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**SOVIET GROSS CAPABILITIES FOR ATTACKS
ON THE US AND KEY OVERSEAS
INSTALLATIONS THROUGH 1 JULY 1957**

Submitted by the
DIRECTOR OF CENTRAL INTELLIGENCE

The following intelligence organizations participated in the preparation of this estimate: The Central Intelligence Agency and the intelligence organizations of the Departments of State, the Army, the Navy, the Air Force, and The Joint Staff.

Concurred in by the
INTELLIGENCE ADVISORY COMMITTEE

on 17 August 1954. Concurring were the Special Assistant, Intelligence, Department of State; the Assistant Chief of Staff, G-2, Department of the Army; the Director of Naval Intelligence; the Director of Intelligence, USAF; the Deputy Director for Intelligence, The Joint Staff; the Atomic Energy Commission Representative to the IAC; and the Assistant to the Director, Federal Bureau of Investigation.

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SOVIET GROSS CAPABILITIES FOR ATTACKS ON THE US AND KEY OVERSEAS INSTALLATIONS¹ THROUGH 1 JULY 1957

THE PROBLEM

To estimate gross Soviet capabilities for attacks on the US and key overseas installations¹ through 1 July 1957.

SCOPE

In planning the actual scale of attack on the US and key US installations overseas the Soviet rulers would recognize that such an attack would inevitably involve general war. Accordingly, some portion of the Soviet nuclear weapons stockpile and delivery capabilities would almost certainly be allocated for use against US allies and for reserve. This estimate does not consider the problem of such allocation, but confines itself to the gross capabilities for attack on the US and key US installations overseas as indicated by the estimated state of Soviet weapons, equipment, and facilities during the period of the estimate.

CONCLUSIONS

1. In attacking the US and key US overseas installations the major Soviet objectives would be to: (a) destroy or cripple as quickly as possible US capabilities for nuclear retaliation; (b) deliver such an

attack on urban, industrial, and psychological targets in the US as would prevent, or at least hinder, the mobilization of US war potential; (c) inflict such destruction on US overseas installations as would be

¹ Key US Overseas Installations: (a) United Kingdom — strategic air bases and forces; (b) Western Europe — strategic air bases and forces; tactical air bases and forces for NATO support; bases and forces for support of naval operations; army forces, depot and port complexes, major headquarters and key bridges and tunnels; (c) Far East (including Okinawa) — strategic air bases and forces; tactical air support bases and forces; naval and naval air forces and army and navy installations; port complexes for support of US and allied forces; (d) French North Africa-Libya — strategic air bases and forces; naval air facilities; (e) Pacific (including Hawaii and Philippines) — strategic air bases and forces;

LOC support bases; army bases; naval and naval air bases and forces; (f) Middle East — strategic air bases and forces; naval air facilities; (g) North Atlantic (including Newfoundland, Greenland, Labrador, Iceland) — strategic air bases and forces; naval and naval air facilities; LOC support facilities; (h) Bermuda-Azores — strategic air bases; naval and naval air facilities; (i) Alaska — strategic air bases and forces; ports; army base; naval air facility; (j) Panama Canal and Caribbean — LOC link; naval and naval air facilities; and (k) US Fleet Units — elements of Sixth, Seventh, Second and First Fleets constituting immediate threats to the USSR.

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necessary to hamper or prevent the US from reinforcing or resupplying its forces.

2. The Soviet leaders would probably calculate that in order to achieve success such an attack would have to be accomplished under conditions of maximum surprise. Therefore the USSR would probably launch its initial attacks from such bases and under such conditions as would offer the greatest security from detection.

3. In order to achieve both maximum surprise and maximum weight in an attack on the US and its overseas installations, we believe that the USSR would place chief reliance on nuclear air attacks. Such attacks would probably receive the highest priority because of: (a) the limited capabilities of naval, ground, and airborne forces against the continental US; (b) the security difficulties inherent in the delivery of large numbers of nuclear weapons by clandestine means; (c) the insufficient development of other methods of delivery of nuclear weapons on a large scale; (d) the insufficient development of other mass destruction weapons, or handicaps to their large-scale use; and (e) the availability of far northern air bases, from which air operations against the US are least susceptible to detection.

4. The areas most suitable geographically for launching long-range air operations against the US are the Kola Peninsula area; the Leningrad complex; the Chukotski and Kamchatka areas in north-eastern Siberia; and the Baltic-East German area. The Chukotski, Kola, and Kamchatka areas are particularly advantageous as bases for surprise attacks since great circle routes would initially avoid overflight of nations friendly to the US.

5. Present Soviet capabilities for air attacks on the continental US are limited by dependence on the TU-4 bomber, by the apparent lack of a developed inflight refueling capability, and by the relatively undeveloped character of the Kola, Chukotski, and Kamchatka base areas. One-way missions or such range extension techniques as inflight refueling would be required to enable Soviet bomber aircraft to strike important targets in the continental US. We estimate that the capacity of air bases in these areas would permit launching a maximum of about 300 aircraft in an initial attack against the US. If all were committed to one-way unrefueled missions, approximately 250 might reach US target areas not considering combat losses. Such a force could deliver all or at least a substantial proportion of the nuclear weapons estimated to be available to the USSR in 1954, while still permitting a portion of the striking force to be used for electronic countermeasures, escort, or diversionary tasks.*

*The Director of Naval Intelligence and the Assistant Chief of Staff, G-2, Department of the Army, believe that available intelligence on over-all Soviet capabilities for long-range air attack is insufficient to warrant a finite estimate of the number of aircraft which might be launched from the Kola, Kamchatka and Chukotski areas in 1954. They therefore believe that paragraph 5 should read as follows:

"Soviet gross capabilities for air attack on targets in the continental United States are presently limited by dependence on the TU-4 bomber, by the apparent lack of a developed inflight refueling capability, and by the relatively undeveloped character of the Chukotski and Kola base areas. The Soviets have sufficient TU-4's to attempt the delivery of all or a substantial part of their atomic stockpile (the number depending upon types of weapons stockpiled) against the United States from bases in Soviet-controlled territory, even though some of the aircraft reaching target areas probably would not be bomb carriers since a number would be used for electronic countermeasures, escort, or diversionary tasks."

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6. If the USSR elected to utilize the additional bases in the Baltic-East German and Leningrad areas and thus lessen its chances of achieving surprise it could launch a maximum of approximately 850 aircraft in 1954 in an initial attack on the US. However, the great bulk of these aircraft would have to fly one-way unrefueled missions. Approximately 650 might reach target areas not considering combat losses. We consider such an attack highly unlikely.

7. Assuming an allocation of 300 TU-4's against the continental US, the USSR could in addition launch approximately 550 medium bombers against such other targets as key US and allied installations overseas. Not considering combat losses approximately 450 might reach target areas. However, the USSR will probably rely more on the 2,100 jet light bombers available in 1954 to attack key installations within operational radius of these aircraft because of the greater capability of the jet bomber to penetrate allied air defenses.

8. By 1957 we estimate that the USSR could, by a major effort, develop the capacity of the air bases in the Kola, Leningrad, Chukotski, and Kamchatka areas

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The implementation of this capability is dependent upon:

(1) Their willingness to accept the loss on one-way missions of a substantial portion of their long-range air force.

(2) Their willingness to accept the expenditure of all or a substantial portion of their nuclear stockpile and to entrust its delivery to the TU-4 aircraft.

(3) The development and employment of range extension techniques.

(4) Use of Leningrad base areas that would considerably decrease the range of aircraft if surprise is to be achieved by not overflying non-Soviet territory."

to permit the launching of approximately 1,000 aircraft in an initial air operation against the US. If all of these aircraft were committed to one-way unrefueled missions (or two-way unrefueled missions, where possible), on the order of 750-800 aircraft might reach target areas not considering combat losses. The exercise of this maximum capability would involve the expenditure on one-way missions of most of Soviet Long-Range Aviation.

9. We consider it more likely, however, that the USSR would elect to commit substantially fewer mission aircraft. It might launch about 900 aircraft, which could comprise 350 tankers and 550 mission aircraft. Of the 550 mission aircraft, about two-thirds would possibly be launched from the Kola-Leningrad area and one-third from northeastern Siberia. About 450 aircraft might arrive over target areas not considering combat losses. However, exercise of this capability would involve difficult operational and logistical problems, particularly those pertaining to the creation of a tanker fleet. Moreover, the exercise of this capability would involve the loss on one-way missions of about one-third of Soviet long-range bomber aircraft. A number of the mission aircraft would probably be used for electronic countermeasures, escort, or diversionary tasks.

10. Assuming the scale of attack in paragraph 9 above, the USSR would have 750 medium and heavy aircraft left for use elsewhere. Of this number, approximately 85 percent would be immediately serviceable for attack against key US and Allied overseas installations, for reattack, or for reserve. Not considering combat losses, approximately 80 percent of these

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launched would probably arrive over target areas. We also estimate that in 1957 about 3,100 jet light bombers will be available for attacks on targets within the operational capabilities of these aircraft.

11. Throughout the period of this estimate the Soviet rulers probably would employ other methods of attacking the US or US installations overseas concurrently with or immediately following a surprise nuclear air attack. They could attack US overseas installations with guided missiles up to ranges of 500 miles and could employ airborne and amphibious forces, ground forces, and chemical warfare. Clandestine attack on the US itself by sabotage, biological warfare, and placement of nuclear weapons, might occur against specially selected targets.

12. The submarine force of the USSR could, at least in the initial phases of an

attack, inflict serious damage on US overseas communications and carry out offensive mining in the shipping approaches to harbors and ports of the US and its Allies, in addition to its potential for launching mass destruction weapons against the US or key US overseas installations within range.

13. The USSR would probably employ ground, airborne, and amphibious forces in attacks that occur simultaneously with or immediately after the initial attacks. Soviet ground forces, particularly in Western Europe, possess a high capability for attacking Allied forces and installations located in forward areas. The additional employment of airborne or amphibious forces would enable the Soviet Ground Forces to attack more distant forces and installations.

DISCUSSION

I. AVAILABILITY OF SOVIET MASS DESTRUCTION WEAPONS

14. *Nuclear Weapons.* The Soviet atomic energy program, directed primarily toward the production of nuclear weapons, will continue to receive special emphasis through 1957. Extensive reserves of uranium exist within the USSR and current rates of exploitation of domestic and Satellite uranium deposits will probably continue to be more than sufficient to support estimated fissionable material production. It is believed that the other basic materials required for nuclear energy purposes up to mid-1957 are available in sufficient quantity as not to cause curtailment of other important Soviet efforts if nuclear program needs are to be met.

