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SOVIET GROSS CAPABILITIES FOR ATTACKS ON THE US AND KEY OVERSEAS INSTALLATIONS AND FORCES THROUGH 1 JULY 1958

Submitted by the

DIRECTOR OF CENTRAL INTELLIGENCE

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Concurred in by the

INTELLIGENCE ADVISORY COMMITTEE

on 23 June 1955. 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 INSTALLATIONS AND FORCES THROUGH 1 JULY 1958

THE PROBLEM

To estimate Soviet gross capabilities for attack on the US and key US overseas installations and forces¹ as of mid-1955 and mid-1958, without taking into account the effectiveness of allied defenses and countermeasures.

SCOPE

In planning an attack on the US and key US overseas installations and forces, the Soviet rulers would consider such an attack in connection with their over-all strategy for general war. Accordingly, some of their forces and materiel, including nuclear weapons, would almost certainly be earmarked for use against US allies and for reserve. This estimate does not consider the problem of such allocation nor, except in section VIII, of over-all USSR strategy, but confines itself to the gross capabilities for attack on the US and key US overseas installations and forces as indicated by the estimated state of USSR weapons, equipment, and facilities during the period of this estimate. In Section VIII, the probable USSR strategic objectives and methods in attacking the continental US and key US overseas installations and forces are considered.

CONCLUSIONS

1. In attacking the US and key US overseas installations and forces the major Soviet objectives would be to: (a) destroy or neutralize as quickly as possible US

continental and overseas capabilities for nuclear retaliation; (b) deliver such an attack on urban, industrial, political, and psychological targets in the US as would

¹Key US Overseas Installations and Forces: Strategic, tactical, and naval air forces and bases, including NATO tactical forces and bases; bases and facilities for the support of naval operations; army depots and port complexes; major headquarters; transportation facilities, including key bridges, tunnels, marshalling yards, and transloading points.

Location of key US Overseas Installations: United Kingdom, Western Europe, Far East (including Okinawa), French North Africa-Libya, Pacific (including Hawaii and the Philippines), Middle East, North Atlantic (including Newfoundland, Greenland, Labrador, and Iceland), Bermuda-Azores, Alaska, and Panama Canal-Caribbean.

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prevent, or at least hinder, the mobilization of US war potential; and (c) inflict such destruction on US overseas installations as would hamper or prevent the US from reinforcing or resupplying its forces. (Para. 110)

2. The Soviet leaders would probably calculate that in order to achieve ^{significant results} success in neutralizing US capabilities for nuclear retaliation, such ~~(an) attack~~ would have to be accomplished ^{under surprise or virtually} ~~with the maximum degree of surprise consistent with the required scale of attack.~~ Therefore, the USSR would endeavor to launch its initial attack from such bases and under such conditions as would offer the greatest security from detection. (Para. 112)

3. In order to achieve the optimum degree of surprise and weight in an initial attack on the continental US, we believe that the USSR would place chief reliance on nuclear attacks by aircraft. This type of attack 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; and (d) the insufficient development of other mass destruction weapons, or handicaps to their large-scale use. (Para. 113)

4. The USSR had tested by the end of 1953, small and medium-yield weapons and has employed thermonuclear boosting principles to produce an energy yield up to 1,000 kilotons of TNT. The 1954 test series showed stockpile types in the medium-yield range and extensive devel-

opment in the small-yield ranges, but there was no further development in the large-yield range. During the immediate future, the types of weapons stockpiled will probably have the general characteristics and explosive powers of weapons already tested although the quantity of the large-yield type that could be produced would probably be limited. We estimate that by mid-1955, the USSR could have nuclear weapons with yields ranging from 5 KT to 1,000 KT and from mid-1956 through mid-1958 weapons with yields ranging from 0.5 KT to 10,000 KT. (Paras. 23, 25)

5. The areas best located geographically for launching long-range air operations against the US are the Kola Peninsula; the Leningrad complex; the Chukotski and Kamchatka areas in northeastern Siberia; the central Arctic area; and the Baltic-East German area. The Chukotski, Kola, and Kamchatka areas are particularly advantageous as forward bases for surprise attack since great circle routes would initially avoid overflight of nations friendly to the US. With jet heavy bombers and inflight refueling the USSR would still require these advanced bases in order to launch two-way attacks on the most distant US targets.² The BEAR, turbo-prop heavy bomber with one inflight refueling, could reach any point in the US from interior bases on two-way missions provided great circle routes were flown. (Paras. 39-49, 71-72, 76)

6. The BULL (TU-4), even if modified to increase its radius-range in a manner similar to the US B-29 conversion and

² There is no intelligence to indicate that the USSR has ever employed inflight refueling. However, its development is readily within their technical capability.

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with bomb loads limited to 3,000 pounds, still could only attack targets in the US Pacific northwest on two-way unrefueled missions. On one-way unrefueled missions, modified BULLS could reach almost all of the US. If the USSR now has an inflight refueling capability, BULLS with 3,000 pound bomb loads could also conduct two-way missions against the extreme northeastern tip of the US and an area roughly northwest of an arc through Phoenix, Kansas City, and Chicago, providing great circle routes were flown. (See Maps, Appendix A). (Para. 74)

7. No two-way missions, even with refueling, could be conducted against the US with the BADGER (Type-39) jet medium bomber, unless great circle routes from the Chukotski area were used.³ On one-way unrefueled missions with a 3,000 pound bomb load it could reach as far as Detroit, St. Louis, and Oklahoma City from the Chukotski area and as far as Boston from the Kola area. On one-way refueled missions from these areas the BADGER could reach most of the important industrial areas in the US. (Para. 73)

8. The BISON (Type-37) jet heavy bomber on two-way refueled missions with a 10,000 pound bomb load could reach virtually all targets in the US in a combination of missions from Chukotski and Kola areas, providing direct great circle routes were flown. If employed on one-way unrefueled missions, they could strike all of the US from interior bases. On two-way unrefueled missions the BISON

³ Great circle routes from Kola and Chukotski would involve refueling over US or Canadian territory.

could reach targets roughly within an arc through Minneapolis, Denver, and Los Angeles from the Chukotski area but could barely reach the northern tip of Maine from the Kola area. (Para. 75)

9. The BEAR turbo-prop heavy bomber on two-way refueled missions with a 10,000 pound bomb load could strike any point in the US from interior bases, provided direct great circle routes were flown. On two-way unrefueled missions the BEAR could reach any point in the US except that portion south of an arc through Corpus Christi, Atlanta, and Norfolk from the Chukotski area, but from the Kola area could reach only north of an arc through Seattle, Chicago, and Richmond. From interior bases in the Leningrad area, on two-way unrefueled missions, the BEAR could reach the North Eastern part of the US as far south as New York, provided direct great circle routes were flown. If employed on unrefueled one-way missions they could reach any point in the US. (See Map 8). (Para. 76)

SOVIET CAPABILITIES FOR AIR ATTACK IN MID-1955

10. Present Soviet capabilities for large-scale air attack on the continental US are limited by the small number of operational heavy bombers and by the relatively undeveloped base facilities in the Kola, Chukotski, Kamchatka, and other Soviet arctic areas. They are probably also limited by the lack of a developed inflight refueling capability. (Para. 70)

11. Although there is a lack of sufficient evidence to permit a firm assessment of the capabilities of individual bases in the Kola, Chukotski, and Kamchatka areas

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for staging bomber aircraft, we believe that by a major effort, the USSR would be capable of launching a maximum of about 440 aircraft from these bases in an initial attack against the US in mid-1955. If all were committed to one-way unrefueled missions, approximately 350 might reach US target areas, not considering combat losses. We believe it almost certain that the USSR is psychologically capable of employing one-way missions. If inflight refueling were available and used about 110 of the 440 aircraft launched would probably be tankers and about 330 would be bombers. In this case 250 strike aircraft might reach target areas, not considering combat losses. Some of these aircraft would probably be used for electronic countermeasures or diversion. (*Paras. 39, 81-84*)

12. If the USSR elected to utilize all available bases, including those in the Baltic East German and Leningrad areas, and thus lessen its chances of achieving surprise it could launch a maximum of approximately 950 aircraft in 1955 in an initial attack on the US. However, the great bulk of these aircraft would have to fly one-way missions. Not considering combat losses, approximately 750 might reach target areas. (*Paras. 81-84*)

13. Assuming the launching of 330 bombers against the continental US, the USSR would have available about 740 bombers for attacks against key US overseas installations and military forces and for reattack or for other missions. About 600 could be immediately launched against key US overseas installations and forces. Not considering combat losses, approximately 500 might reach target areas. In addition, some portion of the

2,500 jet light bombers currently estimated to be available could be used for attacks against targets within their operational radius of about 600 nautical miles. (*Paras. 64, 88-89*)

SOVIET CAPABILITIES FOR AIR ATTACK IN MID-1958

14. By mid-1958, we estimate that the USSR will have available in operational units about 350 jet heavy bombers and 250 turbo-prop heavy bombers, and could have a considerable inflight refueling capability, thus giving it much greater flexibility in launching attacks on the US since interior bases could be used. By this time, moreover, we estimate that the USSR could, by a major effort, have substantially increased the capacity of the air bases in the Kola, Chukotski, Leningrad, and Kamchatka areas. (*Paras. 85-87*)

15. If the USSR did in fact increase the capacity of these base areas and elected to use the above areas as staging bases it could initially launch against the US, all medium and heavy bombers in commission (approximately 1,100). If all were committed to unrefueled missions, thus maximizing the number of mission aircraft, about 850 might reach target areas, not considering combat losses. However, exercise of this maximum capability would involve the expenditure on one-way missions of most of the Soviet Long-Range Aviation. (*Paras. 85-87*)

16. We consider it more likely that if tanker aircraft were available the USSR would employ them, even if it resulted in substantially fewer mission aircraft. In an optimum initial strike, the USSR might launch about 450 tankers and

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about 900 mission aircraft. Of the 900, about one-half might be launched from the Kola-Leningrad area, one-fourth from northeast Siberia, and one-fourth from interior bases. About 700 might arrive in target areas, not considering combat losses. Even under these conditions, about one-third of the total Soviet long-range bomber force would be launched on one-way missions. A number of these mission aircraft would probably be used for electronic countermeasures, or diversionary tasks. (*Paras. 85-87*)

17. If by mid-1958, the USSR decided to use only BISONs and BEARS in an initial attack on the US, it could launch approximately 500 bombers, without using forward bases. Of this number approximately 380 could arrive in target areas, not considering combat losses. To achieve target coverage of the entire US, inflight refueling or one-way missions would have to be employed. (*Paras. 85-87*)

18. Assuming the scale of attack in paragraph 16 above, and the commitment of all heavy bomber aircraft against the US, the USSR would have 300 medium bombers left, about 250 of which would be immediately available for attack against key US overseas installations and military forces or for other missions. We also estimate that in 1958 about 3,150 jet light bombers will be available for attacks on targets within their operational capabilities. (*Paras. 88-89*)

SOVIET CAPABILITIES FOR OTHER FORMS OF ATTACK

19. Throughout the period of this estimate the USSR probably would employ other methods of attacking the US or US

installations overseas concurrently with or immediately following a surprise nuclear air attack. The USSR is technically capable of employing submarine-launched guided missiles with nuclear warheads against targets in coastal areas and they could now have several long-range submarines equipped with guided missiles. It is also technically capable of attacking some US overseas installations with ground-launched guided missiles up to ranges of 500 miles. In addition, the USSR could employ amphibious, airborne, and ground forces and could attack US installations with standard CW agents and nerve gases. (*Paras. 90-94, 99-100*)

20. Clandestine attack on the US itself by sabotage, biological warfare, and placement of nuclear weapons, could occur against specially selected targets. Against key US overseas installations, a considerable capability exists for espionage, sabotage, and subversion. (*Paras. 95-100, 108*)

21. The USSR could launch both nuclear and conventional air attacks and submarine attacks against US naval strike forces. Submarines also could attack US overseas communications and carry out offensive mining in the shipping approaches to US and allied harbors and ports. (*Para. 103*)

22. In conjunction with any Soviet air attack on the US and key overseas installations and forces, the USSR would probably employ ground, airborne, and amphibious forces simultaneously with or immediately after the initial attacks. Soviet ground forces, particularly in Western Europe, already possess a high capability for attacking allied forces and

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installations located in forward areas. The additional employment of airborne or amphibious forces would enable the

Soviet ground forces to attack other forces and installations behind the forward areas. (*Paras. 101-102, 105-106*)

DISCUSSION

I. AVAILABILITY OF SOVIET MASS DESTRUCTION WEAPONS

23. *Nuclear Weapons.*⁴ The Soviet atomic energy program, directed primarily toward the production of nuclear weapons, will continue to receive special emphasis through 1958. The USSR had tested by the end of 1953, small and medium-yield weapons and has employed thermonuclear boosting principles to produce an energy yield up to 1,000 kilotons of TNT. The 1954 test series showed stockpile types in the medium-yield range and extensive development in the small-yield ranges, but there was no further development in the large-yield range. During the immediate future, the types of weapons stockpiled will probably have the general characteristics and explosive powers of weapons already tested although the quantity of the large yield type that could be produced would probably be limited. Within the limits of technological capabilities as of the end of 1954, Soviet military requirements will govern the allocation of available fissionable material to various types of weapons, with consideration probably being given more to operational requirements than to the largest total energy yield attainable.

