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CIA HISTORICAL REVIEW PROGRAM
RELEASE AS SANITIZED

~~SC 09678-61~~

NATIONAL INTELLIGENCE ESTIMATE

NIE 11-8/1-61

STRENGTH AND DEPLOYMENT OF
SOVIET LONG RANGE BALLISTIC MISSILE FORCES*

(SUPPLEMENTS NIE 11 - 8 - 61)

THE PROBLEM

To estimate current Soviet operational strength in ICBM's and other ground-launched ballistic missiles with ranges of 700 n.m. or more, to identify present areas and methods of deployment, and to estimate the probable trends in strength and deployment over the next few years.

* NIE 11-8/1-61 revises and updates the estimates on this subject which were made in NIE 11-8-61: "Soviet Capabilities for Long Range Attack", TOP SECRET, 7 June 1961. [

] The new estimate is issued [] so that the reader can fully appreciate the quantity and quality of information on which it is based.

A brief summary of this estimate, [] will be included in the forthcoming NIE 11-4-61: "Main Trends in Soviet Capabilities and Policies, 1961-1966", now scheduled for completion in December 1961. In that estimate, the treatment of ground launched missiles will be incorporated into a summary of the entire Soviet long-range attack capability, including bombers, air-to-surface missiles, and submarine-launched missiles. For our current estimates on these latter elements of the long range striking force, see NIE 11-4-61, Annex A: "Soviet Military Forces and Capabilities", 24 August 1961, TOP SECRET, paragraphs 16-23.

CONCLUSIONS

1. New information, providing a much firmer base for estimates on Soviet long range ballistic missiles, has caused a sharp downward revision in our estimate of present Soviet ICBM strength but strongly supports our estimate of medium range missile strength.

2. We now estimate that the present Soviet ICBM strength is in the range of 10 - 25 launchers from which missiles can be fired against the US, and that this force level will not increase markedly during the months immediately ahead. 1/ We also estimate that the USSR now has about 250-300 operational launchers equipped with 700 and 1,100 n.m. ballistic missiles. The bulk of these MRBM launchers are in western USSR, within range of NATO targets in Europe; others are in southern USSR and in the Soviet Far East. ICBM and MRBM launchers probably have sufficient missiles to provide a reload capability and to fire additional missiles after a period of some hours, assuming that the launching facilities are not damaged by accident or attack.

3. The low present and near-term ICBM force level probably results chiefly from a Soviet decision to deploy only a small force of the cumbersome, first generation ICBMs, and to press the development of a smaller, second generation system. Under emergency conditions the existing force could be supplemented somewhat during the first half of 1962, but Soviet ICBM strength will probably not increase substantially until the new missile is ready for operational use, probably sometime in the latter half of 1962. After this point, we anticipate that the number of operational launchers will begin to increase significantly. On this basis, we estimate that the force level in mid-1963 will approximate 75-125 operational ICBM launchers. 2/

1/ The Assistant Chief of Staff, Intelligence, USAF, does not concur in this sentence. See his footnote following the Conclusions.

2/ The Assistant Chief of Staff, Intelligence, USAF, does not concur in paragraph 3. See his footnote following the Conclusions.

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4. In addition to 700 and 1,100 n.m. missiles now available, the USSR will probably have a 2,000 n.m. system ready for operational use late this year or early next year. The USSR's combined strength in these missile categories will probably reach 350-450 operational launchers in the 1962-1963 period, and then level off.

5. Soviet professions of greatly enhanced striking power thus derive primarily from a massive capability to attack European and other peripheral targets. Although Soviet propaganda has assiduously cultivated an image of great ICBM strength, the bulk of the USSR's present capability to attack the US is in bombers and submarine-launched missiles rather than in a large ICBM force. While the present ICBM force poses a grave threat to a number of US urban areas, it represents only a limited threat to US-based nuclear striking forces. 3/

3/ The Assistant Chief of Staff, Intelligence, USAF, does not concur in paragraph 3 and the last sentence of paragraph 5. See his footnote following the Conclusions.

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Position on ICBM force levels of the Assistant Chief of Staff, Intelligence, USAF:

1. The Assistant Chief of Staff, Intelligence, USAF believes that the Soviets had about 50 operational ICBM launchers in mid-1961 and that they will have about 100 in mid-1962 and about 250 in mid-1963. In his view, the early availability and high performance record of the first generation ICBM indicates the probability that, by mid-1961, substantial numbers of these missiles had been deployed on operational launchers. Four considerations weigh heavily in this judgment:
 - a. The continuance of [] firings of the first generation ICBM;
 - b. The feasibility of adapting the type "C" pad - now identified as being deployed in the field - for use with the first generation system;
 - c. []
 - d. The USSR's current aggressive foreign policy indicates a substantial ICBM capability.
2. In view of the time that has passed since the first generation system became suitable for operational deployment, now over 18 months, the Assistant Chief of Staff, Intelligence, USAF believes that about 50 operational launchers in mid-1961 is likely, even though the Soviets may have elected to await development of second generation missiles before undertaking large-scale deployment.
3. The Assistant Chief of Staff, Intelligence, USAF believes that the force now deployed constitutes a serious threat to US-based nuclear striking forces.
4. As to the future, the Assistant Chief of Staff, Intelligence, USAF believes that the Soviets will continue to deploy first generation missiles, as an interim measure until the second generation missiles become available. He believes that the Soviets would prefer this approach to acceptance of an inordinate delay in the growth of their ICBM capabilities. Once the second generation system has become operational, which could be in early 1962, he believes that deployment will be accelerated, with first generation missiles being withdrawn from operational complexes and replaced by the new missiles. It is evident from their test program that the Soviets feel obliged to increase the tempo of their efforts. The Assistant Chief of Staff, Intelligence, USAF believes that this sense of urgency, plus the gains realizable from experience will result, in the next year or two, in a launcher deployment program more accelerated than that indicated in the text.

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DISCUSSION

6. The requirement to revise our estimates on Soviet long range ballistic missile forces stems from significant recent evidence [] the 1961 activities at the Soviet ICBM and space vehicle test range has provided information on the new types of ballistic vehicles now being developed and on the pace and progress of the development programs. [] the first positive identification of long range ballistic missile deployment complexes, [] excellent guidance as to Soviet deployment methods, []

[] useful evidence on the general status and organization of long range missile forces. Therefore, although significant gaps continue to exist and some of the available information is still open to alternate interpretations, the present estimate stands on firmer ground than any previous estimate on this critical subject.