15. In the light of technological capabilities as of the end of 1953, Soviet military requirements will govern the allocation of available fissionable material to various types of weap-

ons, consideration being given to the total energy yields attainable from the weapons stockpile. By the end of 1953 the USSR had tested small, medium, and large-yield weapons and had employed thermonuclear boosting principles to produce energy yields in the range of the equivalent of a few thousand to at least one million tons of TNT. During the immediate future, the types of weapons stockpiled will probably have the general characteristics and the explosive powers of weapons already tested. On this basis, one of the ways in which the USSR might allocate its stockpile of fissionable material is as follows:³

³In view of the range of error applicable to the estimate of Soviet fissionable material production, the actual figures for mid-1954 may be as much as one-third lower or higher than the figures given above. Uncertainty increases as estimates are projected into the future and the actual figure for mid-1957 may be as low as one-half or as high as twice the figures given in the table.

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	Mid- 1954	Mid- 1957
Large-yield weapons (1,000 KT each)	18	80
Medium-yield weapons (60 KT each)	85	235
Small-yield weapons (5 KT each)	250	700

16. The USSR will probably continue work on weapons with equivalent yields well in excess of one million tons of TNT as well as on small-yield and small-dimension weapons. Further developments along these lines could be tested in 1954. Such developments would permit more flexibility in the use of nuclear weapons. We estimate that by 1957 the USSR will have weapons with the following ranges of yields:

Large-yield weapons — 1,000 to 10,000 KT or more
 Medium-yield weapons — 20 to 100 KT
 Small-yield weapons — 0.5 to 5 KT

17. *Radiological Warfare.* It is most unlikely, for technological reasons, that the USSR will be able to stockpile militarily significant quantities of radiological warfare weapons during the period of this estimate. Although not strictly within the category of radiological warfare, the significance of radio-active fallout following large nuclear explosions becomes greater as the yield of nuclear weapons increases. This factor should be considered in connection with Soviet capabilities to produce explosions in the megaton range.

18. *Biological Warfare.* The USSR is in possession of all the necessary basic knowledge for the production of most BW agents and effective dissemination devices. If the Soviets chose to do so, they would be able to construct and operate plants for BW agent production and devices for dissemination could be available in adequate numbers. However, there is no evidence that the USSR is engaged in BW agent production or possesses production facilities designed specifically for BW agents. There is also no evidence of Soviet stockpiles of BW agents or munitions. Since it is not feasible to stockpile large quantities of most BW agents in prolonged storage, most operational requirements would have to be supplied directly from production facilities.

19. *Chemical Warfare.* We assume that the stockpile of standard agents and munitions accumulated during World War II has been maintained and will be available for use during the period of this estimate. Intelligence indicates that the Soviets could have been producing at least one of the nerve gases since 1949, and we estimate that the USSR will be capable of employing nerve gases during the period of this estimate.

II. DELIVERY OF CONVENTIONAL AND MASS DESTRUCTION WEAPONS BY AIRCRAFT

Long-Range Aviation

20. *The TU-4.* Soviet Long-Range Aviation constitutes the long-range striking force of the USSR. It consists of 3 Air Armies, 1 in the Far East and 2 in the western USSR, plus 1 corps of undetermined subordination in the western USSR. The TU-4 medium bomber, which was copied from the American B-29, is the only bomber available to the Soviets in large numbers and capable of carrying nuclear weapons to distant targets. As of 1 July 1954, a total of about 1,100 TU-4's was estimated to be available in operational units. (Table of Equipment Strength of Soviet air regiments known to be equipped with or in process of being equipped with TU-4 aircraft totals 1,340 but the TU-4 regiments are currently estimated to be at only about 85 percent of T/E strength.) As of 1 July 1954 approximately 210 TU-4's (eight regiments with a T/E strength of 260) were located in the Soviet Far East. It is believed that deliveries of TU-4's to operational units have virtually ceased and that with the gradual phasing out of these aircraft as new jet models become available only 700 will remain in operational units by mid-1957.

21. *Jet Medium Bomber.* In the past four months there have been conclusive indications that a jet medium bomber equipment program has been initiated in Soviet Long-Range Aviation. During the 1954 Soviet May Day fly-by and the rehearsals preceding it, 9-11 twin jet medium bombers, designated by allied intelligence as the Type 39, participated. Sub-

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sequent intelligence has associated this type with a known Soviet Long-Range Aviation unit. We estimate that as of 1 July 1954 at least two regiments of Soviet Long-Range Aviation with a T/E strength of 60 aircraft were in process of equipment with Type 39 jet medium bombers. Total actual strength of these units is estimated at approximately 20 aircraft. Series production of the Type 39 is estimated to have begun in mid-1953, and total production as of 1 July 1954 is estimated at about 40 aircraft. By mid-1957 it is estimated that Soviet Long-Range Aviation will contain an actual strength of 650 jet medium bombers.

22. *Jet Heavy Bomber.* The Type 37, which was initially observed on 30 July 1953 and later observed in flight on seven different occasions in connection with the 1954 May Day celebration, is a swept wing, four-engine, jet heavy bomber with an estimated gross weight of 365,000 pounds. The aircraft, con-

sidered presently to be in the prototype stage, is expected to appear in operational units by the end of 1956 building up to an actual strength of about 50 aircraft by mid-1957.

23. *Type 31 Class Heavy Bomber.* There has been some evidence of the existence of a large bomber designated the Type 31. On the basis of present evidence, it is highly doubtful that any substantial re-equipment of Long-Range Aviation units with Type 31 class aircraft has occurred to date, though possibly 15 or 20 may have been introduced. The Long-Range Aviation re-equipment program to replace the TU-4 is more likely to be accomplished by introduction of the jet bomber aircraft which have now appeared, and the Type 31 class probably will not be introduced in numbers. The estimated radius/range of this aircraft is 2,500/4,800 nautical miles with a 10,000 pound bomb load or 2,800/5,500 nautical miles carrying a 3,000 pound bomb load.

Aircraft Characteristics of Soviet Long-Range Aircraft

24. Radii/ranges of Soviet Long-Range bombers are shown in the following tables. Table I indicates capabilities calculated in accordance with US military mission profiles. Table II indicates maximum performance under a modified mission profile.

Type	AVIATION	
	Mid-1954	Mid-1957
TU-4 piston medium bomber	1,100	700
Type 39 jet medium bomber	20	650
Type 37 jet heavy bomber	50
Total	1,120	1,400

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TABLE I

ESTIMATED 1954-1957 CAPABILITIES OF SOVIET LONG-RANGE AIRCRAFT
 (Calculated in accordance with US Military Mission profiles)

Conditions	Medium Bomber		Heavy Bomber (1957)	
	TU-4	TU-4 (Modified)	Type 39	Type 37*
<u>Combat Radius/ Range (nm)</u>				
a. 10,000 lb. load	1,700/3,100	2,000/3,600	1,400/2,700	2,350/4,350
one refuel.	2,400/4,300	2,800/5,000	2,000/3,800	3,300/6,100
b. 3,000 lb. load	1,950/3,500	2,300/4,100	1,600/3,200	2,450/4,800
one refuel.	2,750/4,900	3,200/5,700	2,250/4,500	3,400/6,700
<u>Speed/Altitude (kn/ft)</u>				
a. Maxi. speed	350/30,000	360/30,000	535/15,000	540/19,000
b. Com. speed	350/30,000	360/30,000	490/36,000	490/41,000
<u>Combat Ceiling (ft)</u>				
	36,500	37,500	38,500	45,000

* The performance figures shown for the Type 37 were calculated on the basis of a gross take-off weight of 345,000 pounds and a fuel load of 180,000 pounds. Since recalculation indicates a maximum gross take-off weight of 365,000 pounds with a fuel load of 200,000 pounds, the performance figures shown are subject to upward revision.

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TABLE II

ESTIMATED 1954-1957 MAXIMUM PERFORMANCE UNDER COMBAT
CONDITIONS OF SOVIET LONG-RANGE AIRCRAFT

Conditions	Medium Bomber		Heavy Bomber (1957)	
	TU-4	TU-4 (Modified)	Type 39	Type 37*
<u>Combat Radius/ Range (nm)</u>				
a. 10,000 lb. load	1,800/3,300	2,150/4,000	1,550/3,000	3,000/5,850
one refuel.	2,500/4,500	3,000/5,600	2,150/4,200	4,200/8,000
b. 3,000 lb. load	2,050/3,700	2,450/4,600	1,800/3,550	3,100/6,050
one refuel.	2,850/5,100	3,450/6,450	2,500/4,900	4,250/8,100
<u>Speed/Altitude (kn/ft)</u>				
a. Maxi. speed	350/30,000	360/30,000	535/15,000	535/19,000
b. Com. speed	350/30,000	360/30,000	475/38,500	485/43,000
<u>Combat Ceiling (ft)</u>				
	36,500	37,500	38,500	44,500

* The performance for the Type 37 was calculated on the basis of a 365,000 pound take-off weight with 200,000 pounds of fuel.

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25. *Inflight Refueling.* We have no intelligence that the USSR is actually employing inflight refueling. However, inflight refueling techniques do not impose serious technical problems and the USSR has had access to the wartime techniques and equipment employed by the US in this field. The USSR is known to have evinced interest in Western demonstrations of refueling techniques, and refueling methods have been discussed in Soviet technical literature. It is therefore necessary to consider the effect of inflight refueling in extending the range of Soviet bomber aircraft. A fleet of tanker aircraft, appreciable training in their operational use, and the modification of mission aircraft fuel systems, would be necessary before two-way missions against the US could be conducted on a large scale. The establishment of tanker units would require the conversion of TU-4's or production of new tanker aircraft. Since TU-4 strength in operational units is estimated to decrease from the present figure of 1,100 to about 700 by mid-1957, sufficient TU-4's could be available for conversion to tanker aircraft during the period of this estimate. With one refueling the combat radius/range of USSR's long-range aircraft could be increased as shown in the table.