24. In order to provide an example of Soviet stockpile capabilities, we have assumed that: (a) one-third of estimated uranium-235 is utilized in large-yield weapons (500 to 1,000 KT); (b) two-thirds is utilized in medium-yield (70 KT) composite weapons; and (c) the remaining plutonium is divided equally between medium-yield (40 KT) and small-yield (5 KT) weapons. For purposes of com-

⁴ See NIE 11-2-55, *Restricted Data*, "The Soviet Atomic Energy Program," dated 25 April 1955 for details of Soviet nuclear energy program, and specifications of types of nuclear weapons to permit determination of the aircraft types in which they can be employed.

parison this allocation of fissionable material is carried through mid-1958. If the Soviet stockpile were allocated in this manner it would be as follows:⁵

	Mid-1955	Mid-1958
Large-yield weapons (500-1,000 KT)	15	50
Medium-yield weapons (40-70 KT)	320	950
Small-yield weapons (5 KT)	155	250

25. However, due to continued Soviet nuclear progress, other allocations of fissionable material might become more likely toward mid-1958. The USSR will probably continue work on larger-yield weapons as well as on smaller-yield and small-dimension weapons. We estimate that by mid-1956 the USSR could have weapons with ranges of yields from 0.5 KT to 10,000 KT or more. Such developments would permit more flexibility in the use of nuclear weapons. Assuming such progress on the part of the Soviets, one of the ways in which their 1958 weapons stockpile could be divided would be as follows:

Large-yield weapons (500 to 10,000 KT)	230
Medium-yield weapons (5 to 500 KT)	440
Small-yield weapons (0.5 to 5 KT)	570

26. There is no direct information on the nature of the Soviet control organization and facilities for storage, handling, and distribution of nuclear weapons. However, we believe that Soviet nuclear weapons will be handled by a special organization within the

⁵ In view of the range of error applicable to the estimate of Soviet fissionable material production, the actual figures for the end of 1955 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-1958 may be as low as one-half or as high as twice the figures given in the table.

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Ministry of Defense and will be stored at both a few large reserve-stockpile storage sites and a large number of smaller sites. These small sites will probably be located at or near airfields, guided missile sites, and other delivery vehicle installations in advanced areas.

27. *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. However, the significance of radioactive fall-out following large nuclear explosions should be considered in connection with Soviet capabilities to produce explosions in the megaton range.

28. *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 produce BW agents and devices for dissemination in adequate numbers. Although there is some evidence to indicate the USSR is engaged in a BW program, agent production has not been identified either as to location or type. 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.

29. *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. Intelligence indicated that the Soviets could have been producing at least one of the nerve gases since 1949, and we estimate that the USSR is capable of employing nerve gases.

II. DELIVERY OF CONVENTIONAL AND MASS DESTRUCTION WEAPONS BY AIRCRAFT

Strength of Soviet Long-Range Aviation

30. In mid-1955, Soviet Long-Range Aviation will have an estimated over-all authorized strength (TO&E) of 1,600 aircraft, including 1,160 BULL (TU-4) piston medium bombers, 200 BADGER (Type 39) jet medium bombers,

20 BISON (Type 37) jet heavy bombers, 20 BEAR (turbo-prop heavy bombers), and 200 twin-engined piston transports. The estimated actual strength of this bomber force in mid-1955 will be 1,000 BULL, 130 BADGER, and up to 20 BISON and 20 BEAR aircraft.⁶ All units are based in Western USSR except the 3rd Long-Range Air Army, with an authorized strength of 224 aircraft, which is located in the Far East.

31. No substantial change in the authorized strength of approximately 1,600 aircraft (1,400 bombers) is expected between now and mid-1958. We estimate that the USSR will probably not introduce into operational units through mid-1958 any bomber types which have not already appeared either in units or in prototype stage.

32. The appearance during April of as many as 13 BISONs at rehearsals for the May 1st air show indicates a significant increase in Soviet heavy bomber production over that previously estimated. The BISON was first seen in flight in the spring of 1954 and considered as a prototype at that time. With the appearance of BISONs and BEARS at this time, we conclude that production go-ahead on the BISON occurred about January 1952, the first production model was produced in the first quarter of 1954, and approximately 40 will have been produced by 1 July 1955. Present evidence indicates that it is being produced at Plant No. 23 in Moscow. It is estimated that the USSR could achieve a maximum peak rate of 15 per month at this plant by January 1957. It is more probable, however, due to problems associated with supply of equipment, subcontracting, and training of personnel for acceptance in operating units that a production rate of about 8-10 per month would be initiated.

33. It is also possible that other plants could now be producing the BISON and that the

⁶ Throughout this estimate, estimated actual strengths have been used for 1955 while TO&E figures have been used for mid-1958. Actual aircraft strengths should be considered in arriving at Soviet attack capabilities. However, the relation of actual aircraft to TO&E is subject to considerable variance and cannot be accurately predicted for future years. By 1958 actual strength will probably equal TO&E strength.

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planned production rate could be as high as 20-30 per month. Similar analysis of BEAR production has not been made at this time. The USSR could have up to 20 BISONS and 20 BEARS in operational units by mid-1955 and, based upon tentative production estimates, by mid-1958 could have about 350 BISONS and 250 BEARS in operational units.

ESTIMATED OPERATIONAL STRENGTH
OF LONG-RANGE AVIATION¹

Type	Mid-1955	Mid-1958
BULL	1,000	100
BADGER	130	700
BISON	20	350
BEAR	20	250

¹There is no firm intelligence on the planned balance between the types and categories of long-range aircraft or on their future authorized organizational aircraft strengths; the above figures represent our estimate of the most probable way in which Soviet Long-Range Aviation would be proportioned during the period and is predicated on the assumptions: (a) that no change will occur in the total authorized number of aircraft in long-range units; (b) that the BEAR turbo-prop heavy bomber is currently in series production; and (c) that the USSR is devoting a major aircraft production effort to the development of a massive intercontinental attack capability.

34. *Inflight Refueling.* We have no intelligence that the USSR has ever employed 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. It 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 desirable to consider the effect of inflight refueling when assessing the maximum possible ranges of Soviet bombers. However, production of a fleet of tanker aircraft, modification of mission aircraft fuel systems, and appreciable training in their operational use would be necessary before missions involving inflight refueling could be conducted. The establishment of tanker units would require the conversion of bomber types or production of new tanker aircraft. The new turbo-prop

aircraft sighted in the fly-by rehearsals could probably be utilized in this role. Since BULL strength in operational use is estimated to decrease with the introduction of jet bombers, numerous BULLS would be available for conversion to tankers. We also estimate that the USSR will have developed by the end of 1955 a four-engined jet transport which could readily be modified as a tanker aircraft.

35. *Performance Characteristics of Soviet Aircraft.* The radii-ranges and other performance data which are estimated for the various Soviet bomber types are given in Tables I and II appearing on pages 9 and 10.

Base Areas for Air Attack on the US

36. In all, there are some 334 operational airfields in the Sino-Soviet Bloc with runways as indicated below:

	MINIMUM RUNWAY LENGTHS (in feet)				
	8,000	7,000	6,000	5,000	Total
USSR	4	0	30	94	128
European Satellites	44	30	34	4	112
Communist China and North Korea	1	3	39	51	94
Totals	49	33	103	149	334

Of these, approximately 50 are estimated to be part of the base structure of Soviet Long-Range Aviation, which includes home bases, command and/or training bases, factory bases, and testing and development bases. Most of these bases are concentrated in the central portion of the Western USSR.

37. A serious gap exists in current knowledge of runway development at airfields identified as home bases for operational Long-Range Aviation units equipped with BULL or BADGER aircraft. However, in areas where Soviet airfields development can be observed easily, such as the European Satellites, the Soviets have shown themselves fully cognizant of runway requirements and have actually provided more than adequate runway lengths. Assuming similar construction practices in the USSR, we estimate that concrete runways at BULL home bases have been developed to lengths between 7,800 and 8,200 feet. Such runways would permit take-off of BULL aircraft over a 50 foot obstacle at maximum gross take-off weights.

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TABLE I

ESTIMATED PERFORMANCE OF SOVIET LONG-RANGE AIRCRAFT
(Calculated in accordance with US military mission profiles)¹

Conditions	BULL (TU-4)	MODIFIED BULL (TU-4) ²	BADGER (Type 39)	IMPROVED BADGER 1957 ³	BISON (Type 37) ⁴
Combat Radius/ Range (nm)					
a. 10,000 lb. load one refuel ⁵	1,700/3,100 2,400/4,300	2,000/3,600 2,800/5,000	1,500/2,900 2,100/4,000	1,900/3,700 2,660/5,180	2,750/5,300 3,800/7,300
b. 3,000 lb. load one refuel	1,950/3,500 2,750/4,900	2,300/4,100 3,200/5,700	1,700/3,300 2,400/4,600	2,100/4,200 2,940/5,880	2,850/5,500 3,900/7,500
Speed/Altitude (kn/ft.)					
a. Max. speed	350/30,000	360/30,000	535/15,000	550/12,500	535/19,000
b. Target speed	350/30,000	360/30,000	475/41,000	470/43,000	475/44,500
Combat Ceiling⁶					
(ft)	36,500	37,500	43,500	43,500	48,000

¹ Firm estimates of performance characteristics of the BEAR aircraft are not available although preliminary estimates indicate a combat radius/range of 3,700/7,200 nautical miles and an optimum radius of 4,000 nautical miles with a 10,000 lb. bomb load, a combat altitude of 40,000 feet and a maximum speed of 470 knots at 35,000 feet.

² The BULL could be modified in a manner similar to the US B-29B conversion to increase its range. However, we have no indications that this has been or will be done.

³ The improved BADGER performance is based upon estimated installation of improved engines with a thrust of 20,500 lbs.

⁴ Based upon estimated installation of 20,500 lb. thrust engines. Previous estimates indicated these engines would not be available until 1956. The Director of Intelligence, USAF, believes engine development has probably kept pace with the aircraft, and that 20,500 lb. thrust engines could be available at the present time.

⁵ Refueling radius/range estimates based upon the use of compatible tankers.

⁶ The altitude at which rate of climb of 500 ft/min. can be maintained at the end of the given combat radius of the aircraft.

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TABLE II

**ESTIMATED MAXIMUM SOVIET LONG-RANGE AIRCRAFT PERFORMANCE
UNDER A MODIFIED MISSION PROFILE¹**

(Calculated in accordance with maximum US military mission profiles except that fuel reserves are reduced to permit a maximum of 30 minutes loiter at sea level, and aircraft operate at altitudes permitting maximum radius/range.)

Conditions	BULL (TU-4)	MODIFIED BULL ² (TU-4)	BADGER (Type 39)	IMPROVED BADGER 1957 ³	BISON (Type 37) ⁴
Combat/Radius Range (nm)					
a. 10,000 lb. load one refuel. ⁵	1,800/3,300 2,500/4,500	2,150/4,000 3,000/5,600	1,600/3,100 2,200/4,300	2,050/4,000 2,870/5,600	3,100/6,100 4,300/8,100
b. 3,000 lb. load one refuel.	2,050/3,700 2,850/5,100	2,450/4,600 3,450/6,450	1,850/3,700 2,250/5,000	2,300/4,500 3,220/6,300	3,200/6,400 4,300/8,200
Speed/Altitude (kn/ft)					
a. Max. speed	350/30,000	360/30,000	535/15,000	550/12,500	535/19,000
b. Target speed	350/30,000	360/30,000	475/42,000	470/43,500	475/45,500
Combat Ceiling⁶ (ft)					
	36,500	37,500	43,500	43,500	48,000

¹ Firm estimates of performance characteristics of the BEAR aircraft are not available although preliminary estimates indicate a combat radius/range of 3,700/7,200 nautical miles and an optimum radius of 4,000 nautical miles with a 10,000 lb. bomb load, a combat altitude of 40,000 feet and a maximum speed of 470 knots at 35,000 feet.

² The BULL could be modified in a manner similar to the US B-29B conversion to increase its range. However, we have no indications that this has been or will be done.

³ The improved BADGER performance is based upon estimated installation of improved engines with a thrust of 20,500 lbs.

⁴ Based upon estimated installation of 20,500 lb. thrust engines. Previous estimates indicated these engines would not be available until 1956. The Director of Intelligence, USAF, believes engine development has probably kept pace with the aircraft, and that 20,500 lb. thrust engines could be available at the present time.

