UNCLASSIFIED

~~TOP SECRET~~

TS 190177-64
NIE 11-8-64
8 October 1964

NATIONAL INTELLIGENCE ESTIMATE

NUMBER 11-8-64

Soviet Capabilities for Strategic Attack

LIMITED DISTRIBUTION

~~WARNING~~

The sensitivity of this document requires that it be handled with maximum security precautions on a need-to-know basis. Recipients will insure that only personnel having all proper clearances and a need-to-know will have access to this document.

Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE
Concurred in by the
UNITED STATES INTELLIGENCE BOARD
As indicated overleaf
8 OCTOBER 1964

~~58 Pages~~
Copy No. ~~9~~

~~TOP SECRET~~

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.

Concurring:

Director of Intelligence and Research, Department of State

Director, Defense Intelligence Agency

Director of the National Security Agency

The Atomic Energy Commission Representative to the USIB

Abstaining:

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

WARNING

This document contains classified information affecting the national security of the United States within the meaning of the espionage laws U.S. Code Title 18, Sections 793, 794, and 798. The law prohibits its transmission or the revelation of its contents in any manner to an unauthorized person, as well as its use in any manner prejudicial to the safety or interest of the United States or for the benefit of any foreign government to the detriment of the United States. No action is to be taken on any communications intelligence which may be contained herein, regardless of the advantages to be gained, unless such action is first approved by appropriate authority.

GROUP 1
Excluded from automatic downgrading and declassification

~~SECRET~~

THE DIRECTOR OF CENTRAL INTELLIGENCE

WASHINGTON 25, D.C.

8 October 1964

MEMORANDUM FOR: Recipients of NIE 11-8-64

SUBJECT : Extreme Sensitivity of NIE 11-8-64, "Soviet Capabilities for Strategic Attack"

1. In accordance with the wishes of the President, dissemination of NIE 11-8-64 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

~~SECRET~~

~~TOP SECRET~~

NATIONAL INTELLIGENCE ESTIMATE

NUMBER 11-8-64

SOVIET CAPABILITIES FOR STRATEGIC ATTACK

~~TOP SECRET~~

4

TABLE OF CONTENTS

SOVIET CAPABILITIES FOR STRATEGIC ATTACK

THE PROBLEM

To estimate probable trends in the strength and deployment of Soviet forces for strategic attack and in Soviet capabilities for such attack through mid-1970.

SCOPE NOTE

This estimate covers those Soviet military forces which are suitable for strategic attack. Other major aspects of the Soviet military strength are treated in separate estimates on air and missile defense, on theater forces, on the nuclear program, and on the space program. Trends in the USSR's overall military posture and in Soviet military policy are examined in an annual estimate, the next issuance of which will be in the first quarter of 1965.

SUMMARY AND CONCLUSIONS

A. Major changes in Soviet programs for the development of strategic attack forces have become apparent during the past year. In 1962–1963, certain ICBM and ballistic missile submarine programs came to an end, and a pause ensued in the growth of these forces. At the same time, the pace of ICBM research and development increased markedly. More recently, the USSR has resumed ICBM deployment in a new and improved configuration, and the probable advent of a new submarine which we believe is designed to carry ballistic missiles probably marks the start of yet another deployment program. (*Para. 1*)

B. Soviet military policy in recent years has been to build up strategic offensive and defensive capabilities, maintain and improve large general purpose forces, and pursue research and development

12

programs in advanced weapons. In our view, the primary concern of Soviet military policy for the next several years will continue to be the strengthening of the USSR's strategic deterrent. The evidence to date does not indicate that Soviet deployment programs are directed toward a rapid numerical buildup. We do not believe that the USSR aims at matching the US in numbers of intercontinental delivery vehicles. Recognition that the US would detect and match or overmatch such an effort, together with economic constraints, appears to have ruled out this option. (*Paras. 2–4*)

C. A stress on qualitative factors suggests that the Soviets see technological advance in weapons as a means by which they can improve their strategic position relative to the West. In the ICBM force, for example, major qualitative improvements currently being achieved include hardening and dispersal (which will sharply increase the number of aiming points), as well as better accuracy and larger payloads. (*Paras. 4–5*)

D. By the end of the decade, Soviet intercontinental attack capabilities will rest primarily upon an ICBM force of some hundreds of launchers, supplemented by a sizable missile-submarine fleet and a large but reduced bomber force. These forces will represent a marked improvement in Soviet retaliatory capability and a considerable strengthening of the Soviet deterrent. In the light of current and programmed US military capabilities, however, we do not believe that the Soviets will expect to achieve, within the period of this estimate, strategic attack capabilities which would make rational the deliberate initiation of general war. (*Para. 5*)

The ICBM Program

E. Major developments since mid-1963 include a proliferation of test facilities at Tyuratam, flight-testing of two third-generation ICBM systems (the SS–9 and SS–10), and the beginning of construction of hard, single-silo ICBM launchers, probably for one or both of the new systems. The deployment of second-generation ICBMs has probably ceased, and a pause between the second- and third-generation programs has slowed deployment. We believe that the Soviets now have about 200 operational ICBM launchers, and that the total number of operational launchers in mid-1965 will approximate the low

side of the 250–350 range previously estimated. These figures do not include R&D launchers at Tyuratam.[1] (*Paras. 6–8, 10–18, 31*)

F. Research and development on third-generation systems has been generally successful. The SS–9 system appears to be an outgrowth of the SS–7 with improved accuracy and a larger payload. We have little information on the characteristics of the SS–10. Both new systems could enter service in 1965. We believe that work is underway on still other ICBM systems, which we cannot as yet identify. We continue to believe that the Soviets are developing a very large ICBM, capable of delivering up to 100 MT. We estimate that it could enter service in the period mid-1966 to mid-1967. In addition, the Soviets might be developing a new, small ICBM employing improved propellants. If they are, it could become operational as early as 1967. (*Paras. 19–26*)

G. The Soviets are now emphasizing deployment of single-silo hard launchers for ICBMs, and we expect this emphasis to continue. We expect third-generation deployment to include the expansion of both second-generation complexes and the initiation of additional new complexes. (*Paras. 9, 27*)

H. The growth of the Soviet ICBM force over the next several years will be influenced by a number of factors. In economic terms, the program must compete for funds with other military and space activities and with the civilian economy. In the technical field, we believe that research and development is proceeding on additional, follow-on ICBM systems, and we doubt that with these in the offing the USSR will fix upon any one or even two existing systems for urgent deployment on a large scale. We are also mindful that the interruptions that marked second-generation deployment programs may recur. In strategic terms, the Soviets evidently judge that an ICBM force in the hundreds of launchers, together with their other strategic forces, provides a deterrent. On the basis of the evidence now available, to us, we do not believe that they are attempting to deploy a force capable of a first-strike which would reduce the effects of US

[1] The Assistant Chief of Staff, Intelligence, USAF, considers the estimate of the numbers of launchers operational now and expected in mid-1965 is too low. He estimates that the Soviets now have about 240 operational launchers, including about 20 at Tyuratam and a 10 percent allowance for unlocated launchers. He believes the total number in mid-1965 will be between 275 and 325. See his footnote, page 11, para. 10.

retaliation to an acceptable level.[2] At the same time, we expect them to continue a vigorous R&D effort in the hope of achieving important technological advances, in both the offensive and defensive fields, which would alter the present strategic relationship in a major way. (*Para. 30*)

I. We estimate a Soviet ICBM force of 400–700 operational launchers for mid-1970; in our previous estimate, we projected this force level for mid-1969. By mid-1970, we believe that the force will include most or all of the launchers now deployed, some 125–200 single-silo SS–9/10 launchers, and 10–20 launchers for very large ICBMs. We believe that the attainment of as many as 700 operational launchers by mid-1970 would be likely only if the Soviets begin deploying a new, small ICBM at a rapid rate about 1967. The Soviet ICBM force which we estimate for mid-1970 will represent a substantial increase in numbers and deliverable megatonnage. Further, the trend to single silos will increase the number of aiming points represented by individual launch sites from about 100 at present to some 300–575 in mid-1970, the bulk of them hard. This will greatly improve the survivability, and hence the retaliatory capability, of the force.[3] (*Paras. 32–37*)

J. In the past few years the Soviets have improved the readiness and reaction time of their ICBM force. Our evidence now indicates that from the normal state of readiness, the soft sites which constitute the bulk of the present force would require 1–3 hours to fire. Hard sites would require about half an hour or less. A higher state of alert (i.e., 5–15 minutes to fire) can be maintained at most soft sites for a number of hours and at most hard sites for days. (*Paras. 38–40*)

K. There is ample evidence that the Soviets designed their soft ICBM systems to have a refire capability. We have re-examined the

[2] The Assistant Chief of Staff, Intelligence, USAF, considers that the Soviets may already have directed their intensive military R&D effort toward achievement of an effective first-strike counter-force capability before the close of this decade. Considering the length of time covered by this estimate and the number of unknowns involved, he believes this is a possibility which should not be disregarded.

[3] The Assistant Chief of Staff, Intelligence, USAF, considers the ICBM force by mid-1970 could range from approximately 600 to as high as 900 operational launchers depending on whether a new, small, easily deployed system is introduced. (See his footnote to table on page 18.) An ICBM force of this size would increase the number of aiming points represented by individual launch sites to approximately 400–700 in mid-1970.

factors likely to affect refire time, and conclude that it would require little longer to fire the second missile than the first. Our present estimate of refire time is 2–4 hours, considerably less than previously estimated. We believe that, on the average, two or more missiles are provided per soft launcher for initial firing, refire, and maintenance spares. We believe that hard ICBM sites do not have a refire capability. (*Paras. 41–43*)

L. We have little evidence on the hardness of Soviet ICBM sites. Given the many uncertainties in this area, only a very tenuous estimate can be made, but our best judgment is that Soviet hard ICBM sites have a hardness in the 300–600 psi range. This implies a design overpressure in the 200–400 psi range, somewhat higher than previously estimated.[4] (*Paras. 49–50*)

M. Qualitative improvements in the force can be expected as new ICBM systems enter service. Currently operational ICBMs have CEPs on the order of 1–2 n.m. The SS–9 will probably have an accuracy of 0.5–1.0 n.m. with radio assist, or 1.0–1.5 with all-inertial guidance. By mid-1970, the Soviets could achieve accuracies on the order of 0.5 n.m. or better. The SS–9 will probably carry a payload [redacted] as compared with [redacted] or second-generation ICBMs. We do not believe that the Soviets have yet developed penetration aids or multiple warheads, but they may do so in the future, particularly if the US deploys antimissile defenses. (*Paras. 44–48*)

6.2(a)

MRBMs and IRBMs

N. Deployment programs for the 1,020 n.m. MRBM and the 2,200 n.m. IRBM are now ending, and almost certainly will be completed by mid-1965. We estimate that at that time the MRBM/IRBM force will have a strength of about 760 operational launchers, 145 of them hard. The bulk of the force (about 90 percent) is deployed in western USSR, with the remainder in the southern and far eastern regions of the USSR. This force is capable of delivering a devastating first strike or a powerful retaliatory attack against targets in Eurasia, and can attack such areas as Greenland and Alaska as well. Some of the

[4] The Assistant Chief of Staff, Intelligence, USAF, considers that, given the uncertainties involved, no meaningful estimate of the hardness of Soviet hard sites can be made. However, he believes that the design overpressure of Soviet hard sites is no greater than the 100–300 psi previously estimated.

MRBM/IRBM launchers are probably intended to support ground operations. (*Paras. 51–55*)

O. We doubt that the Soviets will expand their MRBM/IRBM force during the period of this estimate. It is possible, however, that operational capabilities will be improved by the introduction of a new missile system, which probably would be deployed in single-silos. Such a system, employing improved propellants, could become operational in the 1966–1968 period and would probably replace some of the soft launchers now operational. (*Paras. 56–59*)

Missile Submarine Forces

P. The Soviets now have operational some 40–50 ballistic missile submarines, including 8–10 nuclear powered. Most of these submarines are equipped with 350 n.m. missiles and must surface to fire. One or two are equipped with a new 700 n.m. submerged-launch missile, and others will probably be retrofitted. The USSR also has operational about 30 cruise-missile submarines, including 11–14 nuclear powered. The majority are equipped with 300 n.m. missiles designed for low altitude attack, primarily against ships. The remainder carry a newer 450 n.m. version of this missile, which probably has an improved capability to attack land targets. Current Soviet missile submarines carry relatively few missiles: the ballistic missile classes, two or three, and the cruise missile types, up to eight. The entire present force has a total of 120–140 ballistic missile tubes and 135–150 cruise-missile launchers. (*Paras. 60–71*)

Q. We believe that the Soviets have under construction a submarine which we estimate to be the first of a new nuclear-powered, ballistic missile class. We estimate that it will employ the submerged-launch 700 n.m. missile, and have a few more missile tubes than current classes. The first unit will probably become operational in 1965. Beyond this new class, we consider it unlikely that the Soviets will develop an entirely new follow-on ballistic missile submarine system within the period of this estimate, although they will probably continue to improve existing systems. We believe that they will also continue to construct cruise-missile submarines. By mid-1970 the Soviet missile submarine force will probably number 100–130 ships, about half of them cruise-missile submarines and about half ballistic. (*Paras. 72–75*)

R. In the past year, limited numbers of Soviet missile submarines have engaged in patrols in the open oceans. We expect a gradual expansion of this activity. By the end of the decade, Soviet missile submarines will probably be conducting regular patrols throughout the North Atlantic and Pacific, and possibly into the Mediterranean. (*Para. 76*)

Long-Range Bomber Forces

S. We have no recent evidence of major changes in the capabilities and structure of Soviet Long-Range Aviation (LRA). The force now includes some 190–220 heavy bombers and tankers and 850–900 mediums. It is being improved primarily through the continued introduction of Blinder supersonic dash medium bombers and through modification of older bombers for air-to-surface missile delivery, for aerial refueling, and for reconnaissance. Use of both medium and heavy bombers of the LRA in support of maritime operations has increased. (*Paras. 80–86*)

T. Considering noncombat attrition factors and the requirements for Arctic staging and aerial refueling, we estimate that the Soviets could put somewhat more than 100 heavy bombers over target areas in the US on two-way missions. Recent trends lead us to believe that medium bombers do not now figure prominently in Soviet plans for an initial bomber attack against North America. Nevertheless, should they elect to do so, we believe that at present the Soviets could put up to 150 Badgers over North American target areas on two-way missions. We have serious doubt about how effectively the Soviets could launch large-scale bomber operations against North America. We consider it probable that initial attacks would not be simultaneous, but would extend over a considerable number of hours.[5] (*Paras. 91–97*)

U. The Soviets will probably maintain sizable bomber forces, which will decrease gradually through attrition and retirement. Although continued Soviet work on advanced transports could be applied to military purposes, we think it unlikely that the Soviets will bring any follow-on heavy bomber into operational service during the period

[5] The Assistant Chief of Staff, Intelligence, USAF, considers this paragraph seriously underestimates the manned aircraft threat to the continental US. In the event war should eventuate and the USSR attacks the US with nuclear weapons, he believes this will be an all-out effort aimed at putting a maximum number of weapons on US targets. He therefore estimates that the number of heavy and medium bombers, including BADGERS on one-way missions, could exceed 500. See his footnote on page 32, para. 94.

of this estimate. We believe that Blinder medium bombers, some equipped with advanced air-to-surface missiles, will be introduced during much of the period of this estimate. By mid-1970, Long-Range Aviation will probably include some 140–180 heavy bombers of present types and 300–500 mediums, mostly Blinders.[6] (*Paras. 87–90*)

Space Weapons

V. Although the USSR almost certainly is investigating the feasibility of space systems for use as offensive and defensive weapons, we have no evidence that a program to establish an orbital bombardment capability is seriously contemplated by the Soviet leadership. We think that orbital weapons will not compare favorably with ICBMs over the next six years in terms of effectiveness, reaction time, targeting flexibility, vulnerability, average life, and positive control. In view of these considerations, the much greater cost of orbital weapon systems, and Soviet endorsement of the UN resolution against nuclear weapons in space, we believe that the Soviets are unlikely to develop and deploy an orbital weapon system within the period of this estimate. (*Paras. 98–103*)

[6] The Assistant Chief of Staff, Intelligence, USAF, believes the Soviets will continue to consider manned strategic aircraft an important adjunct to their ICBM force. 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 the expected follow-on bomber, and that by mid-1970 the medium bomber/tanker force will probably still include about 650–850 aircraft. See his footnote to table on page 31 following para. 90.