Base Areas for Direct Air Attack on the US

26. Five areas within Soviet dominated territory are most suitable geographically for launching long-range air operations against the United States: the Kola Peninsula area; the Leningrad complex; the Chukotski and Kamchatka areas in northeastern Siberia; and the Baltic-East German area. The Chukotski, Kola, and Kamchatka areas are particularly advantageous as bases for surprise attacks since great circle routes would avoid initial overflight of nations friendly to the US. The extension of bomber ranges by mid-1957 will not be great enough to allow the enemy to dispense with these areas if important targets in the whole of the United States are to be reached on other than one-way missions. It is therefore reasonable to suppose that at least until the end of the period of this estimate any large-scale attacks would involve use of these areas.

27. *Chukotski Area.* This area is not known to contain any bases suitable for TU-4 take-offs at maximum gross weights of 140,000 pounds over a 50-foot obstacle, but does have at least four bases which have undergone post-World War II runway development which would probably make them suitable for operations under conditions of either reduced take-off or acceptance of lower safety margins. Among these are: Tanyurer (65-51N, 174-13E), Markovo (64-41N, 170-25E), Provideniya/Urelik (64-20N, 173-14W), and Velkal (65-31N, 179-16W). Available intelligence does not permit conclusive determination of the current status of these facilities. It does indicate that a new hard-surfaced runway was built at Tanyurer after World War II, estimated at approximately 5,200 feet in length. Available intelligence also indicates that development work occurred at Markovo, where a 4,300-foot runway extensible to a maximum of 5,000 feet existed in 1945. Due to this limitation on extensibility of this runway, however, piston medium bomber operations from it would be severely restricted. The runway at Provideniya/Urelik was developed to its present length of approximately 5,000 feet between the spring of 1952 and 1953. Airfield development work has also been carried on at Velkal and at some other locations in the Chukotski area in the postwar period. Such work could be carried out in the area without detection. It is estimated that the construction capability of elements presently in the Chukotski area could provide one additional improved installation (5,000 to 8,000-foot runway) each year between now and 1957. Construction of permanent-surfaced runways suitable for long-range bomber operations may have been retarded in this area due to the perma-frost problem, but the USSR probably has learned to solve this difficulty through frozen soil studies conducted since World War II. The Soviets have had a long-standing interest in ice and snow-impacted runways.

28. Long-range air operations from the Chukotski area would encounter many difficulties because of basic logistic limitations and adverse climatic conditions. However, the USSR has a fund of Arctic flying experience

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which could be exploited for operations from this area. Logistically, the area is served principally by sea-lift limited to the ice-free months of the year. The status of base logistical support facilities in this area is unknown. The supply problem inherent in the support of air operations in the Chukotski area would be difficult; however, the stockpiling of the supplies necessary to sustain limited air operations could be accomplished prior to initiating such operations. Cold, wind, snow, and fog in the area would make air operations difficult and hazardous at certain times of the year. The lack of modern navigational aids would also hamper operations, but there are indications that the USSR is steadily improving its air operational potential in this area through the installation of modern radio navigational facilities. It is believed that no long-range bomber units are presently stationed in this area, although TU-4 flights have been made to the area.

29. *Kola Peninsula Area.* The Kola Peninsula has six known bases which would be suitable for operations of the standard and/or modified versions of the TU-4 at maximum gross weights (140,000 pounds and 135,750 pounds respectively), provided the Soviets accepted a reduced safety margin. These are Murmansk/Vayenga, 69 02N-33 25E, with a 7,600-foot graded earth surfaced runway; Alakurtti, 66 58N-30 21E, 6,000-foot concrete surfaced runway; Nautsi, 69 04N-29 10E, 5,500-foot graded earth surfaced runway; Ponoy, 67 06N-41 07E, 5,300-foot graded earth surfaced runway; Pechenga, 69 24N-31 00E, 5,000-foot concrete surfaced runway; and Nivskiy, 67 26N-32 50E, where recent development is believed to have provided at least a 6,000-foot hard surfaced runway. There is a lack of recent intelligence on the current status of runway surfaces at the above fields other than Nivskiy, although there have been some indications of runway development at several of these installations.

30. In addition to these six airfields there are other fields in the area which could be developed, and which may already have been developed to accommodate medium/heavy bomber operations. Such development could

now be in progress or could have been carried out without detection. We estimate that construction elements in the area would be capable of completing at least one improved installation each year between now and 1957. Permanent surfaced runways can be constructed without difficulty throughout the Kola area as it is relatively free of permafrost. Prevailing climatic conditions, while a restrictive factor on air operations, are relatively more favorable in this area than in other portions of the Soviet Far North. Supply routes by rail and sea are open to the Kola Peninsula on a year-around basis. The status of base logistical support facilities which would be required to conduct long-range nuclear attacks from airfields in this area is unknown. At least four of the six fields named above are now used by other Soviet air components. These units would have to be relocated to permit maximum use of the fields by long-range bomber aircraft. However, the airfield system in the Kola area would permit such relocation if required.

31. *Leningrad Area.* This area, in which long-range bomber units are probably now based, contains at least one known airfield, Leningrad/Pushkin (59-42N, 30-21E), with a 7,000-foot concrete runway. In addition, at least four airfields in the area, Tartu (58-24N, 26-46E), Pakov (57-47N, 28-24E), Paldiski/Vasalemma (59-16N, 24-12E), and Leningrad (59-48N, 30-18E) have runways in excess of 6,000 feet. Seven additional airfields in the area have runways in excess of 5,000 feet. Operations from this area by strike aircraft would offer advantages of launching an operation from a temperate climate with good logistic support. However, if overflight of Scandinavia were to be avoided, a dogleg course over the Kola Peninsula would be necessary on an attempted attack against the United States.

32. *Kamchatka Area.* At present, airfields in the Kamchatka area are not considered to be suitable for TU-4 take-offs at maximum gross weight of 140,000 pounds over a 50-foot obstacle. However, there are four airfields in the area which would permit ground runs of 5,000 feet and could be used by modified versions of the TU-4, providing lower safety

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margins were accepted. These are Petropavlovsk (53-10N, 158-26E), Kataoka (50-44N, 156-52E), Matsuwa (48-03N, 153-15E), and Magadan (59-39N, 150-52E).

33. *Baltic-East German Area.* This area, which includes the Soviet zone of Germany and Poland, now has at least 60 airfields suitable for long-range bomber operations. These bases are favorably situated with respect to communications and weather and are adequately served by existing transportation facilities. A major disadvantage is that great circle routes to the United States from these bases pass over portions of Western Europe or Scandinavia, and any attempted air strike would probably be detected early enough to provide warning. In addition, security of preparations would be lower in this area than in other forward base areas.

34. The capabilities of Soviet bombers operating from these base areas against the US and key US overseas installations are shown in the charts annexed to this estimate.

35. *Navigation and Bombing Accuracy.* Soviet long-range aviation has available through open sources virtually complete target and navigation data on North America and its approach routes. It is even probable that in the event of a surprise attack, certain Western electronic navigational aids would be available during at least part of the flight. Similarly, meteorological reports, including profile data at all altitudes, are regularly broadcast in the United States and Canada in simple cipher. We estimate that Soviet blind-bombing and navigational radar equipment is capable of equal or better performance than the US World War II equipment which the USSR acquired. It is also possible that clandestinely placed navigational beacons may be used for aircraft homing. The current Soviet training program points to continuing improvement in air crew proficiency. In view of these factors and Soviet ability to select a time of attack with respect to favorable route and target weather conditions, it is almost certain that Soviet air crews would be able to navigate with sufficient accuracy to reach the major population and industrial centers of the United States and in bombing

to achieve CEP accuracies of 1,000-4,000 feet for visual bombing from 30,000 feet, and 4,000-7,000 feet for radar bombing from the same altitude. However, the effectiveness of attack delivered by radar alone might be materially reduced by defensive electronic countermeasures.

36. *Availability and Abort Rate.* Maintenance of Soviet aircraft, although below US standards, has improved since World War II. By the end of 1957 the Soviets should be capable of achieving in the forward staging areas a serviceability rate of 85 percent for an initial, deliberately prepared surprise attack against North America. The sustained serviceability rate for bombers is estimated at about 40 percent for normal operations. Cold weather operations might cause some reduction in the foregoing figures. In addition, some of the aircraft taking off would abort and fail to reach target areas for reasons other than our air defense activity. The allowance for aborts and for all causes other than combat attrition is estimated at about 20 percent for nonrefueled and 25 percent for refueled missions.

37. *Replacement Rate.* No appreciable reserves of TU-4's are believed to exist at the present time. If a tanker fleet is created, or TU-4's are converted for other special purposes, appreciable numbers of TU-4's, phased out of operational bomber units during the period of this estimate, would probably not be available as a reserve. There will be no appreciable reserves of any new types of aircraft introduced during the period of this estimate.

38. *Weather.* The USSR has for many years devoted considerable emphasis to both short-period and long-period meteorological forecasting and has achieved a high degree of success in this field. We believe that the USSR has the forecasting capability to support long-range air operations. This capability plus extensive experience in meteorological research in the extreme northern latitudes, weather reporting facilities in Siberia, and constant access to current North American weather reports and forecasts should enable the USSR to predict both route and target

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weather with reasonable accuracy. We estimate that Soviet capabilities in upper air research and in the more complex phases of meteorological instrumentation are somewhat less than those of the US; however, the Soviets have the technical capability to overcome these deficiencies within a few years.

39. Electronic Countermeasures. The USSR has had access to a wide variety of World War II US defensive radar and to some US jamming equipment. It is apparently well aware of the tactical advantage to be gained by jamming defensive radar and other communications. We believe that the USSR is now technically capable of producing limited quantities of ground based and airborne jamming equipment to cover frequencies through 10,000 megacycles, and, by use of ground-based equipment, can seriously disrupt long-range radio communications between the continental US and its overseas facilities. We further believe that the USSR will increase the effectiveness of its jamming equipment as well as the proficiency and number of its trained personnel throughout the period of this estimate. Airborne countermeasures are likely to be available for use against defensive radars and ground/air fighter control communications in use at the present time for the defense of North America. The effectiveness of the future Soviet countermeasures will depend on their degree of success in analysis of signal radiations and in other means of obtaining technical data on the defense radar that will then be in use. The USSR has probably produced sufficient electronic countermeasures devices to equip some aircraft, but we do not know how effective those devices would be against US defensive radar. Use of jamming equipment probably would require the employment of extra aircraft equipped specially for this purpose.