ICBM Development

7. The test-firing program from the Tyuratam ICBM and space launching rangehead has been much more intensive in 1961, and has at the same time suffered many more failures, than in any other period in its four year history. Thirty-nine launching operations were undertaken between January and 17 September 1961. ^{4/} Of these, 13 involved either first generation ICBMs or space vehicles using essentially the same booster. All but one of these 13 were generally successful. The other 26 operations involved new vehicles not previously observed in range activities. Of these, only about half resulted in generally successful

^{4/} A more recent launching operation on 19 September 1961, which resulted in a failure, cannot as yet be categorized as to type of vehicle.

firings which reached the vicinity of the instrumented impact areas. Of the last seven operations involving new vehicles, however, six have been generally successful. (See Figure 1.)

8. One of the new vehicles (called Category B by US intelligence) is probably a second generation ICBM; the other (Category C) may be a competitive ICBM design or a special vehicle to test ICBM and space components. Both are tandem staged, that is, the upper stage is ignited at altitude as in the case of Titan, rather than at launch as in the case of Atlas and the first generation Soviet ICBM. Our data are sufficient to show that both of the new vehicles are liquid propelled, but not to establish whether the propellants are storable or non-storable. Some aspects of [] performance of the upper stage of the Category B vehicle are similar to those of the 2,000 n.m. missile, which was tested intensively at Kapustin Yar for some months preceding the Category B operations at Tyuratam. The vehicles fired to a distance of 6,500 n.m. into the Pacific on 13 and 17 September 1961 were probably Category B vehicles. Some relationship seems to exist between the upper stages of the Category C vehicle and Venus probes. Despite this apparent relationship with space vehicles, it was a Category C firing which immediately preceded Khrushchev's remark to McCloy last July, that a "new ICBM" had been launched successfully. No further details are known about the configuration, propulsion, guidance, range, or payload of the new vehicles.

5/

9. The 1961 tests confirm our previous estimate that the Soviets would develop a new ICBM system, and we continue to believe that a major requirement for such a system is a missile which can be more readily handled and deployed than their original ICBM. This belief is supported by a reliable clandestine source who learned, in 1960 or early 1961, that the Soviet leadership desired an ICBM using higher-energy fuel which

5/ We have taken note of Soviet statements concerning a 100 megaton weapon. We do not believe that present Soviet capabilities include a missile warhead with 100 megaton yield or a ballistic vehicle capable of delivering such a warhead to intercontinental ranges. We will examine this matter in fuller detail in an early estimate.

would require less bulk. In order to be flight tested in early 1961, design work on a new missile was certainly underway in 1958. Nuclear tests appropriate to the development of lighter warheads were conducted in 1957 and 1958; the current nuclear testing program may serve further to prove the warhead design.

10. Although the flight-test failures in the first half of 1961 probably set back the Soviet schedule for development of second generation missiles, it is clear from the test range activities that the R&D program has been pursued with great vigor. The recent successes with the Category B vehicle, and the probable firing of such vehicles to 6,500 n.m. after only about 8 months of testing to Kamchatka, suggest that the initial difficulties with this system may now have been largely overcome. Moreover, it is probable that one or both the new vehicles have borrowed components or at least design techniques from proven systems, thereby aiding the R&D program. We believe that the program will continue to be pursued with vigor, and that a smaller, second generation ICBM will have been proven satisfactory for initial operational deployment in the latter half of 1962.

11. Thus we believe that the first generation system will be the only Soviet ICBM system in operational use for the months immediately ahead and probably for about the next year. Despite its inordinate bulk and the other disadvantages inherent in a non-storable liquid fueled system, the first generation system is capable of delivering a high yield nuclear warhead with good accuracy and reliability against targets anywhere in the US. (For a summary of its estimated operational characteristics, see Figure 2.) Test range launchings of first generation missiles (now called Category A) continued from January through July. [

] These latest Category A firings were normal, [

] Firings 16 hours apart could reflect

the training of operational crews for launching second salvos, but it cannot be determined whether these firings were from a single pad. Accuracy could not be determined, but reliability continued high. 6/

Utilization of Launching Pads

12. Soviet ICBM capabilities at present depend in part, and in the near future will depend in considerable measure, upon whether or not the deployment complexes now being discovered [] can be used to fire first generation missiles, or whether they cannot become fully operational until a second generation missile becomes available. The first generation missile is obviously compatible with massive, fully rail-served launchers similar to those at Tyuratam Areas A and B. But the launchers at confirmed field complexes, whose construction began only in late 1959 or thereafter, resemble the simplified pair of pads at Tyuratam Area C, where missiles are transported to the pad by road and some of the support equipment is mounted on vans. (For artists' conceptions of the launchers at Tyuratam and a layout of the rangehead, see Figures 3-5.)

13. From our examination of the 1961 test firing program, the physical dimensions of various items at Areas A and C, and the requirements for handling and firing the first generation missile, we conclude that the simplified Area C was designed for a new and smaller missile now being test fired. Although it is technically feasible for the Soviets to adapt the rail-based first generation missile to road served launchers of the type at Area C, it would be necessary to redesign much of the check-out, handling, erecting, and fueling equipment. This redesigned equipment would differ from both that at Area A and that designed for use with the

6/ To date we have no firm evidence to indicate that the Soviets have experimentally investigated the decoy problem in ICBM flights to Kamchatka. []

believe that the Soviets can and will provide decoy protection, should they deem it necessary.] We

new missile. Such action might have been taken as an interim measure if a long delay in the advent of the second generation system had been anticipated well in advance.

ICBM Deployment

14. [] over the past three months, we have positively identified three ICBM complexes under construction. Two are near Yur'ya and Yoshkar-Ola, in a region several hundred miles northeast of Moscow, and the third is near Verkhnyaya Salda in the Urals. The paired, road-served pads at these complexes closely resemble those at Tyuratam Area C. Near Kostroma, in the same general region but closer to Moscow, [] we believe this is possibly a fourth complex similar to the others. [] Plesetsk, farther to the northwest, [] was too limited either to confirm or rule out this location as an ICBM deployment complex. (The locations of presently known and suspected areas of ICBM deployment activities are shown in Figure 9.)

15. The new evidence confirms that the present Soviet deployment concept involves large, fixed complexes, with multiple pads and extensive support facilities. The identified deployment complexes are served by rail spurs which provide their major logistic support. The complexes are highly vulnerable to attack. For example, although the Yur'ya complex is quite large, the entire installation is soft and each pair of pads is separated from its neighbor by only 3-4 n.m. []

[] For active defense against aircraft, SA-2 surface-to-air missile sites are being installed near the complexes.

16. At Yur'ya, the confirmed complex whose construction appears most advanced, eight launchers in four pairs were observed in various

stages of construction in mid-1961 (see Figure 6). Considerations of logistics and control, together with evidence from the MRBM program and other factors, lead us to believe that eight is the typical number of launchers for this type of complex.^{7/} Each pair of launchers has checkout and ready buildings which are probably capable of housing a missile for each pad; however, the extent of the support facilities strongly suggests that additional missiles are to be held there to provide a reload or standby capability. The designed salvo capability of the complex is apparently to be eight missiles. There would be at least 5 minutes delay between groups of four missiles if the system is radio-inertial (as is the first generation ICBM) and if one set of guidance facilities is provided for each pair of launchers. A second salvo might be attempted after some hours, assuming the launching facilities were not damaged by accident or attack. Although we have no direct evidence on this matter, we believe it might be feasible to prepare a second salvo in 8-12 hours.

