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Nº 57

RESEARCH AID

ESTIMATED FLOORSPACE
OF MOSCOW/FILI AIRFRAME PLANT NO. 23



CIA/RR RA-20

25 October 1957

CENTRAL INTELLIGENCE AGENCY

OFFICE OF RESEARCH AND REPORTS

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CIA/RR RA-20

(ORR Project 33.1731)

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FOREWORD

This research aid, one of a series evaluating current floorspace of Soviet airframe plants of the Ministry of the Aviation Industry (Ministerstvo Aviatsionnoy Promyshlennosti -- MAP), is based on metrical analysis* of World War II German photography. Supplementary intelligence data also have been used in an attempt to ascertain the composition and functions of the individual plant buildings. An effort has been made to determine the areas of the plant which are multistory, and the latest information on new construction has been included. This research aid will be reviewed and reissued periodically to include new intelligence information as available.

* Determination of measurements by the use of aerial photographs.

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ESTIMATED FLOORSPACE OF MOSCOW/FILI AIRFRAME PLANT NO. 23*

Summary

Moscow/Fili Airframe Plant No. 23 in the USSR contains a minimum of 2.8 million square feet (sq ft) of floorspace** and a final assembly area of approximately 190,000 sq ft, about 7 percent*** of the total floorspace. The administration area of the plant comprises about 140,000 sq ft, or 5 percent of the total floorspace. It is estimated that the plant has at least 140,000 sq ft of warehouse area,**** approximately 5 percent of the total floorspace. There are no reported basement areas in the plant. Analysis of prisoner-of-war reports and of current ground photography reveals approximately 410,000 sq ft of multistory area. New construction estimated at 420,000 sq ft has been reported by reliable observers. The over-all area of the plant site is estimated to be 8 million sq ft with a building density† of about 35 percent.

* Based on aerial photography. (See Figure 1, following p. 2.) 1/
(For serially numbered source references, see Appendix D.) The estimates and conclusions contained in this research aid represent the best judgment of ORR as of 1 September 1957.

** All figures dealing with square footage which are used in the text of this research aid are rounded to two significant digits.

*** All percentages are computed with actual figures.

**** The term warehouse is applied to those buildings or areas within the plant which have the primary functions of receiving materials from external sources and of holding these materials in bulk quantities for subsequent distribution to the processing points in the plant.

The term storage areas is applied to those buildings or areas, usually parts of buildings which have primary functions other than storage, in which materials are stored or maintained for the direct support of production or service activities. These areas normally are located adjacent to the activities which they support, and they receive their stores from plant warehouses.

† The term building density represents the proportion of the total roof area of an airframe plant to the total plant site expressed as a percentage.

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1. Location.

Moscow/Fili Airframe Plant No. 23 (55°45'N - 37°30'E) is located in the USSR on a tip of land in a bend of the Moscow River approximately 3.7 nautical miles west of the Kremlin in Moscow. The plant is approximately 3,000 feet (ft) east-southeast of the Moscow Hydroelectric Power Plant, Karamyshevo. Moscow/Fili Airfield is immediately adjacent to the north side of the plant site.

2. History.

Moscow/Fili Airframe Plant No. 23, originally called the Gorbunov Plant, reportedly was built in the late 1920's or early 1930's. It was Airframe Plant No. 22 until 1941, when it was partially evacuated. By late 1942, however, the plant had been restored sufficiently and was reopened as Airframe Plant No. 23. Since 1942 the plant has produced aircraft almost uninterruptedly. Reconstruction of buildings damaged by World War II bombings was accomplished in the early postwar years. New construction, the last of which was completed by early 1956, added significantly to the floorspace totals of the plant. Currently the plant is estimated to be 1 of the 5 largest Soviet airframe plants.

3. Description.

The plant site of Moscow/Fili Airframe Plant No. 23 is irregularly shaped, with the main axis oriented in an east-west direction (see Figure 2*). The plant covers an area of roughly 8 million sq ft. Analysis of World War II German photography (see Figure 1*) dated September 1942 reveals a total estimated roof area of approximately 2.1 million sq ft. 2/ Available information indicates that as of April 1943 there were, in addition, 280,000 sq ft of multistory area enclosed within the plant. The total floorspace of the plant at the end of World War II, therefore, is estimated to have been approximately 2.4 million sq ft.