⁵ Refueling radius/range estimates based upon the use of compatible tankers.

⁶ The altitude at which rate of climb of 500 ft/min. can be maintained at the end of the given combat radius of the aircraft.

Estimated maximum target altitudes (100 ft/min. rate of climb) for the BISON and BADGER on one-way missions, one hour of fuel remaining, bomb load aboard and with maximum power, are as follows:

Bomb load (lbs)	BISON (altitude ft.)	BADGER (altitude ft.)	IMPROVED BADGER (altitude ft.)
20,000	55,100		
10,000	56,300	49,500	51,500
3,000	57,200	51,000	53,000

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38. Little if any modification of this base structure would be required for the use of BISON heavy bombers or BADGER medium bombers. The BISON at a gross take-off weight of 365,000 lbs is estimated to require a ground run of approximately 5,300 feet, and 8,200 feet to clear a 50 foot obstacle; the BADGER at a gross take-off weight of 150,000 lbs. requires a ground run of only 4,200 feet, and 6,300 feet to clear a 50 foot obstacle. The ground run required for BEAR is probably somewhat less than that required for the BISON.

39. Owing to the range limitations of available bomber aircraft, the launching of strikes against North America in 1955 probably would be limited to operations staged through one or more of six base areas within Soviet-controlled territory — the Chukotski Peninsula, the Kola Peninsula, the Central Arctic area, Kamchatka area, the Leningrad area, and the Baltic-East German area. Even the BISON jet heavy bomber would have to be launched from these areas in order to hit important US targets unless refueled in-flight or employed on one-way missions. Airfields exist in all of these areas although Long-Range Aviation units are stationed only in the Leningrad area. There is a lack of sufficient evidence to permit a firm assessment of the capabilities of individual airfields in the forward staging areas particularly or their suitability for long-range bomber operation. However, we believe that some of the airfields in the forward staging areas have at least minimal facilities for long-range bomber operations.

40. Major construction projects would be required in all Soviet potential forward staging areas (except the Baltic East German area) to improve present staging capabilities for intercontinental strikes. It is estimated that, with only the construction facilities and personnel now available in the area concerned, by mid-1958 three new airfields suitable for such operations could be developed in the Kola and Leningrad areas and two in each of the other forward areas — Chukotski, Central Arctic, and Kamchatka. Minor improvement of

support facilities at already existing potential staging bases in these areas could also be carried out simultaneously without detracting from the construction effort. In the Baltic-East German area, only minor additional construction and development of air facilities would be required.

41. *Chukotski Peninsula.* As the result of runway construction believed to have been carried out at several airfields within the past two years, we believe at least four airfields probably now have runways adequate for staging medium bombers and at least one of these is suitable for heavy bomber operations. Military air units are based on some of these airfields but none are subordinate to Long-Range Aviation.

42. Air operations in this area are made difficult by several factors. Construction of permanent-surfaced runways suitable for bomber operations is difficult (here and in the Central Arctic) owing to the permafrost problem, but the USSR has almost certainly learned to solve this difficulty through frozen soil studies and experiments conducted since World War II. They have also consistently used ice and snow-impacted runways. Cold, wind, snow, and fog, prevalent throughout the area, also tend to make operations difficult and hazardous. The lack of modern navigational aids hampers operations, but there are some indications that the USSR is steadily improving its operational potential through installation of modern radio navigation facilities. In addition the USSR has an ever-increasing fund of Arctic experience which could be applied to staging operations in this area.

43. The status of base logistical support facilities required to stage long-range strike operations from the Chukotski area is unknown. The area is accessible only by air and sea and supply problems would be difficult. However, the USSR is considered capable of stockpiling the necessary supplies. The area's staging potential could be increased by using construction facilities already available to improve existing facilities or develop new installations. No additional construction units and equipment would be required in the area

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to build two additional concrete surfaced runways, 6,000 to 8,000 feet in length, between now and mid-1958.

44. *Kola Peninsula.* The Kola Peninsula has at least five bases believed adequate for staging operations of medium bombers at maximum gross weights, provided the Soviets accepted a reduced safety margin on take-off for the BULL. One other airfield is considered to be suitable for use on an emergency basis, but its extremely isolated location, plus its apparent lack of recent development or utilization, argue against its use as a staging base. At least four of these airfields would be adequate for heavy jet bombers at maximum take-off weights if reduced safety margins were accepted. Permanent-surfaced runways can be constructed throughout the area without difficulty as it is relatively free of permafrost. Prevailing climatic conditions, while a restrictive factor on air operations, are relatively more favorable than in other regions of the Soviet Far North.

45. The status of base logistical support facilities required to conduct long range bomber strikes from airfields in this area is unknown, but it is considered that logistics would not be a limiting factor of consequence. Supply routes by rail and road are open to the Kola Peninsula on a year-round basis, although logistic support of large-scale air operations would still pose difficulties under extreme weather conditions. Moreover, the staging potential of the area could be increased by using already available airfield construction units to improve existing substandard fields, or develop new installations. No additional construction capability would be required in order to build three additional concrete-surfaced runways 6,000 to 8,000 feet in length between now and mid-1958.

46. *Central Arctic.* Firm information as to the exact status of airfield development in this area is lacking, but airfield construction has been in progress since early 1949. Although the program was carried out for the Directorate of Polar Aviation of the Northern Sea Route Administration, the airfields built are estimated to have at least a limited staging capability for medium and heavy bomb-

ers. However, climatic conditions and logistic support factors are relatively unfavorable. Five airfields are known in this area and additional fields probably exist.

47. *Leningrad.* This area contains at least three home bases of Long-Range Aviation units equipped with BULL aircraft which are presently suitable for heavy jet bomber operations. With available construction units already in this area the base potential could be increased without difficulty since five additional airfields in the area have concrete runways at least 6,000 feet in length, and 11 other airfields have runways in excess of 5,000 feet. With a minimum of additional construction, these fields could be made suitable for jet heavy bomber operations. None of these additional bases, however, are known to be associated currently with Long-Range Aviation operations. Operations from this area by long-range aircraft would offer the advantage of a temperate climate and good logistic support. If overflight of the Scandinavian area were to be avoided on an attempted strike against the United States, a dog-leg of about 600 to 750 nautical miles over the Kola Peninsula area would be necessary.

48. *Kamchatka-Sea of Okhotsk area.* Four airfields in this area have runways which would permit ground runs of at least 5,000 feet. One of these airfields is considered adequate for medium bombers at maximum gross weights, provided reduced safety margins were accepted for BULLS. However, the other three could be used by BULLS with reduced take-off weights and by BADGERS providing lower safety margins were accepted. For this reason long-range capabilities from this area are estimated to be extremely limited but facilities could be developed to accommodate medium and heavy bomber operations by mid-1958.

49. *Baltic-East Germany.* Poland and the Soviet Zone of Germany have a total of at least 60 airfields from which medium and heavy bomber operations could be mounted against the US and US bases in Western Europe. However, a disadvantage of this area as a base for air attacks on North America

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is that great circle routes from the area to the US pass over friendly nations. In addition, it would be more difficult to maintain security of preparations for attacks than in other forward base areas. However, climatic conditions are most favorable and there are no logistics problems. This base complex is served adequately by all types of transportation.

Climatic Suitability of Staging Areas⁷

50. *Chukotski Peninsula.* The least favorable conditions occur during November through March. The most favorable conditions occur at all stations during the spring and early summer. The weather in the interior is highly favorable weather during the summer months. Only those areas adjacent to the Chuckchee Sea or which lie along the Bering Sea coast experience a relatively high percentage of unfavorable conditions during the midsummer months.

51. *Kola Peninsula.* In general the most favorable conditions occur in the late spring and early summer. In late summer and early autumn conditions are favorable at most stations except those adjacent to the cold waters of the White Sea. During May through October conditions are favorable over 90 percent of the time at all locations. In winter conditions are slightly less favorable due to the more frequent occurrence of low ceilings and poor visibilities. Extremely cold temperatures are relatively infrequent, less than 10 percent at any station.

52. *Central Arctic.* This area has by far the most unfavorable weather of all the areas

considered. Bad weather occurs most frequently in the cold months of the year, November through April, when 40 to 60 percent of all hours are unfavorable. Even the summer months are not entirely favorable due to the high frequency of fog in the coastal belt. However, locations somewhat protected from the sea would probably experience a much higher percentage of favorable conditions than the coastal airfields now existing. The major handicap to winter operations arises from the frequency and persistence of extremely cold temperatures. For example, at Tiksi over 50 percent of all observations during January record temperatures lower than -20° F.

53. *Leningrad.* The stations in this area have the most favorable weather during the late spring and summer, when about 97 to 99 percent of the time is favorable for operations. Even during autumn and winter 88 to 90 percent of the weather is favorable at all stations. There appears to be little difference between nighttime and daytime weather except during September, October, and November. During these months reduced visibility sometimes occurs during the early morning hours, but this condition obtains in only four to six percent of the 0700 observations. Temperatures below -20° F occur less than five percent of the time at all stations.

54. *Kamchatka-Sea of Okhotsk area.* The weather in this area is relatively favorable for air operations. Throughout the year the weather on the east coast of Kamchatka Peninsula is the most favorable in the entire area. In the Magadan area the best weather occurs during the early spring and autumn.

55. *Baltic-East Germany.* The stations located in the Baltic coastal area are most suitable for air operations during April through August, when favorable conditions occur about 97 percent of the time, both day and night. The least favorable period is during the winter, December through March, when the frequency of favorable conditions drop to about 75 to 78 percent. However, the unfavorable conditions occur most often during the night and early morning hours. Midday and midafternoon hours remain favorable for

⁷In order to estimate the seasonal suitability of average weather conditions in potential staging areas, the percentage frequency of occurrence of those conditions which would seriously handicap or altogether prohibit the mass movement of aircraft into or out of the staging areas was computed. Two conditions were selected as a basis for analysis: (1) ceiling/visibility less than 300 feet/1 mile; and (2) temperature below -20°F. The occurrence of either of these conditions was considered to present a situation unfavorable for staging operations, although staging operations could be carried out successfully in temperatures below -20°F with adequate preparations.

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operations about 85 to 90 percent of the time. Very low temperatures are extremely rare in this area.

Other Factors Affecting Soviet Bomber Capabilities Against the US

56. *Navigation.* The USSR 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.

57. In addition to the basic navigational skills of pilotage, dead reckoning, celestial navigation and radio navigation, it is believed that Soviet Long-Range Aviation is receiving training in the use of more advanced systems and techniques. Although we have no evidence of long range training flights at intercontinental distances, some Soviet crews are probably capable of navigation to the most difficult assigned targets while all trained Soviet crews are probably capable of navigating with sufficient accuracy to reach such targets as major US cities and industrial centers.

58. The bombing proficiency of Long-Range Aviation units is believed to be below the standard of the US SAC. We believe they are currently able to achieve CEP accuracies of about 1,400 feet for visual bombing from 30,000 feet, and 4,000-7,000 feet for radar bombing from the same altitude. There are indications that training standards are being raised and we believe that bombing capabilities will be materially increased by mid-1958 as a result of better equipment and improved training. Radar bombing CEP accuracies

in 1958 with jet bombers are estimated at 1,500 feet at 30,000 feet against well defined targets and at 3,000 feet at the same altitude against difficult targets.

59. *Availability and Abort Rate.* Maintenance of Soviet aircraft, although below US standards, has improved since World War II. We estimate the USSR is now capable of achieving in the forward staging areas a serviceability rate of 80 percent for an initial, deliberately prepared surprise attack against North America and of increasing this rate to 85 percent by mid-1958 owing to greater use of jet aircraft and improved operating conditions at forward bases. The serviceability rate for long-range bombers is estimated at about 40 percent for sustained operations. Cold weather operations would probably 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 losses from all causes (including use of marginal bases, gross errors in navigation, mechanical failure, etc.) other than combat attrition is estimated at about 20 percent for nonrefueled and 25 percent for refueled missions.

60. *Replacement Rate.* No appreciable reserves of BULL (TU-4) bombers are believed to exist at the present time. Those which are phased out of operational units with the introduction of new jet bombers will become available as a reserve unless converted for tanker use or other special purposes. There will be no appreciable reserves of any of the new bomber types introduced during the period of this estimate.

61. *Weather Forecasting.* The USSR has for years devoted considerable emphasis to both short-period and long-period meteorological forecasting and has achieved a high degree of success. We believe that it 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 on ice floes in the Central Arctic basin, and constant access to current North American weather reports and

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forecasts should enable the USSR to predict both route and target 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.

