

~~SECRET~~

Nº 3

RESEARCH AID

ESTIMATED FLOORSPACE
OF VORONEZH AIRFRAME PLANT NO. 64



CIA/RR RA-19
10 October 1957

CENTRAL INTELLIGENCE AGENCY
OFFICE OF RESEARCH AND REPORTS

~~SECRET~~

WARNING

This material contains information affecting the National Defense of the United States within the meaning of the espionage laws, Title 18, USC, Secs. 793 and 794, the transmission or revelation of which in any manner to an unauthorized person is prohibited by law.

S-E-C-R-E-T

RESEARCH AID

ESTIMATED FLOORSPACE OF VORONEZH AIRFRAME PLANT NO. 64

CIA/RR RA-19

(ORR Project 33.1719)

CENTRAL INTELLIGENCE AGENCY

Office of Research and Reports

S-E-C-R-E-T

S-E-C-R-E-T

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.

S-E-C-R-E-T

S-E-C-R-E-T

CONTENTS

	<u>Page</u>
Summary	1
1. Location	2
2. History	2
3. Description	2
4. Final Assembly Area	3
5. New Construction	3

Appendixes

Appendix A. Composition of Floorspace of Voronezh Airframe Plant No. 64	5
Appendix B. Methodology	9
Appendix C. Gaps in Intelligence	11
Appendix D. Source References	13

Illustrations

	<u>Following Page</u>
Figure 1. USSR: Vertical Photograph of Voronezh Airframe Plant No. 64	2
Figure 2. USSR: Layout of Voronezh Airframe Plant No. 64	2
Figure 3. Types of Roofs	4

- v -

S-E-C-R-E-T

CIA/RR RA-19
(ORR Project 33.1719)

S-E-C-R-E-T

ESTIMATED FLOORSPACE OF VORONEZH AIRFRAME PLANT NO. 64*

Summary

Voronezh Airframe Plant No. 64 in the USSR contains about 2.4 million square feet (sq ft) of floorspace.** The plant has a final assembly area of approximately 110,000 square feet. It is estimated that the administration area comprises about 85,000 sq ft, or 4 percent*** of the total floorspace. Analysis of aerial photography and of prisoner-of-war reports reveals a minimum of 81,000 sq ft of multistory area, or approximately 3 percent of the total floorspace. A minimum of 69,000 sq ft is believed to be warehouse area.**** No known basement areas exist within the plant. The site of Voronezh Airframe Plant No. 64 is estimated to encompass approximately 6.9 million sq ft. With a total roof area of slightly more than 2.3 million sq ft, the plant has a building density† of 34 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 15 August 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.

S-E-C-R-E-T

S-E-C-R-E-T

1. Location.

Voronezh Airframe Plant No. 64 (51°38' N - 30°15' E) is located in Voronezh, USSR, adjacent to the double-track Moscow-Voronezh-Rostov Railroad, about 1.2 nautical miles east of the Voronezh River. The plant is approximately 400 feet (ft) west of the Voronezh grain elevators.

2. History.

The airframe plant in Voronezh was constructed in about 1935 and originally was designated Airframe Plant No. 18. Evacuated to Kuybyshev in the late fall of 1941, the plant was dismantled and the workshops were destroyed by the retreating Red Army. The plant was established as a repair base after its recapture by the Red Army in late 1942 or early 1943. In 1944, reactivated and designated Plant No. 64, it was retooled with German equipment from the Bayerische Motorien Werke (BMW) Engine Plant and, reportedly, from a plant in Budapest. 2/

Returning prisoners of war reported that reconstruction of the original plant site continued until as late as 1950. A reliable source reported the completed construction in 1955 of two new hangar types of buildings adjacent to and similarly constructed as Building No. 32 (see Figure 2*). 3/

3. Description.

The plant area of Voronezh Airframe Plant No. 64 is rectangular and occupies the southeast corner of Voronezh East Airfield. On its western edge it adjoins a reported flying school and an aircraft research institute.

Analysis of 1943 German photography and of other available information indicates a total roof area during World War II of approximately 2.2 million sq ft.** The multistory gallery area within the plant is estimated to have been about 81,000 sq ft, or 3 percent of the total floorspace. No significant addition to the roof area of the plant since World War II was reported before 1955. Before 1955 the plant is estimated to have had 2.3 million sq ft of floorspace.*** The new construction,

* Following p. 2.

** Metrical analysis of Voronezh Airframe Plant No. 64 is based on source 4/. Dimensions of individual buildings have been interpreted according to the best judgment of the analyst.

