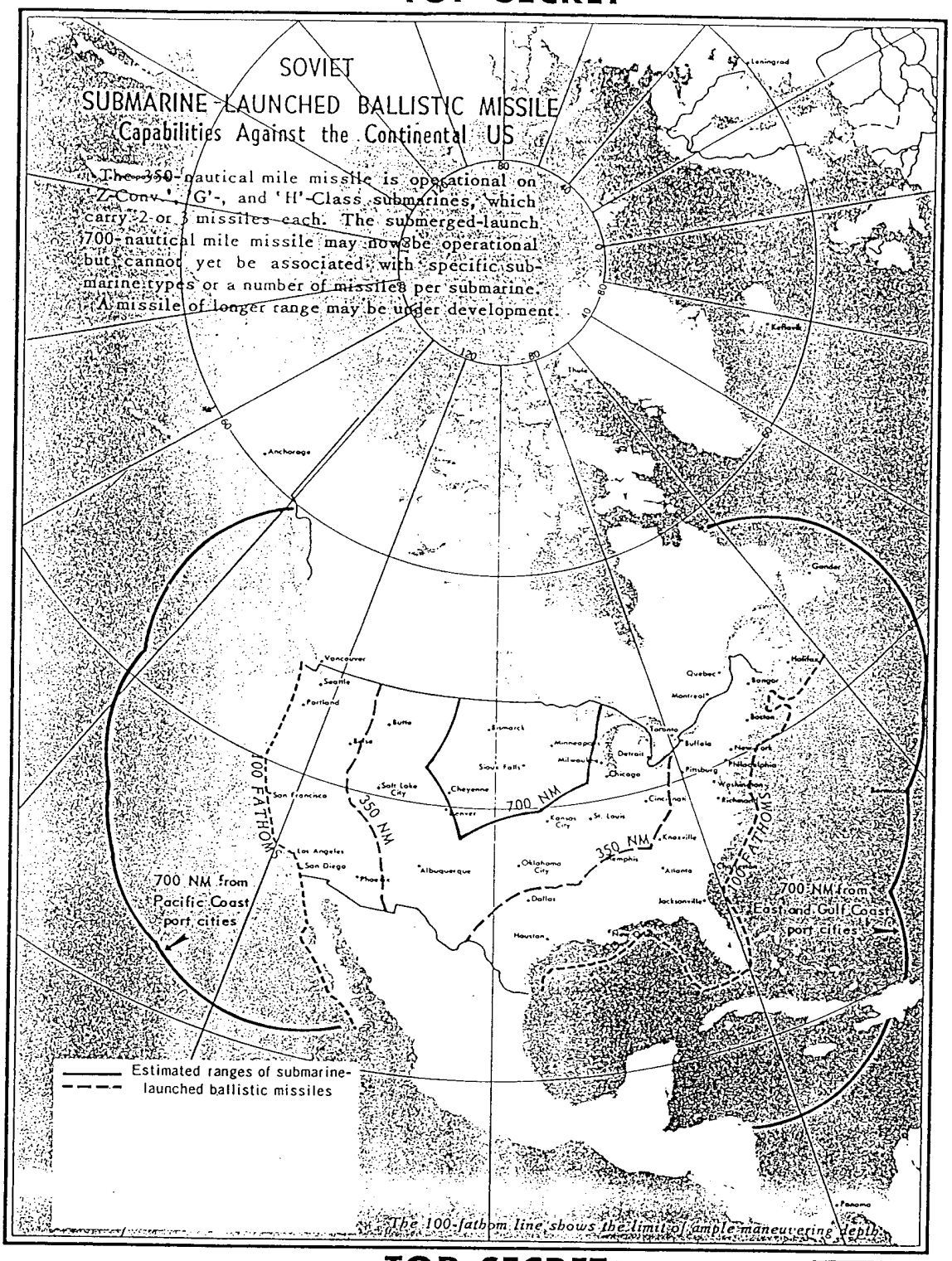
SOVIET SUBMARINE-LAUNCHED BALLISTIC MISSILE Capabilities Against the Continental US

The 350-nautical mile missile is operational on 'Z-Conv', 'G'-, and 'H'-Class submarines, which carry 2 or 3 missiles each. The submerged-launch 3700-nautical mile missile may now be operational but cannot yet be associated with specific submarine types or a number of missiles per submarine. A missile of longer range may be under development.