62. *Electronic Countermeasures.* The USSR has had access to several types 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 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, to seriously disrupt long-range radio communications between the US and its overseas facilities. Between now and mid-1958, the USSR will probably further increase the effectiveness of its jamming equipment as well as the proficiency and number of its trained personnel. The USSR has probably already produced sufficient countermeasure devices to equip some aircraft for jamming or spoofing defensive radars and ground/air fighter control communications in use at the present time for the defense of North America. The effectiveness of 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. Use of jamming equipment probably would require the employment of extra aircraft equipped specially for this purpose.

Factors Affecting Air Attacks Against Key US Overseas Installations and Military Forces

63. *Aircraft.* In addition to the long-range bombers discussed above, the BUTCHER (IL-28) and BOSUN (TU-14) jet light bombers are capable of carrying out attacks on many key US overseas installations and forces abroad. The BUTCHER is the standard light bomber of the Air Force of the Soviet Army. The BOSUN, currently operational in Soviet Naval Aviation, is believed to incorporate special features to carry out naval missions such as torpedo attacks and mine-laying as well as bombing.

ESTIMATED JET LIGHT BOMBER STRENGTH IN OPERATIONAL UNITS

	Mid-1955	Mid-1958
Air Force of Soviet Army	1,900	2,300
Naval Aviation	600	850
Total	2,500	3,100

64. During 1956 the USSR may also have operational an improved jet light bomber, perhaps a twin-turbojet swept-wing bomber. In addition, the performance of BUTCHER and

ESTIMATED 1955-1958 PERFORMANCE CHARACTERISTICS OF SOVIET JET LIGHT BOMBERS

Type	Bomb Load (lbs)	Combat Radius/Range (nm/nm)	Max. Spd./Alt. (kn/ft)	Combat Ceiling (ft.)
BUTCHER (IL-28)				
a. Internal fuel	4,400	590/1,165	440/30,000	37,000
b. Internal fuel	6,600	570/1,100	440/30,000	37,000
c. External fuel	4,400	690/1,365	440/30,000	37,000
d. External fuel	4,400	595/1,180	450/sea level	low level attack
BOSUN (TU-14)				
a. Internal fuel	4,400	765/1,510	455/30,000	39,500
b. Internal fuel	2,000	700/1,390	465/sea level	low level attack
New Jet Light Bomber 1956	4,400	800/1,500	500/35,000	48,000

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BOSUN may be improved during the period of this estimate by the installation of higher-thrust engines. By 1958 we estimate that BOSUN will have been phased out of operational service and replaced by either BUTCHER or the new light bomber.

65. The 334 Sino-Soviet airfields previously mentioned in paragraph 26 are all estimated to be suitable for jet light bombers. We believe that this large number of airfields would permit light bomber attacks against most key US overseas installations and forces. (See Map 7). 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 into the Mediterranean up to an arc drawn southwest of Sardinia and Sicily. From 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.

66. From bases in the USSR, the BULL (TU-4), if modified, 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, BULLS 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. Jet heavy bombers on two-way missions from bases in the USSR 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 BISON could reach the Panama Canal on one-way unrefueled

missions. The BULL and BADGER could reach the Panama Canal on one-way mission only if inflight refueling were employed.

67. *Bombing Accuracy.* The factors discussed in paragraph 49 for long-range operations apply equally to Soviet air attacks against key US installations overseas. In addition, radar bombing by BUTCHER jet light bombers has been carried out using equipment with characteristics similar to the US AN/APS-15 type radar. BUTCHER units in East Germany are known to have practiced bombing at night and during instrument weather conditions and other jet light bomber units probably also carry out such training. We estimate that jet light bomber crews could achieve, at the present time, CEP accuracies on the order of 1,400 feet for visual bombing from 30,000 feet, and 4,000-7,000 feet radar bombing from the same altitude. If the SHORAN type navigation system was employed as a bomb control system, at a range of 100 nautical miles from the ground installation, bombing accuracies of about plus or minus 100 feet could be achieved. Soviet ground fire control radar (similar to the US SCR 584) could be used with appropriate modifications to develop a precise short-range bombing system (similar to the US MPQ-2). This system would have a range of 15-20 nautical miles.

68. *Availability, Abort Rate, Replacement Factors.* The factors previously discussed for long-range bombers apply generally to light bombers. A serviceability rate of 90 percent by mid-1958 for initial attacks from areas 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 is an appreciable reserve likely to be built up between now and mid-1958.

69. *Electronic Countermeasures.* The Soviet ECM capabilities previously discussed apply also to bomber attacks against key US overseas installations. However, Soviet require-

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ments 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 present 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 a jet light bomber with both passive listening and active jamming electronic equipment and probably have some aircraft equipped for this purpose.

III. PROBABLE GROSS SOVIET CAPABILITIES FOR AIR ATTACK ON THE US

70. Present Soviet capabilities for air attack on the continental US are limited by the relatively small numbers of operational heavy bombers and the relatively undeveloped base facilities in forward areas. They are also probably limited by the lack of a developed inflight refueling capability. The forward base capacities will continue to be important during the period of this estimate, but as the number of BEARS increase, the forward base capacities will be less important in determining the number of aircraft which could be launched at one time, in an intercontinental attack. The increase in numbers of the BISON and BEAR heavy bombers, continued Long-Range Aviation training programs, development of an inflight refueling capability and extensive improvement of the forward staging areas would result in a substantial increase in Soviet capabilities for attack on the US by mid-1958.

71. *Base Capacity.* The USSR has the capability of launching its entire long-range bomber force against the United States from bases within Soviet-dominated territory. However, at the beginning of the period this could be done only if bases in the Baltic-East German area were used in addition to those within the USSR. This area is not a likely choice for initial strike operations, because of the probable loss of surprise during overflight of Western territory and the greater likelihood

that preparations in this area would be detected. However, should the USSR undertake reattacks after an initial surprise intercontinental strike, this base area might be used. Use of the Central Arctic area is also believed to be severely limited because of highly unfavorable weather conditions and logistic problems, but might be used for small numbers of aircraft. The Leningrad area is also unlikely to be used for initial strikes in 1955 because of the problems involved in either overflying or by-passing Scandinavia. Therefore, the forward bases believed to be the most likely Soviet choices for mounting initial attacks on the United States in the early part of the period are in the Kola Peninsula, Chukotski, and Kamchatka areas.

72. By 1958 the USSR could increase the capacity of these three forward base areas to the point where, together with bases in the Leningrad area they could simultaneously launch the entire long-range bomber force. If tankers were used for refueling operations, the number of strike aircraft which could be launched from these areas would be reduced. The employment of inflight refueling with the BISON would permit the use of a number of interior bases, particularly in the Leningrad area.

73. *Aircraft.* The principal aircraft used for attempting intercontinental strikes between mid-1955 and mid-1958 would probably be the BULL, BEAR, BISON, and BADGER. At the beginning of the period the BULL medium bomber would probably be the principal aircraft used for this purpose. It would probably continue to be so used, until the BISON and BEAR appear in strength, because of range advantage over the BADGER. We estimate that the Soviets would employ the BADGER medium jet bomber only for special intercontinental operations under circumstances in which the use of high speed and high altitudes against particular targets was considered desirable. The 1955 BADGER would require inflight refueling even for one-way missions for coverage of the most important industrial areas of the US, but the improved BADGER expected in units by 1958 will prob-

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ably have adequate range on one-way missions to cover these areas without inflight refueling.

74. Until the development of inflight refueling, the USSR will be limited, except for a small number of BISON and BEAR missions to two-way missions against the extreme northwest portion of the US even with modified BULL aircraft or to one-way missions employing both BULL and BADGER aircraft. Inflight refueling would permit the recovery of a small number of BULLS launched from the Chukotski region against the northwest portion of the US. However, even inflight refueling would not permit two-way BULL strikes against the major portion of US targets.⁸ On the other hand, provided modified BULLS were available and varying bomb loads were employed, the BULL on a one-way mission without refueling could reach virtually all US targets in a combination of strikes launched from Western and Eastern USSR staging bases. (See Maps 1, 3, 5). From these staging areas, inflight refueling would permit the use of the present shorter range BADGER on a one-way mission to virtually all US targets. (See Maps 2, 4, 6).

75. In the latter part of the period, the USSR would almost certainly place chief reliance on the BISON and BEAR for intercontinental attacks. On two-way missions without refueling from the Chukotski area, the BISON could reach targets roughly within an arc through Minneapolis, Denver, and Los Angeles. From the Kola Peninsula the BISON could under the same condition barely reach the northern tip of Maine. Employing refueling and dog-legs to avoid over-flying Alaska and Canada, BISONs on two-way missions from the Chukotski area could reach Minneapolis, Albuquerque, and lower California. On the same type mission from the Kola Peninsula, the BISON could only reach within an arc through New York and Ottawa. On one-way missions the BISON could reach all of the US and the Caribbean area from either of these

⁸ Only once-refueled missions have been considered because of the problems involved with two refuelings. It is possible that toward the end of the period the USSR might develop a capability for twice refueled missions.

areas. If dog-legs were not employed to prevent over-flying allied territory, BISONs on refueled two-way missions could reach virtually all targets in the US in a combination of missions from the Chukotski and Kola Peninsula areas. On the same type mission from bases in the Leningrad area, the BISON could cover the arc: Minneapolis-Chicago-Richmond. If dog-legs were employed from these bases only the Boston area could be reached with BISONs on two-way refueled missions. In general, the BISON will permit much greater flexibility in the choice of bases and tactics. Particularly advantageous would be the ability to employ compatible tankers from interior bases. However, in order to hit all targets in the US with BISON type aircraft on two-way missions, the USSR would have to employ inflight refueling and forward staging bases.

76. The BEAR turbo-prop heavy bomber on two-way refueled missions with a 10,000 pound bomb load could strike any point in the US from interior bases, provided direct great circle routes were flown. On two-way unrefueled missions the BEAR could reach any point in the US except that portion south of an arc through Corpus Christi, Atlanta, and Norfolk from the Chukotski area, but from the Kola area could reach only north of an arc through Seattle, Chicago, and Richmond. From interior bases in the Leningrad area, on two-way unrefueled missions, the BEAR could reach the North Eastern part of the US as far south as New York, provided direct great circle routes were flown. If employed on unrefueled one-way missions they could reach any point in the US. (See Map 8).

77. *Staging.* About a 10 hour flight would be required to move BULL aircraft from Far East home bases to Chukotski area bases and about three to five hours from Western USSR bases to the Kola area. Flying times for BADGER or BISON aircraft would be about half as long. We have almost no recent firm evidence on the status of servicing and fuel storage facilities or the availability of tank trucks at most of the forward bases. However, the Soviets are fully capable of developing these facilities if they do not already have

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them. For example, we believe the USSR has a fuel truck of 6,000 gallon estimated capacity and a pumping rate of 240 gallons per minute. Careful preparation could permit the Soviets to refuel successive elements of the bomber force at forward bases, which would reduce time on the ground and the number of refueling trucks and servicing personnel required. When BISON and BEAR bombers appear in service in large numbers we estimate that the USSR will have available refueling equipment more compatible with the requirements of these aircraft. In order to service large numbers of long-range bomber aircraft at staging bases in forward areas it would probably be necessary to increase present stocks of POL and servicing equipment and to establish or increase weapons stockpiles at the various bases.

78. *Weather.* Weather and climatic conditions in the far northern staging areas would have a considerable impact on the timing and magnitude of attacks on the US. During cold weather, the need for high speed refueling and heated hangar space are among the critical problems which would be magnified as numbers and size of aircraft increase. The coordinated launching of a large-scale attack composed of elements from widely separated base areas would be complicated by varying weather conditions at such bases.

79. The low temperatures of the Arctic region pose some special problems in the handling of atomic weapons. However, virtually all of the components of nuclear weapons are better able to resist the effects of cold weather than are the delivery aircraft, and provision of adequate shelters and equipment to overcome the undesirable effects of cold weather on the bombs is a much simpler problem. We estimate that the USSR can successfully store and assemble atomic weapons for use at Arctic bases under any weather conditions which will permit the operation of bombers. The problem of storage could also be largely eliminated by storing the bombs in rear areas and moving them to the advanced bases as needed, although such an operation would introduce additional timing problems.

80. Methods employed by the USSR for achieving effective operation of aircraft under cold weather conditions are generally conventional and believed to be effective. In addition, it should be noted that aircraft performance is improved by low ground temperatures in Arctic areas where the higher density of cold air increases engine thrust and increases airfoil lift so that take-off distance may be reduced or maximum gross take-off weights increased.

81. *Estimated Intercontinental Striking Force in Mid-1955.* Within the limits of base capacity, aircraft performance, and operating conditions, the magnitude of strike forces which the USSR could launch would vary according to the method of employment of the various types of aircraft. Various methods of employment are open to the USSR and it is not possible to predict which they might choose. The figures in the tables below for mid-1955 and mid-1958 represent, therefore, merely an estimate of optimum striking forces designed to reach targets throughout the US with recovery of a portion of strike aircraft utilizing a combination of refueled and unrefueled missions.

