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CENTRAL INTELLIGENCE AGENCY

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INFORMATION REPORT

S-E-C-R-E-T

NO FORN [redacted]

COUNTRY USSR (Gorkiy Oblast)

SUBJECT 1. Layout, Personnel, and Activities at NII 11 in Gorkiy
2. Location of Nearby Landmarks and TV Transmitting Station

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REPORT

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REFERENCES

This is UNEVALUATED Information

THE SOURCE EVALUATIONS IN THIS REPORT ARE DEFINITIVE.
THE APPRAISAL OF CONTENT IS TENTATIVE.
(FOR KEY SEE REVERSE)

1. The Frunze Plant at Gorkiy was subordinate directly to the Ministry for Communications Equipment Industry under Minister Alekseyev and had some offices at this ministry. During a visit to Moscow in May 1947, Graduate Engineer Ernst Ziganke met a member of the Frunze Plant management in one of these offices. 25X1

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2. The Frunze Plant was established in about 1937 when it branched off as an indepedent plant from the Lenin Plant (for layout sketch of two plants, see page 16). As a former Siemens enterprise founded under the Tsar, the Frunze Plant was still sometimes referred to as the Siemens Plant by the local population. In 1941, the most important and valuable installations of the Frunze Plant were evacuated to a factory in Novosibirsk which was still engaged in quantity production of radio equipment after the war. Valuable machinery lost during the evacuation was not replaced. While the buildings of the Frunze Plant suffered only broken windows, minor parts of the Lenin Plant were destroyed during the war. A small group of German engineers who worked in the Lenin Plant but were taken care of by the Frunze Plant, represented the only connection between the two plants.

3. On 31 October 1946, about 90 Germans or 28 or 29 families from the Berlin OSW arrived at Gorkiy and were billeted in Kstovo Sanatorium (see sketch page 14). Except for a small group attached to the Lenin Plant, the German engineers worked in six laboratories of the Frunze Plant which were subordinate to the design department under Chief Engineer Rassadin or the design office under

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(Note: Washington Distribution Indicated By "X"; Field Distribution By "#".)

Engineer Kagan (for organization and personnel, see page 7). Before the end of 1949, when they were gradually separated from Soviet personnel and a new German work group was set up, the German engineers worked together with the Soviets on development projects and production problems. Although the reorganization became official on 1 January 1950, the new German work group designated NII 11 was not initiated before summer 1950. The German engineers continued working in their former laboratories even after the reorganization. Contact between the Germans and Soviet civilians, such as during Russian lessons, was no longer allowed.

4. The major project worked on by the Germans before and after the reorganization was the development of a range finder initiated at Laboratory 2 in December 1946. This range finder was to be designed with a maximum of 50 individual airborne sets to determine their range position in relation to a stationary ground set. The desired measuring was to incorporate two ranges, one of up to 7.5 kilometers and the other one of up to 30 kilometers. The Soviets requested that the figures obtained be indicated on a standard gauge rather than on a Braun tube. Although the German engineers pointed out the difficulties connected with this deviation from the system familiar to them and emphasized that standard gauges could not be used for this type of device, the Soviets insisted upon their request and showed a sketch, allegedly of Australian origin, representing a similar unit equipped with gauge.

5. The range finder operated on the 30-cm wave. Its airborne units were equipped with a 6J6-type transmitter tube producing impulses with a duration of one microsecond at a frequency of 500 cycles, to be reflected by the ground station as rectangular impulses of one microsecond impulse duration produced by several mercury vapor tubes. Overlap regulation of the impulses was effected by blocking the receiver one microsecond after the response (reaction) to an impulse for another microsecond period. The ground unit was equipped with a computer giving the number of airborne stations in operation at a time. The ground station identified itself by emitting twin impulses at selective intervals of 2.4 or 6 microseconds. The airborne unit indicated the distance to the ground unit in ranges up to 7.5 kilometers and up to 30 kilometers. In order to simplify flying on a circle around the ground station, it was planned to install an additional instrument indicating deviations from any chosen distance, which would make it possible for many aircraft to fly in circles around the ground station at various altitudes and ranges. [redacted] 25X1
[redacted] the airborne unit at Laboratory 2 and stated that it was a 25X1
cubic device measuring about 30 by 30 by 30 cm.