17. On the basis of evidence dating back to 1957 and other more recent information, we have estimated that Plesetsk is an ICBM complex with rail-served launchers designed to employ the first generation ICBM. The installation at Plesetsk (see Figure 7) is even larger than the Yur'ya complex. Although the presence of ICBM launchers has not been confirmed, there are SAM sites, several very large support areas, and numerous buildings, including what appears to be housing for some 5,000 to 15,000 persons. [] evidence is inadequate to establish the number of launchers which may be at Plesetsk. We believe that the number may be as few as two, but four or more is also possible. An ICBM complex involving this much equipment, investment, and personnel would probably have a reload of at least one missile per pad. Based on

^{7/} The Assistant Chief of Staff, Intelligence, USAF, believes that this typical number may be larger than eight. He agrees, however, that if guidance facilities are provided for each pair of launchers, the sequence of launching would be as described in the text.

Tyuratam experience, we estimate the time to prepare a second salvo at about 16 hours. 8/

18. The new evidence gives a better measure of the timing of some ICBM deployment activities. Based on its size, the extent of its facilities, and its present state of construction, the Yur'ya complex must have been started in the autumn of 1959, concurrent with or very shortly after the start of construction at Tyuratam launch Area C. Yur'ya is probably one of the earliest complexes of its type. Construction and installation of equipment will probably be completed some time early in 1962. The similar complex at Yoshkar-Ola is many months behind Yur'ya; the evidence is less conclusive with respect to Kostroma and Verkhnyaya Salda, but what can be seen is apparently in the early stages of construction. From the evidence, therefore, we have reasonably firm indications that at least two years were used for the construction of even the simpler ICBM complexes, although this may be reduced to about 18 months as experience is gained.

Adequacy of Recent Intelligence Coverage

19. [] since mid-1960, our coverage of suspected deployment areas in the USSR has been substantially augmented.

[] Soviet missile test range installations [] are now known to bear a close resemblance to deployment sites in the field. On the basis of this activity, combined with other information and analysis, we now estimate that we have good intelligence coverage of []

8/ The Assistant Chief of Naval Operations (Intelligence), Department of the Navy, believes that evidence of ICBM deployment at Plesetsk is indeterminate but that, in the aggregate, it points against such deployment.

[] more than 50 percent of those portions of the USSR within which ICBM deployment is most likely. 9/

20. Of the five confirmed or possible ICBM complexes [] Yur'ya, Plesetsk, and Verkhnyaya Salda were previously suspected [] We previously had not suspected Yoshkar-Ola or Kostroma. []

21. [] many previously suspected areas did not contain ICBM complexes as of the summer of 1961. Four areas [] remain under active consideration as suspected locations of ICBM deployment activity (see Figure 9). Past experience indicates that some or all of the areas now under active consideration may prove to be negative, and conversely, that deployment activity may now be under way in other unsuspected areas. []

9/ []

Probable ICBM Force Levels 10/

22. We believe that our coverage of both test range activities and potential deployment areas is adequate to support the judgment that at present there are only a few ICBM complexes operational or under construction. While there are differences within the intelligence community as to the progress of the Soviet program to date and the precise composition of the current force, we estimate that the present Soviet ICBM capability is in the range of 10-25 launchers from which missiles can be fired against the US. The low side of this range allows for the possibility that the Soviets could now fire only a token ICBM salvo from a few launchers, located at the Tyuratam rangehead and an operational complex, perhaps Plesetsk. The high side, however, takes into account the limitations of our coverage and allows for the existence of a few other complexes equipped with first generation missiles, now operational but undetected.

23. The Soviet system is probably designed to have a refire capability from each launcher. The USSR may therefore be able to fire a second salvo some hours after the first, assuming that the launching facilities are not damaged by accident or attack.

24. The reasons for the small current capability are important to an estimate of the future Soviet buildup. The first generation system, designed at an early stage of Soviet nuclear and missile technology, proved to be powerful and reliable but was probably too cumbersome to be deployed on a large scale. One or more first generation sites may have been started but cancelled. [

] The urgent development of at least one second generation system probably began in about 1958, and an intensive firing program is now underway concurrent with the construction of simplified deployment complexes.

^{10.} The Assistant Chief of Staff, Intelligence, USAF, does not concur in the estimate of ICBM force levels. For his position, see his footnote following the Conclusions.

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We therefore believe that in about 1958 the Soviet leaders decided to deploy only a small force of first generation ICBMs while pressing toward second generation systems.

25. The net effect of this Soviet decision, together with whatever slippage is occurring in the development of second generation systems, has been to produce a low plateau of ICBM strength. Under emergency conditions the existing force could be supplemented during the first half of 1962 by putting some second generation ICBMs on launcher at one or two completed complexes before the weapon system has been thoroughly tested. However, the Soviets could not have very much confidence in the reliability, accuracy and effectiveness of such a force. In any event, operational ICBM strength will probably not increase substantially until the new missile has been proved satisfactory for operational use, probably some time in the latter half of 1962. Alternatively, the possibility cannot be excluded that second generation ICBMs could be proved satisfactory for operational use somewhat earlier in 1962, possibly as soon as the first simplified complex is completed. After this point, we anticipate that the number of operational launchers will begin to increase significantly.

26. We continue to believe, for the many reasons adduced in NIE 11-8-61, that the Soviet leaders have desired a force of several hundred operational ICBM launchers, to be acquired as soon as practicable over the next few years. In addition to the complexes known to be under construction, it is probably that work is under way on other undiscovered complexes and that the construction of still others is scheduled to begin soon. Taking account of this probability, together with our present intelligence coverage and our information on site activation lead-time, we estimate that the force level in mid-1963 will approximate 75-125 operational ICBM launchers. The high side of this range allows for eight complexes of eight launchers each under construction at the present time, with four more scheduled to begin by the end of the year; it would

- 14 -

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require site activation time to decrease to about 18 months by the end of the year; it builds from a present force level of about 25 operational launchers. The low side of the mid-1963 range would be achieved if six complexes were now under construction, two more were begun by the end of the year, and the present force level were only about 10 launchers.