82. Despite the lack of evidence that the fields in the forward staging areas are developed for bomber operations, that long range bomber units are stationed in these areas, or that training has been conducted in these areas, we believe that by a major effort, the USSR would be capable of mounting intercontinental strikes from these areas in mid-1955. In order to achieve maximum surprise we estimate that the USSR could launch a limited number of heavy bombers, using only interior bases but in order to achieve optimum size in a surprise attack, the airfields in the Kola, Kamchatka, and Chukotski areas would have to be used. In order to estimate the optimum striking force in mid-1955 we have assumed a limited Soviet inflight refueling capability despite the lack of evidence that one exists. We have used a planning factor of 1.2 tankers for each refueled bomber. Under these assumptions, we estimate the optimum USSR strike capability would be as follows:

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ESTIMATED OPTIMUM INITIAL STRIKE
CAPABILITY IN MID-1955

	On Base	Launched	Arrive in Target Area
BULL	300	250	194
BADGER	80	60	40
BISON	15	10	8
BEAR	15	10	8
Tanker	130	110	...
Total	540 ¹	440 ²	250 ³

¹ Between 20 and 60 aircraft were allocated to each staging base on the basis of a reasonable estimate of its capacity.

² Maximum aircraft which could be launched from above bases, assuming an estimated serviceability rate of about 80 percent. This serviceability factor has not been considered in movement from the home base to the staging area. Some of the aircraft launched would probably be used for ECM and diversion.

³ Based on an estimated allowance for aborts and losses from all causes other than combat attrition of about 20 percent for nonrefueled missions and 25 percent for refueled missions.

STRIKE AIRCRAFT ACCORDING TO METHOD
OF EMPLOYMENT

	Two- Way Unre- fueled	Two- Way Re- fueled	One- Way Unre- fueled	One- Way Re- fueled	Total Launched
BULL	...	40	210	...	250
BADGER	...	...	10	50	60
BISON	10	...	...	...	10
BEAR	10	...	...	...	10
Total	20	40	220	50	330

83. Assuming that the USSR has no present inflight refueling capability, or that the USSR will attempt to maximize the size of an initial strike force by replacing tankers on forward bases with strike aircraft, the number of aircraft reaching the target area could be increased to an estimated 350.

84. If the USSR elected to utilize all available bases, including those in the Baltic East German and Leningrad areas, and thus lessen its chances of achieving surprise it could launch a maximum of approximately 950 aircraft in 1955 in an initial attack on the US. However, the great bulk of these aircraft would have to fly one-way missions. We believe it almost certain that the USSR is psychologically capable of employing one-way missions. Not considering combat losses, approximately 750 might reach target areas.

85. *Estimated Striking Force in Mid-1958.*

By mid-1958 the capacity of the forward staging areas could be greatly increased. We have also estimated that by this time some 350 BISON jet heavy bombers and 250 BEAR turbo-prop heavy bombers will be in operational use. In addition, we estimate that by mid-1958 the USSR could have a substantial inflight refueling capability and a substantial number of heavy bombers could be launched from interior bases in initial attacks, in which case the Leningrad base area could also be used for some of the heavy bombers making initial surprise attacks on the US. Under these circumstances, the optimum Soviet strike capability would probably be as follows:

ESTIMATED OPTIMUM INITIAL STRIKE
CAPABILITY IN MID-1958

	On Base	Launched	Arriving on Target Area
BULL	80	60	50
BADGER	430	360	280
BISON	300	260	200
BEAR	250	210	160
Tanker	530	450	...
Total	1,590 ¹	1,340 ²	690 ³

¹ Assuming use of the Kamchatka, Kola, Chukotski, and Leningrad bases for all aircraft except the BEAR which would be launched from interior bases.

² Maximum aircraft which could be launched from the above bases assuming a serviceability rate of about 85 percent except for a slightly higher rate from the Leningrad base area since aircraft would be operating from a home base rather than staging forward. Some of the aircraft launched would probably be used for ECM and diversion.

³ Based on an estimated allowance for aborts and losses from all causes other than combat attrition of 20 percent for nonrefueled missions and 25 percent for refueled missions.

STRIKE AIRCRAFT ACCORDING TO METHOD
OF EMPLOYMENT

	Two- Way Unre- fueled	Two- Way Re- fueled	One- Way Unre- fueled	Total Launched
BULL	60	60
BADGER	360	360
BEAR	60	150	...	210
BISON	40	220	...	260
Total	100	370	420	890

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86. Should the USSR attempt to maximize the size of the initial strike force by replacing tankers on forward bases with strike aircraft and launching all missions on a one-way unrefueled basis (or two-way unrefueled basis where possible), the estimated number of bombers arriving in target areas would be approximately 850, not considering combat losses.

87. *Scale of Attack Preparations.* At present the pre-strike preparation necessary for launching a maximum scale attack from likely staging areas might require several months. By mid-1958, only minimum preparation would be required, providing that during the interim, a major effort was undertaken to improve base facilities and training, logistics, and equipment of the Long-Range Air Force. Under these circumstances, it might not then be necessary to undertake such final preparations as the movement of additional personnel and equipment.

IV. GROSS SOVIET CAPABILITIES FOR AIR ATTACK AGAINST US OVERSEAS INSTALLATIONS

88. Assuming the USSR launched the optimum scale of attacks against the US shown in the tables above, it would have available for reattacks, attack in other areas, and for reserve, about the following number of long-range bombers:⁹

	Mid-1955	Mid-1958
BULL	700	20
BADGER	50	270
BISON	5	50
BEAR	5	40
Total	760	380

Assuming a serviceability rate of 80 percent in mid-1955 and 85 percent in mid-1958 and a noncombat attrition rate of 15 percent, the number of bombers reaching target areas would be 500 in mid-1955 and 270 in mid-1958.

⁹ These figures were derived by subtracting the estimated number committed for attack against the US from estimated *actual* total strength in mid-1955 and in mid-1958.

89. We estimate that in mid-1955 the USSR will have available a maximum of about 2,500 jet light bombers, which could be used for attacks against the many key US installations and forces overseas within their operational radius. By mid-1958 this number of jet light bombers is expected to increase to a TO&E strength of 3,150. For maximum effectiveness of attacks by light bombers against the more distant targets considerable redeployment to forward bases would be required.

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

90. *Guided Missiles.*¹⁰ A Soviet guided missile research and development program is known to exist. It is within Soviet capabilities to develop and produce numerous types of missiles within the period of this estimate. However, we have no firm evidence that the USSR has these weapons available in operational quantities. The number of nuclear warheads available for guided missiles will depend upon the allocations to other weapons systems on the bases of requirements and established priorities. We believe that the USSR could now have an improved version of the German V-1 nonballistic pulse-jet winged missile with ranges up to 200 nautical miles, a warhead of 2,000-3,000 pounds and a CEP of roughly three nautical miles with inertial guidance. Radar track-radio command guidance could be provided to a range of 100 nautical miles and a CEP of 0.5 nautical miles could be achieved if the missile is launched from land bases or one to two nautical miles if launched from submarines. These missiles could now be equipped with nuclear warheads. The USSR also could now have an improved version of the German V-2 with ranges up to 500 nautical miles, a warhead of 3,000 pounds, and a CEP of two to three nautical miles. Such missiles could be launched from advanced bases in Communist territory against certain key US installations.

¹⁰ For a detailed study of guided missiles see NIE 11-6-54, "Soviet Capabilities and Probable Programs in the Guided Missiles Field," 5 October 1954.

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91. Although V-1 and turbo-jet type missiles with nuclear warheads could be launched from submarines, we have no firm evidence that the USSR has converted any submarines for missile launching. However, the feasibility of launching such missiles from submarines has been proven by the US and this nuclear delivery capability could be an important supplement to nuclear attacks by aircraft. We estimate that the Soviets could now have several long-range submarines equipped to launch guided type missiles.

92. In addition, the USSR is now technically capable of attacking targets within the US with rocket-propelled glide bombs launched from long-range aircraft. These bombs could now have nuclear warheads. However, these glide bombs would be limited to well-defined targets, good visibility conditions, and a maximum range of 20 nautical miles. In 1956-1957 an improved version with a 50 nautical mile range could become available. We estimate that a small glide bomb launched from light bombers could be available by mid-1958. Although we have no evidence of Soviet work in the matter, it is possible that such a missile might be available as early as mid-1958.¹¹

93. The USSR is capable of having available early in the period a MIG-15 modified for use as a guided missile. Such a missile could have a maximum range of 500 nautical miles, a 3,000-pound warhead, and a CEP of ten nautical miles with inertial guidance. With radar tracking guidance the range would be reduced to about 200-250 nautical miles using a single guidance station and a CEP on the order of one nautical mile could be achieved. If launched from submarines, such missiles could be used to attack targets within the limitations of the guidance system, the range of the missile, and the operating radius of the submarine.

¹¹ The estimated dates given in paragraphs 81, 82, and 83 are the earliest probable years during which small quantities of missiles have been produced and placed in the hands of trained personnel of one operational unit. These dates could be one to two years earlier if an intensive effort of the highest priority were undertaken and if no major delays were encountered.

94. We estimate that in 1957 (or at the earliest possible date, in 1955) the USSR could have in limited operational use single stage ballistic guided missiles capable of ranges up to 900 nautical miles carrying a 3,000-pound warhead and achieving a CEP of three to four nautical miles.¹² This missile could be equipped with nuclear warheads.

95. *Clandestine Delivery of 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 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 a million 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 for assembly. 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

¹² For further information pertaining to availability of possible similar missiles of longer range, see NIE 11-6-54.

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substantially greater security risk than the clandestine introduction of all components.

96. 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 by submarines and possibly by merchant ships. 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 awaiting transshipment.

97. 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 who 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.

98. In introducing nuclear weapons clandestinely into the US, 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 were 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 could occur against specially selected targets as a supplement to overt delivery by air, the use of large numbers of such weapons would probably be precluded by security considerations.

99. *Clandestine Use of BW and CW 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. Even small-scale employment of biological warfare agents against livestock could be highly effective. BW attacks against key personnel concentrated in selected buildings could also be effective. There is little likelihood that effective anticrop BW operations could be carried out clandestinely.

100. 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

101. *Attacks by Ground and Tactical Air Forces.* 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 campaigns in these areas, and it would be impossible to

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separate the specific scale of attack on key US installations from the over-all scale of Soviet campaigns.¹³

102. 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 the 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 employ airborne or amphibious forces in connection with a ground attack. It is estimated that for air support of these attacks in mid-1955, the USSR will have an actual strength of approximately 9,800 combat aircraft in the Air Force of the Soviet Army and Naval Aviation. Of this total, approximately 8,300 are jet aircraft. For mid-1958, actual combat aircraft in operational units is estimated at approximately 11,900, of which 11,200 will be jets.

103. *Naval Attack.* A large portion of the Soviet submarine forces would probably be employed against US naval forces, especially against carrier task forces with a nuclear delivery capability. In addition, Soviet submarine forces could, at least in the initial phases of an attack, inflict serious damage on US overseas communications by attacks on shipping and offensive mining of the approaches to harbors and ports of the US and its allies, and could develop the capability to launch mass destruction weapons by missile against US or key overseas targets within range. We estimate that the Soviet submarine force, currently consisting of 236 medium and long-range submarines, will probably be strengthened by the addition of about 75 long-range submarines in 1955, 80 annually during 1956 and 1957, and about 40 during 1958, by a limited modernization of older classes (including installation of snorkel),

¹³ See NIE 11-3-55, "Soviet Capabilities and Probable Courses of Action Through Mid-1960," for Soviet ground and tactical air capabilities.

and by the probable adaptation of submarines to missile launching. We also estimate that by the end of 1955, in a maximum effort, as many as 184 of the long and medium-range submarines located in the Baltic-Northern Fleet and Pacific Fleet areas—133 and 51 respectively—could be made available for attacks against US naval forces, the continental US, and key installations overseas. By mid-1958, these numbers could increase to about 190 and 100 respectively.

104. 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.

105. *Amphibious Attack.* Because of the lack of aircraft carriers and long-range vessels suitable for amphibious warfare, 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, certain restrictions would be imposed on the Soviets by: (a) the limited number of landing beaches; (b) climatic conditions; (c) problems of establishing and maintaining lines of communications; (d) the difficulties of maintaining adequate logistic support; (e) the limited capabilities of the Far Eastern fleet; and (f) the difficulties of maintaining adequate air cover. These limitations would restrict amphibious operation in Alaska to 4,000 to 6,000 troops in the assault phase. It is more probable, however, that amphibious operations would be limited to actions up to battalion size with limited support weapons. Amphibious attacks against key US overseas installations, except in the Far East, would probably be limited to am-

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Amphibious raids by submarine-borne forces. Amphibious attacks in force up to six divisions could be made against US installations in Japan, Okinawa, and Formosa provided adequate air cover was available.