DISCUSSION

I. SOVIET POLICY TOWARD STRATEGIC ATTACK FORCES [7]

1. Major changes in Soviet programs for the development of strategic attack forces have become apparent during the past year. In 1962–1963, certain ICBM and ballistic missile submarine programs came to an end, and a pause ensued in the growth of these forces. At the same time, the pace of ICBM research and development increased markedly. More recently, the USSR has resumed ICBM deployment in a new and improved configuration, and the probable advent of a new submarine which we believe is designed to carry ballistic missiles probably marks the start of yet another deployment program.

2. Soviet military policy in recent years has been to build up strategic offensive and defensive capabilities, maintain and improve large general purpose forces, and pursue research and development programs in advanced weapons. The resulting growth in defense expenditures has been accompanied by a greatly increased demand for scarce, high-quality resources, and this trend has contributed to the tightening economic situation, over which Khrushchev has displayed increasing concern.[8] There were indications early in 1963 that powerful pressures were being applied by some military and political leaders for a major increase in allocations to defense, and that Khrushchev successfully resisted these pressures. Nevertheless, the research and development programs which continued throughout this period, as well as the new deployment programs now underway, indicate a continued Soviet willingness to spend substantial sums on improving their strategic attack capabilities.

3. In a sense, the policy dispute of early 1963 represented the continuation of a debate over military policy and doctrine which has extended over the past several years. Khrushchev has stressed the deterrent role of nuclear and missile weapons, holding that the nature of these weapons makes general war inadmissible in the present era. The military, on the other hand, have been more concerned to have forces adequate to fight a war should it occur. Khrushchev's successful reassertion of authority in the spring of 1963 and trends in military programs since that time indicate that, for the next several years, the primary concern of Soviet military policy will be to continue to strengthen their strategic deterrent.

---

[7] For a more general discussion of Soviet military policy, doctrine, and strategy see NIE 11–4–64 "Main Trends in Soviet Military Policy," dated 22 April 1964, ~~SECRET CONTROLLED DISSEM~~.

[8] For a fuller discussion of the economic situation in the USSR, see SNIE 11–5–64, "Soviet Economic Problems and Outlook," dated 8 January 1964, ~~SECRET~~.

4. We cannot readily translate this objective into specific goals for strategic attack forces. The Soviet leaders have sought to foster the notion that parity in strategic strength exists between the US and the USSR. We do not believe, however, that present Soviet policy aims at matching the US in numbers of intercontinental delivery vehicles. Recognition that the US would detect and match or overmatch such an effort, together with economic constraints, appears to have ruled out this option. Rather, a Soviet stress on qualitative factors in the past year or two suggests that the Soviets see technological advance in strategic weapons as a means by which they can improve their position relative to the West. The evidence to date does not indicate that current programs are directed toward a rapid buildup in numerical strength, and in view of the intensity of the Soviet research and development effort, we consider it unlikely that the Soviets have settled on any one system for urgent deployment on a large scale.

5. By the end of the decade, Soviet intercontinental attack capabilities will probably rest primarily upon an ICBM force of some hundreds of launchers, supplemented by a sizable missile submarine fleet, and a large but reduced bomber force. Major qualitative improvements currently being achieved in the ICBM force include hardening and dispersal (which will sharply increase the number of aiming points), as well as better accuracy and larger payloads. These forces will represent a marked improvement in Soviet retaliatory capability and a considerable strengthening of the Soviet deterrent. In the light of current and programmed US capabilities however, we do not believe that the Soviets will expect to achieve, within the period of this estimate, strategic attack capabilities which would make rational the deliberate initiation of general war.

II. THE SOVIET ICBM FORCE

6. Major developments in the ICBM program since mid-1963 include a proliferation of test facilities at Tyuratam, flight testing of two third-generation ICBM systems, probable cessation of starts of second-generation ICBM launch sites, and the start of construction of hard single-silo launch sites. Some of these new trends, such as the single-silo mode of deployment, were foreseen in our estimates; others, such as the early stoppage of second-generation deployment, were not. In succeeding paragraphs, we analyze these developments and assess their probable impact upon the future size and composition of the Soviet ICBM force.

A. Current Strength and Deployment

7. We have identified a total of more than 250 launchers in various stages of construction at Soviet ICBM deployment complexes. Of these, we believe that 197 launchers (146 soft and 51 hard) are operational as of 1 October 1964, while the remaining launchers, "all hard," are still under construction.[9] There are also

[9] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote to para. 10, page 11.

15

about 20 completed R&D launchers at the Tyuratam test range, and about 15 more under construction.

8. More than 20 ICBM deployment complexes have now been identified. Eighteen are older complexes, begun in 1961 or earlier, and five are new complexes begun in late 1963- early 1964. Deployment at the older complexes consisted almost entirely of second-generation systems, the SS–7 and the SS–8, in two-launcher soft sites and three-silo hard sites. Deployment of the first-generation SS–6 was limited to four soft launchers. We believe that new deployment of the second-generation systems has also ceased, the SS–8 in 1962 and the SS–7 in 1963. New deployment resumed in late 1963 or early 1964 with the start of construction of dispersed single silos which we believe are intended for third-generation systems.

9. Single silos represent an important departure in Soviet deployment concepts, indicating an intention to confront an enemy with separate aiming points. Construction time for a single silo will probably be less than the 22–24 months required to construct a three-silo site, probably 12–18 months. We believe that some single silos could be operational by mid-1965.

10. We consider it almost certain that there are no additional, undetected second-generation ICBM complexes, and we believe it highly unlikely that second-generation launchers at the older complexes could have escaped detection.[10] Additional launchers of new types may be under construction at second-generation complexes or at undetected complexes of the new type. However, the status of third-generation ICBM development and the apparent timing of third-generation deployment indicate that such additional launchers could not yet have reached operational status. In our estimate for mid-1965 we allow for undetected third-generation launchers which would now be in early stages of construction.

B. Trends in ICBM Deployment

11. From its inception, Soviet ICBM deployment has followed an uneven course. In contrast to a continuing and vigorous research and development effort, operational deployment has been marked by spurts of activity, long pauses, and abrupt cutbacks of what initially appeared to be large-scale programs. The Soviets have deployed the three ICBM systems now operational concurrently with their development at the test range, but concurrent programming has not resulted in a smooth and uninterrupted buildup of ICBM capabilities.

[10] The Assistant Chief of Staff, Intelligence, USAF, recognizes that there are 197 identified operational launchers in the field. He considers the completed launchers at Tyuratam are also available for operational wartime use. In addition, he feels some allowance for the existence of unlocated launchers should be included in the estimate of launchers currently available for wartime use. How large such a factor should be is uncertain, but he considers that a figure of 10% is reasonable. He therefore estimates the current total operational launchers at about 240.

12. The first major interruption resulted from a Soviet decision to cut back the planned deployment of the first-generation SS–6 before deployment of second-generation missiles had begun. A second occurred in 1962 when deployment of the second-generation SS–7 and SS–8 was halted, probably because of technical difficulties with the SS–8 and modifications to the SS–7 system. The Soviets apparently decided to halt the SS–8 deployment program altogether. By contrast, deployment of the SS–7 was resumed in the late summer of 1962, after a six-month pause, and continued for about a year, when this program too was apparently halted. We believe that ICBM deployment resumed in late 1963-early 1964 with single-silo launchers.

13. The reasons for this unevenness are not clear. In most cases, the primary cause of interruptions was probably the prospective availability of improvements, such as better deployment configurations or new and superior missile systems. In some instances important inadequacies in existing programs were probably contributing factors. Whatever the specific reasons, the record to date clearly indicates that the USSR has accepted considerable slippage in progressing toward whatever force goals it has set for itself.

14. *SS–6 Program.* Construction of four soft launchers for the SS–6 began in 1957 and was completed in 1960. Our evidence indicates that the system is still operational. As recently as July 1964, an SS–6 was fired from Tyuratam, [redacted] We estimate that the SS–6 is presently equipped with a [redacted] With development of a new re-entry vehicle, it probably could be retrofitted to carry as much as [redacted] but we consider such development unlikely. We believe that the system will be phased out of the force within the period of this estimate.

6.2(a)
6.2(a)

15. *SS–7 Program.* The SS–7 system offered a number of advantages over the SS–6, chiefly, considerably smaller size, storable liquid propellants, and all-inertial guidance. This system is deployed with [redacted] warheads, but missiles entering inventory in 1964 have probably been equipped with [redacted] warheads, and some of the missiles deployed earlier will probably be retrofitted. The SS–7 is deployed in 15 of the complexes now identified in the USSR and constitutes the bulk of the present force. We estimate that 173 SS–7 launchers are now operational at these complexes, of which 128 are soft and 45 are hard.

6.2(a)

16. We previously considered that the Soviets would continue to deploy the SS–7 beyond 1963. However, the apparent lack of any new launcher starts during the past year and indications of initial deployment of third-generation systems lead us to believe that SS–7 deployment is ending. A decrease in SS–7 activity at Tyuratam—nine firings thus far in 1964 compared to 16 in the last half of 1963—indicates that developmental work on the SS–7 is also drawing to a close.

17. *SS–8 Program.* The SS–8 ICBM was developed at the same time as the SS–7, probably in order to insure the Soviets of at least one successful second-generation system. We believe that it is somewhat smaller than the SS–7 and

6.2(a)

that it carries the [redacted] warhead.[11] In comparison with the SS-7, however, the SS-8 system has certain operational disadvantages. It employs nonstorable liquid propellants, a handicap in maintaining a prolonged condition of alert. The system also incorporates radio inertial guidance, raising the problem of protecting the radio components in a hardened deployment mode. These features, together with technical difficulties revealed in range tests of the SS-8 and the successful development of the SS-7, probably weighed in the Soviet decision to limit SS-8 deployment.

18. The SS-8 system is deployed in four complexes at 23 launchers, nearly all of which are operational. No SS-8 are know to have been started since the summer of 1962. Despite a flurry of successful SS-8 test firings in late 1963 and early 1964, we expect no further deployment of this system. Moreover, the inefficiency of supporting only a few sites deployed at four different complexes may lead the Soviets to phase out the SS-8 system within the period of this estimate.

C. Research and Development

19. There are about 20 completed R and D launchers at the Tyuratam test range, and about 15 more under construction. Some of the new facilities are probably used in testing of the third-generation SS-9 and SS-10 ICBM systems. Others, however, are probably related to future space activities or to the development of other new ICBM systems which have not yet reached the stage of flight testing.

20. *The SS-9 System.* Beginning in December 1963, the Soviets have conducted 11 test firings of the SS-9 with only one failure. Three of these were extended range firings (7,000 n.m.) to the Pacific. This record indicates that development is proceeding satisfactorily.

21. Our evidence indicates that the SS-9 is a product of the same design team that produced the SS-7 system; it appears to represent an intent to develop a more accurate missile with a larger payload. [redacted] it is a two-stage, tandem missile, somewhat heavier than the SS-7, employing storable liquid propellants. The guidance system, which appears to be an improved version of that on the SS-7, consists of an inertial system refined by a radio link. The inertial system alone can probably guide the missile, but with somewhat reduced accuracy. Re-entry data indicate that the SS-9 re-entry vehicle is considerably larger than that of the SS-7; we estimate that this system could deliver a warhead with a maximum yield [redacted] We estimate that it could become operational early in 1965.

6.2(a)

[11] Although the Director, DIA, and the Assistant Chief of Staff, Intelligence, USAF, believe that the weight of the intelligence available makes it more likely that the SS-8 is comparable to the SS-7 in payload delivery capability, they note an anomaly [redacted] which does not correlate with the indicators of a relatively small missile. They, therefore, cannot exclude the possibility that the SS-8 nosecone could weigh about 10,000 pounds or somewhat more, with a yield of [redacted]

6.2(a)

22. *The SS–10 System.* We have little information on the characteristics of the other new system being tested at Tyuratam. The first flight test of the SS–10, on 11 April 1964, was a failure, but six subsequent firings to the Kamchatka impact area have been successful. the SS–10 is being developed as an ICBM. It was probably designed by the same team that produced the SS–6 and SS–8. Like the SS–8, it is a two-stage, tandem vehicle employing liquid fuels and radio-inertial guidance. We have insufficient evidence to determine the size of the SS–10. If its development follows the normal cycle, it could be operational in the latter half of 1965.

D. Future ICBM Systems

23. The great expansion of launch facilities at Tyuratam, cannot all be associated with known systems. In NIE 11–8–63 we estimated three future lines of development: standard size follow-on ICBMs, very large ICBMs, and smaller ICBMs employing improved propellants. The first of these types has now appeared in the SS–9, and possibly the SS–10 .

24. *Very Large ICBM.* We continue to believe that the Soviets are developing a very large vehicle (with a million or more pounds of thrust) which could be used as a "global rocket," as a carrier for the 100 MT warhead, or as a space booster. We believe that test firings of a very large ICBM could begin, by the end of the year, and an initial operational capability could be achieved in the period mid-1966 to mid-1967. This is about a year later than estimated in NIE 11–8–63. The initial deployment sites for a very large ICBM system would probably be soft, but we continue to believe that the Soviets might find it feasible to incorporate a degree of hardening at some stage in the program.

25. *Small ICBM.* We continue to believe that it would be advantageous for the Soviets to develop an economical ICBM system with high survivability and very fast reaction time. These requirements might be met by a small missile employing either solid or improved storable liquid propellants. The evidence of such development remains tenuous, and such a missile would run counter to the Soviet emphasis on relatively large systems with multimegaton payloads. However, since our last estimate, we have acquired evidence indicating a sizable solid-propellant program which could have application in the strategic missile field.

26. We cannot estimate with confidence whether a smaller ICBM system is under active development, but we take account of this possibility in estimating the future composition of the Soviet ICBM force. Such a system would almost certainly be deployed in a hard configuration. If testing of a new, small ICBM should begin about mid-1965, an initial operational capability could be acheived as early at mid-1967. This is about a year later than the earliest date estimated in NIE 11–8–63. There is no evidence that the Soviets are seeking to develop a mobile ICBM system, and we consider such a development unlikely.

E. Deployment Concepts

27. We doubt that the USSR will resume any substantial program of soft-site ICBM deployment. Deployment of the SS–7 and the SS–8 in a soft configuration probably ceased more than a year ago. Third-generation systems may be deployed in new soft sites, but we consider such deployment unlikely. The recent trend to single-silos indicates that the Soviets recognize the strategic advantages of hardened and dispersed ICBM deployment.

28. Single-silo deployment will probably involve both the expansion of other old complexes and the inauguration of additional new complexes. A third generation system is probably being deployed in the new single-silo complexes, but we are unable to determine whether it is the SS–9 or the SS–10. We believe that one or both of these systems will be deployed in such complexes.

29. We believe that SS–9s will also be deployed in the uncompleted three-silo hard sites at SS–7 complexes. It is also possible that the Soviets will retrofit some presently operational SS–7 launchers for the SS–9, but in view of the continued utility of the SS–7 against many types of targets, we consider it unlikely that they would undertake such a program at an early date. We do not know whether SS–8 launch facilities can be retrofitted for the SS–10.

F. Future Force Levels

30. The growth of the Soviet ICBM force over the next several years will be influenced by a number of factors. In economic terms, the program must compete for funds with other military and space activities and with the civilian economy, and we note that the deployment mode currently preferred—large, liquid-fueled missiles in single silos—is more expensive on a per launcher basis than previous configurations. In the technical field, we believe that research and development is proceeding on additional follow-on ICBM systems, and we doubt that, with these in the offing, the USSR will fix upon any one or even two existing systems for urgent deployment on a large scale. In strategic terms, the Soviets evidently judge that a force of some hundreds of ICBM launchers provides a deterrent. On the basis of the evidence now available to us, we do not believe that they are attempting to deploy a force capable of a first strike attack which would reduce the effects of US retaliation to an acceptable level.[12] They will, of course, expect the deterrent effect of an ICBM force of moderate size to be enhanced by qualitative improvements in weapons systems. At the same time, we expect them to continue a vigorous R and D effort in the hope of achieving important technological advances, in both the offensive and defensive fields, which would alter the present strategic relationship in a major way.