Aircraft Available for Attacks Against Key US Overseas Installations

40. The long-range aircraft discussed above could also be used for attacks on installations overseas. In addition, the IL-28 and Type 35

jet light bombers are estimated to be capable of carrying out attacks on many of these installations. The IL-28 is the standard light bomber of the Air Force of the Soviet Army. It is powered by two centrifugal flow gas turbines each delivering approximately 6,000-pounds thrust. With a normal bomb load of 4,400 pounds and two 220-gallon external wing tanks the high altitude combat radius is estimated to be 690 nautical miles. As a low level attack bomber its radius is estimated to be 595 nautical miles.

41. The Type 35 is believed to be currently operational in Soviet Naval Aviation in addition to the IL-28. This aircraft is believed to incorporate special features to permit it to carry out naval missions such as torpedo attacks and mine-laying as well as high level bombing. The Type 35 is believed to be powered by two VK-1 centrifugal flow gas turbines rated at approximately 6,000-pounds thrust. Its combat radius carrying a 4,400-pound bomb load is estimated at 765 nautical miles.

ESTIMATED JET LIGHT BOMBER STRENGTH IN OPERATIONAL UNITS

	Mid-1954	Mid-1957
Air Force of Soviet Army	1,550	2,300
Naval Aviation	550	850
	2,100	3,150

42. By 1957 the USSR may also have an operational jet light bomber with improved performance characteristics. This aircraft could be a twin-turbojet swept-wing bomber with a radius of 800 nautical miles and a range of 1,500 nautical miles carrying a 4,400-pound bomb load. Moreover, the performance of the IL-28 and Type 35 aircraft may improve during the period of this estimate because of the installation of higher-thrust engines.

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ESTIMATED 1954-1957 PERFORMANCE CHARACTERISTICS OF SOVIET
JET LIGHT BOMBERS

Type	Combat Radius/Range/ Load (nm/nm/lbs)	Max Spd/Alt (kn/ft)	Combat Ceiling (ft)
<u>IL-28</u>			
a. Internal fuel	590/1,165/4,400	440/30,000	37,000
b. Internal fuel	570/1,100/6,600	" "	"
c. External fuel	690/1,365/4,400	" "	"
Type 35	765/1,510/4,400	455/30,000	39,500
Imp. Jet Light Bomber (1957)	800/1,500/4,400	500/35,000	48,000

**Base Areas for Direct Attack on Key US
Installations Overseas**

43. *Soviet Base Areas.* In the Soviet Union, the European Satellites, Communist China, and North Korea, there are approximately 175 airfields with hard-surfaced runways of 6,000 feet or over which are estimated to be suitable for operations by jet light bombers, medium bombers, and heavy bombers. Of this number approximately one-third are located in the European Satellites and one-fourth in Communist China and North Korea. The remainder are located chiefly in the western and southern USSR and in maritime provinces of the Soviet Far East. In addition, there are approximately 150 airfields in the Soviet Bloc which are estimated to be potentially capable of accommodating jet light bomber and medium and heavy bomber operations. We believe that the large number of suitable airfields available could adequately support Soviet bomber attacks against most key US overseas installations.

44. *Soviet Capabilities for Attack on Key US Overseas Installations.* From bases in East Germany, Soviet jet light bombers on two-way missions could reach the entire North Sea area, the UK and its northern and western approaches (including the Faroes), France and its western approaches, and northeastern Spain. From bases in Hungary these aircraft could reach the Mediterranean area up to an arc drawn south of Sardinia and Sicily. From bases in the southern USSR, they could

reach an area north of an arc Crete-Israel-Kuwait. Jet light bombers based in the Vladivostok and Dairen areas could reach all of Japan. To reach Okinawa and Luzon on two-way missions, they would have to stage from bases in Communist China.

45. From bases in the USSR, Soviet stripped-down TU-4's on two-way missions could reach key US installations in the UK, Western Europe, Iceland, Greenland, the Azores, French North Africa, Libya, the Middle East, Japan, Okinawa, Alaska, Guam, and the northern Philippines. To reach key installations beyond these areas, TU-4's would have to resort to inflight refueling or one-way missions. Jet medium bombers from bases in the USSR could reach all the above areas except southern Greenland (marginal against Thule), the Azores, Guam, and the Philippines. In 1957 jet heavy bombers on two-way missions could reach key US installations in the UK, Western Europe, Far East including Okinawa, French North Africa-Libya, the Philippine and Mariana Islands, Middle East, Greenland, Iceland, and the northeastern coast of Labrador, the Azores, and Alaska. The TU-4 and jet heavy bombers could reach the Panama Canal on one-way missions only if inflight refueling were employed.

46. *Targeting and Bombing Accuracy.* The factors discussed in Paragraph 35 for long-range operations apply equally to Soviet air attacks against key US installations overseas. In addition, it has been established that radar

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bombing by IL-28 jet light bombers has been carried out using equipment with characteristics similar to the US AN/APS-15 type radar. IL-28 units in Eastern Germany are known to have practiced bombing at night and during instrument weather conditions and such practice is probably included in other jet light bomber units. In the absence of definite information on Soviet radar and visual bombing proficiency, it is assumed that accuracies for trained units approach the limitations of the equipment. It is estimated, therefore, that jet light bomber crews could achieve CEP accuracies of 1,000-4,000 feet for visual bombing from 30,000 feet, and 4,000-7,000 feet for radar bombing from the same altitude.

47. Availability, Abort Rate, Replacement Factors. The factors discussed in Paragraph 36 for long-range bombers attacking the US apply generally to bomber aircraft attacking key US installations overseas. A serviceability rate of 90 percent by mid-1957 for initial attacks from other than the forward northern bases, is considered possible because of the better facilities and logistic support in these areas. The sustained serviceability rate for jet light bombers is estimated to be about 50 percent. No reserves of jet light bombers are believed to exist at present, nor do we estimate an appreciable reserve of this type of aircraft will exist during the period of this estimate.

48. Electronic Countermeasures. The Soviet ECM capabilities discussed in Paragraph 39 apply also to bomber attacks against key US overseas installations. However, Soviet requirements for ECM would probably be less because of the less elaborate defenses around most of these installations and the shorter times required to penetrate defenses before targets are reached. Space and weight limitations would probably preclude Soviet jet light bombers from carrying ECM equipment (except for Chaff) in addition to bomb loads. However, the USSR has the technical capability to produce and configure a jet light bomber with both passive listening and active jamming electronic equipment. No evidence is available of Soviet intentions in this regard.

III. PROBABLE MAXIMUM SCALE OF SOVIET AIR ATTACK IN 1954

Attack Against Continental US with Maximum Effort to Achieve Surprise

49. Soviet capabilities for air attacks on the continental US are presently limited by dependence on the TU-4 bomber, by the apparent lack of a developed inflight refueling capability, and by the relatively undeveloped character of the Kola, Chukotski, and Kamchatka base areas. These three base areas are the closest to the US and are so situated as to offer the best possibilities for launching attacks without allied detection. We believe, therefore, that if the USSR attempted a surprise attack against the US, aircraft would probably be launched from bases in the Kola, Chukotski, and Kamchatka areas. In 1954 the estimated capacity of air bases in these areas would permit launching approximately 300 aircraft in an initial attack against the US. If all these aircraft were committed to one-way unrefueled missions, approximately 250 might reach target areas, not considering combat losses. A portion of these aircraft would probably be used for electronic countermeasures, escort, or diversionary tasks. If the USSR were to use inflight refueling to extend the radius/range of some of the mission aircraft, the size of the striking force from forward bases would be reduced by the number of tanker aircraft launched from these bases.⁴

⁴The Director of Naval Intelligence and the Assistant Chief of Staff, G-2, Department of the Army, believe that available intelligence on overall Soviet capabilities for long-range air attack is insufficient to warrant a finite estimate of the number of aircraft which might be launched from the Kola, Kamchatka and Chukotski areas in 1954. They therefore believe that paragraph 49 should read as follows:

"Soviet gross capabilities for air attack on targets in the continental United States are presently limited by dependence on the TU-4 bomber, by the apparent lack of a developed inflight refueling capability, and by the relatively undeveloped character of the Chukotski and Kola base areas. The Soviets have sufficient TU-4's to attempt the delivery of all or a substantial part

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50. Bases in the Leningrad area could also be used to launch additional long-range bombers on one-way missions in a surprise attack against the US in 1954 provided aircraft detoured north of Scandinavia. However, use of these bases by the USSR is unlikely since the capacity of the more advanced base areas is estimated to be adequate to launch a force capable of delivering a substantial proportion, and perhaps all, of the estimated Soviet stockpile of nuclear weapons.

Full-Scale Attack Against Continental US

51. If the USSR elected to utilize the additional bases in the Baltic-East German and Leningrad areas, thus lessening chances of surprise, it could, using its entire medium bomber force, launch a maximum of approximately 850 aircraft in the initial attack on the US. However, practically all of these aircraft would have to fly one-way missions. Approximately 650 might reach target areas, not considering combat losses. We consider such an attack highly unlikely, since it would involve the loss of practically the entire Soviet long-range air force and since the considerably smaller number of aircraft described in paragraph 49 would probably be great enough to deliver all, or at least a substantial proportion, of the

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of their atomic stockpile (the number depending upon types of weapons stockpiled) against the United States from bases in Soviet-controlled territory, even though some of the aircraft reaching target areas probably would not be bomb carriers since a number would be used for electronic countermeasures, escort, or diversionary tasks.

The implementation of this capability is dependent upon:

(1) Their willingness to accept the loss on one-way missions of a substantial portion of their long-range air force.

(2) Their willingness to accept the expenditure of all or a substantial portion of their nuclear stockpile and to entrust its delivery to the TU-4 aircraft.

(3) The development and employment of range extension techniques.

(4) Use of Leningrad base areas that would considerably decrease the range of aircraft if surprise is to be achieved by not overflying non-Soviet territory."

nuclear weapons available to the USSR in 1954, if the USSR should wish to do so.

Attacks Against Overseas Installations

52. Assuming a surprise attack against the continental US as outlined in paragraph 49 above, the remaining force of approximately 750 medium bombers in Soviet Long-Range Aviation would be available for re-attack purposes, for attacks against targets in other areas, and for reserve. If the USSR made no provision for re-attack or for reserve it could launch all remaining serviceable medium bombers — approximately 550 — against key US and allied installations overseas. Not considering combat losses approximately 450 of these mission aircraft might reach target areas. In addition the USSR could employ jet light bombers to attack those key installations within the operational radius of these aircraft. In fact, the USSR would probably rely more on jet light bombers than on piston medium bombers to attack such installations because of the greater capability of the jet bomber to penetrate allied air defenses. Although Soviet jet light bombers would also be engaged in close ground support, interdiction, air superiority, and mining and torpedo missions in support of other Soviet campaigns, the USSR could probably allocate a sufficient number of the 2,100 jet light bombers available in 1954 to attempt to neutralize or destroy with HE or nuclear weapons selected allied forces and installations within range.