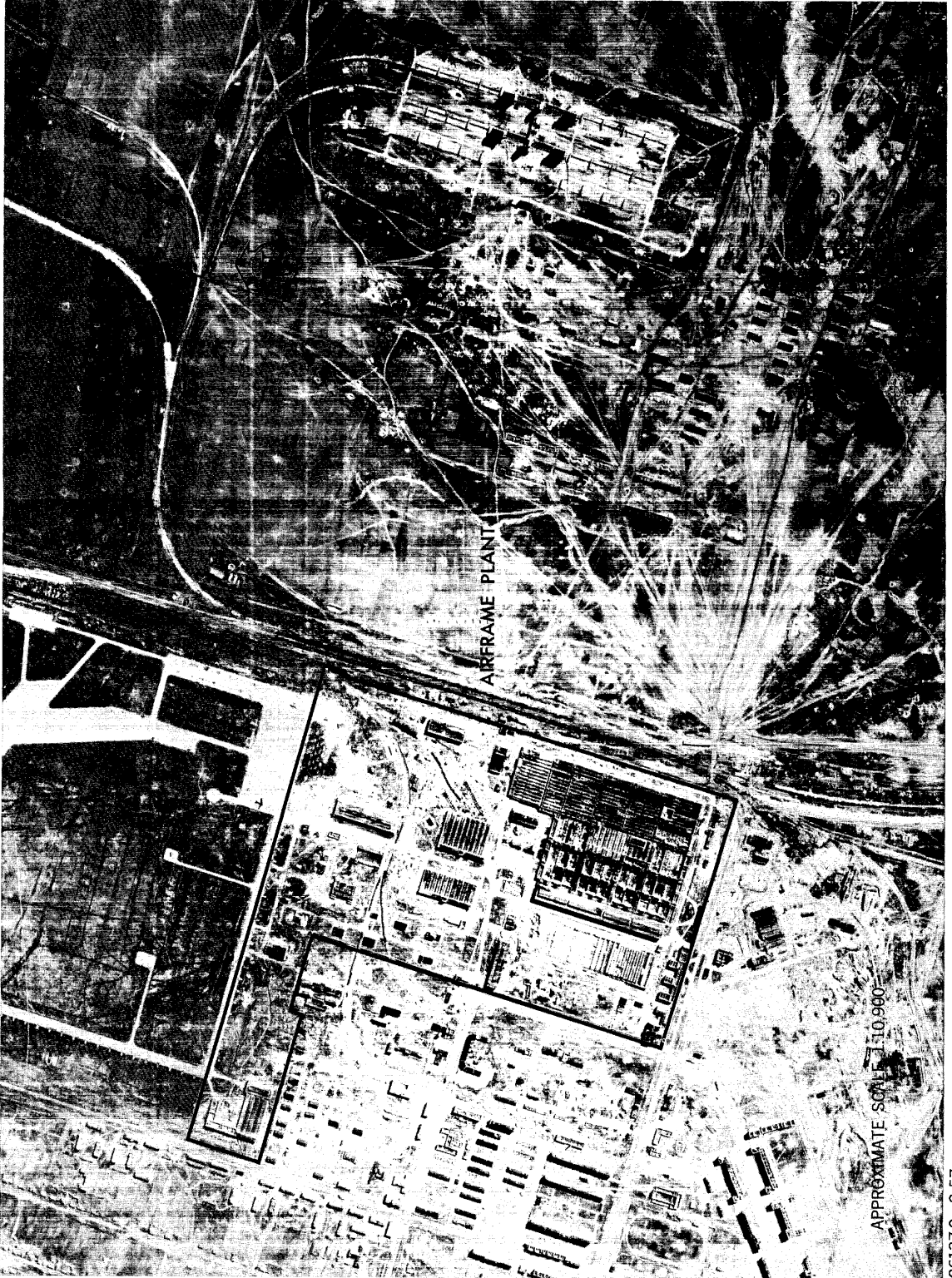
*** See Appendix A.