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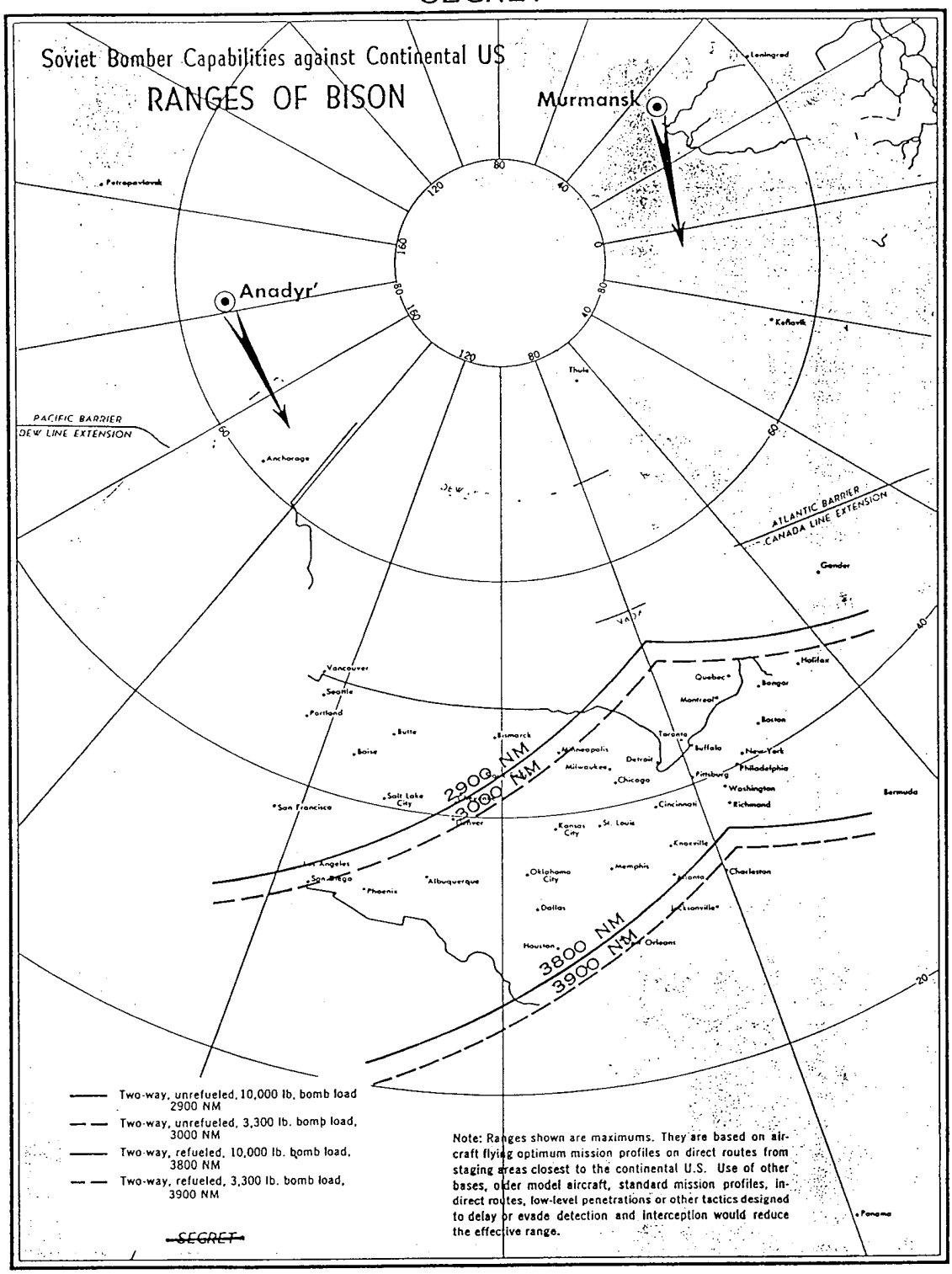

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GROUP 1
EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