IV. PROBABLE SCALE OF SOVIET AIR ATTACK IN MID-1957

53. If the USSR attempted a surprise attack against the US in 1957, all aircraft could be launched from bases in the Kola, Leningrad, Chukotski, and Kamchatka areas in order to reduce the possibility of detection. We estimate that by 1957 the USSR could, by a major effort, develop the capacity of the air bases in these areas to permit the launching of approximately 1,000 aircraft in an initial air operation against the US. If all of these aircraft were committed to one-way unrefueled missions (or two-way unrefueled missions, where possible), the magnitude of the attack

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might be on the order of 750-800 aircraft reaching target areas not considering combat losses. This would probably be the maximum Soviet long-range bomber capability against the US and its exercise would involve the expenditure of one-way missions of most of Soviet Long-Range Aviation. A number of these aircraft would probably be used for electronic countermeasures, diversionary, and escort missions.

54. We consider it more likely, however, that the USSR would elect to commit substantially fewer mission aircraft. It might launch about 900 aircraft, which could comprise 350 tankers and 550⁵ mission aircraft. Of the 550 mission aircraft, about two-thirds would possibly be launched for the Kola-Leningrad area and one-third from northeastern Siberia. About 450 aircraft might arrive over target areas not considering combat losses. However, exercise of this capability would involve difficult operational and logistical problems, particularly those pertaining to the creation of a tanker fleet. Moreover, the exercise of this capability would involve the loss on one-way missions of about one-third of Soviet long-range bomber aircraft. A number of the mission aircraft would probably be used for electronic countermeasures, escort, or diversionary tasks.

Attack Against Key US Overseas Installations

55. Assuming the USSR launched a maximum bomber attack against the US employing 1,000 aircraft (mostly on one-way missions without refueling), less than 30 percent of

⁵Of these 550 mission aircraft about 80 percent would be used in one-way missions. It is estimated that a total of about 160 bombers, including 70 TU-4's and 90 Type 39's could be launched from Chukotski and Kamchatka base areas; of this number approximately 115 would be one-way missions. From the Leningrad and Kola areas about 390 of the 550 mission aircraft could be launched. Of this number perhaps 270 would be TU-4's, 80 Type 39's, and 40 Type 37's. Of the mission aircraft launched from the Kola and Leningrad areas about 330 would be one-way missions. This distribution shows one of several possibilities. It represents what might be regarded as the optimum striking force to insure target coverage in various US areas.

Soviet long-range bombers would remain and these would probably not be immediately serviceable. If, as we consider more likely, the USSR launched 550 mission aircraft against the US, it would have 750 long-range aircraft available for re-attack, for attack in other areas, and for reserve. Assuming no provision for re-attack or reserve, the USSR could launch all serviceable bombers — about 550 — against key US and allied installations overseas. Not considering combat losses, approximately 80 percent would probably arrive over target areas. Since the probable number of long-range aircraft estimated to be involved in initial air attacks against the US in 1957 would still leave a major portion of Soviet Long-Range Aviation available for other uses, it is considered unlikely that the estimated force striking the US would be decreased to make available additional long-range aircraft to attack key US installations overseas. Such diversion of long-range aircraft is also unlikely in view of the great number of jet light bombers which could be employed against key installations within their radius.

56. We estimate that in 1957 the USSR will have about 3,100 jet light bombers which could also be available for attacks against key US and allied installations within the operational capabilities of these aircraft. We believe that the USSR could allocate a sufficient number of these jet light bombers to attempt to neutralize or destroy with HE or nuclear weapons selected allied forces and installations within range.

57. Soviet air attacks against key US and allied overseas installations could achieve varying degrees of surprise depending on the location of such installations with respect to base areas from which the USSR could launch attacks. Soviet aircraft attempting to attack key installations in Western France, Spain, the UK, North Africa, and the Azores would initially have to overfly the Western zones of Germany or Austria or other friendly allied areas and it is probable that defenses would be alerted some time before aircraft reached target areas. Therefore, surprise would probably not be a primary consideration in determining the scale of attack against installations in these areas, since allied de-

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fenses would probably be alerted by a small as well as a large number of attacking aircraft. On the other hand key installations in Iceland, Greenland, Labrador, and Newfoundland could be reached from Soviet base areas without overflying areas friendly to the allies. Attacks against key US installations in the Middle East could probably be launched undetected from the southern USSR but might be detected approaching or over Turkey, Iraq, or Iran. From bases in the Soviet Far East the USSR could make direct attacks across the open Pacific against Midway, Wake, and Guam. To attack Okinawa and the Philippines by a direct course from bases in the Vladivostok area, Soviet aircraft would have to overfly early warning radar areas in Japan and South Korea.

V. DELIVERY OF CONVENTIONAL AND MASS DESTRUCTION WEAPONS BY OTHER MEANS

Guided Missiles⁶

58. *General.* A native Soviet guided missile research and development program is known to exist. The extent of Soviet exploitation of the German wartime guided missile program was comparable to their exploitation of such other programs as electronics and aircraft. However, we are unable to assess the priority of the Soviet guided missile program vis-a-vis other weapons programs, or to assess the priorities accorded the various guided missile categories within this program. Indications are that the Soviet exploitation of German guided missile developments resulted in the USSR acquiring by 1948 a thorough familiarity with the German program and that by 1950 the USSR was capable of continuing independent guided missile development, except possibly in the field of advanced guidance and control systems. The types and characteristics of the missiles which might be produced by the USSR would depend upon the Soviet assessment of military require-

ments and upon the allocation of priority among the many possible types which might be developed. To avoid spreading its talent thinly, the USSR may be concentrating on a small number of missile projects. Nevertheless, it is well within Soviet capabilities to develop numerous types of missiles within the period of this estimate.

59. *Present Capabilities.* We believe that the USSR could now have an improved version of the German V-1 pulse-jet winged missile with ranges up to 200 nautical miles, a warhead of 2,000-3,000 pounds and a CEP of 2 to 3 nautical miles. The USSR also could now have an improved version of the German V-2 with ranges up to 350 nautical miles, a warhead of 2,000 pounds, and a CEP of 2 to 3 nautical miles. Such missiles could be launched from advanced bases in Communist territory against key US installations in West Germany. However, we have no firm evidence that the USSR has these weapons available in operational quantities. In addition, the USSR is now technically capable of attacking targets within the US with rocket-propelled glide bombs launched from long-range aircraft and V-1 type missiles from submarines; however, we have no evidence that the USSR has developed these capabilities either as to production of the missiles or as to conversion of submarines to missile launchers.

60. *Capabilities through 1957.* Intelligence confirms that at least as early as 1948—the USSR began a research and development program for guided missiles. The dates at which various missiles are estimated to become available in future are based on the assumption of a concerted and continuous effort started in 1948. These dates of estimated availability are the earliest probable dates at which each missile type could be brought by the USSR into limited operational use.⁷

⁶ Detailed studies of this subject are currently in progress and will provide the basis of NIE 11-6-54, "Soviet Capabilities and Probable Programs in the Field of Guided Missiles," scheduled for production in the third quarter of 1954.

⁷ "Limited operational use" is defined for the purposes of this estimate as a stage of development where small quantities of guided missile systems have been produced and are in the hands of trained personnel of at least one operational unit.

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61. In 1955 the USSR could have in limited operational use an improved V-2 type missile with a range of 500 nautical miles, a warhead of 3,000 pounds, and a CEP of 2 to 3 nautical miles. Subsonic, turbojet powered pilotless aircraft missiles with a maximum range of 500 nautical miles and a warhead of 3,000 pounds could also become available in 1955. Launched from advanced Bloc bases in Eastern Europe, such weapons could be used to attack targets in Western Europe as far west as London, Paris, and Rome. In the Far East, if launched from Soviet or North Korean territory, these weapons could be used to attack targets in Western Japan; if launched from Chinese territory, they could be used to attack targets in the Ryukyu Islands. The pilotless-aircraft missiles could also be launched from submarines against the US or key US overseas installations within range.

62. We believe that in 1957, the USSR could have in limited operational use single stage guided missiles capable of ranges up to 900 nautical miles carrying a 3,000-pound warhead and achieving a CEP of 3 to 4 nautical miles.⁸ Launched from Bloc bases, such missiles could reach all of the UK, France, Italy, Scandinavia, and Turkey. In the Far East, if launched from Soviet or North Korean territory, these weapons could reach all of the Japanese islands, and if launched from China, they could reach all of Luzon.

Clandestine Delivery

63. *Nuclear Weapons.* We have no evidence as to any Soviet plans or preparations for clandestine delivery of nuclear weapons against the US. However, during the period

⁸The Director of Intelligence, USAF, believes this missile could be in limited operational use in 1955, and that a ballistic missile with a range of about 1300 n.m. could be in limited operational use in 1957. This belief is based on intelligence of early Soviet exploitation in Germany, on Soviet interest in guided missiles up through 1952 and the demonstrated ability to follow a concerted development program as witnessed by rapid developments in aircraft, armament, and electronics in the past 8 years. It is also possible that accuracies better than those quoted will be within Soviet capability.

of this estimate the USSR will be capable of producing nuclear weapons which could be smuggled into the US either as complete assemblies or as component parts or subassemblies. These could range from small-yield weapons (equivalent of 5,000 tons of TNT or less) weighing a few hundred pounds to larger-yield weapons (possibly up to the equivalent of 1,000,000 tons of TNT) weighing less than ten thousand pounds. Their size could range from that of a package small enough to fit into the luggage compartment of an automobile to that of a packing case large enough to contain an automobile. All of these weapons could be designed to break down into a number of relatively simple and readily transportable components. Those designed to give a relatively low yield would not require much labor or technical training to assemble. Somewhat more labor and training would be required to assemble weapons designed to give high yields, and, once assembled, they would be more difficult to transport. It is conceivable that only the fissionable material, in small pieces, need be smuggled into the US, since other components could be fabricated or procured in this country. This scheme, however, would require careful advance planning and coordination by supervisory personnel with engineering skill and familiarity with the US sources of needed components, and would take a longer time to carry out. It would probably result in a reduced yield for a given amount of fissionable material. It would also incur a substantially greater security risk than the clandestine introduction of all components.