The first reports of noteworthy new construction were received in 1954 (see 5, below). This construction is incorporated in three large buildings (see Figure 2*) in the western end of the plant site. It is estimated that the new construction was completed by early 1956 3/ and added approximately 420,000 sq ft of floorspace. The total floorspace of the plant, therefore, is estimated to be about 2.8 million sq ft.** Of this

* Following p. 2.

** See Appendix A.

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USSR: VERTICAL PHOTOGRAPH OF MOSCOW/FILI AIRFRAME PLANT NO. 23

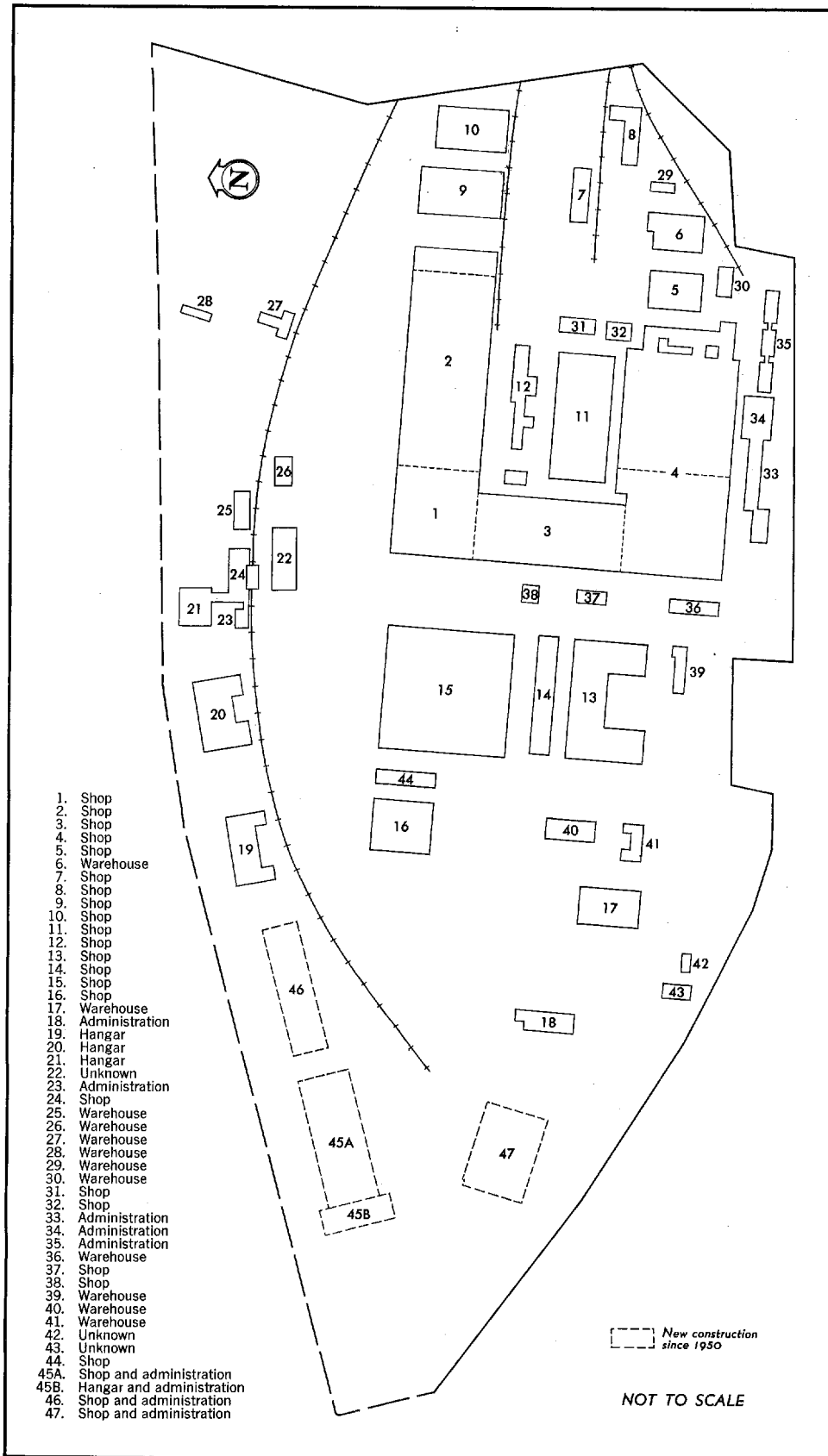
Figure 1



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Figure 2

USSR: LAYOUT OF MOSCOW/FILI AIRFRAME PLANT NO. 23



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total, both the administration area and the warehouse area account for 140,000 sq ft each, or 5 percent, and the multistory area accounts for 410,000 sq ft. The plant has a building density of 35 percent.