6. In late 1948, the ground unit was installed for testing purposes in a temporary building located at the border of a small airfield south of the Frunze Plant. A plant-owned aircraft and a pilot to test the airborne set were available at the plant when the German engineers arrived in late 1946. After completion of the testing program, which revealed that only minor modifications were required, an experimental series of ten units was constructed by Soviet technical candidates in a northern part of the Frunze Plant. The series was completed in summer and early fall 1950. Mass production was scheduled to start at another plant in the USSR. Since no priority was attached to this project before the end of 1949 when the activities were accelerated, a comparatively long period was required to complete this project. The designing work was also hampered by red tape in the higher offices of the ministry. No supply difficulties were noticed, however.

7. The development of various equipment for testing the range finder had started in 1948; the first testing device was constructed between early 1950 and fall 1950. In fall 1950 [redacted] Laboratory 4, was ordered to design 25X1
and construct an impulse transmitter within two weeks. The set was to produce twin impulses of one-microsecond duration at intervals of 2.4 and 6 microseconds. Graduate Engineer Ziganke was ordered to construct an impulse generator adjustable for individual (single) pulses of durations between one and fifty microseconds. Another laboratory was requested to develop a unit to reproduce impulses originally produced by the fifty airborne sets. The last-mentioned project was too complicated, however, and could not be finished. Shortly before the range finder was completed, the Soviets demanded that morse code be utilized. This request could not be fulfilled because of the lack of time.

8. The antenna was composed of a rod incorporating a coaxial cable with a horizontal disk with another vertical rod eight to ten cm long on top. [redacted] 25X1
[redacted] a truckload of transparent plastic cylindrical casings, about 1.2 25X1
meters long and 25 cm in diameter, which had a hemispherical top and believed that these casings might have fitted this specific antenna.

9. Prof. Isidor Bershteyn frequently visited the plant and showed great interest in the project. A Soviet technical candidate who had worked for him before 1950 stated that Bershteyn worked on the same set but used a different system.

10. In 1947, Engineer Pokrovskiy (fnu) showed [redacted] an American impulse altimeter. 25X1
[redacted] a set obtained from a dismantled aircraft at 25X1
the Siemens Plant and had had to analyze it for the Reichsluftfahrtministerium. [redacted] The Soviets 25X1
later requested the reproduction of the set. The Braun tube which was installed was produced in the USSR. Blueprints, unit descriptions, and operational manuals were prepared by the Germans and submitted to the secret laboratory in early 1950.

11. Other activities within the field of measuring devices included the development of various tube voltmeters, output meters, voltage dividers, and slotted lines.

a. A VKS-7-type tube voltmeter to measure voltages from five to ten volts at a frequency range of 20 cycles to 50 megacycles was developed and produced at the plant. The set included a voltage divider for 15,000 volts maximum as auxiliary equipment. The tube voltmeter was standard equipment for sale to factories and on the market. Up to 100 units per day were produced in one of the workshops in the northern portion of the plant, depending on the work orders received. [redacted] 25X1
[redacted] 25X1

b. In late 1946, the development of a VIK-type impulse voltmeter began. The set was equipped with one diode each for positive and negative impulses at frequencies ranging from 100 cycles to 10 kilocycles and impulse durations from 1/10 to 100 microseconds and voltages between 10 and 50 kv. Although it did not provide an exact measurement of impulse durations of 1/10 microsecond, the unit was accepted by the Soviets because the figures obtained were identical with the figures indicated by an electric voltmeter. In 1947, the capacity voltage dividers showed disruptions of the porcelain insulators which, in 1950, could have been eliminated by a German engineer.