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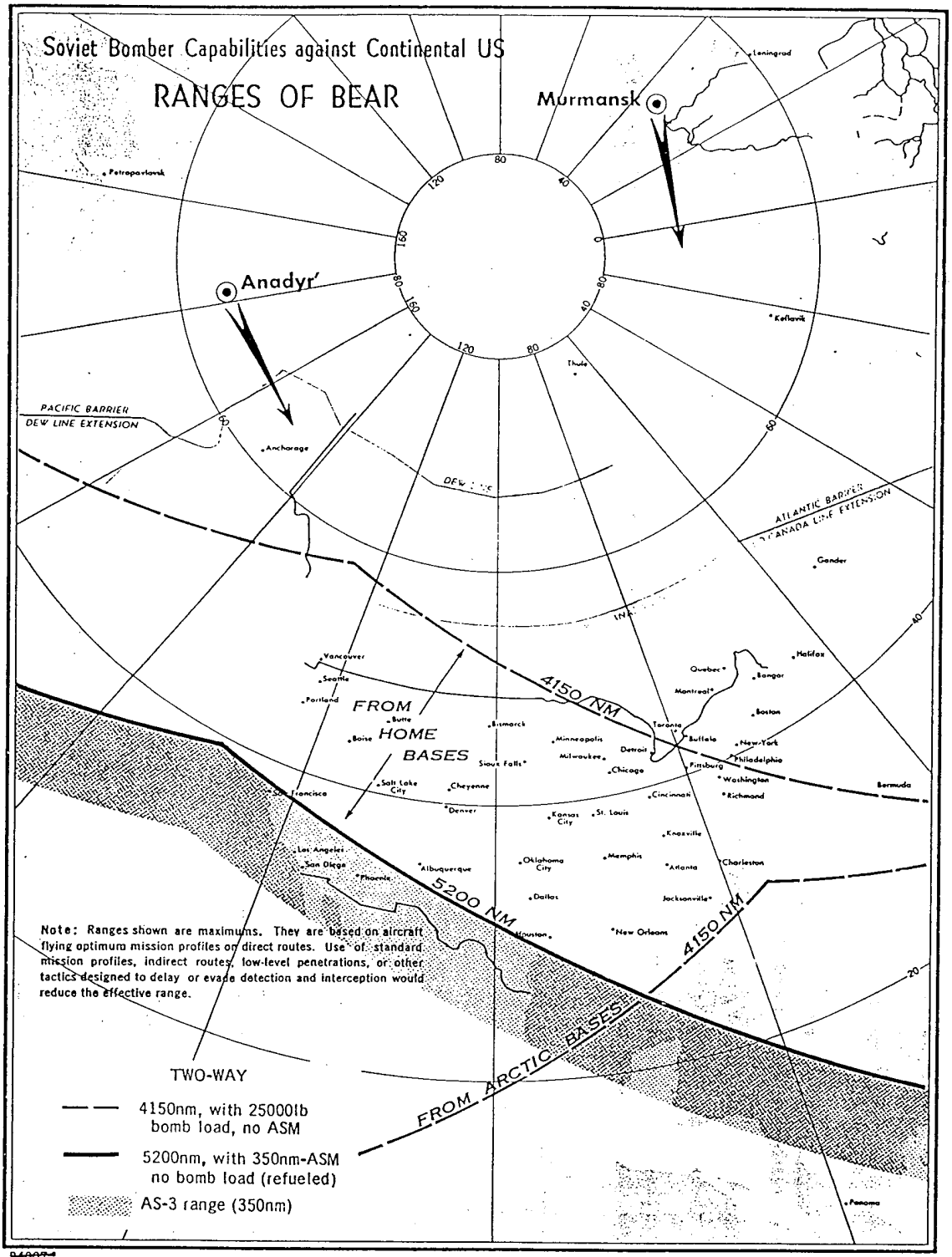