64. Considering the known limitations of the means of physical detection, the USSR could probably introduce into the US and detonate in place a considerable number of nuclear weapons by clandestine means. A variety of methods of clandestine delivery suggest themselves. Assembled weapons could be dropped by apparently friendly aircraft, detonated in the hold of a merchant ship, or sown as underwater mines. Either components or assembled weapons could be brought in under diplomatic immunity, smuggled across land or sea frontiers, introduced through normal import channels, or brought in as bonded merchandise.

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awaiting transshipment. The selection of the method of introduction and of transport and assembly within the US would depend on the Soviet objective and the risk of detection which the USSR was willing to accept. Satellite agents and merchant ships could be utilized for such attacks as could Communists in other countries. There are at least 5,000 Communists in Mexico and 10,000 in Canada together with thousands of other persons belonging to Communist led labor unions and front organizations that could be instrumental in clandestine attacks against the US. In addition, Mexico is considered a traffic center for Communists in North and South America giving Communists from other countries access to the US borders. Although these Communist elements of other countries could be used, it is doubtful if the Soviets would incur the risk of using them in surprise clandestine attack against the US prior to overt military attack.

65. In introducing nuclear weapons clandestinely into the US, however, the USSR would have to take into account not only the estimated chances of detection, but also the consequences of such detection in forfeiting the element of surprise in any intended overt attack and provoking US counteraction. As the number of weapons clandestinely introduced was increased, the risk of compromise would increase. This increased risk would be less a function of US capabilities for physical detection than of the scope and complexity of the clandestine operations, particularly insofar as larger numbers of Soviet agents became involved. Considering the consequences of a breach of security, the USSR would probably be unwilling to risk the use of even selected and trained agents in such numbers as would be involved in the clandestine delivery of large numbers of nuclear weapons. We conclude, therefore, that, although clandestine attack with nuclear weapons might occur against specially selected targets as a supplement to overt delivery by air, such attack, with large numbers of weapons, would probably be precluded by security considerations.

66. *Biological Weapons.* Most biological warfare (BW) agents are peculiarly adaptable to

clandestine utilization, since the introduction of small amounts of BW agents would be difficult to detect. Small-scale employment of biological warfare agents against livestock could be highly effective. BW attacks against key personnel concentrated in selected buildings could be effective. There is little likelihood that effective anticrop BW operations can be carried out clandestinely.

67. *Chemical Weapons.* CW agents are not easily adaptable to clandestine use. They are easily identifiable by their immediate effects and it probably would not be feasible to build up sufficient supplies or to procure the means clandestinely in the required areas for their dissemination against large population centers. The most practicable use would be against personnel in key installations, but even this would be difficult.

VI. ATTACK WITH CONVENTIONAL FORCES

Attacks by Ground Forces and Tactical Air Forces

68. Many key US installations overseas, such as those in Western Europe, the Middle and Far East, are subject to attack by Soviet ground and tactical air forces. Such attacks, however, would almost certainly be an integral part of the over-all Soviet campaign in these areas, and it would be impossible to separate the specific scale of attack on key US installations from the over-all scale of Soviet campaigns.*

69. The peacetime establishment of the Soviet Army probably will continue at 175 divisions and supporting troops, which can be expected to be combat-ready on D-day. By M+30, this force can be expanded to about 300 line divisions. These forces would be capable of overrunning large areas of Western Europe, the Middle East, and Far East. However, to attain a high capability for destruction of most key US installations in these areas the Soviet Army probably would have to be reinforced in peripheral areas or to employ airborne or amphibious forces in connec-

*See NIE 11-4-54, "Soviet Capabilities and Probable Courses of Action through Mid-1959," for Soviet ground and tactical air capabilities.

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tion with a ground attack. It is estimated that for air support of these attacks in 1954 the USSR has an actual strength of approximately 9,500 combat aircraft in the Air Force of the Soviet Army and Naval Aviation. Of this total, approximately 7,500 are jet aircraft. For 1957 actual combat aircraft in operational units is estimated at approximately 12,500 of which about 11,500 will be jets.

Naval Attack

70. Soviet submarine forces could, at least in the initial phases of an attack, inflict serious damage on US overseas communications and carry out offensive mining in the approaches to harbors and ports of the US and its allies, in addition to its potential for launching mass destruction weapons against the US or key US overseas installations within range. During the period of this estimate the Soviet submarine force will probably be enlarged and strengthened by the addition of about 46 long-range submarines per year, by a limited modernization of older classes (including installation of snorkel), and by the possible adaptation of submarines to missile launching. It is estimated that during 1954 the Soviet Navy will have a total of 221 long and medium-range submarines, of which 65 will be snorkel-equipped boats of the long-range type developed since World War II. In a maximum effort, as many as 135 of the long and medium-range submarines located in the Baltic-Northern Fleet and Pacific Fleet areas — 92 and 43 respectively — could be made available for attacks against the continental US and key installations overseas. By 1957, the availability of long- and medium-range submarines in the two Soviet fleet areas would increase to about 165 and 65 respectively. Assuming that egress from the Black Sea would be denied Soviet submarines at least in the initial stages of a war, the Black Sea submarine force is not considered an immediate threat to US installations.

71. The capabilities of surface naval forces for attack on the US are low. The Soviet surface fleet is geographically divided, lacks advance bases and does not possess a shipborne air arm. Sporadic raider operations are possible, but the surface fleet, in general,

lacking aircraft carriers, is unsuitable for transoceanic naval attack on any significant scale.

Amphibious Attack

72. Because of the lack of long-range amphibious type vessels and aircraft carriers, large-scale Soviet amphibious attacks will be limited to areas where air cover can be provided from Communist-controlled territory. However, amphibious raids by submarine-borne forces for the purpose of attempting the destruction or neutralization of key US overseas installations are possible within a radius of 2,000 miles from Soviet submarine bases. Amphibious assault against the continental US (except Alaska) is beyond Soviet capabilities. In assaults against Alaska, logistic problems, weather, and the requirement for air cover would probably limit the scale and duration of such attacks to raids in force to destroy or neutralize US installations in the Aleutian Islands or along the Bering Sea coast. Amphibious attacks against key US overseas installations, except in the Far East, would probably be limited to amphibious raids by submarine-borne forces. Amphibious attacks in considerable force could be made against US installations in Japan, Okinawa, and Formosa.

Airborne Attack

73. The USSR has approximately 100,000 trained paratroopers, organized into 6 to 8 airborne divisions, plus about 100,000 trained airborne reserves. The capability of these forces to seize and destroy key US installations overseas is limited by the availability of transport aircraft. The USSR can utilize about 2,000 two-engine transports which could lift about 32,000 paratroopers in a maximum initial assault and about 77,000 troops during a five-day assault operation in Western Europe. The operational radius of such assaults would be from 500 to 650 nautical miles. This capability will probably increase through 1957 with the addition of new medium transports. The most likely objectives of airborne assaults would be the neutralization of key US installations, the seizure of bases, and the securing of important com-

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munications features in Western Europe, Japan, and Alaska. Because of air transport limitations, the USSR will not be capable of launching major airborne operations against the continental US during the period of this estimate. However, small, highly-trained assault groups probably could be delivered to some targets in the US.

VII. SOVIET CAPABILITIES FOR SABOTAGE OTHER THAN BY CLANDESTINE PLACEMENT OF WEAPONS OF MASS DESTRUCTION

74. The USSR is capable of widespread sabotage in the US through the use of existing subversive elements and the placement of foreign agents. However, such sabotage efforts probably would not be initiated on a large scale prior to an all-out attack on the US since such efforts would nullify the advantage of surprise. Large-scale sabotage of US transportation, industrial, and communications facilities, and military installations could be expected with and immediately following surprise attack by the USSR. Communist party members and adherents are capable of organizing saboteur units or teams of varying sizes equipped with small arms and other suitable material which could strike at especially selected and widely separated targets simultaneously and without warning. Whether such attacks would be timed with a surprise military attack or carried out after such an attack would be dependent upon the Soviet appraisal of the relative advantages of such action.

75. Soviet capabilities for widespread sabotage attacks against key overseas bases are greater than against the continental US, because of the much larger percentage of Communist elements, widespread political discontent, and lack of adequate security measures in certain foreign nations. Those areas in which such capabilities are now greatest are France, Italy, Japan, and the Philippines. However, in numerous other countries the Communists almost certainly have capabilities for acts of sabotage. The populations of these areas are experienced in such operations and sabotage

efforts timed with large-scale military attacks could materially reduce the capability of US military forces overseas.

VIII. PROBABLE SOVIET STRATEGIC OBJECTIVES AND METHODS OF ATTACK

Probable Soviet Strategic Objectives

76. In determining the scale and type of initial attacks on the US and key US overseas installations to be adopted in event of general war, the Soviet leaders would be influenced by the following factors:

a. The power of the US is the main support of Free World opposition to the Communist Bloc and the main obstacle to Communist world domination. The USSR would probably calculate that if US war-making strength could be sufficiently reduced in the initial stages of a war, organized anti-Communist resistance throughout the world would probably collapse.

b. The chief immediate threat to the USSR in event of general war is a US strategic air offensive. The Soviet rulers have demonstrated their sensitivity to the danger of US air attack with nuclear weapons by the high priority which they have given to the development of defenses against such an attack. Despite the substantial progress already achieved in building up their defenses, it is unlikely that they would regard their defensive capabilities as adequate to prevent substantial numbers of attacking aircraft from reaching strategic targets in the USSR.

c. The major proportion of facilities, equipment, and forces which together constitute US nuclear capabilities are located in the continental US. Soviet destruction of all key US installations and forces overseas which possess a capability for employing nuclear weapons would greatly handicap but would not prevent the delivery of nuclear weapons on targets throughout the USSR.

d. At the same time, however, certain key US installations overseas are essential to a maximum strategic air offensive against the USSR. The Soviet leaders would probably calculate that destruction or neutralization of

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these installations, as well as those in the US, would be essential to neutralize the US strategic air capability.

e. Soviet leaders also must realize that other US forces and installations, as well as those of US allies particularly in Eurasia, present formidable obstacles to Soviet success in operations that will occur simultaneously with or immediately after the initial attacks.