27. As noted in NIE 11-8-61, Soviet force goals for the period to 1966 will be increasingly affected by developments in US and Soviet military technology, including the multiplication of hardened US missile sites, the possible advent of more advanced Soviet missiles which can better be protected, and by developments in both antimissile defenses and space weapons. The international political situation will also affect Soviet force goals, and there is a good chance that the Soviet leaders themselves have not yet come to a definite decision. We have not been able as yet to review, in the light of the new evidence, these and other considerations pertaining to the probable future pace of the Soviet ICBM program. Therefore we are unable to project a numerical estimate beyond mid-1963. Considering the problems involved in site activation, however, we believe that a rate of 100 or possibly even 150 launchers per year beginning in about 1963 would be feasible. To accomplish such a schedule, the USSR would have to lay on a major program of site construction within the next year, which we believe would be detected

[]

Medium and Intermediate Range Ballistic Missiles

28. [] confirms the large-scale deployment of 700 and 1,100 n.m. ballistic missiles in western USSR. [] approximately 50 fixed sites with a total of about 200 pads suitable for launching these MRBMs have been firmly identified in a wide

belt stretching from the Baltic to the southern Ukraine. [] we are virtually certain that there are about 10 additional sites [] Taking account of indicators pointing to still other locations [] we estimate with high confidence that in the western belt alone there are now about 75 sites with a total of about 300 launch pads, completed or under construction. (For known and estimated site locations in this area, see Figure 9.)

29. The new information does not establish whether individual sites are fully operational, nor does it reveal which type of missile each is to employ. []

[] approximately three-quarters of the identified sites appeared to be complete or nearly so, some were under construction, and the evidence on others is ambiguous. Construction has probably been completed at some sites [] the installation of support equipment and missiles could probably be accomplished relatively quickly thereafter, perhaps in a period of some weeks. Three basic site configurations have been observed, all of them bearing a strong resemblance to launch areas at the Kapustin Yar rangehead (see Figure 8). Any of the three types could employ either 700 or 1,100 n.m. missiles, whose size and truck-mounted support equipment are virtually identical. The sites could not employ ICBMs, but one type might be intended for the 2,000 n.m. IRBM which has been under development at Kapustin Yar.

30. On the basis of the new evidence and a wealth of other material on development, production, training and deployment, we estimate that in the western belt alone the USSR now has about 200-250 operational launchers equipped with 700 and 1,100 n.m. ballistic missiles, together with the necessary supporting equipment and trained personnel. From these launchers, missiles could be directed against NATO targets from Norway to Turkey. On less firm but consistent evidence, about 50 additional

launchers are believed to be operational in other areas: in the Transcaucasus and Turkestan, from which they could attack Middle Eastern targets from Suez to Pakistan; and in the southern portion of the Soviet Far East within range of Japan, Korea, and Okinawa. [

] the presence of some sites in Turkestan and in the Soviet Far East, north of Vladivostok.

31. On this basis, we estimate that the USSR now has a total of about 250-300 operational launchers equipped with medium range ballistic missiles, the bulk of them within range of NATO targets in Europe. This is essentially the same numerical estimate as given in NIE 11-8-61, but it is now made with greater assurance.

32. Contrary to our previous view that MRBMs were deployed in mobile units, we now know that even though their support equipment is truck-mounted, most if not all MRBM units employ fixed sites. Like the ICBM complexes, these are soft, screened from ground observation by their placement in wooded areas, and protected against air attack by surface-to-air missile sites in the vicinity. The systems are probably designed so that all ready missiles at a site can be salvoed within a few minutes of each other. Two additional missiles are probably available for each launcher; a second salvo could probably be launched about 4-6 hours after the first. There is some evidence that after one or two salvos the units are to move from their fixed sites to reserve positions. Their mobility could thus be used for their immediate protection, or they could move to new launch points to support field forces in subsequent phases of a war.

33. The Soviet planners apparently see a larger total requirement for MRBMs and IRBMs than we had supposed. While the rate of deployment activity in the western belt is probably tapering off after a vigorous three-year program, some sites of all three basic types are still under construction. There will therefore be at least some increase in force levels in the coming months. The magnitude of the buildup thereafter will depend largely on the degree to which the 2,000 n.m. system is deployed,

and whether or not it will supplement or replace medium range missiles.

34. With the advent of the 2,000 n.m. IRBM, probably in late 1961 or early 1962, the Soviets will acquire new ballistic missile capabilities against such areas as Spain, North Africa, and Taiwan. To this extent at least, they probably wish to supplement their present strength. They may also wish to deploy IRBMs or MRBMs to more northerly areas within range of targets in Greenland and Alaska. Moreover, evidence from clandestine sources indicates that the Soviet field forces are exerting pressure to acquire missiles of these ranges. In general, however, we believe that the future MRBM/IRBM program will emphasize changes in the mix among the existing systems, and later the introduction of second generation systems, rather than sheer numerical expansion. Taking these factors into account, we estimate that the USSR will achieve 350-450 operational MRBM and IRBM launchers sometime in the 1962-1963 period, and that the force level will be relatively stable thereafter.

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FIGURES

1. Soviet ICBM Test Range Activities, Tyuratam, USSR - Launching Operations in 1961.
2. Estimated Current Performance Characteristics, Soviet Long Range Ballistic Missiles.
3. Tyuratam Missile Test Center (Status in late 1960-early 1961).
4. Concept of Tyuratam Launch Area A.
5. Concept of Tyuratam Launch Area C.
6. ICBM Deployment Complex, Yur'ya, USSR (Status in mid-1961).
7. Suspected ICBM Deployment Complex, Plesetsk, USSR (Status in mid-1961).
8. Typical Fixed MRBM Launch Site.
9. Known and Suspected Areas of Soviet Long Range Ballistic Missile Deployment - September 1961.