31. In NIE 11–8–63, we estimated a Soviet ICBM force level for mid-1965 of 250–350 operational launchers, including those at Tyuratam. It now appears

[12] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote on page 4, Conclusion H.

that the number of ICBM launchers operational in mid-1965 will approximate the lower side of this range.[13] This conclusion stems directly from the limited deployment activity in 1963 and the pace thus far in 1964. These figures do not include R and D launchers at Tyuratam.[14]

32. Through about 1967, the growth of the Soviet ICBM force will depend primarily upon the rates of deployment of the SS–9 and SS–10. We estimate a substantial deployment of these third-generation systems, both in old and new complexes, but not to a level exceeding the second-generation total. This judgment rests in part upon consideration of the economic, technical, and strategic factors previously noted. Further, we think the pace of deployment will be affected by the probable Soviet decision to deploy the SS–9 and SS–10 systems exclusively in hard sites, which take longer to build than the soft sites which comprised the major part of the second-generation program. We are also mindful that the interruptions which marked the second-generation programs may recur.

33. As to future systems, a very large ICBM could become operational in the period mid-1966 to mid-1967. We doubt that the Soviets would require large numbers of this missile, since it would probably be useful primarily for psychological intimidation and for special military purposes. We had previously estimated that the USSR would deploy some 25–50 launchers for very large ICBMs, but the costliness of such a system plus the advent of high yield warheads [redacted] in the SS–9 system now lead us to conclude that 10–20 launchers is a better estimate.

6.2(a)

34. A small ICBM could also become operational as early as 1967, and, if developed, would probably be deployed in substantial numbers. Its advent would have a significant effect on the scale and pace of ICBM deployment in the later years of the decade. In particular, the construction of additional SS–9 and SS–10 sites would probably be terminated in about 1967 if a smaller follow-on system were brought in, but would probably continue beyond that time if it were not.

35. In NIE 11–8–63, we estimated a Soviet ICBM force of 400–700 operational launchers of all types in mid-1969. In addition to the various technical and economic factors taken into account in arriving at this range, we reasoned that when the Soviets had acquired about 400 ICBM launchers, a considerable portion of them hard silos, they might consider the resulting force in conjunction with other strategic weapon systems an adequate deterrent. As to the high side of the estimate (700 launchers), we reasoned that construction of such a force might reflect not only a Soviet concern for deterrence, but also an effort

[13] The Assistant Chief of Staff, Intelligence, USAF, estimates that the number of launchers in mid-1965 will lie between 275 and 325 rather than the low side of NIE 11–8–63. See his footnote to table, page 18.

[14] We are no longer including facilities at Tyuratam in our count of operational launchers. We judge that they are not normally available for operational use, but varying numbers of them could be prepared to fire ICBMs at the US, depending on the amount of advance notice.

2

to put the USSR in a somewhat better position to undertake a pre-emptive attack if a Western strike appeared imminent and unavoidable. We still consider this reasoning to be valid, but our present evidence and analysis leads us to believe that the Soviets are not likely to acquire as many as 700 operational ICBM launchers before 1970.[15] Indeed, it now appears that the attainment of such a force level at that time would be likely only if the USSR develops a small ICBM and deploys it at a rapid rate beginning in 1967.

36. In the table on the following page, we present our estimates of the numbers and types of Soviet ICBM launchers at mid-years through 1970; it should be recognized that other force compositions and force levels within these ranges are possible.

G. Capabilities of the Force

37. Whether falling toward the high or low side of the estimated range, the mid-1970 force will represent a substantial increase in numbers of launchers and in deliverable megatonnage over the force now deployed. Further, its survivability, and hence its retaliatory capability will be markedly improved. Both the low and the high sides of the estimate involve a great increase in the number of aiming points represented by individual launch sites, from about 100 at present to some 300–575 in mid-1970, including some 225–475 hard sites. Unless we are grossly incorrect in these estimates, however, the size and composition of the Soviet ICBM force in mid-1970 clearly will fall short of that required for a first-strike attack which might reduce devastation of the USSR to an acceptable level.[16]

38. *Reaction Time.* We believe that the Soviet ICBM units at soft sites are normally maintained in readiness Condition 3, i.e., launch crews in launch area and on alert, missile and re-entry vehicle mated and checked out in ready building. Considering the evidence of Soviet efforts to reduce reaction time and the experience probably gained over the past few years, we now estimate that the SS–7 and SS–8 can be launched from readiness Condition 3 within one to three hours, as compared with our previous estimate of three to four hours. Ready missiles in hard sites probably have a reaction time of about half an hour or less under normal readiness conditions, depending upon whether or not the missile is fueled.

39. From Condition 1, the highest state of readiness, with missiles erected and fueled, some 5 to 15 minutes would probably be required to launch from either a soft or a hard site. For storable-fuel systems, such as the SS–7 and the SS–9, this state of readiness can be maintained for a number of hours at soft sites depending on weather and other factors, and for days in hard sites. Readiness

[15] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote to table, page 18.

[16] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote on page 4, Conclusion H.

ESTIMATED OPERATIONAL SOVIET ICBM LAUNCHERS, 1964–1970

	1 Oct 1964	Mid-1965	Mid-1966	Mid-1967	Mid-1968	Mid-1969	Mid-1970
Soft Launchers							
SS-6	4	4	0–4	0–4	0–4	0	0
SS-7 [a]	128	128	128	128	128	128	128
SS-8	14	14	14	14	0–14	0–14	0–14
SS-Large [b]	0	0	0–5	5–10	10–15	10–20	10–20
	146	146	142–151	147–156	138–161	138–162	138–162
Hard Launchers							
Three-Silo							
SS-7 and 9 [c]	45	72	72–78	72–78	72–78	72–78	72–78
SS-8	6	9	9	9	0–9	0–9	0–9
Single-Silo							
SS-9 and 10 [d]	0	10–35	60–80	100–125	150–125	200–125	200–125
SS-Small	0	0	0	0–25	0–100	0–215	0–325
	51	91–116	141–167	181–237	222–312	272–427	272–537
TOTALS (rounded) [e]	197	235–260	285–320	330–395	360–475	410–590	410–700

[a] Some SS-7 soft launchers may be retrofitted with SS-9 missiles, but we think this is unlikely to occur at an early date.

[b] Initial deployment will probably be soft, but the Soviets may find it feasible to incorporate a degree of hardening at some stage in this program.

[c] The 27–33 launchers becoming operational in 1965–1966 will probably be equipped with the SS-9. In addition, some of the hard launchers already operational with the SS-7 may be retrofitted with SS-9 missiles, but we think this is unlikely to occur at an early date.

[d] The transposition of figures in this line after 1967 reflects our view that SS-9 and SS-10 development will be less extensive if a new, small ICBM is developed and enters service.

[e] These totals do not include R&D launchers at Tyuratam. There are now about 20 completed R&D launchers, and we believe this number will increase to roughly 35 in the next year or so. We judge that these launchers are not normally available for operational use, but varying numbers of them could be prepared to fire ICBMs at the US, depending on the amount of advance notice.

ASSISTANT CHIEF OF STAFF, INTELLIGENCE, USAF, FOOTNOTE:

The Assistant Chief of Staff, Intelligence, USAF, would project the number of operational Soviet ICBM launchers as follows:

1 Oct 1964	Mid-1965	Mid-1966	Mid-1967	Mid-1968	Mid-1969	Mid-1970
240	275–325	325–425	380–525	450–625	525–700	600–900

He considers that for the near term the majority estimate makes insufficient allowance for the existence of thus far unobserved launchers. During the 1966–1967 time period, fourth-generation ICBM systems could become operational, and he estimates that one of these, a small ICBM perhaps similar to the US Minuteman, will probably be deployed in substantial numbers by mid-1970.

and reaction time will improve markedly with the continued deployment of hard launchers.

40. *Simultaneity.* Theoretically, the entire force could be brought simultaneously to readiness Condition 1 and thereafter fired within a 5 to 15 minute period. 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. We believe, however, that even under the most favorable conditions, and with a time to fire given sufficiently in advance, the resulting salvo would be ragged, with initial firings extending some 15 to 30 minutes from launch of the first missile. We believe that the Soviets are working to improve coordination of operations, not only within the ICBM force but also between it and the other elements of Soviet strategic attack forces.

41. *Refire.* There is ample evidence that soft ICBM systems were designed to have a refire capability. A belief that they could keep secret the location of their ICBM sites probably contributed to the Soviet decision to pursue this course. We consider it extremely unlikely that hard ICBM sites have a refire capability.

42. In the light of our revised estimates of reaction time, we have re-examined our estimates on the closely related question of time required to refire from a soft ICBM site. The only essential difference in procedures for refire is the requirement to cool the launch pad and to refurbish the launch facilities prior to launching the next missile. Assuming that the SS–7 and the SS–8 were designed with a rapid refire capability in mind, the time required for these operations would probably be minimal. We now conclude that if no major repairs are needed, refire time for the SS–7 and SS–8 would be about 2–4 hours, that is, little longer than reaction time from Condition 3. However, [redacted] it is possible that actual refire times would be longer.

43. We estimate that the total number of ICBMs deployed for the 146 soft launchers in the field is on the order of 300–400. Such an inventory would provide, on the average, two or more missiles to each soft ICBM launcher for initial firing, refires, and maintenance spares. Since some of these launchers probably have a multiple refire capability, the low side of this estimate implies that others have no refire missiles. Adding ICBMs deployed at the 17 operational three-silo hard sites, which we believe do not have a refire capability, we estimate that the Soviet operational ICBM inventory as of 1 October 1964 totals some 350–450 missiles.

44. *Reliability and Accuracy.* [redacted] 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 good basis for determining these effects. We believe that reliability would be degraded under operational conditions. Overall reliability of the force will probably improve, particularly if a new, small ICBM with improved propellant is deployed in sizable numbers.

45. We estimate that currently operational ICBM systems have CEPs on the order of 1–2 n.m. The SS–9, when it becomes operational, will probably have

[17] For performance characteristics of ICBMs, see Annex A, Table 1.

an accuracy of 0.5–1.0 n.m. with radio assist, and 1.0–1.5 with all-inertial guidance. Our evidence indicates that the Soviets are concerned with improving ICBM accuracy, and we believe that by mid-1970 they could achieve accuracies on the order of .5 n.m. or less.

46. *Multiple Warheads and Penetration Aids.* The large payloads of Soviet ICBMs present an obvious opportunity for trade-offs between nuclear yield and such modifications as multiple warheads and penetration aids. We believe that the Soviet leaders attach a high value to maximum nuclear yields, but they may in the future reduce yields in order to incorporate such devices.

47. Penetration aids, i.e., decoys, jammers, and shielding would be particularly likely if the US deploys antimissile defenses. Relatively unsophisticated types of penetration aids are within Soviet technical capabilities at present. Multiple warheads could be developed as penetration aids or to increase the efficiency of a given number of deployed missiles. For example, a missile could be equipped with several warheads designed to bracket a single target—this might produce enhanced weapons effects on the target even though the total yield of the warheads were less than the missile's maximum deliverable yield. A more sophisticated multiple warhead system, could be designed to direct several warheads carried by a single missile against separate targets, although this would involve complex problems of system accuracy and reliability. These problems would be particularly acute if the Soviets should seek a capability to attack hard targets. While achievement of such a capability would represent a substantial improvement in the Soviet strategic posture, and is technically feasible, we do not believe that they can attain such an objective by the end of the period of this estimate.[18]

48. We feel confident that, to date, neither decoys nor multiple warheads have been tested. We believe that flight testing would precede the incorporation of these devices in deployed systems, and the chances are good that we would detect such testing,

49. *Hard Sites.* We have undertaken exhaustive studies of the factors likely to affect the ability of Soviet hard sites to withstand nuclear attack, and we are confident that they were designed to withstand overpressures of some hundreds of pounds per square inch. Beyond this generalization, however, our studies have

[18] The Assistant Chief of Staff, Intelligence, USAF, believes that paragraph 47 does not adequately present the strategic attack implications of a Soviet multiple warhead program. He considers the Soviets might seek to offset any US numerical superiority by converting all or part of their large payload capability into multiple warheads in an effort to achieve a capability to attack a number of separate targets with each launch vehicle. In his view a payload of 10,000 pounds, for example, could equate to at least 10 reentry vehicles each with By the use of such systems the Soviets could make more effective use of their heavy payload capability against soft military targets than would be the case if they were to continue to concentrate on single reentry vehicles with very high yield warheads. He estimates that, with extensive development effort, the Soviets could achieve operational status with a multiple warhead system approximately two years after the first flight and quite possibly within the period of this estimate. He believes that such a program could lead to a significant counter force capability.

6.2(a)

shown that the assessment of the hardness of a site is a very uncertain matter. We estimate that the design overpressures of Soviet three-silo ICBM hard sites falls in the 200–400 psi range, (a somewhat higher range than that estimated in NIE 11–8–63), and that their hardness is in the 300–600 psi range.[19] This is a tenuous estimate; additional studies and collection efforts are underway in an attempt to provide higher confidence figures.

50. We have no direct information on which to base even a tenuous estimate of the vulnerability of single-silo sites, but it seems reasonable to assume that they will be at least as hard as the three-silo sites.

III. MEDIUM AND INTERMEDIATE RANGE BALLISTIC MISSILE FORCES

A. Force Levels

51. The deployment programs for the 1,020 n.m. MRBM (SS–4) and the 2,200 n.m. IRBM (SS–5) are now ending and almost certainly will be completed by mid-1965. Although 20 to 30 hard MRBM/IRBM launchers are still under construction, there have been no known construction starts for primary MRBM sites since early 1962 and few if any for IRBMs since early 1963. In NIE 11–8–63, we estimated that MRBM/IRBM deployment would be virtually complete in mid-1964. However, an interruption of several months in deployment activity in 1963 delayed completion of the program.

52. We estimate that by mid-1965 the Soviet MRBM/IRBM force, deployed at almost 200 sites, will have a strength of about 760 operational launchers, some 145 of them hard. The higher number of MRBM/IRBM launchers that we now estimate reflects our conclusion that MRBM hard sites consist of four launchers, and IRBM hard sites, of three. In NIE 11–8–63, we estimated that MRBM and IRBM hard sites had two launchers each.

ESTIMATED OPERATIONAL MRBM/IRBM LAUNCHERS

	1 Oct 1964	Mid-1965
MRBM (SS–4)		
Soft	548–552	548–552
Hard	76–80	84–84
Total	624–632	632–636
IRBM (SS–5)		
Soft	64–64	64–64
Hard	39–45	60–63
Total	103–109	124–127
Total MRBM/IRBM	727–741	756–763
(Hard)	(115–125)	(144–147)

B. Capabilities of the Force

53. The bulk of the MRBM/IRBM force is deployed in the western half of European USSR, within range of targets in Western Europe and parts of North

[19] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote on page 5, Conclusion L.

Africa and the Middle East. The remainder of the force, i.e., roughly ten percent of the launchers, is deployed in the Caucasian, southern Asiatic, and Far Eastern regions of the USSR. The Soviets MRBM/IRBM force is capable of delivering a devastating first strike or a powerful retaliatory attack against Eurasian targets. Some sites can attack important targets outside of Eurasia, such as those in Greenland and Alaska. Some of the MRBM/IRBM launchers probably are intended to support Soviet theater operations.[20]

54. The evidence indicates that the production of MRBMs and IRBMs is slowing. We estimate that the Soviets have now produced enough missiles to provide all soft MRBM/IRBM launchers with a refire capability. We believe refire time for current systems is probably about 2–4 hours. The warheads employed by the MRBM force probably vary from kiloton yields [redacted] and we believe that some warheads with yields of [redacted] could be available now to IRBMs. 6.2(a)

55. The evidence is not adequate to permit a firm judgment as to the hardness of MRBM/IRBM launchers or as to the manner of launch, i.e., silo-lift or fly-out. Nevertheless, we think it likely that these launchers were designed for a hardness comparable to that of hard ICBM sites (see paras. 49–50).