77. In view of the above factors it is likely that the USSR in attacking the US and key overseas installations would have the following major objectives: (a) to destroy swiftly or cripple US capabilities for nuclear retaliation; (b) to deliver such an attack on urban, industrial, and psychological targets in the US as would prevent, or at least hinder, the mobilization of the US war potential and its projection overseas; and (c) to inflict such destruction on US overseas installations as to hamper or prevent US reinforcement and logistical support of overseas forces. To achieve these objectives we consider it almost certain that a portion of the Soviet nuclear stockpile would be employed against certain key US installations outside the continental US. We believe that these Soviet objectives would remain the same throughout the period of this estimate although Soviet capabilities for achieving them will obviously increase through 1957.

78. *Desirability of Surprise.* In order to be successful, an attack on US nuclear capabilities would have to be accomplished with almost complete surprise. It is therefore probable that the USSR would launch initial attacks against the US and key overseas installations in size and from base areas which would offer the greatest security from detection, with attacks by other forces against other areas after the element of surprise had lost its significance.

79. A maximum Soviet attack on the continental US, and key overseas installations, involving utilization of all or most of the capabilities discussed in this estimate, would require preparations that would almost certainly result in the loss of surprise. Therefore, if the USSR attempts to achieve maximum

surprise it will probably be forced to accept the following major limitations: (a) no large-scale mobilization of additional units; (b) no large-scale redeployment of Soviet air, naval, or ground forces to reinforce peripheral dispositions; and (c) no unusual movement of Soviet air, naval, or ground forces in such areas as would likely to indicate the imminence of attack.

Probable Methods of Attack Against the US

80. *Nuclear Attacks by Aircraft.* In view of the desirability of achieving both maximum surprise and maximum weight in any attack on the US, we believe that the USSR would place chief reliance on nuclear air attacks. Among the forces and weapons available, the USSR's greatest capability lies in overt military attack with nuclear weapons delivered by long-range aircraft. It is probable that such attack would receive the highest priority because of : (a) the limited capabilities of conventional naval forces, ground forces, and airborne forces against the US; (b) the security difficulties inherent in the delivery of large numbers of nuclear weapons by clandestine means; (c) the insufficient development of other methods of delivery of nuclear weapons on a large scale; (d) the insufficient development of other mass destruction weapons, or handicaps to their large-scale use; and (e) the availability of far northern air bases, from which air operations against the US are least susceptible to detection.

81. *Other Methods of Attack.* The Soviet rulers might, however, employ other methods of attacking the US concurrently with or immediately following a surprise nuclear air attack. Soviet capabilities for airborne attack and chemical and biological warfare, against the continental US, appear to be comparatively slight. Clandestine attack in the form of sabotage, biological warfare, or use of nuclear weapons might occur against specially selected targets. Guided missiles could be launched from submarines against US ports and coastal installations.

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Probable Methods of Attacks Against Key US Overseas Installations

82. The USSR would have a much wider range of capabilities for effective attack on many key US installations overseas than on the US itself because of the shorter ranges, greater possibilities for clandestine action, and other factors involved. However, we believe that if the USSR planned a surprise attack on the US itself, it would time its attacks on US installations overseas so as not to compromise the achievement of surprise against the US. Thus initial attacks on these installations would probably take place simultaneously with or shortly after the attack on the US, and prior detectable preparations would be avoided to the maximum extent. These considerations would markedly affect the scale and timing of the attacks discussed below.

83. *Western Europe and the Middle East.* Attacks on the majority of key US installations in these areas (except the UK and Spain) probably could most profitably be carried out primarily by ground and tactical air forces. The Soviets have the capability to launch attacks on these areas from Soviet-controlled territory without increasing their forces, but might elect to carry out at least partial mobilization to insure the decisive success of the operations.

84. *Other Overseas Installations.* Except for Japan, Okinawa, and Formosa, US installations in other areas would be subject primarily to air attacks with nuclear and conventional weapons. Sufficient Soviet jet light bombers are now available in peripheral areas occupied by or under the influence of

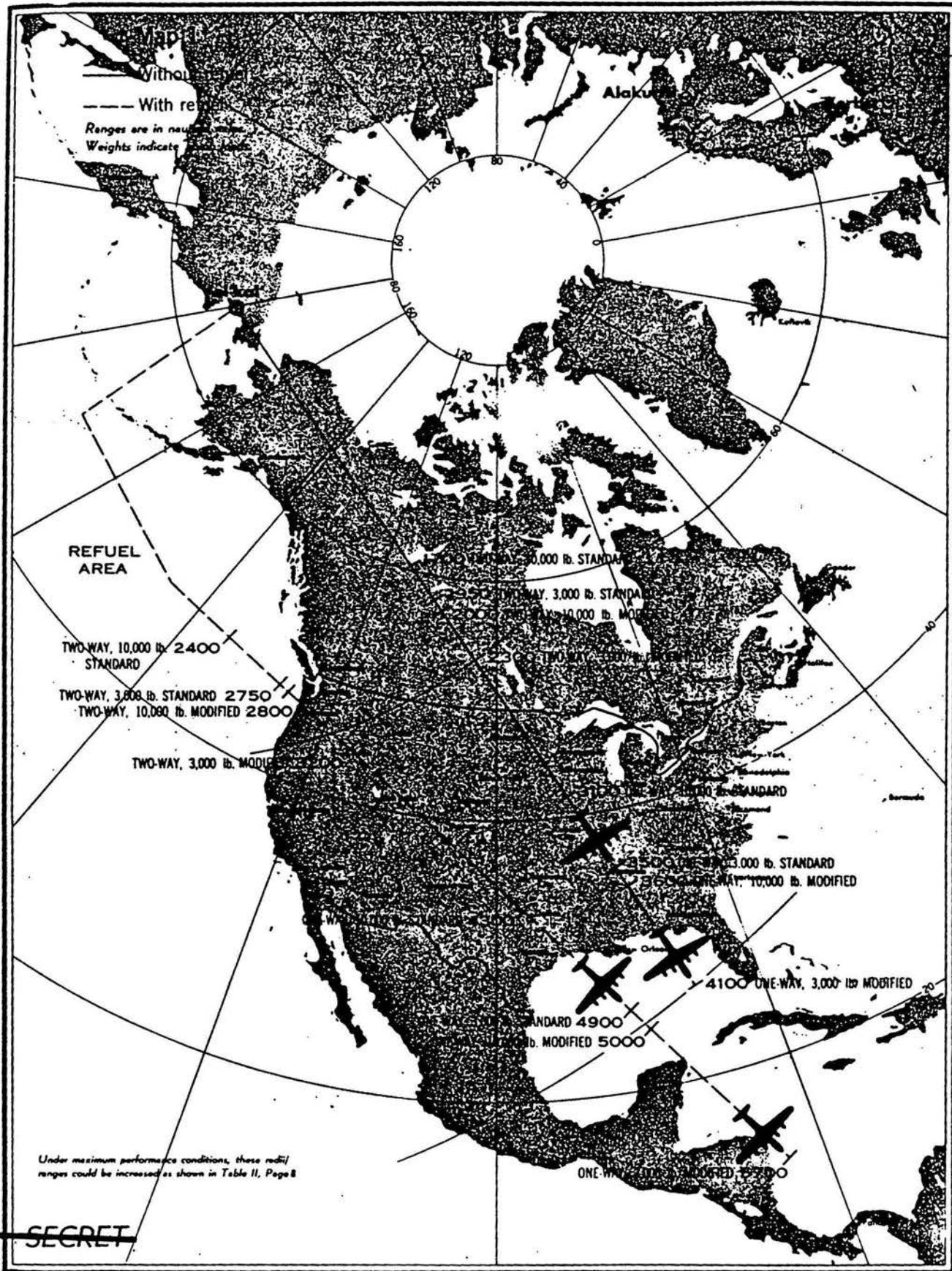
the USSR to permit large-scale attacks on installations in the UK, Turkey, and the Middle East. Attacks in considerable force could be launched by amphibious and airborne forces against Japan, Okinawa, and Formosa. Overseas installations within 2,000 miles of Soviet submarine bases could be subjected to amphibious raids by submarine forces and virtually all overseas installations are subject to nuclear attacks by long-range aircraft. In addition the Soviets possess the capability of making attacks on selected overseas installations by special small airborne teams and could mount large-scale airborne attacks on installations within a radius of 500 to 650 nautical miles of Soviet bases.

85. *Likelihood of Change in Primary Methods of Attack through Mid-1957.* Soviet capabilities for all methods of attack will increase considerably by mid-1957 as a result of improved aircraft, an enlarged stockpile of nuclear weapons, increased naval strength (including possible utilization of submarine launched guided missiles), and ground forces probably supported by weapons employing nuclear warheads. However, the choice of primary method of attack will be unlikely to change materially because the improvement of Soviet capabilities in any particular field will probably not be sufficient to guarantee success against the US or key US installations overseas. If anything, Soviet capabilities for large-scale nuclear air attack on the US will increase more during this period than Soviet capabilities for use of any other weapons system against the US. In addition, however, by 1957 the USSR could have substantially increased capabilities for use of guided missiles, particularly against US coastal areas and key installations overseas.