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FIGURE 1

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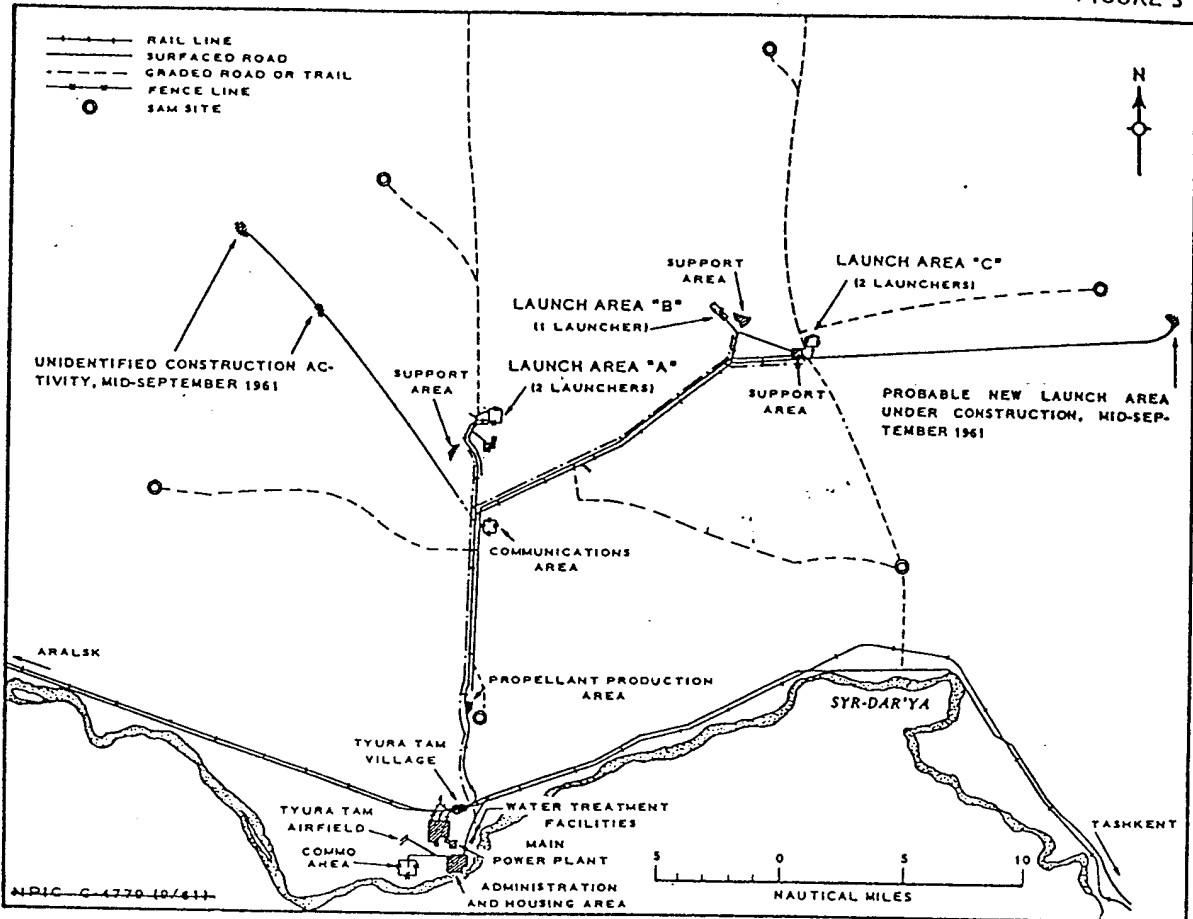
FIGURE 2

ESTIMATED CURRENT PERFORMANCE CHARACTERISTICS
SOVIET LONG RANGE BALLISTIC MISSILES

	SS-3	SS-4	SS-5 ¹	SS-6 ²	Second Generation ICBM ¹
Max. Operational Range (nm)	700	1100	2000	5000 7000	at least 6500
Guidance	Radio/ Inertial	Radio/ Inertial	Radio/ Inertial	Radio/ Inertial	NA
Accuracy	1 nm	1½ nm	1½ nm or better	2 nm	NA
Configuration	Single Stage	Single	Single	Partial or Parallel	Tandem
Propellants	NonStor. Liquid	NonStor. Liquid	Liquid	NonStor. Liquid	Liquid
Gross Takeoff Weight (lbs)	60,000	75,000	NA	450,000- 500,000	Prob less than SS-6
Warhead Weight (lbs)	3000	3000	3000- 5000	6000-10000 6000	NA
Ready Missile Rate	85%	85%	75%	70-85% ³	NA
Reliability, on Launcher	90%	95%	80%	85-90% ⁴	NA
Reliability, in Flight	80%	80%	75%	70-85% ⁴	NA
Reaction Time ⁵ - Condition I	1-3 hrs	1-3 hrs	1-3 hrs	1-3 hrs	NA
Reaction Time - Condition II	15-30 min	15-30 min	15-30 min	15-30 min	NA
Reaction Time - Condition III	5-10 min	5-10 min	5-10 min	5-10 min	NA
Refire Capability ⁶	4-6 hrs	4-6 hrs	6-8 hrs	about 16 hrs	8-12 hrs

¹ Not yet operational.² For this missile the range and warhead weight figures are for heavy nosecone (top figure) and lighter nosecone (bottom figure).³ The lower limit of this range approximates the percentage which might be maintained ready in continuous peacetime operations for an indefinite period. The upper limit might be achieved if the Soviets prepared their force for an attack at a specific time designated well in advance, i.e., maximum readiness.⁴ The upper limit would be more likely to be achieved if the Soviets had provided time for peaking their forces on launcher prior to an attack at a specific time.⁵ Condition I: Crews on routine standby, electrical equipment cold, missiles not fueled.
Condition II: Crews on alert, electrical equipment warmed up, missiles not fueled.
Condition III: Crews on alert, electrical equipment warmed up, missiles fueled and topped. This condition probably can not be maintained for more than an hour or so.⁶ From same pad, and dependent upon condition of alert.

FIGURE 3



TYURATAM MISSILE TEST CENTER (Status in late 1960-early 1961)

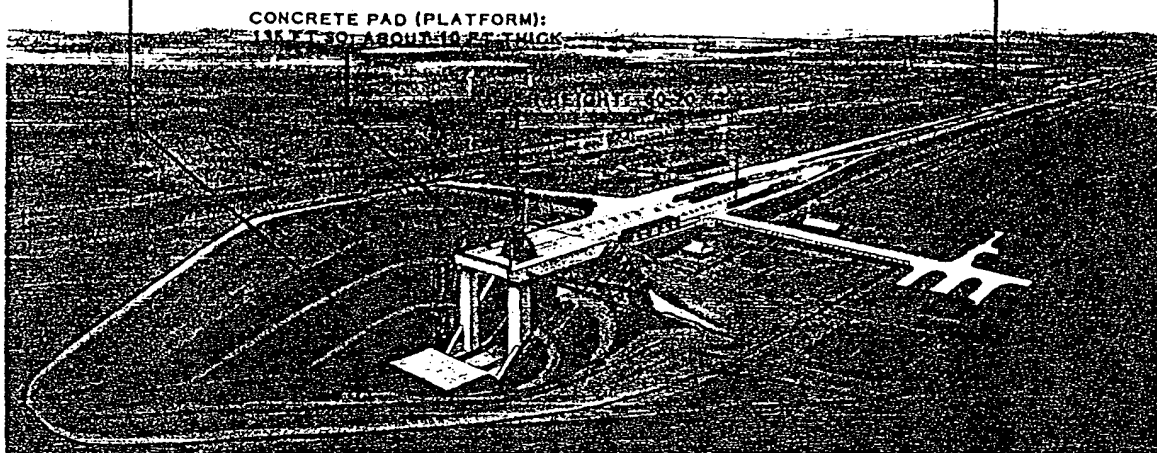
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FIGURE 4