C. Future Developments

56. In NIE 11–8–63, we noted the testing of a probable new MRBM at Kapustin Yar during the first half of 1963 and estimated that the Soviets could bring a follow-on MRBM into the force by mid-1965 and possibly a new IRBM a year after that. However, testing of the new MRBM has not been observed since mid-1963, and it seems likely that this test program was cancelled. If the Soviets are developing a new missile, it would probably employ improved storable liquid or solid propellants and be deployed in hard single-silos. On the basis of Soviet technical capabilities, we believe that such a system could become operational in the 1966–1968 period.

57. Assuming that the target system remains essentially unchanged, we believe the Soviets would feel under no pressure to expand their total MRBM/IRBM force beyond that estimated for mid-1965. If they should deploy a more effective follow-on system, they probably would phase out a number of soft launchers. We have acquired no evidence to indicate that the Soviets are developing or intend to deploy a mobile MRBM/IRBM system during the period of this estimate, and we consider this unlikely.

58. It is possible that political and military developments 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 nuclear

[20] For performance characteristics of MRBMs and IRBMs, see Annex A, Table 2.

equipped missiles over to Satellite control. Further, as was demonstrated in Cuba in 1962, the Soviets could deploy present MRBM/IRBM systems to distant areas.

59. We have also considered the possibility that the Soviets will come to view the Chinese as a threat requiring them to target some MRBM/IRBMs against China. The advent of a Chinese nuclear capability might 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 persuade the Soviets to retain more bombers, such as Badgers, capable of employing conventional as well as nuclear weapons.

IV. SUBMARINE-LAUNCHED MISSILE FORCES

60. Current Soviet missile submarine forces are the outgrowth of decisions taken in about 1954–1955 to develop quickly an extensive but unsophisticated capability, evidently in response to demands from the Soviet leadership that the Soviet Navy modernize. Initially, long-range conventional submarines were converted to carry ballistic missiles. This effort was followed by the construction of two new classes of ballistic missile submarines, the first conventionally-powered and the second nuclear.[21]

61. The decision to develop cruise missile submarines, probably made about 1957–1958, led to a similar pattern. The conversion of conventional submarines by the installation of cruise missile launchers topside was followed by two new classes of submarines, the first nuclear and the second conventionally-powered, configured to employ the new weapon system. Although the present missile submarine force consists largely of ballistic types, cruise missile types have been entering service at a growing rate during the past two years.

62. Both public and classified Soviet statements indicate that the original mission of the ballistic missile submarines was to "carry out strikes deep in enemy territory and to support ground force operations." By the late 1950's, Soviet planners probably recognized that this mission could be better performed by ground launched missiles, then entering service in significant numbers. They also probably concluded that the relatively unsophisticated ballistic missile submarines were of little value in carrying out the Soviet Navy's primary mission of defense against a seaborne attack. Accordingly, emphasis was placed on cruise missile submarines, with a primary mission of countering Western naval nuclear strike forces, particularly carrier task forces. Both ballistic and cruise missile submarines have a capability to attack land targets. However, information from Soviet classified military writings, as well as the operational practices of the force, indicate that they are not now assigned the mission of participating in initial nuclear attacks on land targets.

[21] For performance characteristics of missile submarines, see Annex A, Table 5.

A. Current Ballistic Missile Submarine Forces

63. The Soviets now have some 43–48 operational ballistic missile submarines, armed with some 120–140 missiles. This force includes 8–10 nuclear-powered H class, 28–31 diesel-powered G class, and 7 diesel-power Z-Conversion class units. We believe that almost all of these are equipped with SS–N–4 ballistic missile systems.[22] The SS–N–4 is a 350 n.m. missile which employs storable liquid propellants and must be elevated to a position above the sail of the surfaced submarine for launching. Soviet ballistic missile submarines can probably launch their first missiles within two minutes after surfacing, and the remainder within 3 to 5 minutes. The G and H class submarines which carry the SS–N–4 are equipped with three tubes, and the converted Z class with two.

64. One G class submarine was converted to serve as a test bed for development of the 700 n.m. SS–N–5 system, which probably became operational in 1963. The SS–N–5 is a liquid-fueled missile which can be launched from a submerged submarine. At least one H class submarine has probably also been equipped to employ the new system.

65. The present force of Soviet ballistic missile submarines represents a considerable potential threat. Most SS–N–4 missiles are probably equipped with warheads yielding [redacted] and some could now have [redacted] warhead. The SS–N–5 warhead probably has a yield of [redacted] However, the operational capability of the force is limited by a number of factors: (a) the small number of missiles per submarine; (b) the short range of the SS–N–4 missiles and the need for the submarines equipped with this system to surface before launching; (c) the operational limitations of the diesel-powered units which comprise the bulk of the force; (d) the absence of operational training cruises to likely launch areas off US coasts.

6.2(a)

B. Current Cruise Missile Submarine Forces

66. In addition to ballistic missile submarines, the Soviets have operational some 29–31 cruise missile submarines. Twelve are converted W-class submarines, of which half are equipped to carry four missiles each and five to carry two missiles each; one, probably a prototype, has only one launcher. Nuclear-powered E class submarines, which entered service in 1961, make up more than a third of the force. Six of these are of the E–I type which carries six missiles, and 5–7 are of the newer E–II type, which carries eight missiles. The remainder of the force is comprised of the new diesel-powered J class, equipped with four missile launchers, which was first identified in mid-1963; six units of this class are believed to be operational.

67. Soviet cruise missile submarines are equipped with two versions of the SS–N–3 missile system. The first of these, the 300 n.m. SS–N–3A, was probably developed primarily as an anti-shipping weapon. For attacking ship targets beyond the radar horizon, effectiveness is limited by the requirement for a

[22] For performance characteristics of submarine-launched missiles, see Annex A, Table 3.

forward observer to provide target data. Soviet documents indicate that submarines and aircraft will perform this function; the missile itself contains terminal homing guidance for use against ship targets. We believe that the SS–N–3A could also be used against land targets, the low altitude flight profile (1,000–3,000 feet) of this missile would complicate Western defensive problems.

68. An improved version of this system, the 450 n.m. SS–N–3B, probably became operational in 1963. This missile cruises at supersonic speed at an altitude of 40,000 feet and then descends to an estimated 1,000–3,000 feet for the terminal approach to the target. A low-altitude, reduced-speed flight profile, similar to that of the SS–N–3A, is probably available as an option. The converted W class and the E–I class nuclear submarines are probably equipped with the SS–N–3A system; the E–II class and the diesel-powered J class submarines probably carry the SS–N–3B missile. Soviet cruise missile submarines can probably launch the first missile five minutes after surfacing, and the others within a few minutes.

69. Recent developments in the cruise missile submarine force indicate that the Soviets are improving its capabilities to attack land targets. Although its accuracy in this role would be less than against ships, the increased range and speed of the SS–N–3B missile, its low altitude terminal flight profile, and its small radar cross section would render it a difficult target. Its use against coastal targets, particularly in conjunction with a ballistic missile attack, would greatly complicate defensive problems. The submarine-launched cruise missile could deliver a warhead with a maximum yield [redacted] For use against ships, lower yield nuclear or non-nuclear warheads could be employed.

6.2(a)

C. Construction and Conversion Programs

70. Production of the G class and probably the H class ballistic missile submarines has terminated. We believe that the Soviets will retrofit all of their present force of H class submarines and at least some G class submarines with the 700 n.m., submerged-launch SS–N–5 ballistic missile system. Conversion of the H class probably began in 1962–1963, and we have recently acquired evidence suggesting that conversion of several G class submarines is under way. We believe that conversion programs for the H class and G class submarines could be completed by 1967–1968.

71. Construction of cruise-missile submarines is continuing. We believe that the first E class submarine was delivered in 1960. Construction of the E class is probably now under way at two yards with a combined delivery rate of about 3–4 units per year. Construction of the J class diesel-powered, cruise-missile submarine probably began in 1962 at two shipyards. The first unit was sighted in the Baltic in 1963. The involvement of more than one shipyard indicates a considerably larger J class program than previously estimated, and we believe that 4–6 units per year will be built over the next several years.

72. We believe that the Soviets also have under construction a submarine which we estimate to be the first of a new, nuclear-powered ballistic missile class. Since we have no evidence that new submarine-launched missiles are under development, we believe that it will employ the 700 n.m. SS–N–5. We feel sure that the new class will carry more missiles than the three carried by the G and H classes, possibly 4–8. The first unit of this new class probably will enter service during 1965.

73. We have no evidence of Soviet work on more advanced missile submarines, Soviet writings show awareness of the advantages of the US Polaris system. There is evidence of a sizable solid-propellant program in the USSR, but it has no known naval associations. Based solely on estimated Soviet technical capabilities, we think that during this decade the USSR could develop a 1,000–2,000 n.m. submarine-launched ballistic missile employing solid or improved liquid propellants, and a follow-on nuclear submarine capable of carrying considerable numbers of such a missile. If developmental work is already well under way, such a weapon system could be operational as early as 1967.

74. We have estimated above that the Soviets are about to bring into service a new nuclear-powered submarine class carrying the 700 n.m. submerged-launch ballistic missile. Such a submarine would go far to meet what we judge to be Soviet strategic requirements in this field. We therefore think it unlikely that the Soviets will bring an entirely new follow-on system into service during the period of this estimate. Present systems will continue to be improved, however, and longer range missiles could be developed for employment with them.

D. Estimated Force Levels

75. The USSR will continue to expand and improve its missile submarine forces, but there is much uncertainty at present as to the future scope and direction of Soviet missile submarine programs. Our estimate of the future force is heavily influenced by recent trends in Soviet construction of nuclear submarines, which has remained relatively constant at the estimated rate of 7–9 units per year. We believe that construction will continue at approximately this rate during the period of the estimate, and that it will continue to be divided among ballistic missile, cruise missile, and torpedo attack classes. We believe that construction of torpedo attack nuclear powered submarines will continue at about the current rate of about three per year, although the growing obsolescence of the Soviet fleet of diesel-powered torpedo attack submarines and the Soviet requirement for ASW submarines may bring some increase in this rate. As to missile submarines, our estimate takes account of the cessation of G and probably H class production, retrofit of G and H class submarines with the longer range SS–N–5, production of the probable new class of ballistic missile submarine, and continued production of cruise missile submarines.

ESTIMATED OPERATIONAL SOVIET MISSILE SUBMARINES 1964–1970

	1 Oct-1964	Mid-1965	Mid-1966	Mid-1967	Mid-1968	Mid-1969	Mid-1970
Ballistic							
Nuclear							
H class	8–10	8–10	8–10	8–10	8–10	8–10	8–10
New class	0	1–1	2–3	3–5	5–8	7–11	9–14
	8–10	9–11	10–13	11–15	13–18	15–21	17–24
Diesel							
Z-Conv. class	7	7	7	7	7	7	7
G class	28–31	28–31	28–31	28–31	28–31	28–31	28–31
	35–38	35–38	35–38	35–38	35–38	35–38	35–38
TOTAL BALLISTIC	43–48	44–49	45–51	46–53	48–56	50–59	52–62
Cruise							
Nuclear							
E-I class	6	6	6	6	6	6	6
E-II class	5–7	8–11	11–15	14–19	14–22	14–25	14–28
	11–13	14–17	17–21	20–25	20–28	20–31	20–34
Diesel							
W-Conv. class	12	12	12	12	12	12	6
J class	6	10–12	14–18	16–22	18–24	18–24	18–24
	18	22–24	26–30	28–34	30–36	30–36	24–30
TOTAL CRUISE	29–31	36–41	43–51	48–59	50–64	50–67	44–64

E. Operational Capabilities

76. The failure of the Soviets to conduct patrols to potential launch areas remains a key limiting factor in the development of operational capabilities. Until very recently, Soviet missile submarines operated almost exclusively within local waters, and we do not believe that they have yet conducted patrols off US coasts. However, they have conducted a very limited number of out-of-area patrols since mid-1963, and a slow, cautious expansion of such operations by Soviet Northern and Pacific Fleet submarines can be expected. By mid-1970, Soviet missile submarines will probably be conducting patrols throughout the North Atlantic and Pacific, and possibly into the Mediterranean.

77. The Soviets are building up the logistic structure for their missile submarine forces. Several new types of submarine auxiliaries, including one designed specifically to support missile submarines, have appeared at major bases. In addition, the Soviets are improving existing base facilities.

78. The Soviets have been seeking to improve the operational characteristics of their submarines, both diesel- and nuclear-powered. Early Soviet nuclear submarines experienced difficulties in the operation of their engineering plants, but many of these problems have probably been overcome in submarines built since 1961; some of the earlier nuclear submarines have probably been modified. With existing hull designs and currently operational engineering plants, Soviet nuclear

submarines can attain a maximum speed of about 20 knots; normal cruising speeds are probably on the order of 12 to 14 knots. The maximum speed theoretically attainable with existing Soviet hull designs could be as high as 25 knots. Improvements in engineering plant and hull design could produce a nuclear submarine capable of even greater speeds. Utilizing present steels and technology, new Soviet submarines could achieve maximum operating depths of 1,300 to 1,500 feet in the period of this estimate.

79. The radiated noise levels of existing Soviet nuclear submarines appear comparable to those of early US nuclear submarines. These levels can be reduced, but we have insufficient evidence to determine the extent to which noise reduction techniques may have been applied to existing operational Soviet submarines. Incremental improvements could be made at any time; however, an effective noise reduction program for existing submarines would probably require extensive modification of the engineering plant. The Soviets could develop a relatively quiet new class of submarine, but we do not believe that they will have significant numbers of such a new type within the period of this estimate.

V. LONG RANGE BOMBER FORCES

80. During the past year, we have acquired no evidence of major change in the capabilities and structure of Soviet Long Range Aviation (LRA). The force is being improved through introduction of new supersonic-dash medium bombers and modification of older model aircraft.[23] Use of LRA medium and heavy bombers in a maritime reconnaissance role continues. Soviet military writings during the past year have included some spirited defenses of the utility of manned aircraft in a wide spectrum of military operations; this is in contrast to the denigration of manned bombers which was a prevalent Soviet theme a few years ago. We believe that the Soviets will maintain sizable but declining bomber forces.

81. The heavy bomber force still constitutes a significant portion of the current Soviet capability for intercontinental strategic attack, but Soviet LRA, by reason of its equipment, basing, and deployment, is in general much better suited for Eurasian operations. The bulk of the force is deployed in the Western USSR, the Ukraine, and the southern portion of the Soviet Far East. We estimate that there are about 850–900 medium and 190–220 heavy bombers in operational units in Long Range Aviation, some of which are utilized as tankers.

A. Recent Developments in Long Range Aviation

82. Heavy bomber training in the Arctic has emphasized extended navigational flights into the Polar basin. Bison training is oriented towards those activities normally associated with a strike bomber role, and Bear training has the added feature of reconnaissance specifically oriented against surface ships in the Atlantic and Pacific. The training of the medium bomber force has been

[23] For performance characteristics of Long Range bombers, see Annex A, Table 6.

increasingly oriented toward continental or naval rather than intercontinental operations.[24]

83. The heavy bomber force of some 200 aircraft contains about equal numbers of turboprop Bears and jet Bisons. The primary improvement in heavy bomber capabilities in recent years has resulted from a modification program for the Bear. Three variants of this aircraft have been identified. The Bear A is a bomber, not equipped for aerial refueling. The Bear B is an air-to-surface missile carrier. Some Bear Bs have been equipped for aerial refueling, and we believe that this modification program will continue. The Bear C is a missile carrier which is equipped both for aerial refueling and reconnaissance. We believe that the current operational Bear force consists of 45–50 As, 45–50 Bs, and 10–15 Cs.