106. *Airborne Attack.* The USSR has approximately 100,000 trained paratroopers in an estimated 10 airborne divisions, plus about 100,000 trained airborne reserves. The capability of these forces to seize and destroy key US installations overseas would be substantial in certain areas but is limited by the availability of transport aircraft. It is estimated that during 1955-1958 the USSR will have about 1,900 transport aircraft in the various components of the Soviet Air Force. In addition, it may have built up its helicopter force to about 600 aircraft. We also estimate that the Civil Air Fleet will be operating at least 1,600 transports during the period of this estimate, including some four-engine types. Utilizing only those aircraft belonging to the Aviation of Airborne Troops, the USSR can now lift about 9,000 well-equipped and well-trained troops with one drop on D-day or about 14,000 with two drops. For a five-day operation the Aviation of Airborne Troops can lift approximately 23,000-25,000 troops depending on whether one or two drops are executed on D-day. This lift capacity can be increased by about 1,800 troops for every 100 aircraft borrowed from the Civil Air Fleet or the military air forces. This capability could be increased during the period by the availability of four-engined transports. Because of transport aircraft performance 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

107. The USSR is capable of subversion, espionage, and widespread sabotage in the US through the use of existing subversive ele-

ments and the placement of foreign agents. Sabotage 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, if identifiable with the USSR. 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.

108. Soviet capabilities for subversion, espionage, and 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. In numerous other countries the Communists almost certainly have capabilities for serious acts of sabotage. The populations of these countries 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. SOVIET STRATEGIC OBJECTIVES AND METHODS OF ATTACK

Probable Soviet Strategic Objectives in Attack on the US and Key US Overseas Installations

109. The foregoing discussion of Soviet capabilities has assumed an all-out Soviet effort against the US and key US overseas installations, without consideration of other strategic objectives against which some of these forces might be employed. The actual initial allocation of Soviet effort against various objectives

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in event of general war would depend upon the over-all strategy of the USSR. In deciding upon this strategy, the Soviet leaders would be influenced by the following considerations:

a. The power of the US is the main support of Free World opposition to the Communist Bloc. The USSR would probably calculate that if US war-making strength could be sufficiently reduced in the initial stages of a war, Soviet chances for ultimate success in a general war would be virtually assured.

b. The chief immediate threat to the USSR in event of general war is a US nuclear air offensive. The Soviet rulers have demonstrated their sensitivity to the danger of US nuclear air attack by the high priority which they have given to the development of their air defenses. Despite the substantial progress already achieved in building up these 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 is located in the continental US. Soviet destruction of all key US installations and forces overseas which possess a capability for employing nuclear weapons would handicap but would not preclude the delivery of a very substantial number of nuclear weapons on targets within the USSR. At the same time, Soviet destruction or neutralization of US nuclear capabilities located in the continental US would not prevent the delivery of a substantial number of nuclear weapons from those US overseas installations and forces which possess a nuclear strike capability. Consequently, Soviet leaders would probably calculate that simultaneous destruction or neutralization of both these overseas installations and forces and those in the US would be essential.

d. 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 would occur simultaneously with or immediately after the initial attacks.

110. In view of the above considerations it is likely that the USSR in attacking the US and key overseas installations and forces, would have the following major military objectives: (a) to destroy or neutralize US capabilities for nuclear retaliation; (b) to deliver such an attack on urban, industrial, political, 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. We believe that these Soviet objectives would remain the same throughout the period of this estimate although Soviet gross capabilities for achieving them will increase through mid-1958.

111. *Implications of Soviet efforts to achieve surprise.* An attempted maximum Soviet attack on the continental US, key overseas installations and forces overseas, 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. If the USSR attempted to maximize surprise it would 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 be likely to indicate the imminence of attack.¹⁴

112. In planning an attack on the US and key US overseas installations and forces, the Soviet estimate of the success they would be likely to achieve against various target systems would not necessarily be the determinant of the priority of their attack. This priority would most likely be determined by their estimate of the necessity for destroying or neutralizing the foremost threat to their security — a nuclear air attack by US forces. The initial Soviet attack, therefore, would

¹⁴ For complete discussion of the problem of achieving surprise, see NIE 11-6-55 (scheduled for publication in June 1955).

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probably be directed primarily toward those areas and against those forces which comprise the US nuclear strike capability. It is not likely that they would take prior actions against other target systems and thus risk losing the advantage of surprise which they would require for successful attacks against the primary threat, although simultaneous attacks against such other targets would probably be made.

Probable Methods of Attack Against the US

113. *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 attacks by aircraft. It is probable that such attacks would receive the highest priority because of: (a) the limited capabilities of conventional naval, ground, and airborne forces for neutralizing US nuclear capabilities; (b) the security difficulties inherent in the delivery of the necessary 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.

114. *Guided Missiles.* Guided missiles constitute a growing delivery capability. While no intercontinental missiles capable of reaching the US are expected to be available during this period, guided missiles might be launched from submarines against US ports and other targets within range. In addition, air-to-surface missiles might be employed late in the period for terminal attack on the most heavily defended targets.

115. *Other Methods of Attack.* The Soviet rulers might employ other methods of attacking the US concurrently with or immediately following a surprise nuclear air attack by aircraft. Clandestine employment of sabotage, biological warfare, or nuclear weapons might occur against specially selected targets.

Probable Methods of Attacks Against Key US Overseas Installations and Forces

116. The USSR would have a much wider range of capabilities for effective attack on key US installations and forces overseas than on the US itself because of the shorter ranges, greater possibilities for clandestine action, and ability to employ varied methods of attack. However, attacks on US naval task forces would present many difficult problems, including location and weapons selection.

117. *Western Europe and the Middle East.* Attacks on the majority of key US installations in these areas (except the UK and Spain), which do not possess a nuclear strike capability, would be carried out primarily by ground and tactical air forces concurrent with or subsequent to the initial attack on US nuclear delivery capabilities. The USSR has 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 increase their chances for success of the operations.

118. *Other Overseas Installations.* Except for Japan, Okinawa, and Formosa, US installations in other areas would be subject primarily to air attacks. 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 might be subjected to amphibious raids and guided missile attacks by submarine forces. Virtually all overseas installations are subject to nuclear attacks by aircraft. In addition the USSR possesses 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 about 500 nautical miles of Soviet bases.

119. *Likelihood of Change in Primary Methods of Attack through Mid-1958.* We estimate

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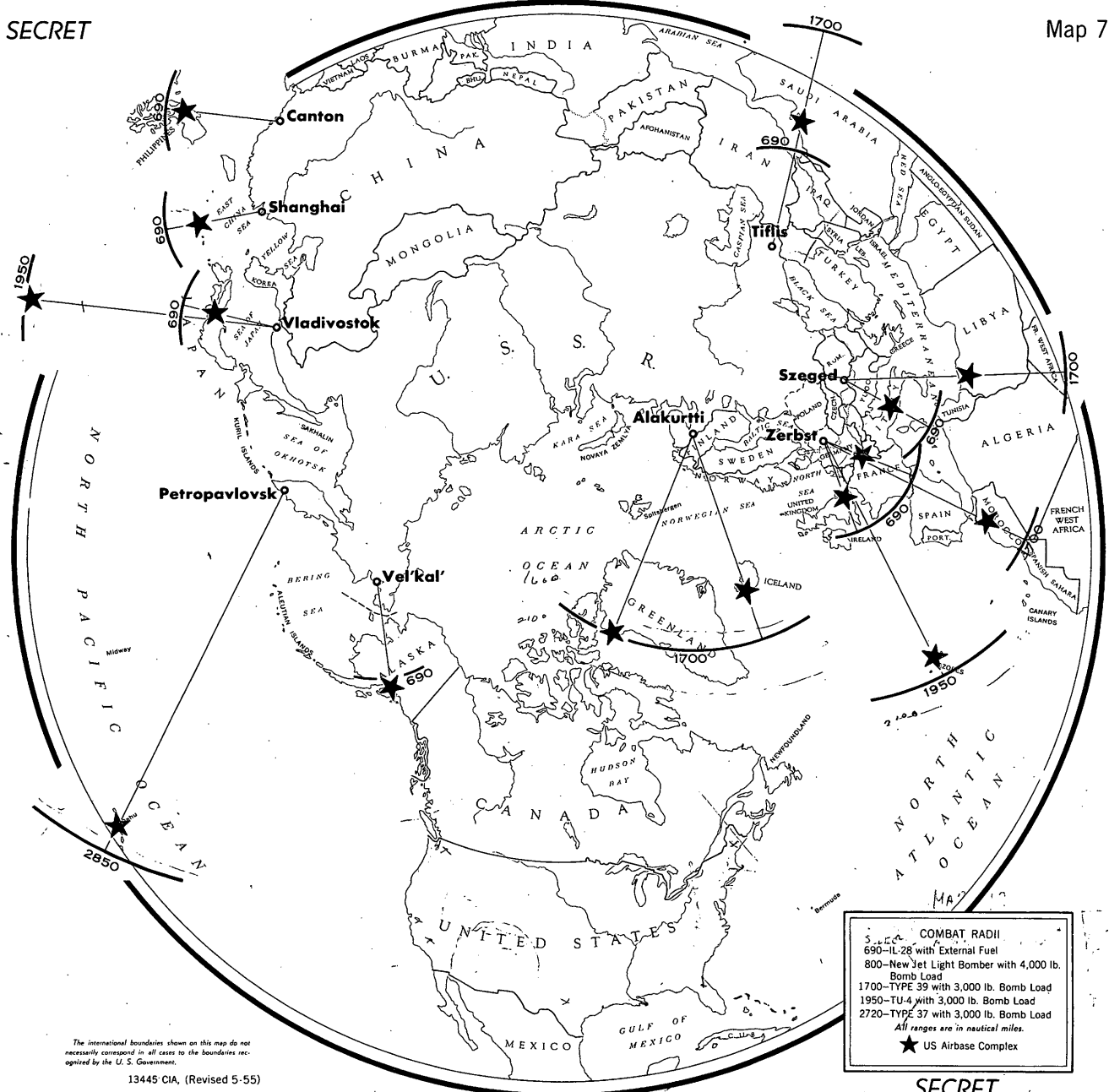
Soviet gross capabilities for attack will increase considerably by mid-1958 as a result of improved aircraft, an enlarged stockpile of nuclear weapons, increased naval strength, improved guided missiles, and greater effectiveness of ground forces due to introduction of nuclear weapons. However, the choice of primary method of attack will be unlikely to change materially because Soviet capabilities

for large-scale nuclear attack by aircraft will probably continue to be greater during this period than Soviet capabilities for use of any other weapons system against the US. However, it is estimated that by mid-1958 the USSR will probably have substantially increased capabilities for use of guided missiles, particularly against US coastal areas and key installations overseas.