PIT: ABOUT 900 X 550 FT
TOP OF CONCRETE PAD TO
BOTTOM OF PIT: 140 FT

TO ASSEMBLY/CHECKOUT
AREA 1.5 NM FROM PAD

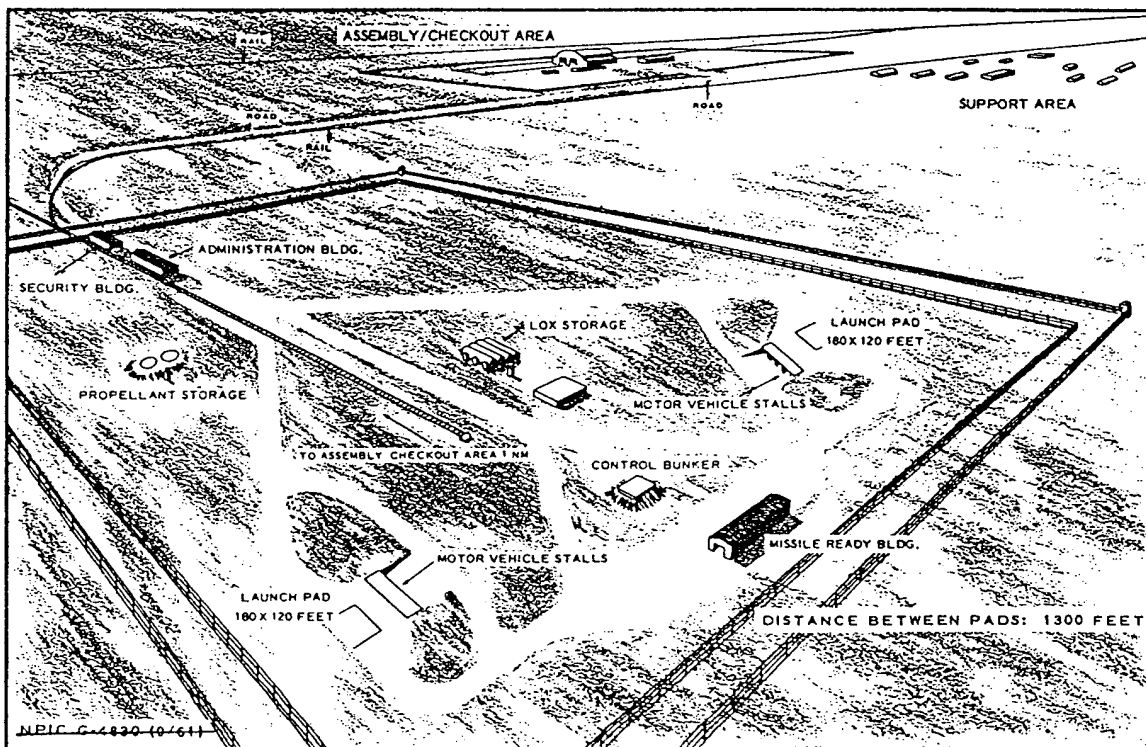


NOTE: A SECOND LAUNCH PAD, WITHOUT PIT, IS NOW AVAILABLE AT LAUNCH AREA A. LITTLE DETAIL IS AVAILABLE ON THIS NEWER PAD. THE SINGLE LAUNCHER AT TYURA TAM LAUNCH AREA B IS SIMILAR TO THAT SHOWN ON THIS DRAWING.

NPIC G-4832 (9/61)

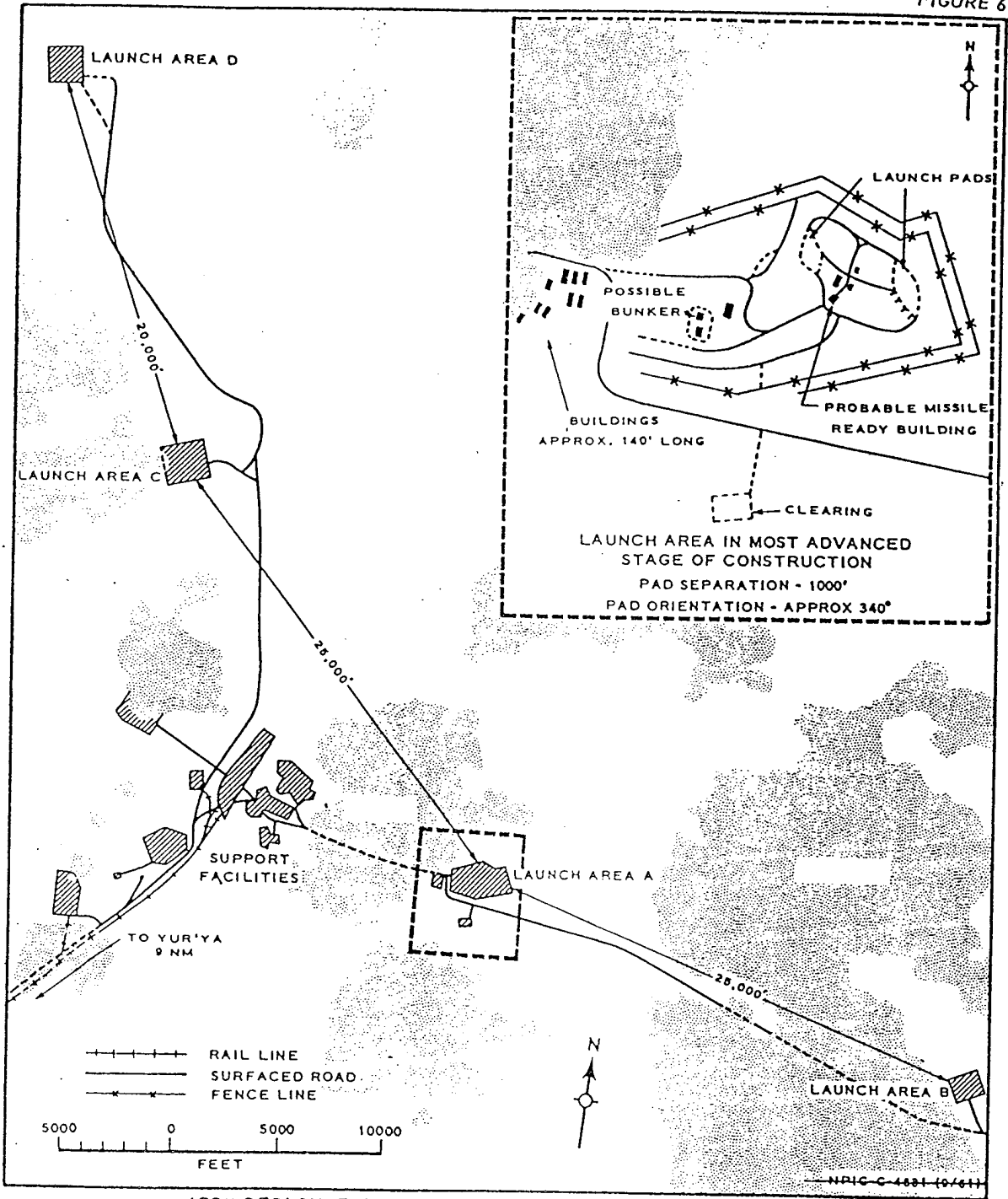
CONCEPT OF TYURATAM LAUNCH AREA "A"