84. The provision of an aerial refueling capability for Bear B and C enables the aircraft to reach important targets in the US directly from home bases with heavy loads such as the Kangaroo (AS–3) missile [25] and permits extended reconnaissance missions. However, this modification of the Bear imposes new requirements for conversion of Bisons to tanker use, thereby reducing the Bison bomber force. The Kangaroo (AS–3) missile has a range of about 350 n.m. It was designed for use against land targets, but it could be used against naval formations, although it would have limited effectiveness because of greatly reduced accuracy and range. A different guidance system would improve its accuracy against ships.

85. There is firm evidence that Bear production extended into 1962, and there has been considerable activity since then at the Bear production facility. At least part of this activity is accounted for by the Bear modification programs and by production of the Cleat heavy transport, but we cannot exclude the possibility that a few new Bears are being produced.

86. In the medium bomber force, a gradual reduction in the number of Badgers and introduction of the supersonic-dash Blinder have continued. New information indicates that fewer Blinders have been delivered to LRA than previously estimated; we believe that there are about 50–75 in operational units of LRA. There are two versions of this aircraft: Blinder A, a bomber, and Blinder B, a missile carrier which may be equipped for aerial refueling. We believe that a new ASM (designated Kitchen, AS–4) could become operational next year for use with the Blinder B.

B. Future Trends in Bomber Forces

87. The Soviets would probably plan to employ bomber forces in follow-on attacks after missile strikes had been delivered. Aircraft equipped with pene-

[24] The Assistant Chief of Staff, Intelligence, USAF, believes that the intelligence available on medium bomber Arctic training indicates continued Soviet interest in intercontinental use of the medium bomber.

[25] For performance characteristics of LRA air-to-surface missiles, see Annex A, Table 4.

tration 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.

88. If the USSR actively pursues R&D work and commits funds for production and deployment, new types of large military aircraft could be brought to operational use in the 1966–1970 period. The Soviets are technically capable of developing long-endurance subsonic aircraft (for reconnaissance and/or low altitude penetration) and medium-range high-altitude aircraft with maximum speeds of about Mach 2 in this time period.

89. We have no evidence that the Soviets are developing follow-on bomber aircraft. Current Soviet R&D work in large aircraft seems directed primarily toward the development of new transports. Continuation of this work will advance the Soviets' state-of-the-art and will provide a technological and production base which they could apply to military purposes. However, considering their likely missile capabilities toward the end of the decade as well as the probable continued availability of existing heavy bomber types, we think it unlikely that the Soviets will introduce a follow-on heavy bomber into operational service during the period of this estimate.[26] If they should, US intelligence is likely to obtain indications of its development and production one to three years prior to entry into operational units.

90. The increasing age of the Bison and Bear and continued phase-out of Badger will reduce 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, and we believe that in 1970 there will be some 200–300 of these bombers in LRA. On the basis of present trends we estimate LRA strength as indicated on the following page.[27]

C. Operational Capabilities

91. A major restriction on LRA intercontinental attack capabilities has been the limited range of the jet bombers which make up the bulk of the force.[28] Aerial refueling and Arctic training in the past several years reflect Soviet efforts to overcome this limitation. The USSR has not developed aircraft specifically for tanker use; instead, Bisons and Badgers are converted for use as tankers. Even with aerial refueling, the capabilities of LRA for intercontinental attack

[26] The Assistant Chief of Staff, Intelligence, USAF, considers that the Soviets will continue to emphasize improvement of their manned strategic aircraft capability as an important adjunct to their missile force. He believes that much of the R&D work on larger aircraft (reflected in Para. 89 as directed toward development of new transports) represents work already underway on a follow-on strategic bomber. He believes it likely that the Soviets will introduce a new heavy bomber by 1968 and a new medium bomber by 1970.

[27] For the views, of the Assistant Chief of Staff, Intelligence, USAF, as to the future strength of LRA, see his footnote to the table on page 31.

[28] New technical information on the Badger acquired in 1963 has decreased our estimate of the maximum combat radius of this aircraft by over 10 percent.

ESTIMATED STRENGTH OF SOVIET LONG RANGE AVIATION 1964–1970

	1 Oct 1964	Mid-1965	Mid-1966	Mid-1967	Mid-1968	Mid-1969	Mid-1970
Heavy Bombers and Tankers							
Bear	100–115	100–115	95–115	90–110	85–105	80–100	75–95
Bison	90–105	90–105	85–105	80–100	75–95	70–90	65–85
TOTAL	190–220	190–220	180–220	170–210	160–200	150–190	140–180
Medium Bombers and Tankers							
Badger	800–825	700–750	550–675	400–525	300–390	210–300	90–210
Blinder	50–75	70–100	100–160	140–230	180–280	200–300	200–300
TOTAL	850–900	770–850	650–835	540–755	480–670	410–600	290–510

ASSISTANT CHIEF OF STAFF, INTELLIGENCE, USAF, FOOTNOTE:

The Assistant Chief of Staff, Intelligence, USAF, estimates that the introduction of a follow-on heavy bomber, the continued retention of sizable numbers of Badger, the continued production of Blinder, and the introduction of a follow-on medium bomber about 1970, will result in composition of Soviet Long Range Aviation as follows:

	1 Oct 1964	Mid-1965	Mid-1966	Mid-1967	Mid-1968	Mid-1969	Mid-1970
Bear	115	115	115	110	105	95	85
Bison	105	105	105	100	95	85	75
Follow-on	...	...	0–10	0–30	10–45	20–65	30–85
TOTALS	220	220	220–230	210–240	210–245	200–245	190–245
Medium							
Badger	800–825	725–775	650–725	575–675	500–600	425–525	350–450
Blinder	50–75	75–125	125–175	175–225	225–275	250–325	250–350
Follow-on	...	...	...	...	...	...	50
TOTALS	850–900	800–900	775–900	750–900	725–875	675–850	650–850

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 with better capabilities than those of the Bear by about 1966, a supersonic-dash bomber or a nuclear powered bomber by 1968. These uncertainties are reflected in the spread of the tabulation above.

remain limited, and we do not believe that they are likely to improve within the period of this estimate.[29]

92. In addition to its 32 permanent home bases, LRA also operates a number of Arctic airfields that could be used as staging bases for attacks on North America. Arctic training activity has centered around the four or five of these airfields, which are capable of supporting bomber operations throughout the year. To stage a large bomber force in an initial intercontinental attack, the

[29] For the view of the Assistant Chief of Staff, Intelligence, USAF, see his footnote on page 30, para. 89.

Soviets would have to utilize other Arctic airfields as well. There are about 28 other fields in the Arctic which have runways long enough for LRA bombers. Some of these have natural surface runways usable only in winter; some are occupied by other units, e.g., Naval Aviation; some have little POL storage and servicing facilities; and most are too distant from targets in the continental US to allow for two-way missions with medium bombers. We believe that the Soviets would have great difficulty in utilizing these bases effectively to stage a simultaneous initial attack, although they could be used for recovery operations.[80]

93. Refueled Badgers could reach targets in the extreme northwestern portion of the continental US on two-way missions from Arctic bases in the Chukhotsk Peninsula, but they would have little flexibility of routing and tactics. The Bison would require both Arctic staging and inflight refueling to cover the bulk of US targets on two-way missions. Unrefueled Bear bombers could reach many US targets directly from home bases, but, when equipped with AS–3 or bomb loads of 25,000 lbs. or more, unrefueled Bears would probably need to stage through the Arctic. Refueled Bears carrying the AS–3 could reach most US targets directly from their home bases.

94. 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 noncombat attrition factors, we estimate that at present the Soviets could put somewhat over 100 heavy bombers over target areas in the US on two-way missions. However, the use of Soviet heavy bombers in maritime reconnaissance roles leads us to believe that a few of these aircraft might be diverted to this mission.[81]

95. Our evidence leads us to conclude that Badgers do not now figure prominently in Soviet plans for an initial bomber attack against North America. Nevertheless, considering the requirements for Arctic staging and refueling, as well as noncombat attrition factors, we believe that at present up to 150 Badgers could arrive over North American target areas on two-way missions. The combat radius of these bombers would limit such attacks to targets in Greenland, Canada,

---

[80] The Assistant Chief of Staff, Intelligence, USAF, recognizes the difficulties of staging through Soviet Arctic bases, but he believes that available facilities are sufficient to enable the Soviets to launch enough bombers and tankers to put at least 500 bombers over the continental US.

[81] The Assistant Chief of Staff, Intelligence, USAF, considers that paragraphs 94–97 seriously underestimate the manned aircraft threat to the continental US. In the event war should eventuate and the USSR attacks the US with nuclear weapons, he believes this will be an all-out effort aimed at putting a maximum number of weapons on US targets. In any such attack, he believes that the Soviets would augment their ICBM force with strategic bombers. Considering all factors except combat attrition, the Soviets could, by using Arctic bases, put 300 bombers over North America on two-way missions and still leave several hundred medium bombers to attack Eurasian targets. If the USSR were to employ Badgers extensively in one-way missions as part of the attack, the number of bombers reaching the US could exceed 500.

Alaska, and the extreme northwestern US. As for Blinders, we have no evidence that they have engaged in Arctic training and, because this aircraft, when flying its designed mission, has even less range than the Badger, we believe that few if any would be assigned to North American targets.

96. The Soviets could further increase the number of bombers arriving over North America should they resort to one-way unrefueled attacks with medium bombers. With the growing Soviet ICBM and missile submarine forces, this use of the medium bomber force becomes increasingly unlikely.

97. In view of the limitations of the Soviet Arctic base structure, we have serious doubt about how effectively the Soviets could launch large scale bomber operations against North America.

VI. SPACE WEAPONS SYSTEMS

98. Available evidence does not of itself indicate whether or not the Soviets now have programs for the military use of space, apart from the military support capability provided by the Cosmos reconnaissance satellites. In particular, we have no evidence that a program to establish an orbital bombardment capability is seriously contemplated at present by the Soviet leadership. However, the USSR almost certainly is investigating the feasibility of space systems for use as offensive and defensive weapons and to provide other types of military support.

99. Since the publication of NIE 11-8-63, the Soviets have launched and deorbited an increasing number of satellites in the 10,000 and 15,000 pound classes, using the SS-6 booster with suitable upper stages. The Soviets have a capability to place a nuclear-armed satellite in orbit, but we consider it unlikely that they will do so. Such a satellite would have limited military effectiveness, and the decision to orbit it would be based primarily on political and psychological considerations. The Soviet leadership probably would recognize that this would be an act of major international import which would intensify greatly East-West hostility, prejudice the option of detente tactics, and give a strong new stimulus to Western military programs.

100. We believe that the attainment of reliability and accuracy, particularly for out-of-orbit detonation near the earth's surface, would require a series of tests extending over at least a year after an initial launching. After such testing, the USSR probably could deploy a small number of bombardment satellites with CEP's on the order of 5-10 n.m. against targets located up to several hundred nautical miles from its earth track and with orbital lifetimes ranging up to several months. With the SS-6 as a booster, the nuclear payload could be [redacted] if there were no requirement that the payload be recoverable.

1.2(a)

101. For an orbital bombing system of military significance, there is a wide range of delivery techniques and types of orbital bombardment forces which might be sought by the Soviets, with considerable differences in developmental requirements, costs, and effectiveness. To provide a threat of retaliation against

population centers, they might consider a relatively small force of limited effectiveness composed of some 10–25 weapons in orbit. For large-scale use against smaller or harder military targets, however, a much larger, sophisticated force with short times to target, near-simultaneity of delivery, and an accuracy approaching that of ICBM's would be necessary. Even the lesser of these forces would be extremely complex and expensive, and would require a major Soviet effort to perfect new hardware and to develop advanced techniques. 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.

102. For accomplishing military missions, we think that orbital weapons will not compare favorably with ICBMs over the next six years in terms of effectiveness, reaction time, targeting flexibility, vulnerability, average life, and positive control. In view of these considerations, the much greater cost of orbital weapon systems, and Soviet endorsement of the UN resolution against nuclear weapons in space, we believe that the Soviets are unlikely to develop and deploy an orbital weapon system within the period of this estimate.

103. Even without any special efforts, however, Soviet technology applicable to this field will improve in the normal course of continued development of nuclear technology, ICBMs, and space projects. We recognize that the Soviets might reach different conclusions as to cost and effectiveness, and that altered political considerations in some future phase of East–West relations might lead them to a different decision. Even in these circumstances, we believe that they would regard space weapons primarily as means of supplementing existing forces, of introducing additional complications into US defense planning, and of supporting Soviet claims to strategic parity or even superiority.

VII. COMMAND AND SUPPORT ELEMENTS

A. Command and Control

104. Final authority for the use of strategic strike forces rests firmly with the top political leadership. 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 should events so dictate. This action together with Khrushchev's assumption of the title of Supreme Commander-in-Chief of the Armed Forces provides in peacetime the framework of the command structure which historically has existed only in wartime.

105. The several elements of the Soviet long range striking forces are subordinate to different major commands: Long Range Aviation, the Soviet Navy, and the Strategic Rocket 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. The Soviets continue their efforts to improve their com-

mand and control system for strategic attack forces. The general picture remains one of considerably less sophistication and precision than in comparable US command and control systems.

106. Long Range Aviation has existed as a separate command throughout the post-war period, and missile submarines have been assigned to existing fleets. While strategic bombers and missile submarines are attached to older commands with well-developed and refined communications and control arrangements, the Strategic Rocket Forces were established in 1960 as a new component of the Soviet military establishment. These forces had new and pressing requirements in the field of command and control, which were revealed in classified Soviet military writings of 1961. We believe that these earlier shortcomings in communications, control, and data-processing have been largely overcome.

B. Long Range Reconnaissance

107. We believe that the USSR has devoted considerable effort to pinpointing potential targets for strategic attack in the US and elsewhere. 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 1,200–2,500 feet. We believe that, by using all available means, including reconnaissance satellites, the USSR will be able to reduce geodetic error to about 700–1,500 feet by the end of the decade.

108. 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 met in large part by the extensive Soviet radio 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.

109. The Soviet reconnaissance satellite program probably provides support to long-range striking forces. The program uses recoverable vehicles launched from Tyuratam under the mantle of the Cosmos series. A requirement for precise targeting information on US targets, not obtainable through other collection means, seems to be the primary reason for the program.

110. In conducting any long-range attack, the Soviets would desire to learn as rapidly as possible which targets had survived their initial strikes. High-frequency back-scatter antennas in the USSR could determine general areas and yields of large nuclear explosions in the US, but probably not precisely enough for retargeting ICBM's. These devices might assist in programming post-attack reconnaissance.

111. For precise post-attack reconnaissance, the USSR could use manned aircraft to seek out and strike at surviving targets or targets of uncertain location. 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. 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. Damage assessment of US targets could be achieved by employing reconnaissance satellites.

C. Electronic Warfare and Countermeasures

112. The Soviets have considerable capabilities to disrupt or degrade Western strategic and tactical communications. They have developed a substantial range of active and passive ECM equipment including improved chaff and jammers for use primarily against radar and communications. The Soviets have the capability to greatly expand the limited use they have made of electronic deception techniques. Soviet countermeasures capability presently extends into all the significant frequency bands used by the West, from low frequencies through 10,700 Mc/s, and probably higher, but the capability is not uniform throughout this range. Existing Soviet countermeasures capabilities, however, are not likely to be effective against some of the less susceptible US communications systems, such as those employing ionospheric or tropospheric scatter techniques. The Soviets are continuing to enhance their electronic warfare capability, and equipment expected to become available will include such improvements as greater power and more sophistication.

113. *Airborne systems.* Soviet Long Range Aviation has placed heavy emphasis on the role of electronic warfare in its overall mission. All bombers are probably equipped with basic mechanical and electronic ECM devices, and the Soviets would probably employ some bombers primarily in an ECM role. They have demonstrated capabilities for employment of ECM under a wide variety of operational conditions. Long Range Aviation aircraft are capable of conducting active and passive ECM (jammers and chaff) against enemy air defense electronic systems within most of the frequency spectrum from 70 to 10,700 Mc/s, and of conducting electronic intercept operations to cover the frequency spectrum from 60 to 10,700 Mc/s. Development of electronic warfare capabilities in the frequency spectrum above 10,700 Mc/s can be expected. Future improvements could include broader band jammers, higher powered and more automatic equipment, and increased use of deception devices. Although there is no evidence of such systems as 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, these could also be made available provided the Soviets see a requirement for them.