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GROUP 1
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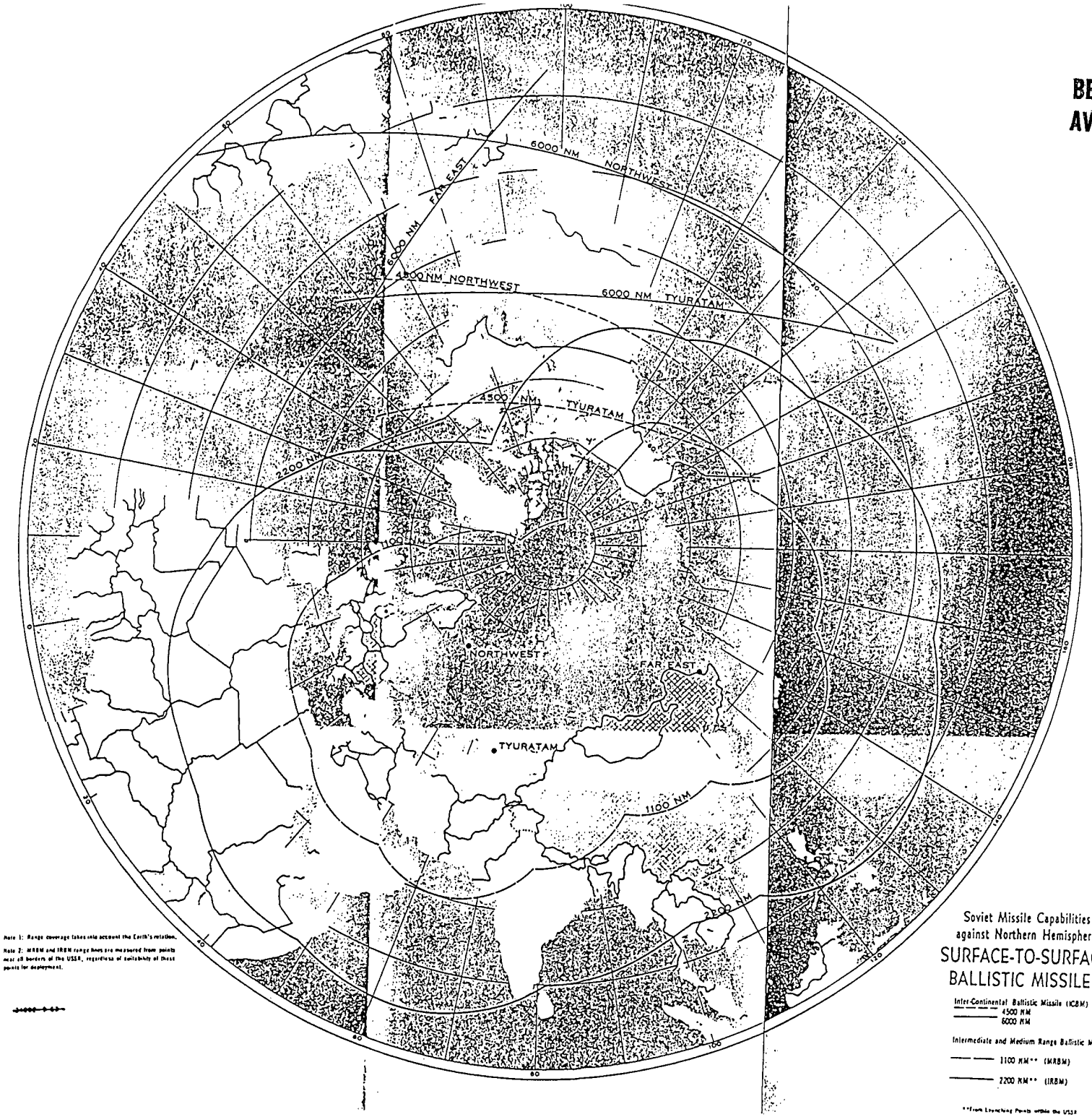


Note 1: Range coverage takes into account the Earth's rotation.

Note 2: MRBM and IRBM range lines are measured from points near all borders of the USSR, regardless of suitability of these points for deployment.