FIGURE 5



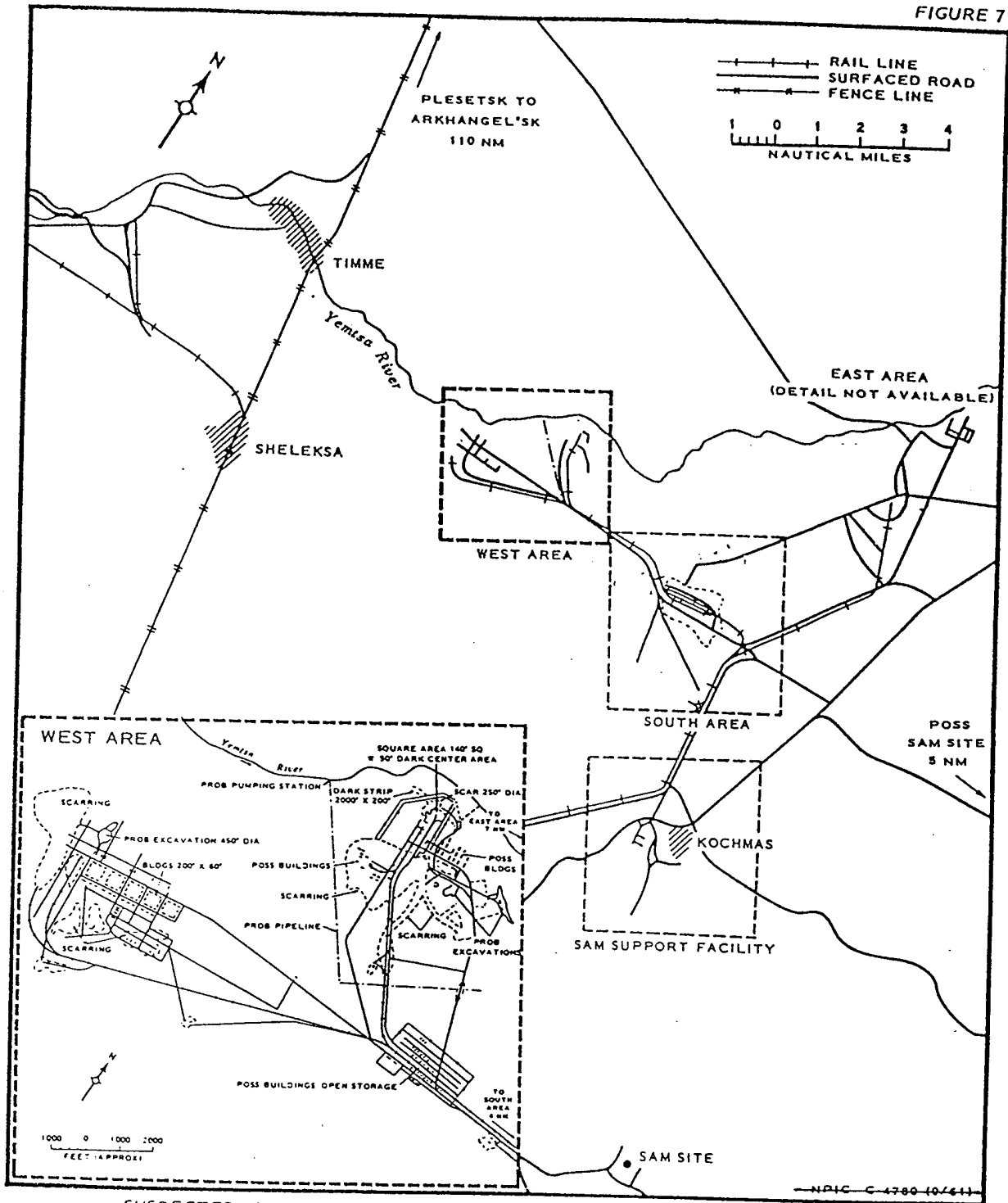
CONCEPT OF TYURATAM LAUNCH AREA "C"

FIGURE 6



ICBM DEPLOYMENT COMPLEX, YUR'YA, USSR (Status in mid-1961)

FIGURE 7



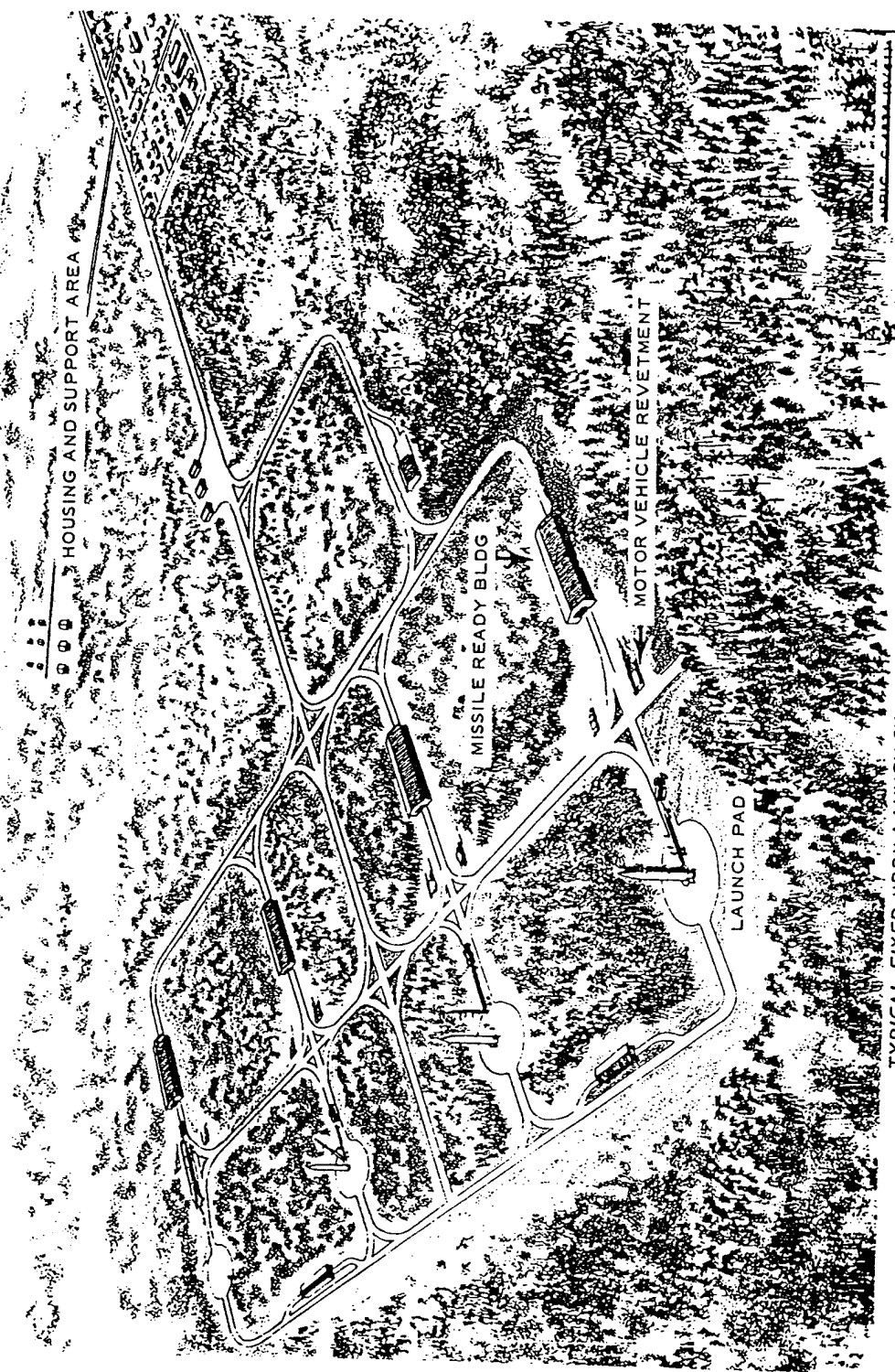
SUSPECTED ICBM DEPLOYMENT COMPLEX, PLESETSK, USSR. (Status in mid-1961)