114. *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 jamming would insure detection, we doubt that Soviet submarines would employ active jamming against Western radar or sonar, but passive intercept equipment would be used to provide warning of radar and sonar search activity.

ANNEX A

TABLES OF WEAPON SYSTEMS CHARACTERISTICS AND PERFORMANCE

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.)

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

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.

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 accuracy 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.

Re-entry Vehicle—That part of a missile designed to re-enter the earth's atmosphere in the terminal portion of its trajectory. Reentry vehicle weight includes that of the warhead, necessary shielding and structure, any penetration aids that may be present and any other necessary or desired components.

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

Reliabilities

Ready Missile Rate—The percentage of the operational missile force that will be available to immediately initiate launch preparation from a normal readiness condition. The Ready Missile Rate may vary with international conditions and will probably be somewhat higher during periods of tension and strategic alert.

Countdown Reliability: The percentage of the missile force that after initiation of launch preparation will be successfully launched with no more than 15 to 30 minutes delay in their normal preparation time.

Inflight Reliability: The percentage of the missiles successfully launched that will detonate as planned in the target area (i.e., within three CEP's of the aiming point).

Overall Reliability: The percentage of the operational missile force that will successfully detonate in the target area. (Overall Reliability is the product of the Ready Missile Rate, Countdown Reliability and Inflight Reliability.)

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

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

Readiness Conditions—The following conditions of readiness apply to all ground launched ballistic missiles having maximum operational ranges of 600 n.m. or greater.

Condition 4: Launch crews not on alert. Re-entry vehicle 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 re-entry vehicle mated and checked but in ready building.

Condition 2: Launch crews at launch stations. Missile with re-entry vehicle erected on launch pad. Propellant facilities in position, attached and ready to start propellant loading. Subsystems checkout complete and guidance aligned.

Condition 1: Launch crews at launch stations. Missile propellant loading completed. All systems ready for final checks.

45

TABLE 1

SOVIET ICBM SYSTEMS

ESTIMATED CHARACTERISTICS AND PERFORMANCE •

	SS-6	SS-7	SS-8*	SS-9
IOC	1960	early 1962 (soft) early 1963 (hard)	Mid-1963 (soft) Mid-1964 (hard)	1965
Max. Range (NRE)	6,000	6,000	6,000	6,000
Guidance	Radio Inertial	Inertial	Radio Inertial	Radio Inertial [b]
CEP (initial) [c]	2.0	1–2	1.0	0.5–1.0
(Improved year)		1.0/1966	0.8/1967	0.5/1968–1970
Re-entry vehicle [d] Weight (lbs)	8,000 [redacted]	4,500 [redacted]	3,000–6,000	8,000–13,000
Warhead Weight	6,000 [redacted]	3,500 [redacted]	2,000–5,000	6,500–10,500
Warhead Yield [e]	[redacted]			
Gross Lift-Off Weight (lbs)	500,000	280,000	180,000	350,000 [redacted]
Configuration	Parallel	Tandem 2-stage	Tandem 2-stage	Tandem 2-stage
Propellant	Non-Storable Liquid	Storable Liquid	Non-Storable Liquid	Storable Liquid
Ready Missile Rate [f]	80%	80%	80%	80%
Reliability, Countdown [f] (Initial)	85%	85%	85%	80%
(Improved/Year)				85%/1967
Reliability Inflight [f] (Initial)	85%	90%	90%	85%
(Improved/Year)				90%/1967
Overall Reliability [f] (Initial)	60%	60%	60%	55%
(Improved/Year)				60%/1967
Reaction Time From [g]				
Readiness Condition 3	at least 12 hrs.	1–3 hrs.	1–3 hrs.	1–3 hrs.
2	1–2 hrs.	15–30 min.	30–45 min.	15–30 min.
1	5–15 min.	5–15 min.	5–15 min.	5–15 min.
Hold Time in Cond. 1 [h]	1 hr.	hours (soft)/ days (hard)	about 1 hr.	hours (soft)/ days (hard)
Refire Time [i] (Soft sites)	at least 12 hrs.	2–4	2–4 hrs.	2–4 hrs.

See footnotes on following page.

[a] The evidence is insufficient to enable us to make an estimate of SS–10 characteristics and performance.

[b] It is believed that the SS–9 has an additional all inertial guidance capability with a CEP of 1–1.5 n.m.

[c] Advances in accuracies assume improvements in missile sub-systems, operational methods, and crew training, but not the introduction of new guidance systems in existing types of ICBMs.

[d] Decoys, jammers, other penetration aids and warhead shielding could be incorporated at some sacrifice in nuclear warhead weight which could be carried within this total re-entry vehicle weight. To date, no decoys or penetration aids have been identified. We feel confident that should such devices be used, they would be detected.

[e] We believe these to be current maximum yields. Warhead yield of SS–6 could be increased to as much [redacted] a new re-entry vehicle is developed, but we consider this unlikely. Most SS-7s probably have [redacted] warheads. However, a new nosecone with [redacted] is probably available for missiles entering service this year, and some portion of the existing force will probably be retrofitted with higher yield warheads. We consider development of a new nosecone with higher yield warhead for the SS–8 unlikely.

[f] These reliability rates may be too high since they may not sufficiently take into account the effect of Soviet operational methods and troop training which are at least as important as technical characteristics in determining system reliability. We have little basis for estimating these effects.

[g] Readiness Condition 3 is believed to be the normal readiness condition for ICBMs deployed at soft sites and Condition 2 for hard sites.

[h] An unfavorable environment could seriously degrade these hold times. Because of the protection afforded a missile in a hardened site, it is given a longer hold time than its soft counterpart. We believe the cryogenic properties of non-storable propellants probably limit these missiles to a hold time of about one hour.

[i] Refire capabilities are applicable to soft sites only. Estimated refire times are based on the assumption that the launch site was designed specifically for an efficient refire capability and that no major refurbishment of ground support equipment or launch stand is necessary.

*Although the Director, DIA, and the Assistant Chief of Staff, Intelligence, USAF, believe that the weight of the intelligence available makes it more likely that the SS–8 is comparable to the SS–7 in payload delivery capability, they note an anomaly [redacted] which does not correlate with the indicators of a relatively small missile. They, therefore, cannot exclude the possibility that the SS–8 nosecone could weigh about 10,000 pounds or somewhat more, with a yield of [redacted]

TABLE 2

SOVIET MRBM AND IRBM SYSTEMS

ESTIMATED CHARACTERISTICS AND PERFORMANCE

	SS-3 [a]	S-4	S-5
IOC	1956	Late 1958	Late 1961
Max. Range (nm)	630	1,020	2,200
Guidance	Radio Inertial	Inertial	Inertial
(CEP) Accuracy	1.0	11/4	1.0
Re-entry Vehicle [b]	3,000 [redacted]	3,200 [redacted]	4,500 [redacted]
Warhead Weight (lbs)	2,000 [redacted]	2,200	3,500 [redacted]
Warhead Yield	[redacted]	[redacted]	[redacted]
Gross Lift-Off Wt. (lbs)	60,000	88,000	150,000
Configuration	Single stage	Single stage	Single stage
Propellant	Non-storable liquid	Storable liquid	Storable liquid
Ready Missile Rate [c]	80%	80%	80%
Reliability, Countdown [c]	90%	90%	85%
Reliability, Inflight [c]	80%	85%	90%
Overall Reliability [c]	55%	60%(soft) 65%(hard)	60%(soft) 65%(hard)
Reaction Time from [d]			
Readiness Condition 3	2½–5 hrs.	1–3 hrs.	1–3 hrs.
2	¾–2 hrs.	15–30 min.	15–30 min.
1	15–30 min.	5–15 min.	5–15 min.
Hold Time Condition 1 [e] soft/hard	1 hour	Many hrs/days	Many hrs/days
Refire Time [f]	2½–5 hrs.	2–4 hrs.	2–4 hrs.

6.2(a)

[a] The SS-3 has probably been phased out of operational service.

[b] Decoys, jammers, other penetration aids and warhead shielding could be incorporated at some sacrifice in nuclear warhead weight which could be carried within this total re-entry vehicle weight. [redacted] To date no decoys or penetration aids have been identified. We feel confident that should such devices be used they would be detected.

[c] These reliability rates may be too high, since they may not sufficiently take into account the effect of Soviet operational concepts and troop training, which are at least as important as technical characteristics in determining system reliability. We have no good basis for estimating these effects.

[d] Readiness condition 3 is believed to be the normal readiness condition for MRBM/IRBMs deployed at soft sites and condition 2 for hard sites. These times are applicable only to operations at permanent fixed sites and might be appreciably longer when operating from alternate, field type sites.

[e] An unfavorable environment could seriously degrade these hold times. Because of the protection afforded a missile in a hardened site, it is given a longer hold time than its soft counterpart. We believe the cryogenic properties of nonstorable propellants probably limit the SS-3 to a hold time of about one hour.

[f] Refire capabilities are applicable to soft sites only. Estimated refire times are based on the assumption that the launch sites were designed specifically for an efficient refire capability and that no major refurbishment of ground support equipment or launch stand is necessary.

TABLE 3

SOVIET SUBMARINE-LAUNCHED MISSILE SYSTEMS
ESTIMATED CHARACTERISTICS AND PERFORMANCE

	SS-N-3A	SS-N-3B	SS-N-4	SS-N-5 [a]
IOC	1961	1963	1960	1963
TYPE	Surface-Launch Cruise	Surface-Launch Cruise	Surface-Launch Ballistic	Submerged-Launch Ballistic
Max. Range (n.m.)	300	450	350	700
Speed	Low Supersonic	Mach. 1.6	NA	NA
Cruise Altitude (ft)	1,000–3,000	40,000 (1,000–3,000 terminal approach) [b]	NA	NA
Guidance	Inertial [c] with active radar terminal homing. Against land targets: inertial.	Inertial [c] with active radar terminal homing. Against land targets: inertial.	Inertial	Inertial
Accuracy (CEP)	150 ft. with Terminal Homing Against Ships; 1–2 n.m. Against Land Targets.	150 ft. with Terminal Homing Against Ships; 1–2 n.m. Against Land Targets.	1–2 n.m.	1–2 n.m.
Warhead Weight (lbs)	1,000–2,000 (HE or Nuclear)	1,000–2,000 (HE or Nuclear)	1,500–2,500 (Nuclear)	1,500–2,500 (Nuclear)
Warhead Yield (Nuclear)				
Propulsion	Turbojet	Turbojet	Stor. Liquid	Stor. Liquid
Reliability on Launcher [d]	80%	80%	80%	80%
Reliability in Flight	85%	85%	80%	80%
Reaction Time [e]	20–40 min.	20–40 min.	20–40 min.	15–30 min.
(Includes Minutes on Surface Before Launch)	(5 minutes)	(5 minutes)	(2 minutes)	(none)
Salvo Time [f]	W-Conv. (2): 2 min.	J (4): 5 min.	Z-Conv, (2): 3 min.	H (3): 5 min.
(No. Missiles): Time	W-Conv. (4): 9 min.	E-II (8): 15 [g] min.	G (3) : 5 min.	G (3): 5 min.
	E-I (6): 10 min. [g]		H (3) : 5 min.	

[a] 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.

[b] An optional, low-altitude (1,000–3,000 ft) flight profile is probably available with reduced range and speed.

[c] There is some possibility that the terminal homing systems involves an additional infra-red homing device as a back up system. The SS-N-3B system is improved by the addition of command override guidance.

[d] 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.

[e] Reaction time is taken to include the time from the moment of the order to fire to the launch of the first missile, assuming: (a) The submarine is on alert; (b) Targets have been selected; (c) The missile system includes continuous computation of firing data; and (d) The missiles have been checked and are ready for countdown.

[f] Salvo time is the time from the launch of the first missile until all missiles are launched.

[g] The E-I Class and probably E-II Class are capable of launching two cruise missiles simultaneously.

TABLE 4

SOVIET LONG RANGE AVIATION AIR-TO-SURFACE MISSILE SYSTEMS CHARACTERISTICS AND PERFORMANCE

	KANGAROO AS-3	KITCHEN AS-4
IOC	1960–1961	1965
Max. Range (n.m.)		
Against Land Targets	350 [a]	275 [b] or 190 [b]
Against Ships	About 160	About 160
Guidance	Preprogrammed auto-pilot with command override [c]	Inertial [c]
Accuracy (CEP)		
Against Land Targets	1 to 2 n.m. [a]	1 to 2 n.m. [a]
Against Ships	[c]	[c]
Warhead		
Weight (lbs)	5,000	2,200
Yield [d]	[redacted]	
Speed (Mach No.)	1.5 to 2.0	5 at 90,000 or 3.5–4 at 80,000 [b] [f]
Reliability [e]		
On Launcher	80%	80%
In Flight	70%	70%
Overall	55%	55%
Carrier Aircraft	BEAR B&C	BLINDER B
Number of Missiles	1	1
Launch Altitude (ft)	39,000	About 40,000
Launch Speed	420 Kts	860 Kts

6.2(a)

[a] This interrelated range and accuracy assume an offset bombing technique in which the location of the land target is precisely known with respect to a reference point.

[b] The first figures in these entries are for a boost-glide vehicle, and the second for a boost-cruise.

[c] With this guidance, the CEP against ships would be 5–10 n.m. The inclusion of a seeker to provide a more effective anti-ship capability is feasible technically. We have no evidence that this has occurred; such readily could be accomplished within the period of this estimate.

[d] Yields shown are maximums. Smaller yields might be employed against ships.

[e] These reliability rates may be high because the effects of Soviet operational concepts and troop training standards are at least as important as technical characteristics in determination of system reliability. We have no reliable basis for estimating these effects.

[f] The terminal phase of the AS-4 flight profile would be at low supersonic speed.

TABLE 5

SOVIET MISSILE SUBMARINES

CHARACTERISTICS AND PERFORMANCE

	Dimensions			Depth		Speed [a]			Armament		Patrol capabilities [b c d]			
	Length/ beam (feet)	Displacement (tons) surfaced/ submerged		Normal oper. depth limit (feet) [e]	Collapse depth	Surfaced	Snorkel	Submerged speed/ endurance (N.M.)	Torpedo [f]	Missiles [g]	Days on station	Radius (N.M.)	Patrol duration (days)	Endurance factors
BALLISTIC MISSILE														
Nuclear-Power H	365/32	5,400	6,200	800	1,270	Max 20	..	20/–NA	20	3	20	5,300	60	Sea
						Cruise 12–14	..	12–14/–NA			10	6,600		
											1	7,800		
Diesel-Power G	320/28	2,400	2,800	900	1,440	Max 17.5	10.5	16/12	24	3	20	4,400	60	Sea
						Cruise 8.3	6.0	2/100			10	4,700	53	Fuel
											1	4,850	46	Fuel
Diesel-Power Z–Conv.	295/27	2,000	2,400	735	1,170	Max 18.4	7.0	15/15	24	2	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														
(MOD I)	370/32	5,400	6,500	800	1,270	Max 20	..	18–20/–NA	20	6	20	5,300	60	Sea
(MOD II)				940	1,500	Cruise 12–14	..	12–14/–NA		8	10	6,600		
											1	7,800		
Diesel Power W–Conv.														
(TWIN CYLINDER)	249/21	1,100	1,400	675	1,080	Max 18.5	6.8	13.5/13.5	12	2				
						Cruise 10	6.8	2/100			20	1,800	40	Sea
(LONG BIN)	275/21	1,200	1,500	675	1,080	Max 18	5.5	12/12	10	4	10	2,600	39	Fuel
						Cruise 10	5.5	2/100			1	3,000	34	Fuel
Diesel Power J	280/34	2,800	3,700	800	1,300	Max 18.4	9.5	17.5/13	24	4	20	4,400	60	Sea
						Cruise 8.5	7.0	2.5/125			10	5,400	60	Sea
											1	6,150	58	Fuel

See footnotes on following page.