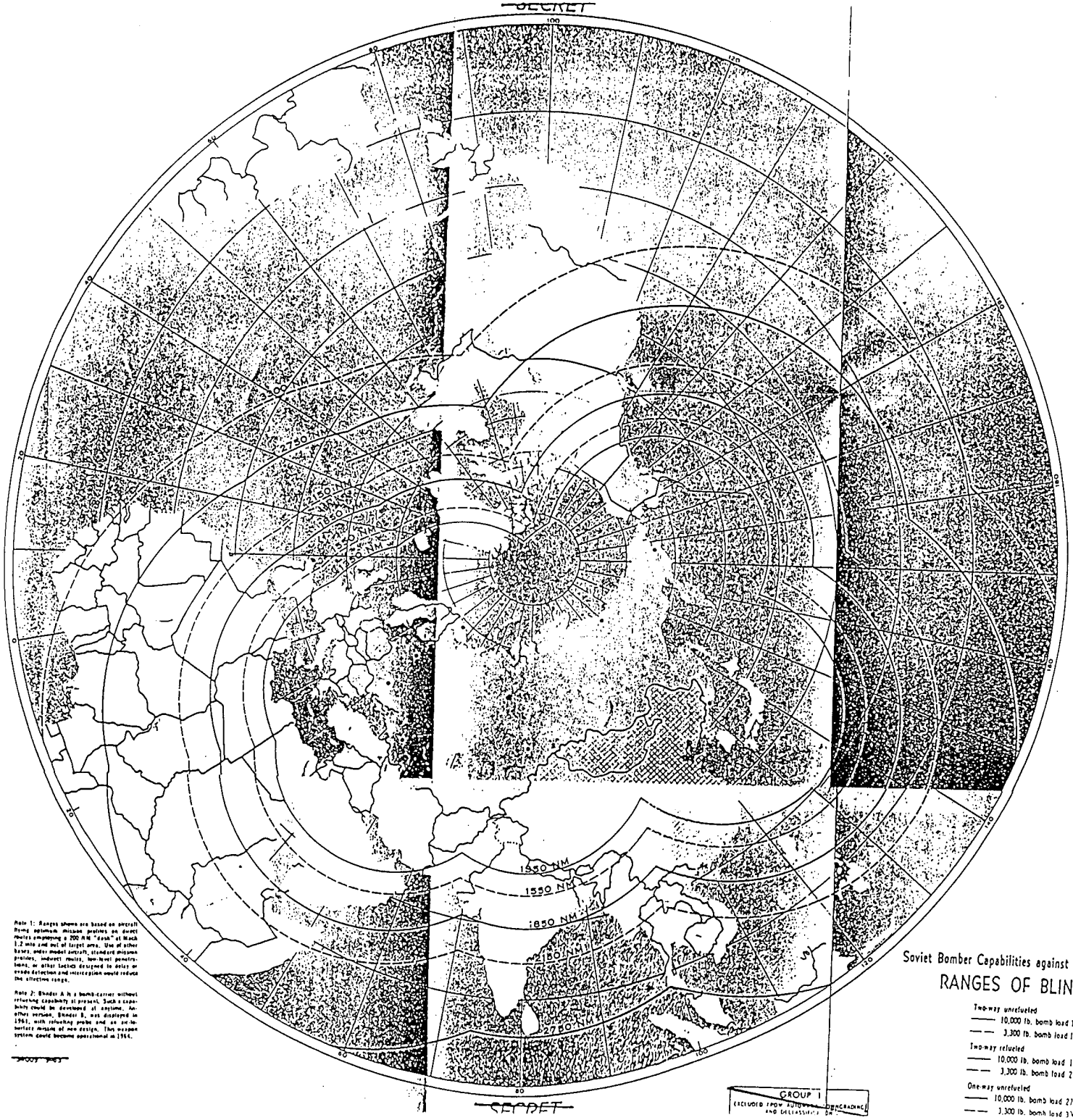
Soviet Missile Capabilities
against Northern Hemisphere

SURFACE-TO-SURFACE BALLISTIC MISSILES

Inter-Continental Ballistic Missile (ICBM)
- 4500 NM
- 6000 NM

Intermediate and Medium Range Ballistic Missiles
- 1100 NM** (MRBM)
- 2200 NM** (IRBM)