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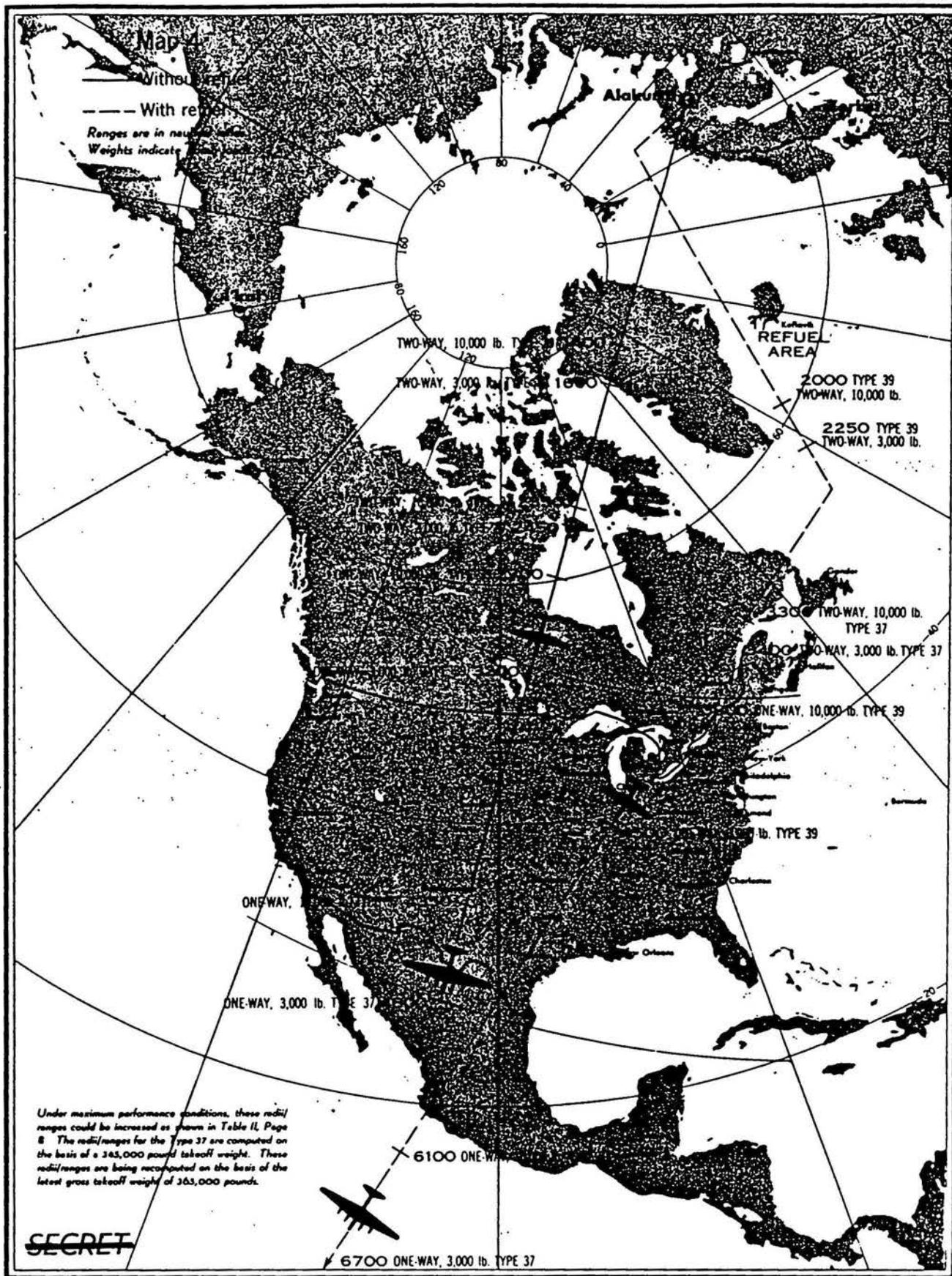
TU-4, STANDARD AND MODIFIED

From the Chukotski Area

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TYPE 39 AND TYPE 37

From the Kola Area

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TU-4, STANDARD AND MODIFIED

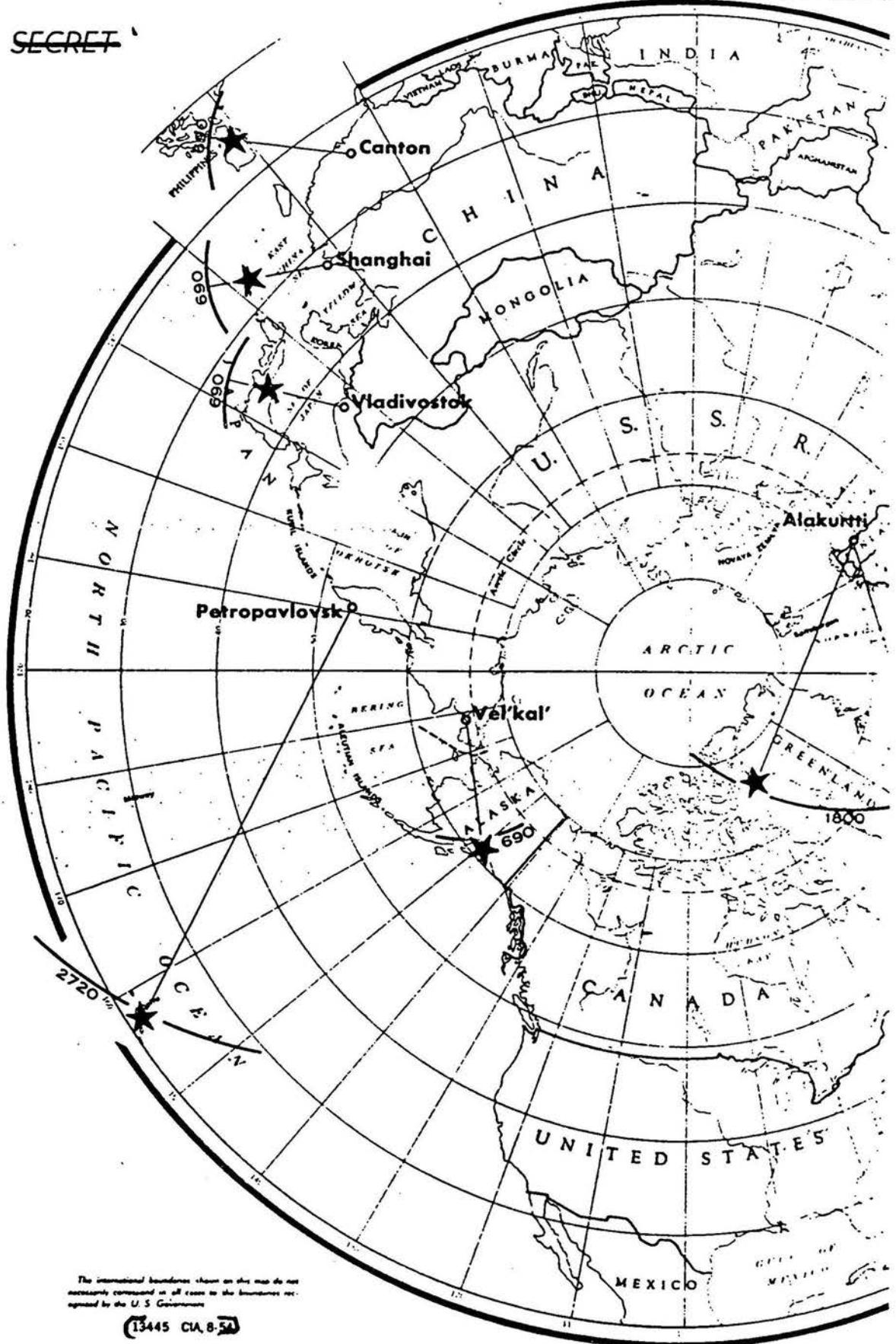
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From the Baltic-East German Area

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CAPABILITIES AGAINST KEY US OVERSEAS

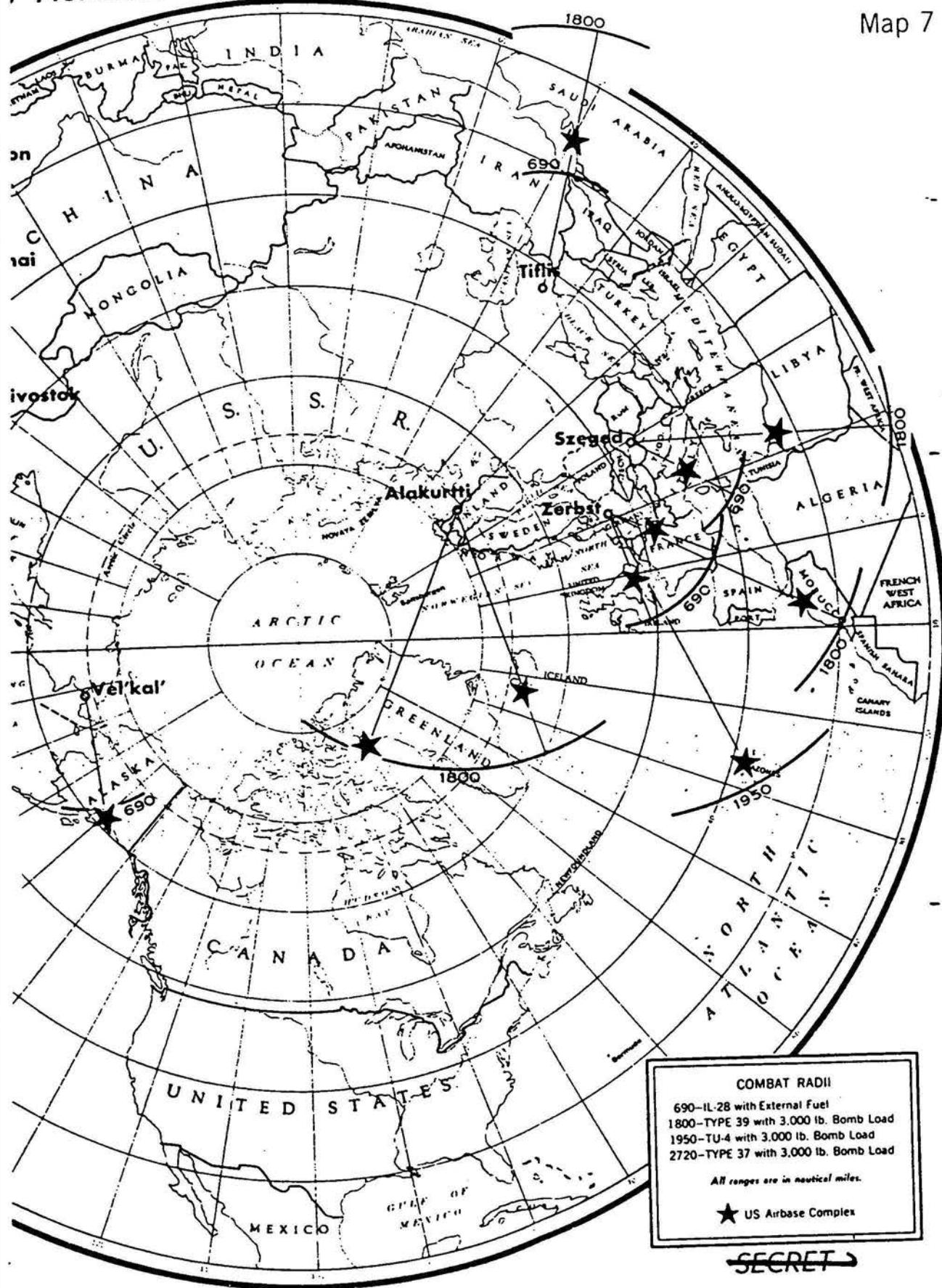
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The international boundaries shown on the map do not necessarily correspond in all cases to the boundaries recognized by the U.S. Government

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; AGAINST KEY US OVERSEAS INSTALLATIONS

Map 7



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