51

[a] Quantitative measurements on various classes of Soviet diesel-powered submarines indicate that their radiated noise output in the low-frequency band is about equal in intensity to that of a conventional diesel-powered submarine of the US operating in a similar mode. Initial observations on the radiated noise levels of Soviet nuclear-powered submarines indicate that they radiate a substantial amount of noise—generally exceeding those of even the earliest US nuclear-powered submarines (Nautilus)—in the band of importance to both LOFAR detection systems and to submarine-borne passive sonar systems. It is unlikely that existing Soviet submarine classes can be made appreciably quieter without considerable effort. If a noise-reduction research program is to produce significant results, it will probably be seen only in an entirely new submarine design.

[b] The time on station and radius (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 assumed to have a "Sea endurance" of 60 days. The J, G, and Z–Conv. classes of diesel-powered submarines are estimated to have a "Sea endurance" of 60 days, while the W–Conv. classes are 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 with submerged operation the remainder of the day.

[c] The endurance and maximum operating radius of nuclear-powered submarines are limited by factors other than fuel. For the purpose 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 transit time).

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

[d] *Availability:* About 85 percent of the Soviet missile submarine force is assumed to be operationally available (i.e., at sea or in port for routine repairs and ready for deployment in less than 7 days) at any time.

[e] Normal operating depth limit is the depth to which submarines can proceed an unlimited number of times.

[f] Torpedo capacities are the maximum numbers which can be carried. A combination of torpedoes/mines could be carried.

[g] Three different conversions have been observed on W class cruise missile launching submarines, enabling 6 (named LONG BIN) to carry 4 SS–N–3A missiles each, 5 (named TWIN CYLINDER) to carry 2 each, and 1 (named SINGLE CYLINDER) to carry 1 missile. Also, one Z class submarine was converted to carry only one SS–N–4 ballistic missile and one G Class unit has been converted to carry two SS–N–5 ballistic missiles.

TABLE 6

SOVIET STRATEGIC 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 A	BISON	BEAR [b]	BLINDER [c]
Gross Weight (lbs)	167,000	400,000	365,000	185,000
Empty Weight (lbs)	80,000	153,000	155,000	86,500
Combat Radius/Range (n.m.) [e]				
a. 25,000 lb bombload		2,700/5,100	4,150/7,800	
one refuel		3,650/6,900		
b. 10,000 lb bombload	1,550/2,950	2,900/5,700	4,500/8,800	1,250/2,650
one refuel	2,200/4,150	3,800/7,500		NA
c. 6,600 lb bombload	1,650/3,200			1,300/2,850
one refuel	2,300/4,400			NA
d. 3,300 lb bombload	1,750/3,400	3,000/6,000	4,700/9,300	1,400/3,050
one refuel	2,400/4,600	3,900/7,800		NA
e. With ASM				
i. 1xAS-3 (BEAR B&C)			3,900/7,250	
one refuel (BEAR C)			5,200	
ii. 1xAS-4 (BLINDER B)				1,000/2,100
one refuel (BLINDER B)				1,600/3,300
Speed Altitude (kts/ft)				
a. Maximum Speed at Optimum Altitude	540/22,500	535/18,800	500/25,000	975/36,000
b. Target Speed/Target Altitude	475/41,100	460/42,700	435/41,600	860/46,500
c. Launch Speed/Launch Altitude with ASM			420/39,000	860/40,000
Combat Ceiling (ft) [d]	44,800	45,900	40,300	47,500
System Accuracy (CEP)				
a. Bombing Accuracy [e]				
i. From 40,000 ft	2,000 ft	2,000 ft	2,000 ft	2,000 ft
ii. From 20,000 ft	1,200 ft	1,200 ft	1,200 ft	1,200 ft
b. ASM Accuracy				
i. AS-3			1-2 n.m. vs. land targets	1-2 n.m. vs. land targets
System Reliability (%) [f]				
a. Aircraft Reaching Target Areas in North America-Unrefueled/refueled [g]	73/69	73/69	73/77	73/69
b. ASM reliability-On launcher/In flight/Overall			80/70/56	80/70/56
c. Acft and ASM Overall-unrefueled/refueled			41/43	41/39

See footnotes on following page.

• 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, other 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 or degradation in range and radius resulting from sophisticated penetration tactics is a complex process which can be best 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.

[b] BEAR A is a bomber. BEAR B has been equipped to carry one AS-3 missile (350 nm range), KANGAROO, rather than a bombload. The AS-3 missile is estimated to weigh about 25,000 lbs. BEAR C has been equipped to carry one AS-3 and also to conduct reconnaissance missions; a probe-and-drogue refueling system has been provided. In addition, one BEAR B has been observed equipped for such refueling.

[c] BLINDER A is a bomber not known to be equipped for refueling. BLINDER B carries one KITCHEN ASM which is expected to become operational in 1965. We believe that BLINDER was designed for a supersonic dash mission. Our estimates of combat radius/range include 200 n.m. dash (100 n.m. in and 100 n.m. out) at Mach 1.5. If BLINDER were flown subsonic all the way, combat radius would be increased by some 450–500 n.m.

[d] Associated combat load is 10,000 lbs. for BISON and BEAR A; 6,600 lbs. for BADGER A and BLINDER A; one AS-3 for BEAR B&C; and one AS-4 for BLINDER B.

• Bombing accuracies indicated 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.

[f] 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.

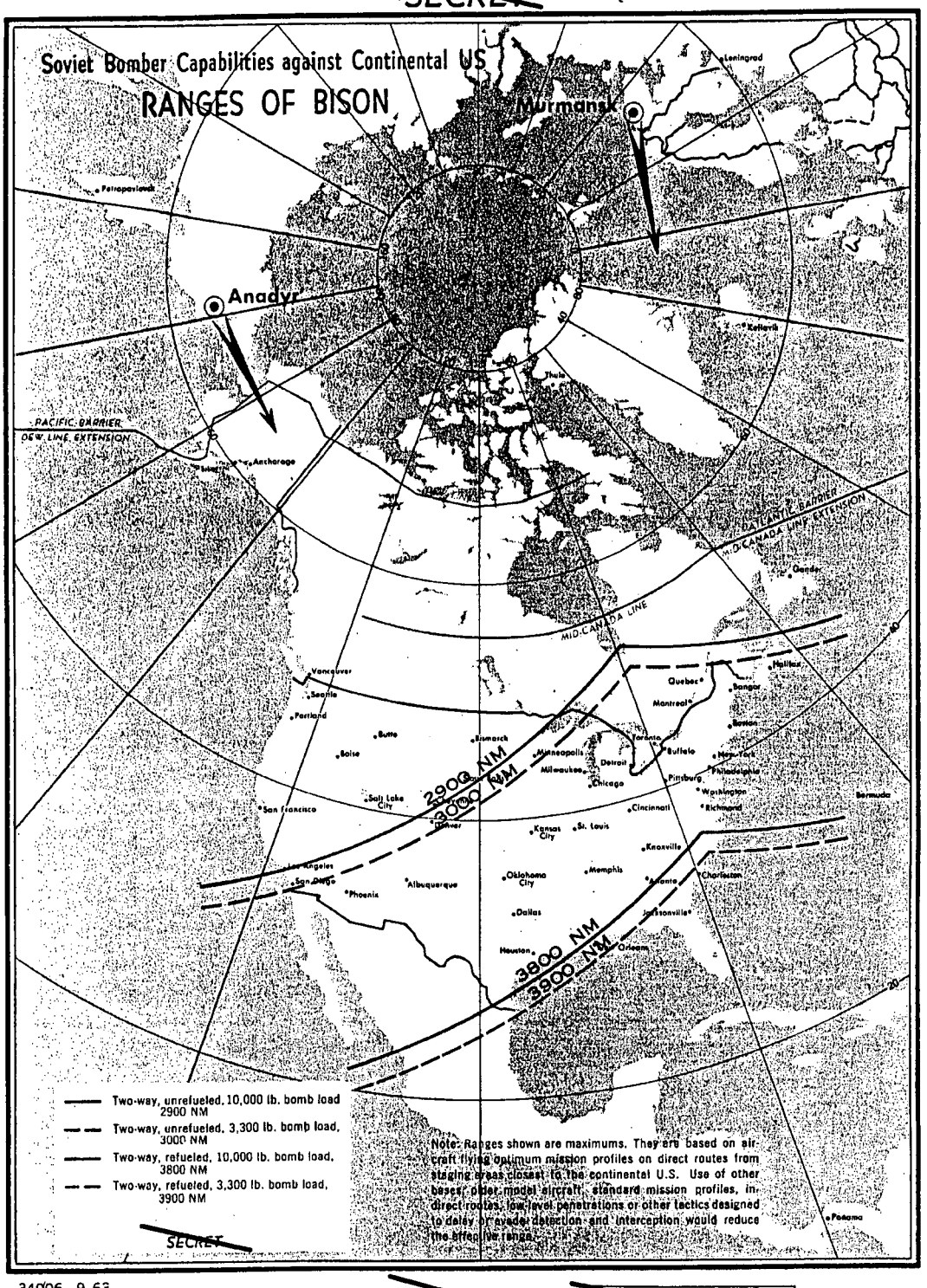
[g] Includes the following operational attrition rates, excluding combat attrition: (a) 90% of aircraft at home bases would be in commission after 5–10 day maintenance standdown prior to initial operations; (b) 90% of aircraft in commission at home bases would be launched from staging bases; (c) 90% 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 and BISON 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%.

ANNEX B

MAPS OF RANGE CAPABILITIES

Soviet Bomber Capabilities against the Continental US—Ranges of Bison
Soviet Bomber Capabilities against the Continental US—Ranges of Bear
Soviet Missile Capabilities against the Continental US—Submarine-Launched Missiles
Soviet Missile Capabilities against the Northern Hemisphere—Medium and Intermediate Range Ballistic Missiles
Soviet Bomber Capabilities against the Northern Hemisphere—Ranges of Badger
Soviet Bomber Capabilities against the Northern Hemisphere—Ranges of Blinder