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c. The Soviets ordered the development of a standard tube voltmeter for 20 to 700 megacycles AC and for DC. The units constructed on this order included one tube voltmeter for DC and AC from 20 to 100 megacycles and one set for 1 to 700 megacycles. The tube voltmeter was equipped with an SA-102-type diode and was designed without voltage divider for voltages up to 100 volts, with the smallest measuring range being about one volt. [redacted] an American-manufactured SA-102 diode and the former German-produced diodes of this type had a resonance frequency of about ten cm. 25X1

d. The Lotos-type slotted line of the Telefunken firm, about one meter long, was converted from 70 ohms to Soviet standard requiring a characteristic impedance of 75 ohms for wave lengths above 30 cm and of 50 ohms at wave lengths below 30 cm. Until early 1953, the East German radio industry was still using the 70 ohms standards. Kuryachev stated that a direct connection of the inner conductor with the anode of the measuring diode would not be efficient and suggested that it be capacitively coupled to make possible that a tabular conductor could also be used for measuring. [redacted] Kuryachev's statement that it was anticipated to work with tabular conductors. By the end of 1950, the designing work on the slotted line was not yet completed. 25X1

e. Problems arising during the development and production of oscillographs were discussed with German engineers. The types developed were similar to the models published in US and Canadian magazines. Until 1950, American measuring devices, especially oscillographs, were continuously received at the institute.

f.. By late 1950, the improvement of the Soviet-developed heterodyne warblers, which easily burned through, had failed. The production of heterodyne warblers for frequencies up to 20 kilocycles and voltages up to about 50 volts had started in about mid-1947 in a workshop in the northern part of the plant. These products were available on the market and a large number of them were used in the plant.

g. An overtone measuring device was developed by Soviet engineers to measure non-linear harmonic distortion coefficients. Since the set did not meet requirements, a substitute was brought from the US and it was planned to put this set into production. Measuring instruments developed by Soviet engineers without German assistance also included the ohmmeter of Engineer Arfanov (fnu).

h. [redacted] Soviet-designed thermistor (sic) output measuring device, designed for a measuring range of 100 milliwatts to ten milliwatts, which could be extended to one watt by means of a potentiometer (voltage divider). The set was calibrated for the 30-cm to one-meter wave band and had been planned for wave lengths up to 2.3 meters. The units delivered were lead sealed and had to be exchanged at the plant in case of failures. The balancing of the bridge was effected by high frequency power of 100 kc or one megacycle, rather than by direct current. Bauer and Baier of Laboratory 1 tried to replace the thermistors by layer resistances. 25X1

i. Hasselbeck developed field strength measuring sets. After the set was completed, a field strength meter which had been ordered from the US caused disappointment at the institute because it was much smaller than the instrument constructed there. Further activities at the institute included the development of measuring sets for spark gaps and the production of various single parts most of which were developed in the ceramic laboratory and were being produced at the plant.

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12. The three or four rooms of the secret laboratory under Skibarko were off limits to all German personnel. This laboratory was constantly guarded by an armed female sentry. Graduate Engineer Volkmar concluded from a technical question asked by this laboratory that an airborne firing device was developed there. Other rumors indicate that a proximity fuse was involved.

13. The development projects to be handled by the German engineers were first briefly discussed between the Soviet management and the individual German experts before the detailed work order was prepared by the chief engineer. The development of the range finder was based on detailed descriptions with sketches published in a technical magazine from Australia or New Zealand. The Soviet key personnel felt that, since the problem had already been solved in that magazine, no risk was involved in having the German group begin the required development and construction activities. For requests from some other institute, work orders were precisely formulated. Occasionally, the German engineers asked for Soviet approval of a research project based on their own current activities.

14.. The daily activities of the German engineers were supervised by the Soviet laboratory chief, who checked the work books containing each note, calculation, draft, etc. The pages of these books were consecutively numbered and it was forbidden to tear pages out. Although it was not allowed to use unbound sheets, the German engineers used to buy them in town and frequently used them. The supervising Soviet engineer occasionally entered some questions and directive notes in the work books which had to be followed or answered. Since diffent books were being used while the work books were being checked, notes were distributed over various books, which made it difficult to follow the directions. Drafting paper was issued in numbered sheets which had to be turned in with the script books and sketches the moment a project was finished and the final study had been dictated in the German language. A captured German teletype set, which made it possible to give orders simultaneously from a central station to various receiver stations, was never used.