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Map 7

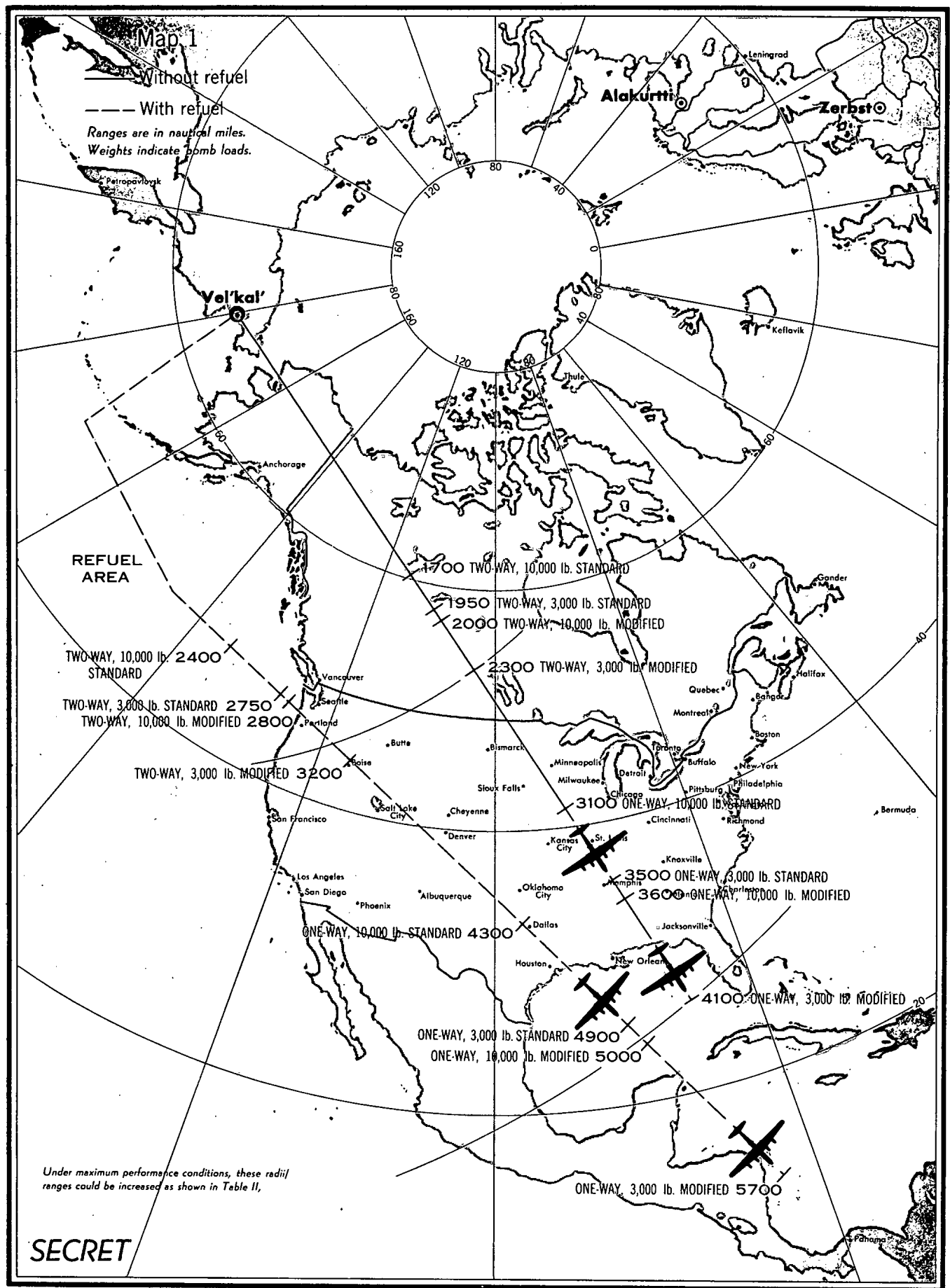


The international boundaries shown on this map do not necessarily correspond in all cases to the boundaries recognized by the U. S. Government.
 13445 CIA, (Revised 5-55)

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From the Chukotski Area

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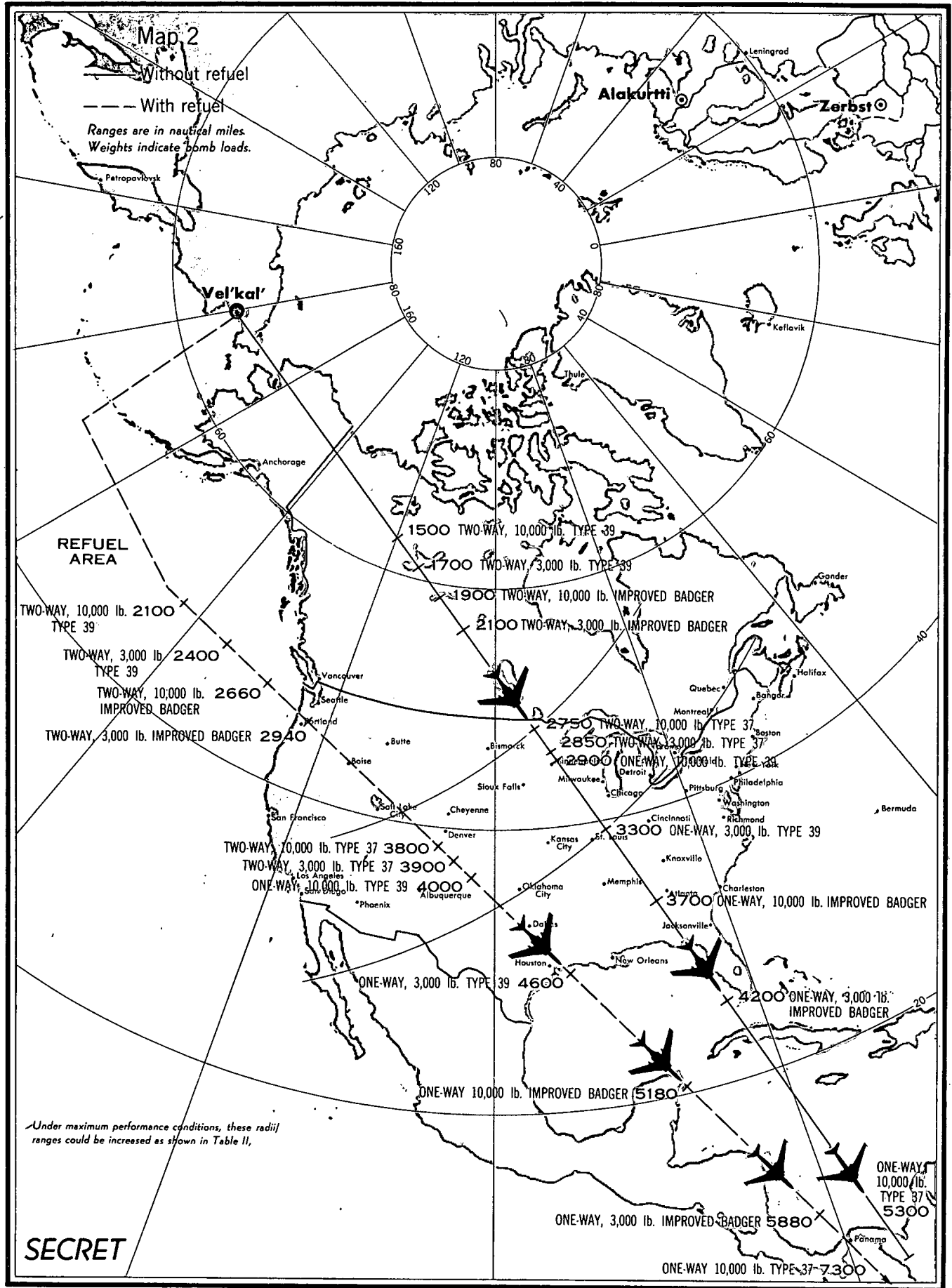


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BADGER TYPE 37, IMPROVED BADGER, AND BISON TYPE 37

From the Chukotski Area

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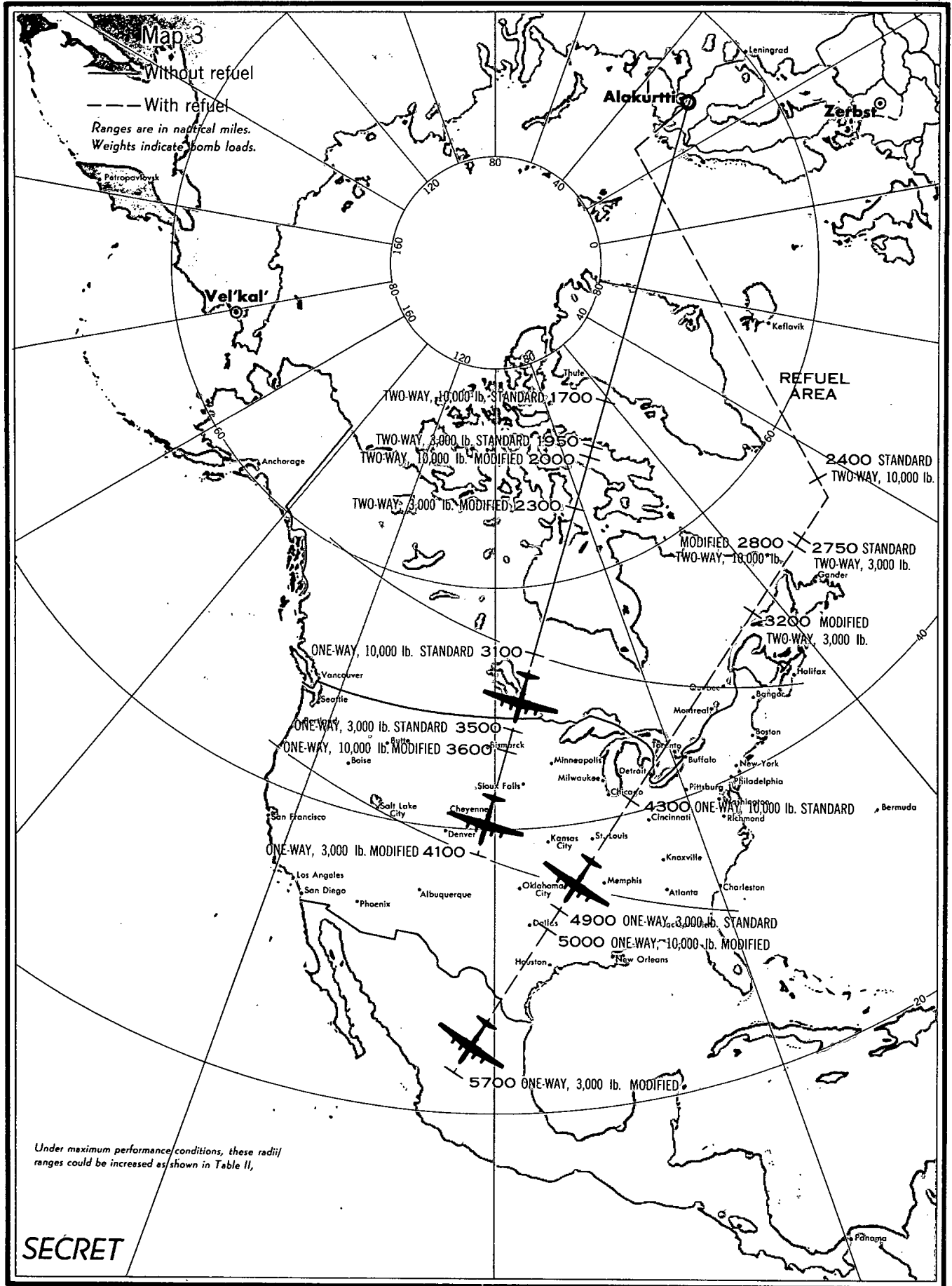


Under maximum performance conditions, these radii ranges could be increased as shown in Table II,

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From the Kola Area

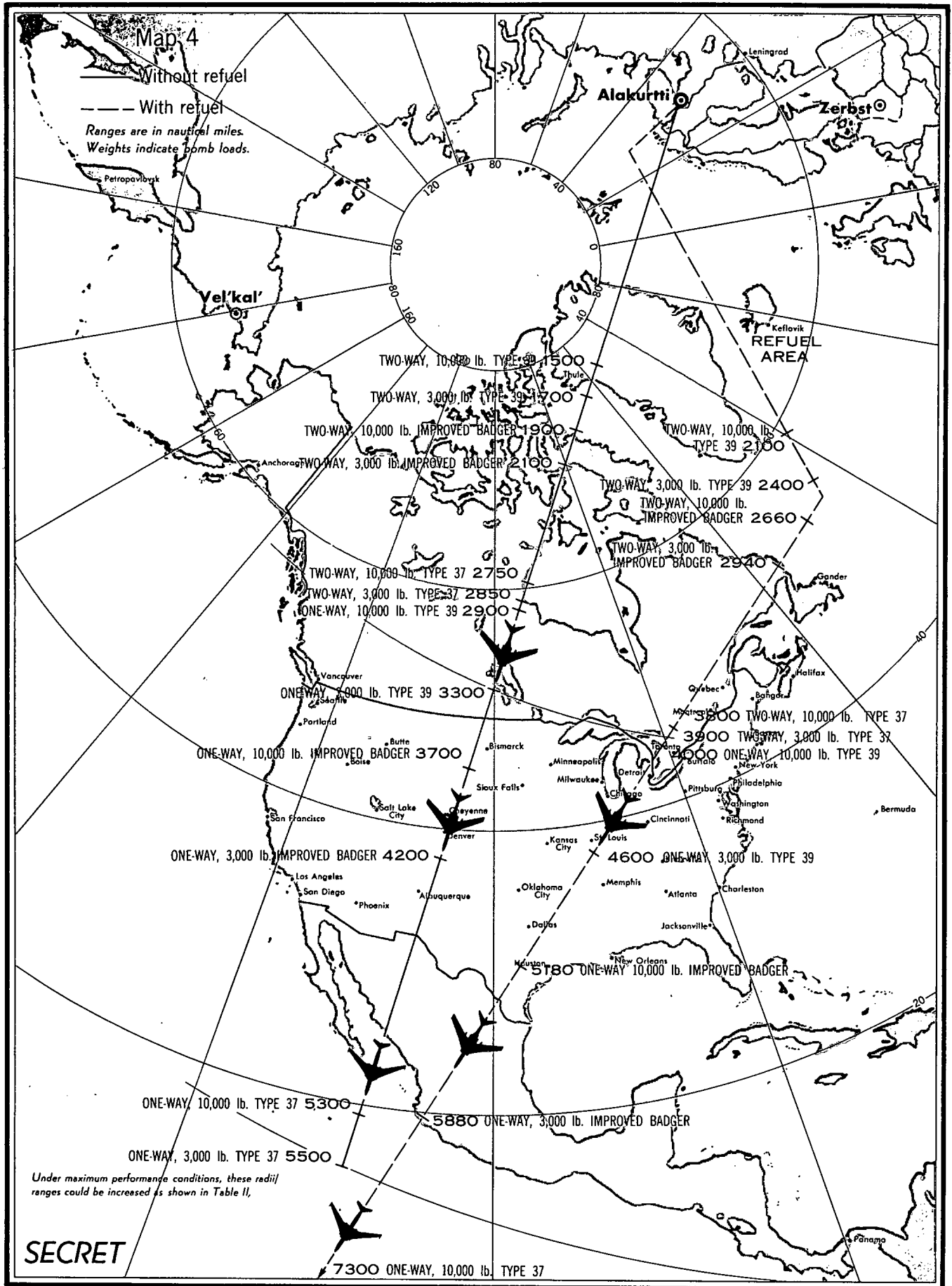
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From the Kola Area