Significant expansion of the plant site appears to be restricted by adjacent built-up areas, the factory airfield, and the Moscow River (see Figure 1*). No evidence has been reported of construction begun subsequent to the completion of the three buildings discussed under new construction (see 5, below).

The majority of the buildings of the plant are of reinforced concrete with slab or brick filler walls. Roofs are predominantly of gable design with monitor lighting (see Figure 4***).

The plant site is served by several good roads and by a rail spur from the Moscow Circular Railroad, and river transportation facilities are also available. Moscow/Fili Airfield is used as a flyaway field for Airframe Plant No. 23.

4. Final Assembly Area.

Analysis of World War II German photography and of prisoner-of-war reports indicates that until the late 1940's the final assembly area of Moscow/Fili Airframe Plant No. 23 was located in Building No. 9.** Reports from reliable sources, together with ground photography, 4/ indicate that at the present time final assembly of the aircraft is being accomplished in Building No. 15 (see Figure 3***) in the center, or double-arch, section. This area, estimated to be 480 ft long by 400 ft wide, 5/ provides a final assembly area of approximately 190,000 sq ft, or 7 percent of the total floorspace. No information is available from which the present internal layout of Building No. 15 can be determined and the probable final-assembly flow pattern established.

5. New Construction.

The first postwar report of noteworthy new construction at Moscow/Fili Airframe Plant No. 23 was received from a reliable source in 1954. 6/ At the time of this report, Building No. 45A-45B was completed. An examination of World War II German photography of the plant reveals

* Following p. 2, above.

** Building numbers refer to the designations in Figure 2, following p. 2, above.

*** Following p. 4.

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at least part of the outside walls of this building standing on the date of the photography, 1942. Analysis of available information indicates, however, that the building had not been completed before 1942. Prisoner-of-war reports reflect no construction activity associated with this building as late as 1948. In this research aid, therefore, it has been assumed that this building probably was completed between 1950 and the date of the 1954 report cited above. 7/

New construction activity related to two other large buildings adjacent to Building 45A-45B was revealed in the same report. 8/ These buildings, Nos. 46 and 47, are estimated to have been completed by early 1956. 9/

Available reports do not provide information from which an accurate determination of the functions of these three buildings can be made. It appears, however, that a tentative association can be made between the construction of Buildings Nos. 46 and 47 and the production of Bison heavy bomber aircraft at Airframe Plant No. 23. The dates of reports revealing the initiation of Bison production and the beginning of construction of the latter two buildings are nearly coincident.

Pending receipt of information from which the functions of these buildings can be determined, an estimate is advanced that Buildings Nos. 46 and 47 are being utilized in subassembly functions and that Building No. 45A-45B is being used for wing and/or fuselage construction.

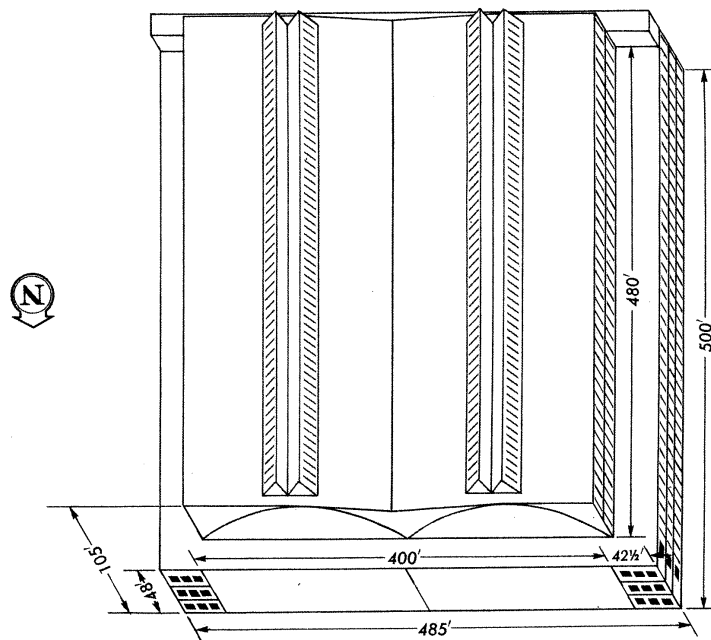
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Figure 3

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USSR: SKETCH OF BUILDING NO. 15
MOSCOW/FIL AIRFRAME PLANT NO.23



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APPENDIX A

COMPOSITION OF THE FLOORSPACE OF MOSCOW/FILI AIRFRAME PLANT NO. 23 a/*

* Footnotes for this appendix follow on p. 7.