15. The production of an instrument developed at NII 11 consisted of a first experimental series of two to ten units constructed by the design department and a second experimental series of 5 to 50 units, depending on the type of instrument, constructed by the production department. The second experimental series was constructed by Soviets only, who used the German designs. Occasionally, units produced in the first and second experimental series were sent to a customer, e.g., the range-finder series was submitted to the Ministry for Communications Equipment Industry, from which it was forwarded to the Ministry for Aviation Industry for further examination. [redacted] the latter's examination in requests received from that ministry in late 1950. 25X1

16. After 1947, the supply of the most important tubes for transmitters and receivers was generally adequate. The tubes came from the Fryazino tube plant and Berlin OSW. Large stocks of American tubes were apparently still available for use in the range finder. By late 1947 or early 1948, the original American tubes with English inscriptions had all been used. The same type of tubes were produced by the Moscow tube plant and Berlin OSW and were received and used only in Laboratory 4 -- no priority had been given to the radar set being developed there. The tubes still had English inscriptions and American-type designations. After late 1948 or early 1949, the tubes had Russian inscriptions. All types of tubes received from Berlin OSW were inadequate in exact specifications, quality of material, and endurance.

17. Equipment received from plants in East Germany included a wattmeter for light bulbs from the OSW, which could not be used because of repeated errors; good-quality output meters for centimeter instruments from the Erfurt Telefunken; slotted lines of a badly shielded type and of fair quality from the Radeberg Sachsenwerk, which did not fully meet requirements; and first-class frequency generators and impulse voltmeters. 25X1

18. In 1949, about 25 candidates, including about eight women, arrived at the Frunze Plant from Gorkiy State University. About 20 of these candidates were assigned to various German and Soviet laboratories of NII 11 for practical training on calculations, while the remainder of the candidates were assigned to the workshops. It was planned that, in fall 1950, these candidates be transferred to the Novosibirsk Plant. However, in fall 1950, it was decided that the candidates could remain in Gorkiy. Their practical training was completed with a fairly difficult examination at that time in the field of instrument design and development.

19. At the plant, the number of practical trainees was high. About 33 percent of them were women. The trainees had previously worked in entirely different fields. Among the trainees was a very intelligent 23-year-old biology student who was assigned work in the high-frequency field. She stated that there was no longer any demand for biological experts. [redacted] these young trainees were qualified for development and design work only in a very limited technical field as they lacked a general education and knowledge of related technical fields. This often caused misunderstandings and hampered their development. 25X1

20. The Frunze Plant was guarded by sentries with submachine guns who patrolled the plant area at regular intervals. Some were women. Extra guards were posted at either entrance to the institute building (see point 7 on layout sketch, page 16), at the plant management building (see point 11, same sketch), and, even when no equipment was there, at the temporary building housing the testing equipment for the radar (see point 10, same sketch). Sentries were also posted at each stair landing of the institute building and in front of each office of leading Soviet personnel. No dog kennel was observed.

21. All Germans were issued gate passes giving the bearer's name, photograph, and laboratory or office of employment. These gate passes were handed to the Germans in one of Personnel Director Zuyev's offices in the guardhouse. Gate passes and all work records had to be turned in when the bearer left the plant. Additional certificates listing the building were required for the German engineers to enter other buildings in their work. No written or printed work records were to remain in the laboratories in their absence.

22. The southern side of the plant area bordering the airfield, the western side along the road, and the northern side between the heating plant and the bunker were enclosed by a barbed wire fence, about two meters high. It was unknown whether this fence also extended along the eastern border of the plant area. A fire department was available. Air raid precautionary measures were not observed.

23. In November 1946, a transmitter station was in operation in the vicinity of the streetcar park at the kremlin in Gorkiy. In 1948 or 1949, the scaffold for a transmitter was erected on top of the new post office building. An ultra short-wave antenna, about two meters high, could clearly be determined on the building from 1 May Square. Soviets stated that this equipment belonged to a television transmitter station (see location sketch on page 15).