~~TOP SECRET~~

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FIGURE 8

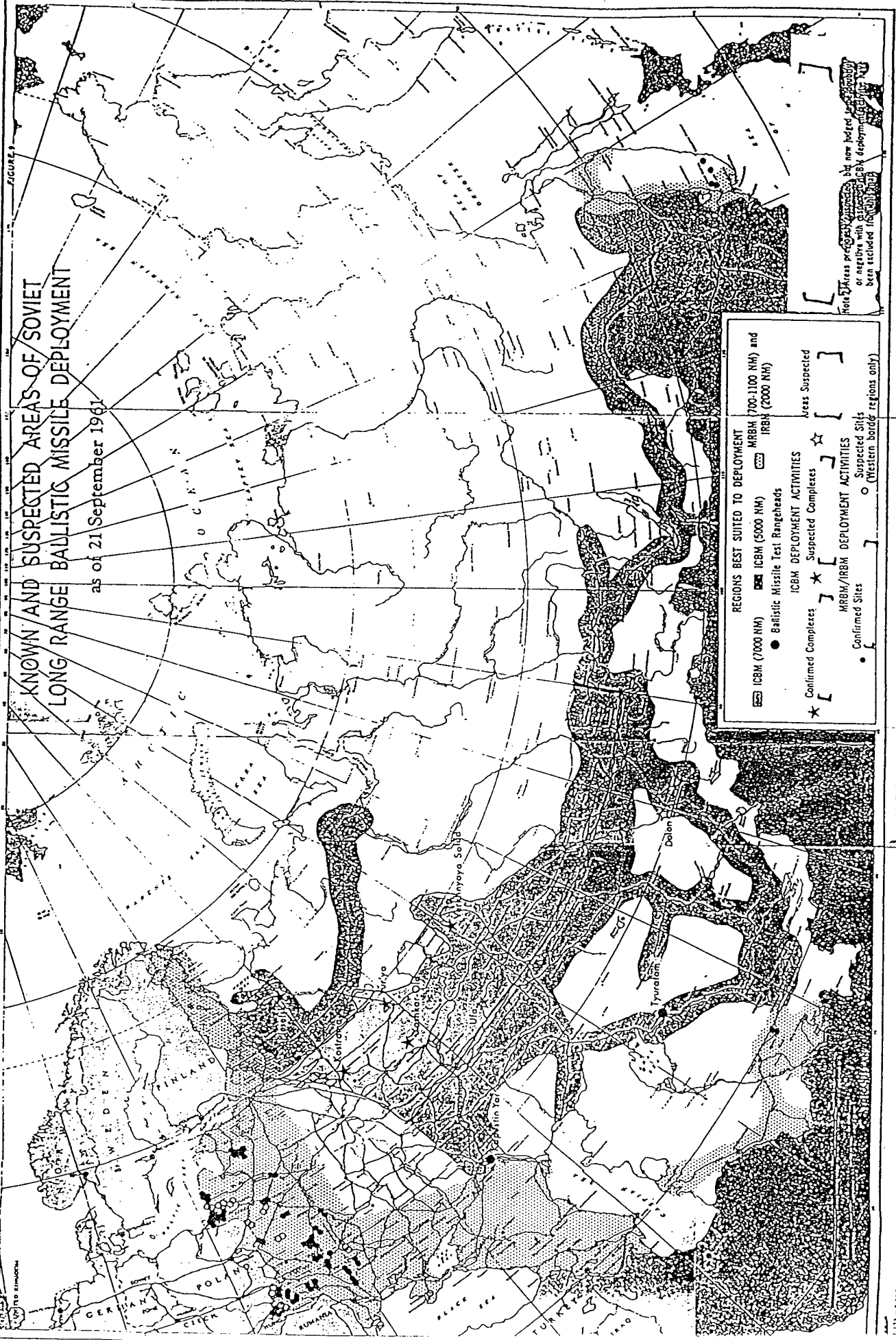
DISTANCE BETWEEN PADS: 500-700'



TYPICAL FIXED MRBM LAUNCH SITE (one of three general configurations)

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KNOWN AND SUSPECTED AREAS OF SOVIET LONG RANGE BALLISTIC MISSILE DEPLOYMENT as of 21 September 1961



REGIONS BEST SUITED TO DEPLOYMENT

- ICBM (7000 NM) [Stippled pattern]
- ICBM (5000 NM) [Cross-hatched pattern]
- MRBM (700-1100 NM) and IRBM (2000 NM) [Dotted pattern]

ICBM DEPLOYMENT ACTIVITIES

- Confirmed Complexes [Star symbol]
- Suspected Complexes [Star in square symbol]
- Confirmed Sites [Solid circle symbol]
- Suspected Sites [Circle in square symbol]

AREAS SUSPECTED

- MRBM/IRBM DEPLOYMENT ACTIVITIES [Dotted pattern]
- Suspected Sites (Western border regions only) [Circle in square symbol]

Note: Areas previously suspected but now judged to be unlikely of nearby ICBM deployment have not been included in this map.

FIGURE 1

TOP SECRET 27