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16 September 1963

GEOGRAPHIC SUPPORT STUDY

KEYHOLE COVERAGE
OF THE SOVIET RAIL NETWORK
THROUGH JUNE 1963

CIA/RR GS 63-23

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

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Foreword

This report is the second supplement to CIA/RR GP 62-182:L, "Utilization of KEYHOLE Coverage of the Soviet Rail Network in ICBM Estimates," which set forth in detail the definition of "effective" photographic coverage, explained how this coverage is plotted and measured, and described how the resulting statistics are correlated with construction timing at Soviet ICBM complexes to indicate how much is known, and conversely, how much knowledge is lacking about the existence of complexes of a given type and age. The first supplement was issued as CIA/RR GP 63-153:L,

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KEYHOLE COVERAGE
OF THE SOVIET RAIL NETWORK
Through June 1963

KEYHOLE photography constitutes a major source of information on ICBM deployment, permitting the identification of deployed complexes as well as the determination of areas that are void of known types of complexes. Inasmuch as all known Soviet ICBM complexes are rail served, knowledge of the extent to which the Soviet rail network has been covered by photography of sufficient quality to reveal the presence or absence of the typical pattern formed by known types of Soviet ICBM complexes, as well as the timing of that coverage, can be very useful in estimating the magnitude and pace of the Soviet ICBM deployment program. With the knowledge of what exists along the portion of the rail network covered by effective photography it is possible to infer what is likely to exist along the portion of the network not covered.

Statistics on effective KEYHOLE coverage of the Soviet rail network are therefore computed periodically by the Office of Research and Reports on the basis of photo interpretation done by the National Photographic Interpretation Center. A recent report* provided figures on coverage through November 1962. A supplement** to this report updated the data on coverage through March 1963. The present report updates the data on coverage through the second quarter of 1963. [   ] which took place in June 1963, is the last mission included.

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A total of 96.3 per cent of the Soviet rail network has been covered by effective photography from the beginning of the KEYHOLE

* CIA/RR GP 62-182:L, [   ] (31 December 1962), "Utilization of KEYHOLE Coverage of the Soviet Rail Network in ICBM Estimates." 25X1
** CIA/RR GP 63-153:L, [   ] (15 May 1963), "Utilization of KEYHOLE Coverage of the Soviet Rail Network in ICBM Estimates." 25X1

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program in August 1960 through June 1963. The coverage acquired since the last computation has extended effective coverage forward about 6 months; the first three missions in 1963 acquired photography of somewhat more than half the Soviet rail network.

Table 1* presents the statistics on the extent of effective coverage. The geographic distribution of effective coverage is shown on the accompanying map.** The "net" mileage credited to each mission in column 3 represents only the mileage covered by that mission which has not been covered by more recent photography (this net mileage is given as a percentage in column 4). As new coverage becomes available the net mileage for earlier missions becomes progressively smaller. In column 5 the net percentages are added, cumulatively, from the most recent mission to the oldest. The table thus indicates how much of the Soviet rail network has been photographed since any given date in the past. The total amount of photography acquired after a specific date can be used as a factor in estimating the number of complexes initiated during a specific earlier time period.

Soviet ICBM complexes are recognizable on KEYHOLE photography after the first launch area has been started and the typical pattern of main support base, road, and launch area has been formed. This recognition pattern appears in about the 8th month of construction for soft complexes and about the 13th month for hard complexes. Tables 2 and 3*** indicate the amount of the Soviet rail network that has been inspected on KEYHOLE photography relative to complexes of a given type and age. The earlier report, CIA/RR GP 62-182:L, describes the basis for these tables and gives examples of how they can be used.

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  * Table 1 follows on page 4.
 ** Map follows page 6.
*** Tables 2 and 3 follow on pages 5 and 6, respectively.

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As of [   ] there was no photography on which soft ICBM complexes begun after November 1962 would be recognizable, and hence no basis for estimating the number of such complexes begun after that date. Since hard complexes take even longer to become recognizable, photography acquired through the second quarter of 1963 provides no basis for identifying or estimating the number of hard complexes started after June 1962.