- 2 -

S-E-C-R-E-T

Figure 1

USSR: VERTICAL PHOTOGRAPH OF VORONEZH AIRFRAME PLANT NO. 64



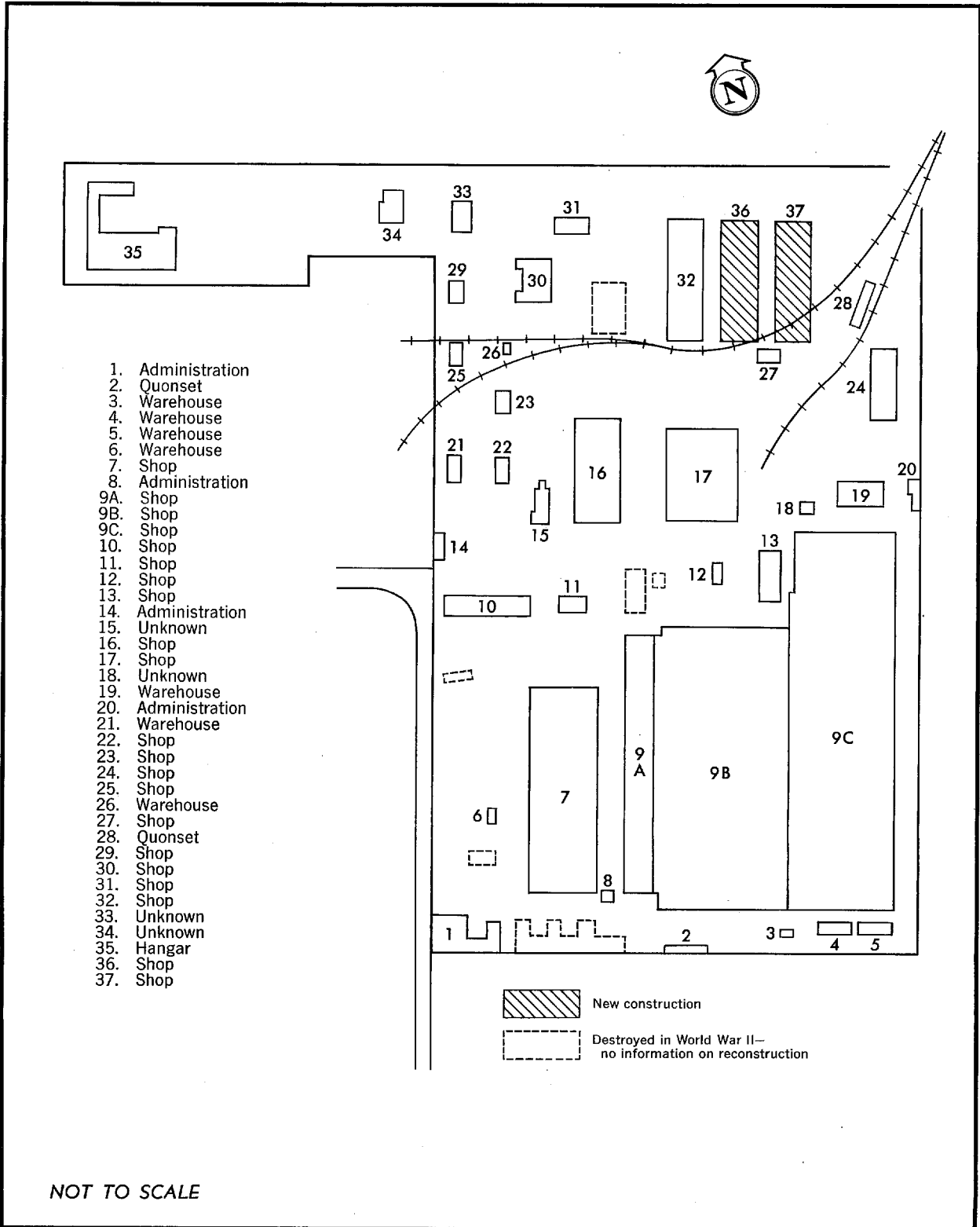
261372 8-57

SECRET

SECRET

Figure 2

USSR: LAYOUT OF VORONEZH AIRFRAME PLANT NO. 64



1. Administration
2. Quonset
3. Warehouse
4. Warehouse
5. Warehouse
6. Warehouse
7. Shop
8. Administration
- 9A. Shop
- 9B. Shop
- 9C. Shop
10. Shop
11. Shop
12. Shop
13. Shop
14. Administration
15. Unknown
16. Shop
17. Shop
18. Unknown
19. Warehouse
20. Administration
21. Warehouse
22. Shop
23. Shop
24. Shop
25. Shop
26. Warehouse
27. Shop
28. Quonset
29. Shop
30. Shop
31. Shop
32. Shop
33. Unknown
34. Unknown
35. Hangar
36. Shop
37. Shop

26137.1 8-57

SECRET

S-E-C-R-E-T

which was reported in 1955, is estimated to have added 140,000 sq ft of floorspace, resulting in an estimated current total of approximately 2.4 million sq ft. It is estimated that 85,000 sq ft, or 4 percent, of the total floorspace is used for the administration area and that a minimum of 69,000 sq ft is used for the warehouse area.