24. The airfield located south of the plant was seldom used. Aircraft stationed there included the aircraft owned by the Frunze Plant and used for experiments with radar equipment and three twin-engine monoplanes which were seldom flown. According to the Soviets, the latter were used as ambulance planes for the population in remote areas. The aircraft were parked in two small hangars.

Table of Organization and Personnel at Frunze Plant

1. The following is the organizational setup and list of personnel of the Frunze plant between late 1946 and mid-1949, when the design department started to be split up into one group for development activities and the other group for supervising the production. [redacted] changes in the personnel assignments might have taken place between mid-1948 and late 1949. 25X1

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[redacted]

Next 1 Page(s) In Document Denied

Legend to Layout Sketch of Frunze and Lenin Plants (page 16)

Frunze Plant

1 NII 11, 12-14 by 70 by 20 meters, a brick building with flat tarred roof. (For details, see sketch of offices on page 13.)

2 Guardhouse and check point for German and Soviet pedestrians.

3 Temporary construction office, a former guardhouse.

4 Garages.

5 Approximate location of heating plant.

6. Forgery, a brick building.

7 Frame tool shops (2).

8 Half-buried concrete tank with aircraft fuel.

9 New building, still not completed, front part 40 meters long, wings 50 meters long and 15 meters wide. Construction took place from 1949, when the second floor was completed, to spring 1950.

10 Temporary building housing the ground set of the range finder.

11 New three-story brick building with flat roof. The two wings, 40 meters long, were completed in late fall 1947. The curved middle part, 25 meters long, was started in 1948 and completed in 1950. Part (a) of the ground floor housed Engineer Kagan's office. Plant director Gusev's office was on the second floor.

12 Approximate location of various workshops.

Lenin Plant (Exact location and dimensions of the buildings were not known.)

13 Workshops with design office, an old building.

14 Brick building, probably main plant building.

15 Partly destroyed workshop.

16 Mess hall, etc.

17 Unidentified plant buildings, brick structures.

18 Unidentified plant building, a brick structure.

Other Landmarks

19 Hospital, a prominent new building.

20 Administrative office of a Gorkiy rayon; also houses State prosecuter's office.

21 House of Rest and Culture, a prominent building.

22 Northern border of airfield.

23 Gorkiy-Myza.

24 Terminal of a streetcar line.

Legend for Sketch of NII 11 Offices (by room number)

Ground Floor

001 Wooden annex, with exhaust fan of carpenters shop.
002 Carpenters shop, with model store.
003 Ceramic laboratory.
004 " "
005 Branch offices of the experimental workshop.
006 " " " " " "
007 " " " " " "
008 " " " " " "
009 " " " " " "
010 " " " " " "
011 Bookkeeping department.
012 First-aid room.
013 Pay office.
014 Chief Party functionary Petrov's office.
015 Offices of Malyshev.
016 " " "

Second Floor

101 Drafting room.
102 Draftmen's offices of the design department.
103 " " " " " "
104 Standardizing office, registration office for sketches, etc.
105 Kuryachev's office, mostly occupied by his deputy Kagan.
106 Probabaly an office.
107 High-voltage room.
108 Chief Pokrovskiy's office, Laboratory 2.
109 Chief Loshchilov's office, Laboratory 4.
110 Part of Laboratory 2.
111 Part of Laboratory 4.
112 Measuring and calculating room.
113 Chief Zuyev's office, Department 1.
114 Storage room for measuring equipment.
115 Chief Afranov's office, Laboratory 3.
116 Probably part of Laboratory 3.
117 Chief Lebedev's office, Laboratory 6.
118 Chief Selimanovskiy's office, Laboratory 1.
119 Personnel registration office; lists persons on duty.
120 Conference rooms.
121 " "
122 Antechamber of Director Gorshkov's office.
123 Gorshkov's office.
124 Secret laboratories.
125 " "

Third Floor

201 Archive for sketches, etc.
202 Archive for instrument descriptions, etc.
203 Photographer's shop for pass photos, etc.
204 Chemical laboratories.
205 " "
206 Libraries and archives for drafts.
207 " " " " "
208 Vacuum laboratory.