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Table 1

25X1   Effective KEYHOLE Coverage of the Soviet Rail Network

Net Route Miles Covered (3)	Percent of Total Network Covered	
	Net (4)	Cumulative (5)
24,160	28.7	28.7
11,179	13.2	41.9
8,280	9.8	51.7
5,502	6.5	58.2
2,585	3.1	61.3
9,219	10.9	72.2
2,956	3.5	75.7
535	.7	76.4
3,962	4.7	81.1
1,341	1.6	82.7
2,205	2.6	85.3
236	.3	85.6
2,955	3.5	89.1
688	.8	89.9
1,462	1.7	91.6
1,701	2.0	93.6
652	.8	94.4
524	.6	95.0
73	.1	95.1
-	-	95.1
-	-	95.1
216	.3	95.4
320	.4	95.8
380	.4	96.2
50	.1	96.3
27	0 (.03)	96.3
TOTAL 81,208	96.3	

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Table 2

Correlation of Construction Timing at Soft ICBM Complexes
and
Effective KEYHOLE Coverage of the Soviet Rail Network

Date of start of construction	Percent of rail network along which complexes would be recognizable
Oct - Nov 62	41.9
June - Sep 62	51.7
May 62	58.2
Mar - Apr 62	72.2
Feb 62	76.4
Jan 62	82.7
Dec 61	85.6
Nov 61	89.9
Oct 61	91.6
Aug - Sep 61	93.6
Jun - Jul 61	94.4
May 61	95.0
Feb - Apr 61	95.1
Jan 61	95.4
Dec 60	95.8
Jun - Nov 60	96.2
before Jun 60	96.3

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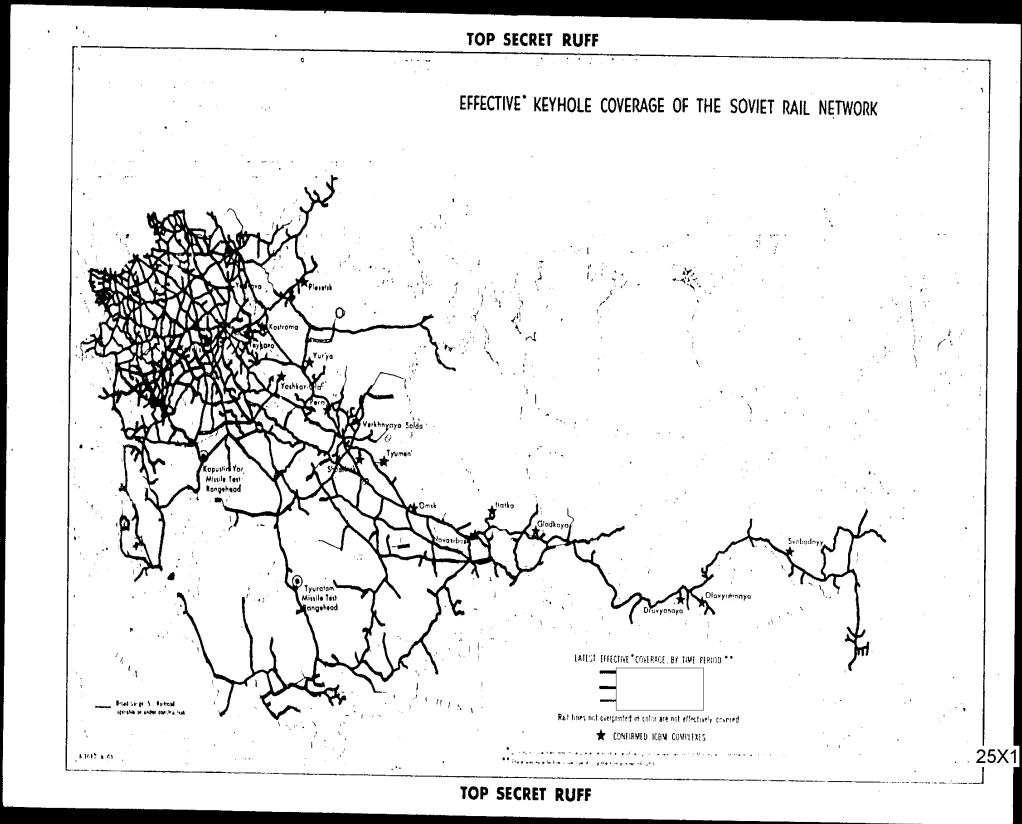
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Table 3

Correlation of Construction Timing at Hard ICBM Complexes
and
Effective KEYHOLE Coverage of the Soviet Rail Network

Date of start of construction	Percent of rail network along which complexes would be recognizable.
May-June 62	41.9
Jan-Apr 62	51.7
Dec 61	58.2
Oct-Nov 61	72.2
Sep 61	76.4
Aug 61	82.7
Jul 61	85.6
Jun 61	89.9
May 61	91.6
Mar-Apr 61	93.6
Jan-Feb 61	94.4
Dec 60	95.0
Sep-Nov 60	95.1
Aug 60	95.4
Jul 60	95.8
Jan-Jun 60	96.2
before Jan 60	96.3

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EFFECTIVE* KEYHOLE COVERAGE OF THE SOVIET RAIL NETWORK

LATEST EFFECTIVE*COVERAGE BY TIME PERIOD **

Rail lines not overprinted in color are not effectively covered.

★ CONFIRMED ICBM COMPLEXES

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