The plant site encompasses approximately 6.9 million sq ft and has a total roof area of slightly more than 2.3 million sq ft, giving a building density of 34 percent. Little space exists within the present plant boundaries for significant plant expansion, although expansion could be accomplished with little difficulty by moving into the adjoining sites of the flying school and the research institute.

The major buildings are primarily of concrete construction with brick and concrete slab side walls. Roofs are predominantly of monitor and sawtooth design (see Figure 3*).

A spur of the Moscow-Voronezh-Rostov Railroad services the plant. In addition, good roads and tram facilities connect the installation with the city of Voronezh.

4. Final Assembly Area.

Analysis of German prisoner-of-war reports indicates that the final assembly area of Voronezh Airframe Plant No. 64 probably is contained in one shop type of building, Building No. 17, which measures 370 ft by 290 ft (see Figure 2**). This building has approximately 110,000 sq ft of roof area with no reported multistory sections. Its height is 35 feet, topped by a sawtooth roof. It is possible that the final-assembly function has been shifted from this building, although evidence to confirm such a shift is lacking. No available reports reveal the internal layout of this building or any postwar changes in its configuration.

5. New Construction.

Analysis of World War II photography and of German prisoner-of-war reports indicates that Voronezh Airframe Plant No. 64 was heavily damaged during World War II. By far the most significant damage to the plant buildings was sustained by Buildings Nos. 7, 9B, and 9C (see Figure 2**). Prisoners of war assigned to reconstruction work

* Following p. 4.

** Following p. 2, above.

- 3 -

S-E-C-R-E-T

S-E-C-R-E-T

at Plant No. 64 reported completion of this work by 1950. This reconstruction has not been considered "new construction" for the purposes of this research aid, primarily because the reconstruction reported is not believed to have added significantly to the original production capability of the plant.

The only reliably reported new construction at Voronezh Airframe Plant No. 64 since World War II is that of two buildings, Nos. 36 and 37 (see Figure 1*), in the northeast corner of the complex. These two buildings, similar in type and size to Building No. 32 (see Figure 2*), ⁵ were reported in July 1955, and it was indicated that one of the buildings was of brick construction. No other information concerning these buildings has been reported. Together with Building No. 32, Buildings Nos. 36 and 37 border a large parking ramp which is on the plant airfield (see Figure 2*).

* Following p. 2, above.

- 4 -

S-E-C-R-E-T

25X1B0a

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

S-E-C-R-E-T

APPENDIX A

COMPOSITION OF FLOORSPACE OF VORONEZH AIRFRAME PLANT NO. 64 a/*

* Footnotes for this appendix follow on p. 7.

- 5 -

S-E-C-R-E-T

25X1B0a

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

Next 1 Page(s) In Document Exempt

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

S-E-C-R-E-T

APPENDIX B

METHODOLOGY

On the basis of available intelligence, an effort was made to determine the function of each building in Voronezh Airframe Plant No. 64, to identify multistory plant areas, and to account for new plant construction. All buildings within the plant site, except sheds with areas less than 1,000 sq ft, are listed in Appendix A.

German vertical photographs of 1943 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 interrogations, was used. Although this category of information is often considered unreliable, plausible data from this source were used to determine the functions of the plant buildings and, in some cases, to account for multistory or gallery areas. Whenever functions of buildings or the number of stories were unknown, the best judgment of the analyst was used to provide an estimate.

- 9 -

S-E-C-R-E-T

S-E-C-R-E-T

APPENDIX C

GAPS IN INTELLIGENCE

The accuracy of the estimates of the floorspace of Voronezh Airframe Plant No. 64 is greatly impaired because of a paucity of information. Vertical photographs of 1943 are available, however, and from these photographs the roof area and the physical layout of the plant as it was in 1943 can be computed. Lack of current vertical photographs precludes further study of the plant by this means.

Helpful information was obtained from reports of interrogations of German prisoner-of-war returnees. Unfortunately, these returnees were restricted primarily to the warehouse areas of the plant, and reports of their observations of the remaining areas of the plant are vague and incomplete.

Information pertaining to multistory or gallery areas within the plant is virtually nonexistent. Because estimates of floorspace in multistory areas greatly affect the estimates of total floorspace, acquisition of this information is of prime importance. The lack of oblique ground photography further hinders the determination of building heights and designs, and the lack of both vertical and oblique ground photography hinders the analysis of new construction in the plant. Details of the final assembly area and reliable information concerning the composition of other essential buildings likewise are not available.

- 11 -

S-E-C-R-E-T

S-E-C-R-E-T

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.

25X1A2g



S-E-C-R-E-T

25X1A2g

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

SECRET

Approved For Release 1999/09/08 : CIA-RDP79S01046A000500080001-8

SECRET