The basement housed a small fitting shop and a room with electric machines. Air raid precautionary equipment, such as gas locks, was not observed. The institute was heated by the heating plant of the Frunze Plant.

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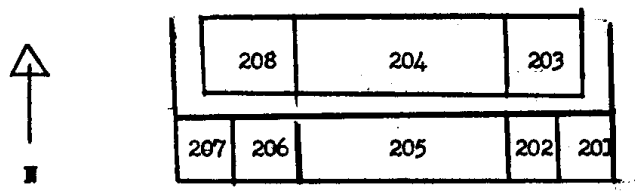
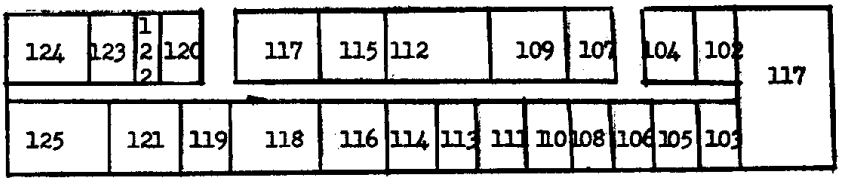
Offices of NII 11

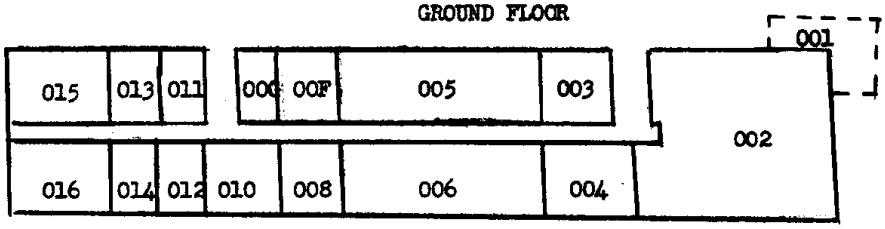
FIRST FLOOR



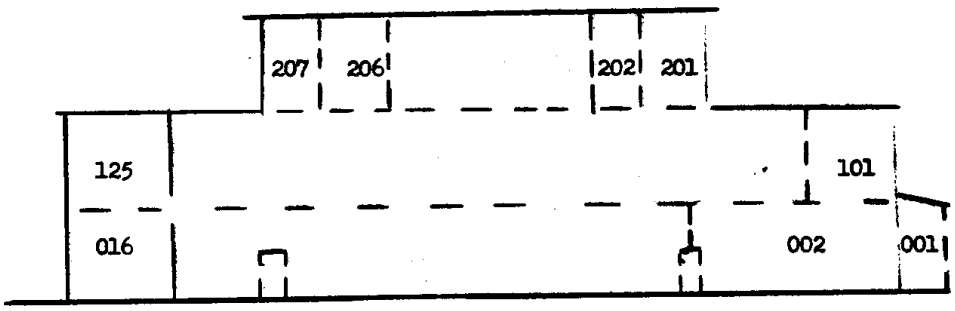
SECOND FLOOR



GROUND FLOOR



CROSS SECTION



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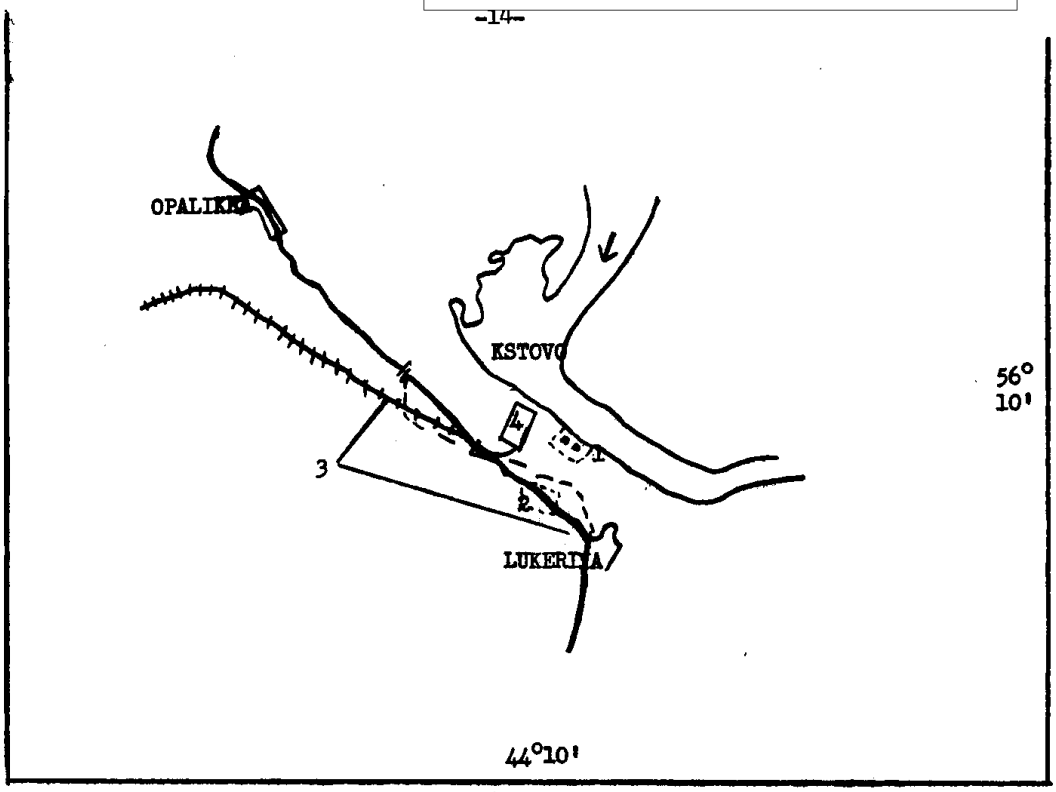