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APPENDIX B

METHODOLOGY

On the basis of available intelligence, an effort was made to determine the function of the major buildings in Moscow/Fili Airframe Plant No. 23, to identify multistory plant areas, and to account for new plant construction. All buildings within the plant site, except sheds with areas less than 500 sq ft, are listed in Appendix A.*

German vertical photographs of 1942 were used to determine the roof area and the physical layout of the plant. Metrical analysis of this photography provided an estimate of the total roof area of the plant. In the computation of this total, no allowance could be made for multistory buildings. To compensate for this factor, intelligence information, consisting chiefly of prisoner-of-war interrogation reports and recent ground photographs, was used. Whenever functions of buildings were unknown, the best judgment of the analyst was used to provide an estimate. Estimates of new construction are based on observations [REDACTED]

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* P. 5, above.

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APPENDIX C

GAPS IN INTELLIGENCE

The accuracy of the estimates of the floorspace of Moscow/Fili Airframe Plant No. 23 is impaired because of a lack of current information concerning the old areas of the plant.

Helpful information was obtained from interrogations of German prisoner-of-war returnees. Unfortunately, significant changes in building functions and total floorspace have taken place since the Germans were removed from the plant.

Information pertaining to the new construction is confined solely to ground photographs taken by reliable observers. There is no information available from which an accurate determination can be made of the functions of the newly constructed buildings. Details of the current internal composition of major buildings within the plant site likewise are not available.

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APPENDIX D

SOURCE REFERENCES

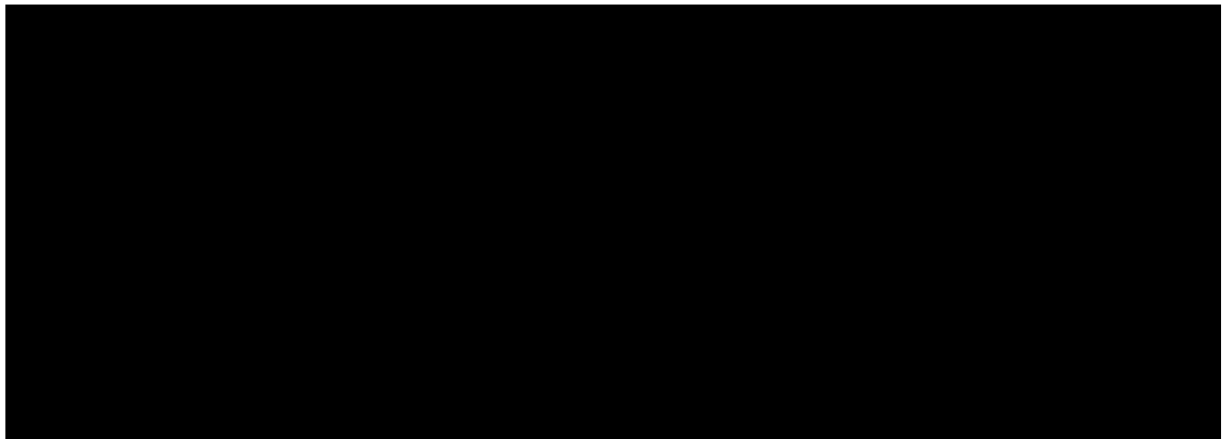
Evaluations, following the classification entry and designated "Eval.," have the following significance:

<u>Source of Information</u>	<u>Information</u>
Doc. - Documentary	1 - Confirmed by other sources
A - Completely reliable	2 - Probably true
B - Usually reliable	3 - Possibly true
C - Fairly reliable	4 - Doubtful
D - Not usually reliable	5 - Probably false
E - Not reliable	6 - Cannot be judged
F - Cannot be judged	

"Documentary" refers to original documents of foreign governments and organizations; copies or translations of such documents by a staff officer; or information extracted from such documents by a staff officer, all of which may carry the field evaluation "Documentary."

Evaluations not otherwise designated are those appearing on the cited document; those designated "RR" are by the author of this research aid. No "RR" evaluation is given when the author agrees with the evaluation on the cited document.

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