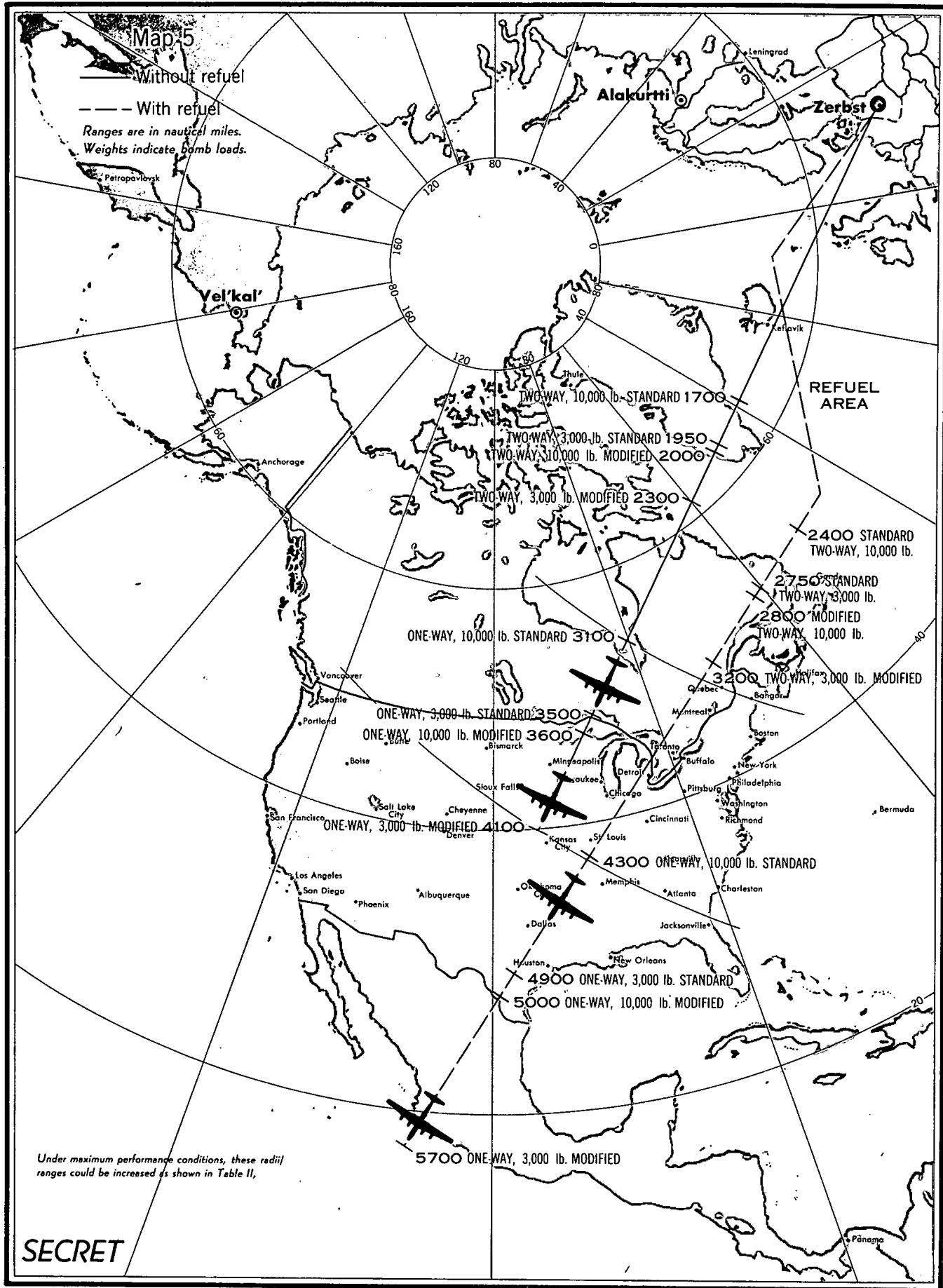
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From the Baltic-East German Area

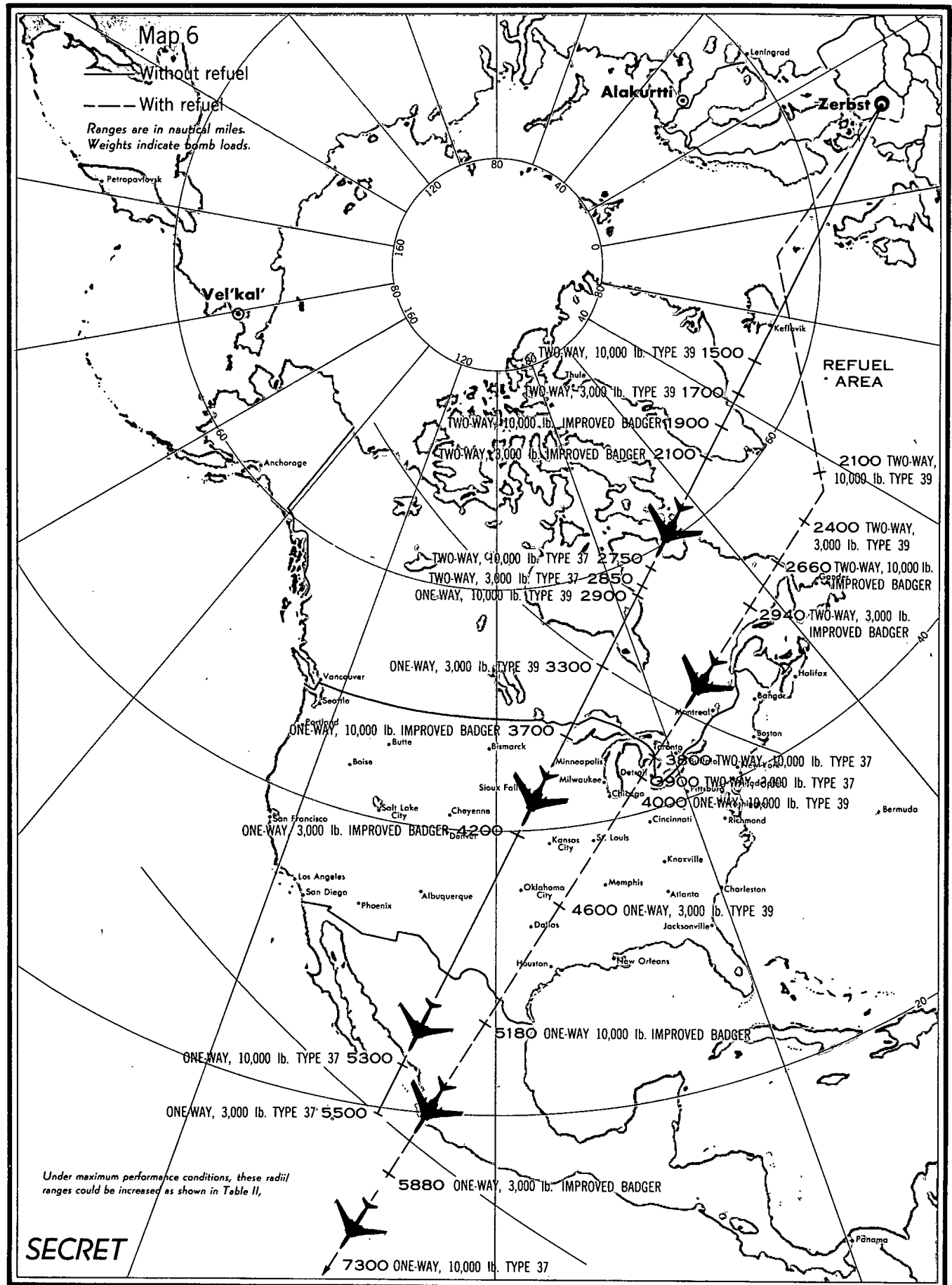
SECRET



SECRET

From the Baltic-East German Area

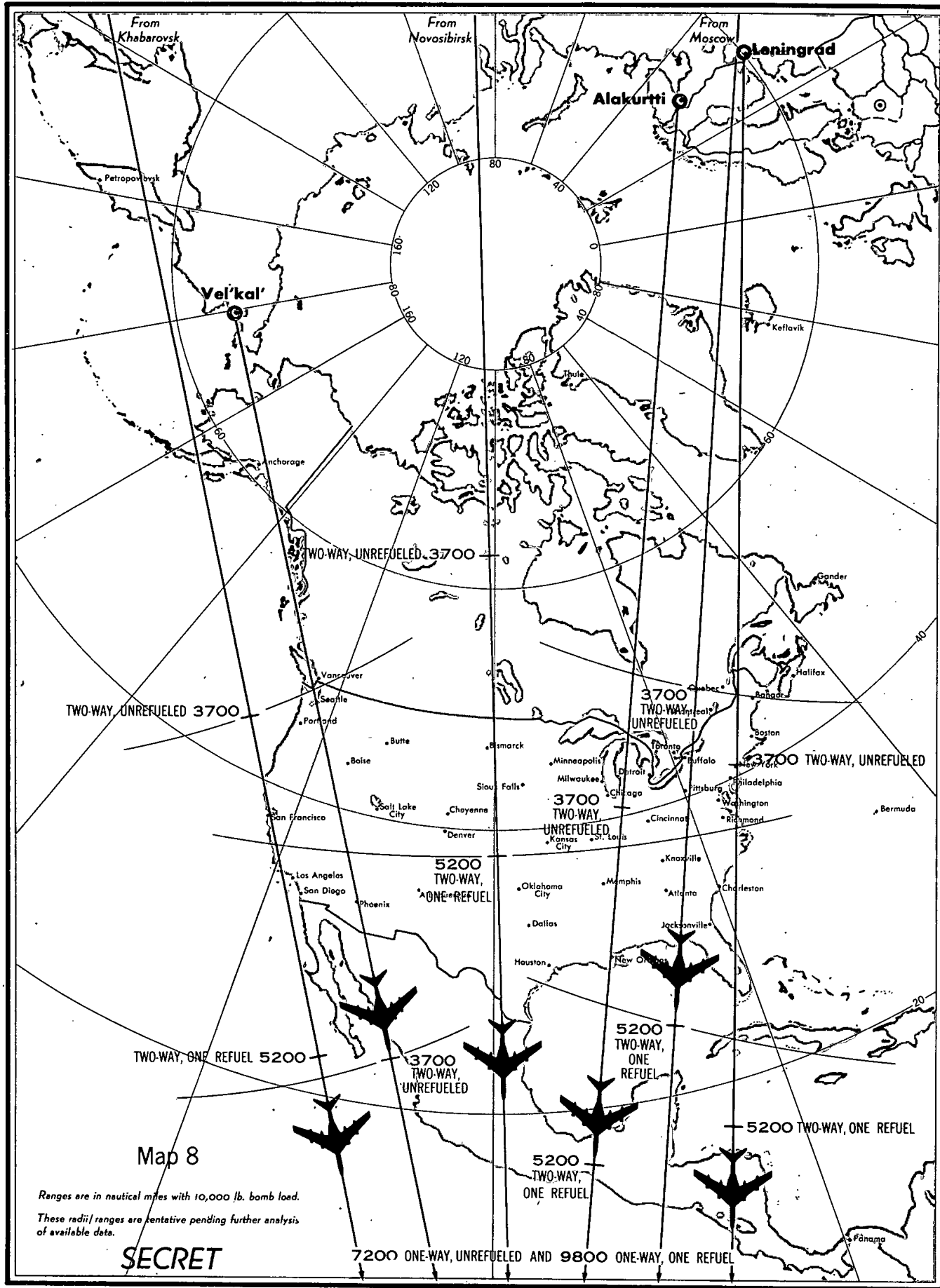
SECRET



13451 CIA, (Revised 5-55)

BEAR (Turbo Prop Heavy Bomber)

SECRET



13883 6-55

~~TOP SECRET~~

CONFIDENTIAL

CONFIDENTIAL

~~TOP SECRET~~