~~SECRET~~



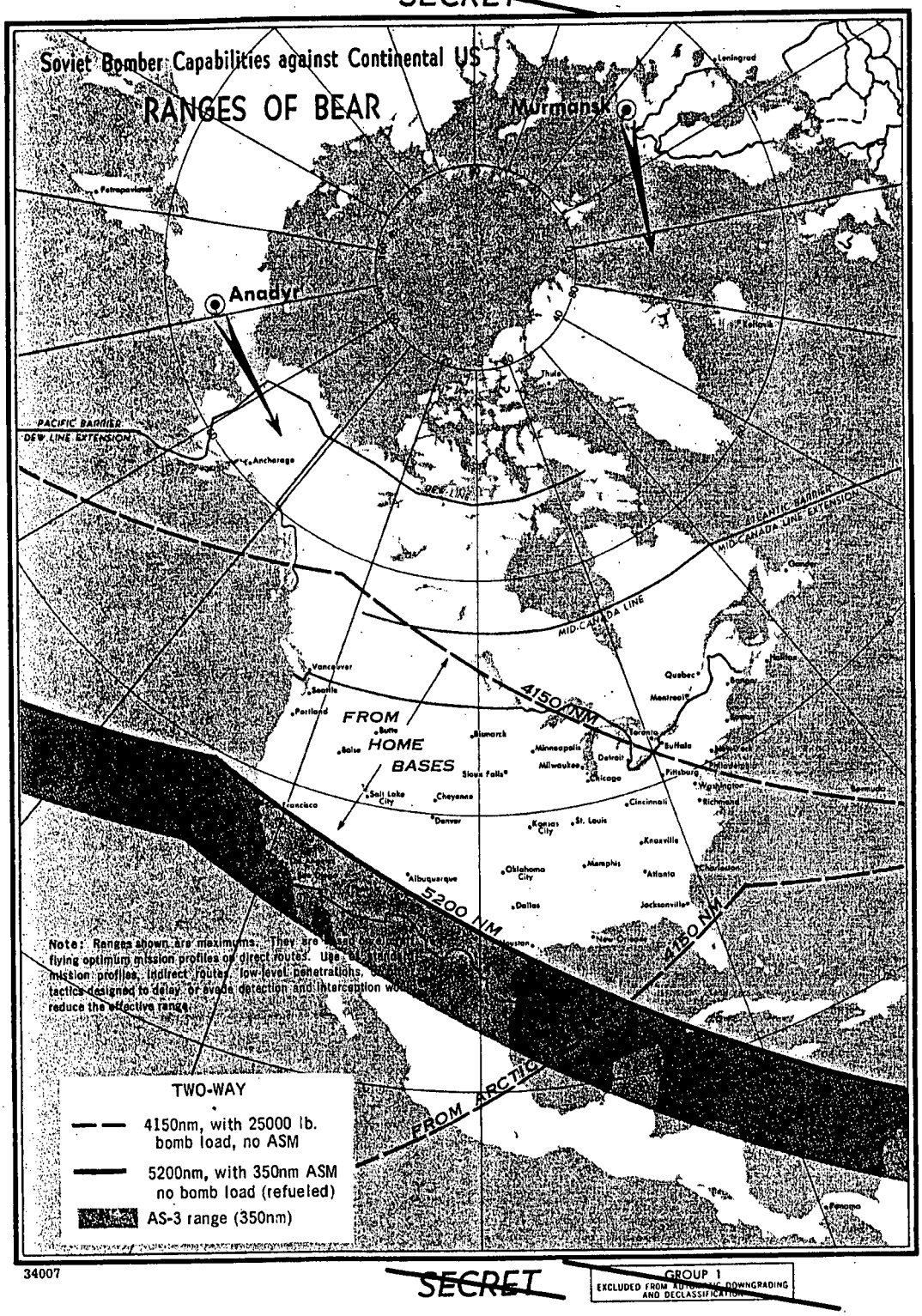
34006 9-63

~~SECRET~~

GROUP 1
EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

56

SECRET

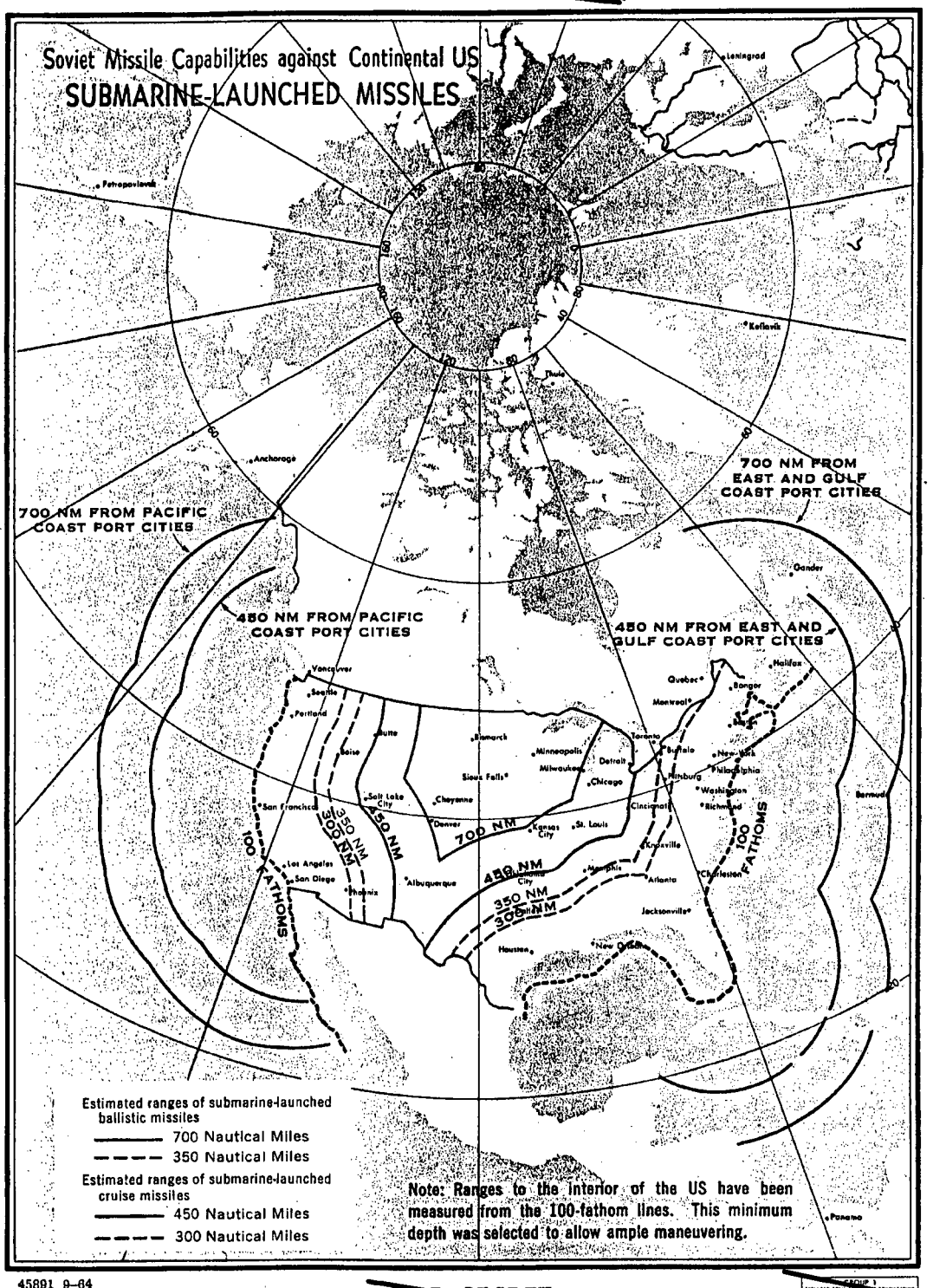


SECRET

GROUP 1
EXCLUDED FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

57

TOP SECRET



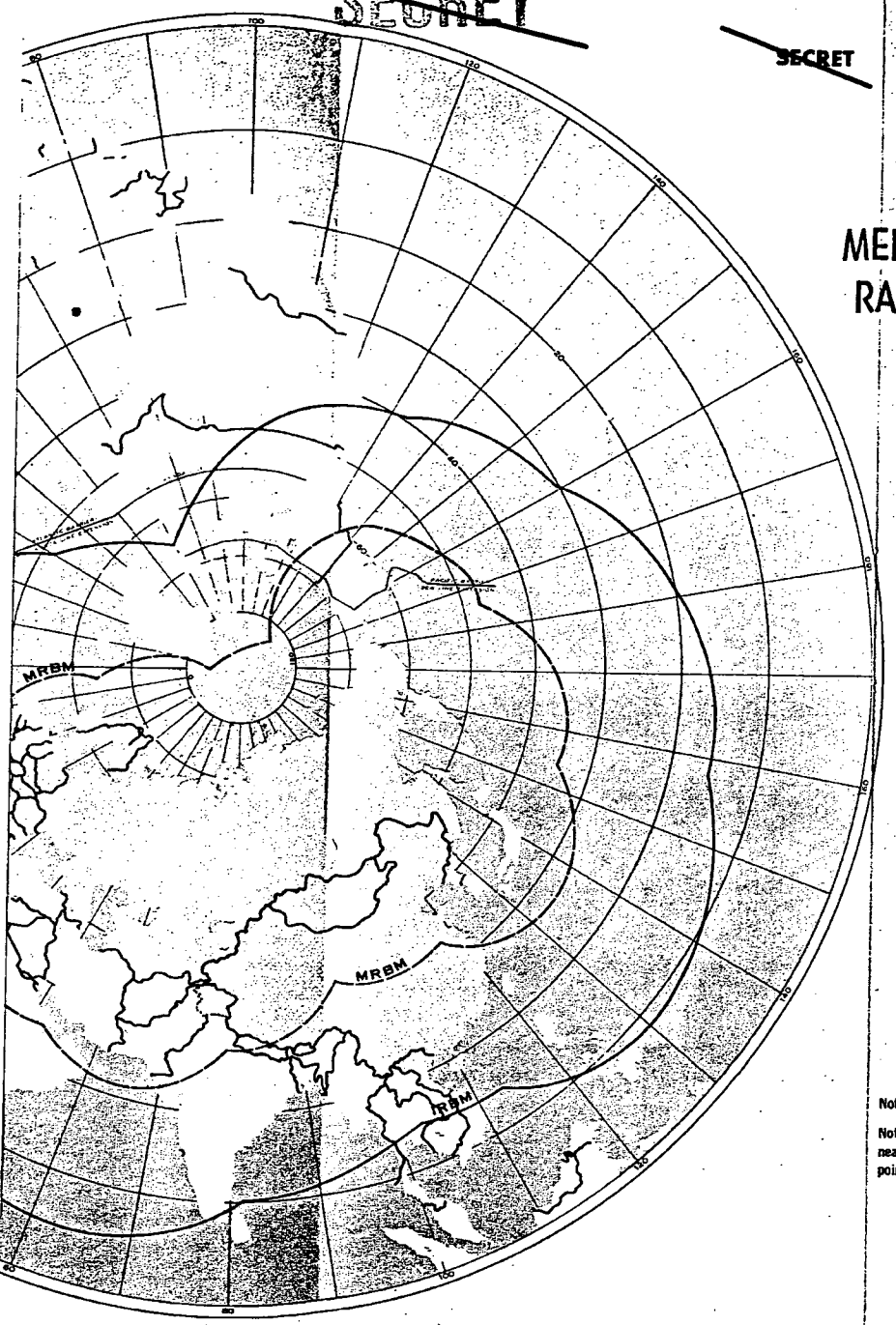
45891 9-64

TOP SECRET

56

Soviet Missile Capabilities
against Northern Hemisphere

MEDIUM AND INTERMEDIATE RANGE BALLISTIC MISSILES

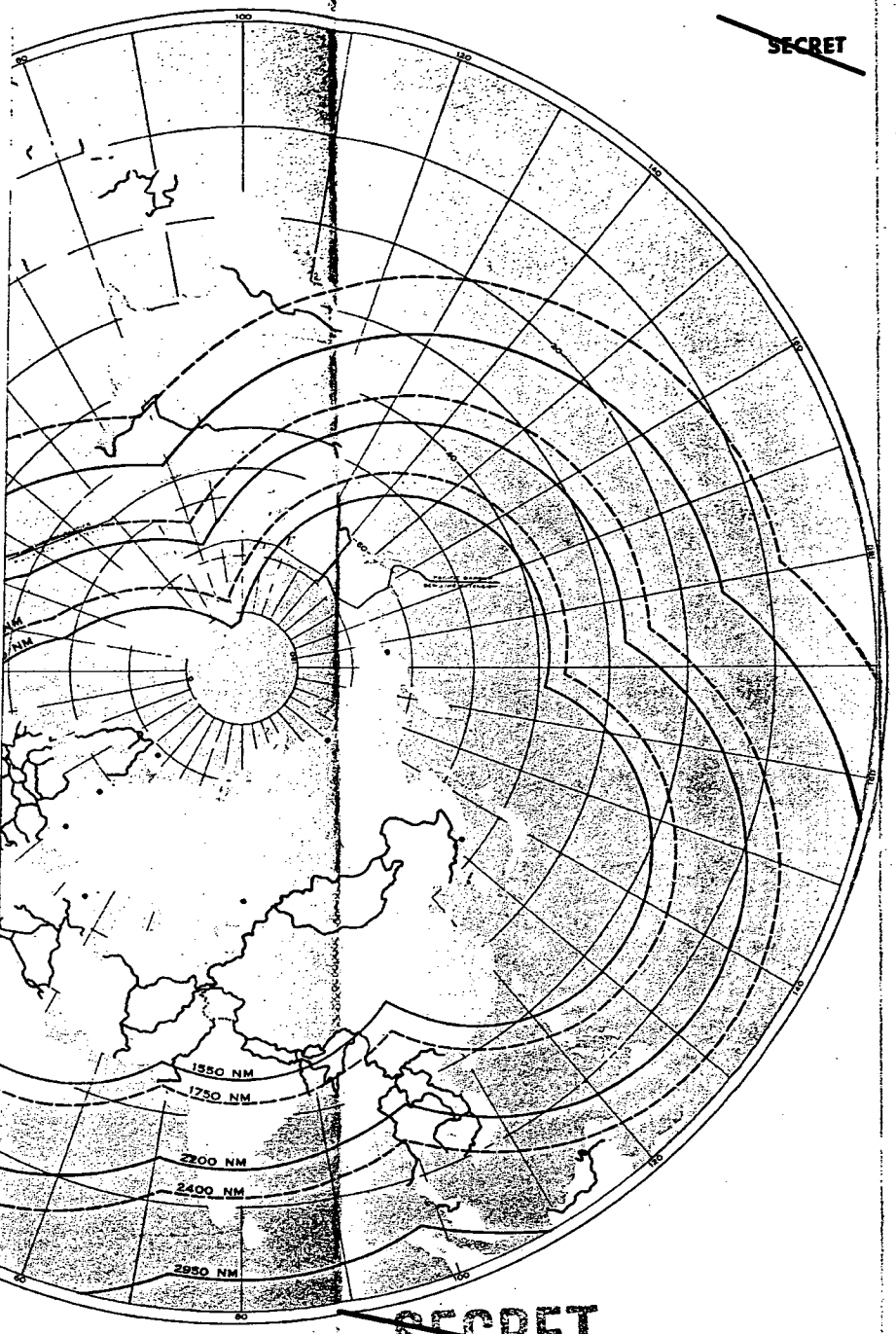


—— 1020 NM MRBM

—— 2200 NM IRBM

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 Bomber Capabilities against Northern Hemisphere

RANGES OF BADGER

Two-way unrefueled

—— 10,000 lb. bomb load 1550 NM

– – – 3,300 lb. bomb load 1750 NM

Two-way refueled

—— 10,000 lb. bomb load 2200 NM

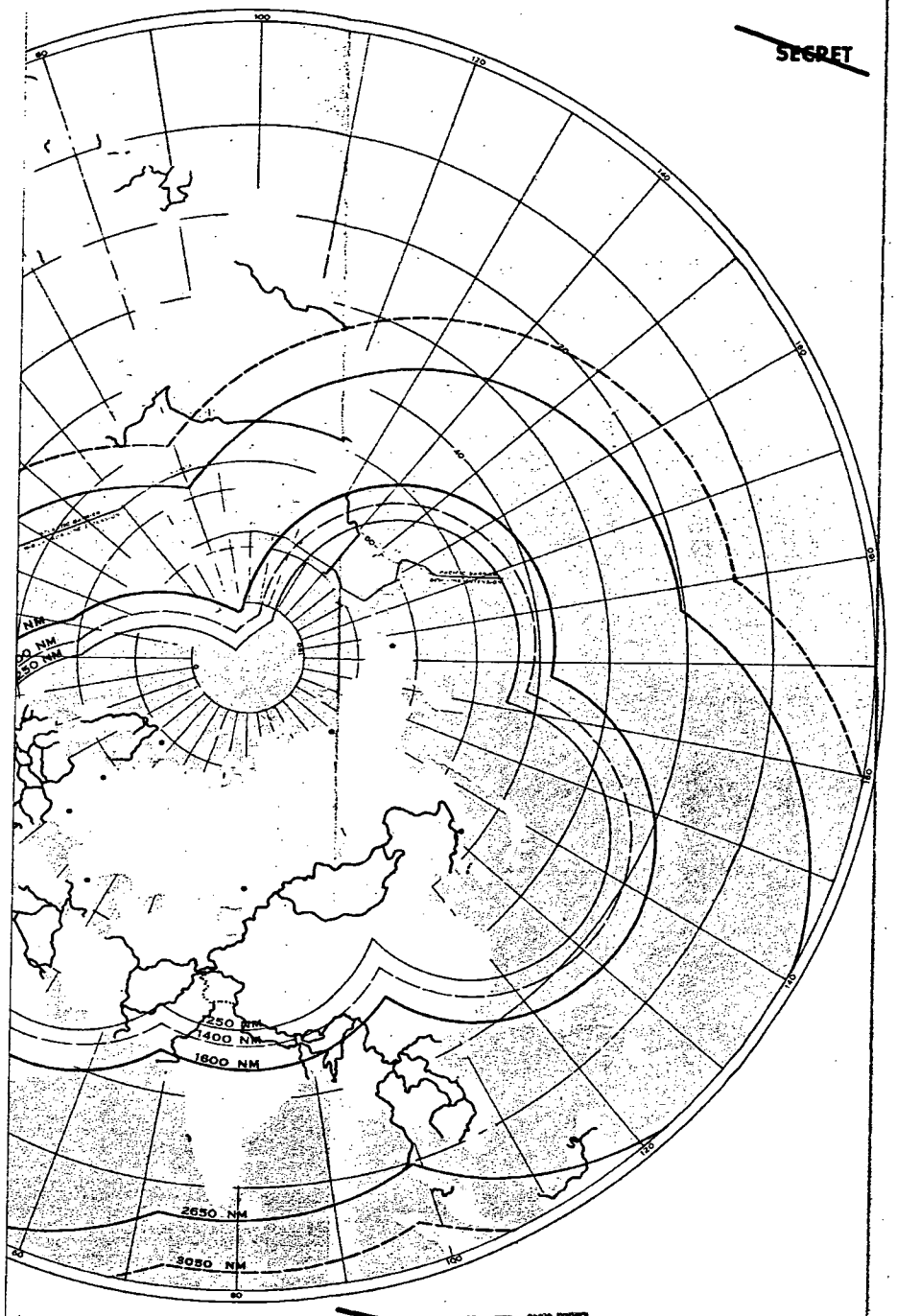
– – – 3,300 lb. bomb load 2400 NM

One-way unrefueled

—— 10,000 lb. bomb load 2950 NM

– – – 3,300 lb. bomb load 3400 NM

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 BLINDER

BLINDER A

Two-way unrefueled

—— 10,000 lb. bomb load 1250 NM

– – – 3,300 lb. bomb load 1400 NM

One-way unrefueled

—— 10,000 lb. bomb load 2650 NM

– – – – 3,300 lb. bomb load 3050 NM

BLINDER B

Two-way refueled

—— With ASM 1600 NM

Note 1: We believe BLINDER was designed for a supersonic-dash mission. Therefore, ranges shown, based on aircraft flying optimum mission profiles on direct routes, include a 200 NM dash at Mach 1.5 in the target area. If BLINDER were flown subsonic all the way, combat radius would be increased by some 450-500 NM. On the other hand, the effective range would be reduced by use of other bases, older model aircraft, standard mission profiles, indirect routes, low-level penetrations, or other tactics designed to delay or evade detection and interception.

NOTE 2: BLINDER A is a bomber not known to be equipped for in-flight refueling. The other version, BLINDER B, is equipped for in-flight refueling and ASM delivery; this weapon system could become operational in 1965.

CENTRAL INTELLIGENCE AGENCY

DISSEMINATION NOTICE

1. This document was disseminated by the Central Intelligence Agency. This copy is for the information and use of the recipient and of persons under his jurisdiction on a need to know basis. Additional essential dissemination may be authorized by the following officials within their respective departments:

a. Director of Intelligence and Research, for the Department of State
b. Director, Defense Intelligence Agency, for the Office of the Secretary of Defense and the organization of the Joint Chiefs of Staff
c. Assistant Chief of Staff for Intelligence, Department of the Army, for the Department of the Army
d. Assistant Chief of Naval Operations (Intelligence), for the Department of the Navy
e. Assistant Chief of Staff, Intelligence, USAF, for the Department of the Air Force
f. Director of Intelligence, AEC, for the Atomic Energy Commission
g. Assistant Director, FBI, for the Federal Bureau of Investigation
h. Director of NSA, for the National Security Agency
i. Assistant Director for Central Reference, CIA, for any other Department or Agency

2. This document may be retained, or destroyed by burning in accordance with applicable security regulations, or returned to the Central Intelligence Agency by arrangement with the Office of Central Reference, CIA.

3. When this document is disseminated overseas, the overseas recipients may retain it for a period not in excess of one year. At the end of this period, the document should either be destroyed, returned to the forwarding agency, or permission should be requested of the forwarding agency to retain it in accordance with IAC-D-69/2, 22 June 1953.

4. The title of this document when used separately from the text should be classified: ~~SECRET~~

DISTRIBUTION:
White House
National Security Council
Department of State
Department of Defense
Atomic Energy Commission
Federal Bureau of Investigation

62

THIS PAGE LEFT INTENTIONALLY BLANK.