**From Launching Points within the USSR



Soviet Bomber Capabilities against Northern Hemisphere

RANGES OF BLINDER A

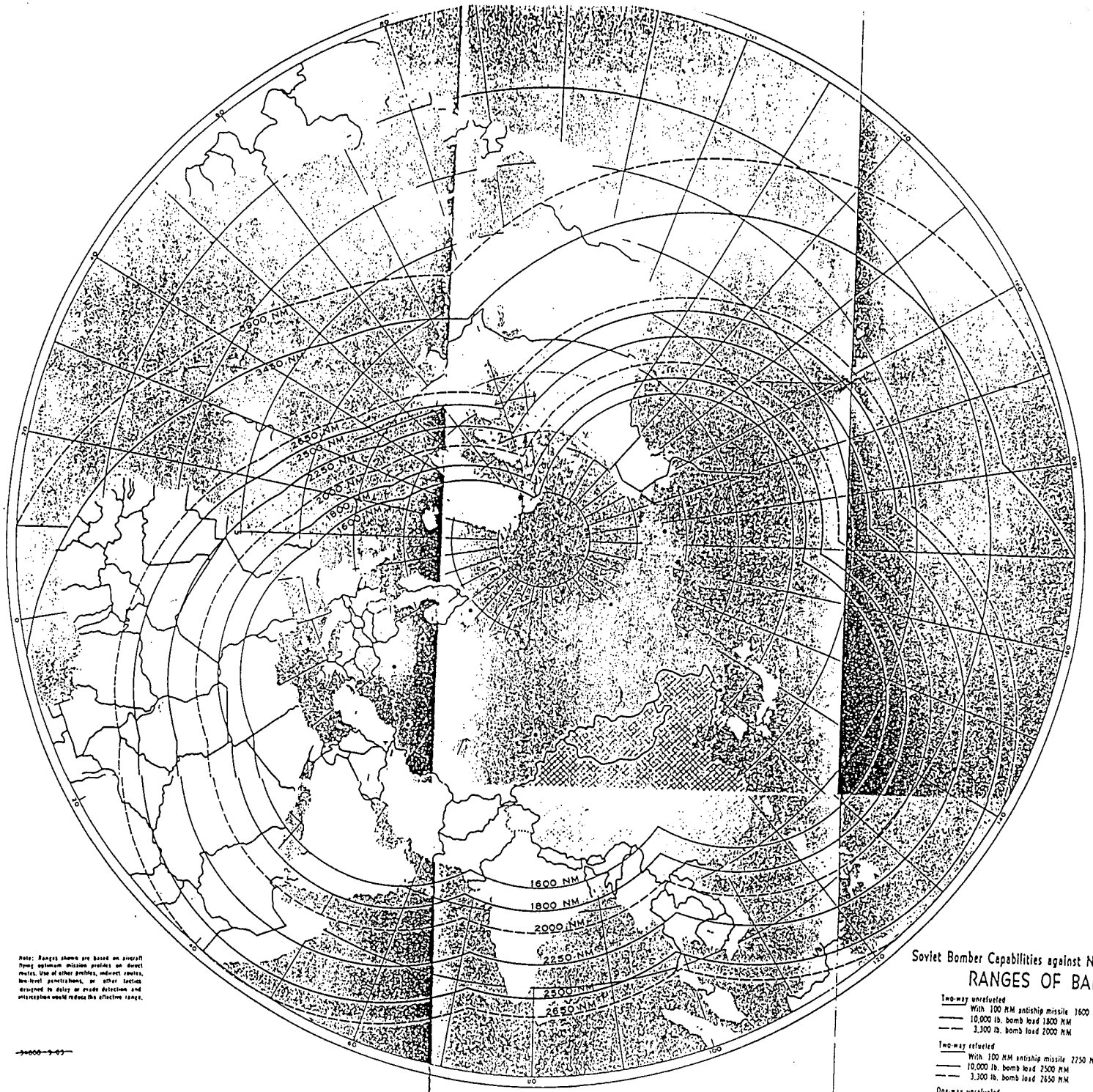
Two-way unrefueled
- 10,000 lb. bomb load 1350 NM
- 3,300 lb. bomb load 1550 NM

Two-way refueled
- 10,000 lb. bomb load 1850 NM
- 3,300 lb. bomb load 2150 NM

One-way unrefueled
- 10,000 lb. bomb load 2750 NM
- 3,300 lb. bomb load 3300 NM

Note 1: Ranges shown are based on aircraft flying optimum mission profiles on direct routes employing a 200 NM "dash" at Mach 1.2 into and out of target area. Use of other bases, under modal aircraft, standard mission profiles, indirect routes, low-level penetrations, or other tactics designed to delay or evade detection and interception would reduce the effective range.

Note 2: Blinder A is a bomb-carrier without refueling capability at present. Such a capability could be developed at anytime. Another version, Blinder B, was displayed in 1961, with refueling probe and an air-to-surface missile of new design. This weapon system could become operational in 1964.



Note: Ranges shown are based on aircraft flying optimum mission profiles on direct routes. Use of other profiles, indirect routes, low-level penetrations, or other tactics designed to delay or evade detection and interception would reduce the effective range.

Soviet Bomber Capabilities against Northern Hemisphere

RANGES OF BADGER

Two-way unrefueled
- With 100 NM antiship missile 1600 NM (Naval Badger only)
- 10,000 lb. bomb load 1800 NM
- 3,300 lb. bomb load 2000 NM

Two-way refueled
- With 100 NM antiship missile 2250 NM (Naval Badger only)
- 10,000 lb. bomb load 2500 NM
- 3,300 lb. bomb load 2650 NM

One-way unrefueled
- 10,000 lb. bomb load 3450 NM
- 3,300 lb. bomb load 3900 NM

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