LOCATION SKETCH OF KSTOVO SANATORIUM

LEGEND

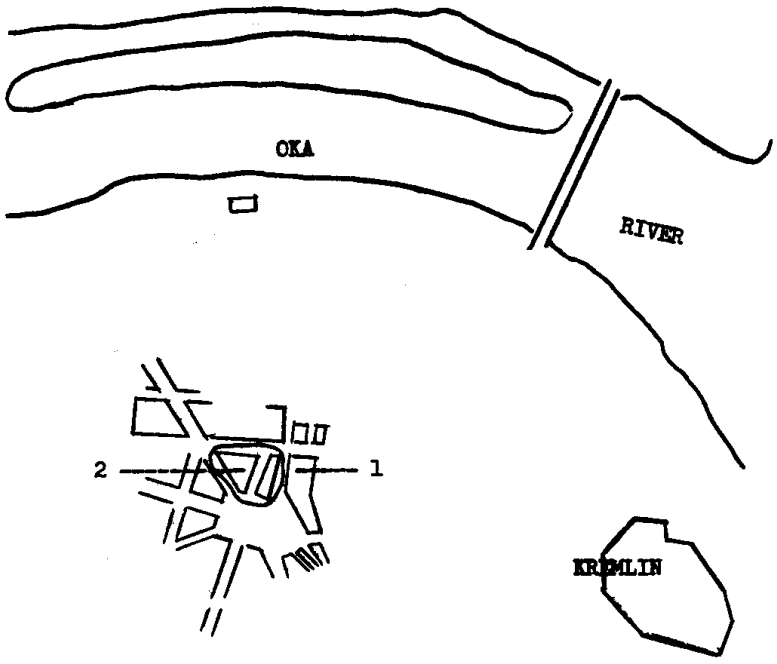
1 - Kstovo Sanatorium, billets of German experts.

2 - Unknown object.

3 - New route of asphalt road, repaired in 1948.

4 - Extensive storage installations with railroad connection, three loading ramps, and cranes. A translator stated that large quantities of grain had been destroyed here by fire.

Scale 1: 1,000,000



LEGEND

1 - Transmitter on the roof of the post office building.

2 - Dismantled buildings.

Scale - 1: 1,000

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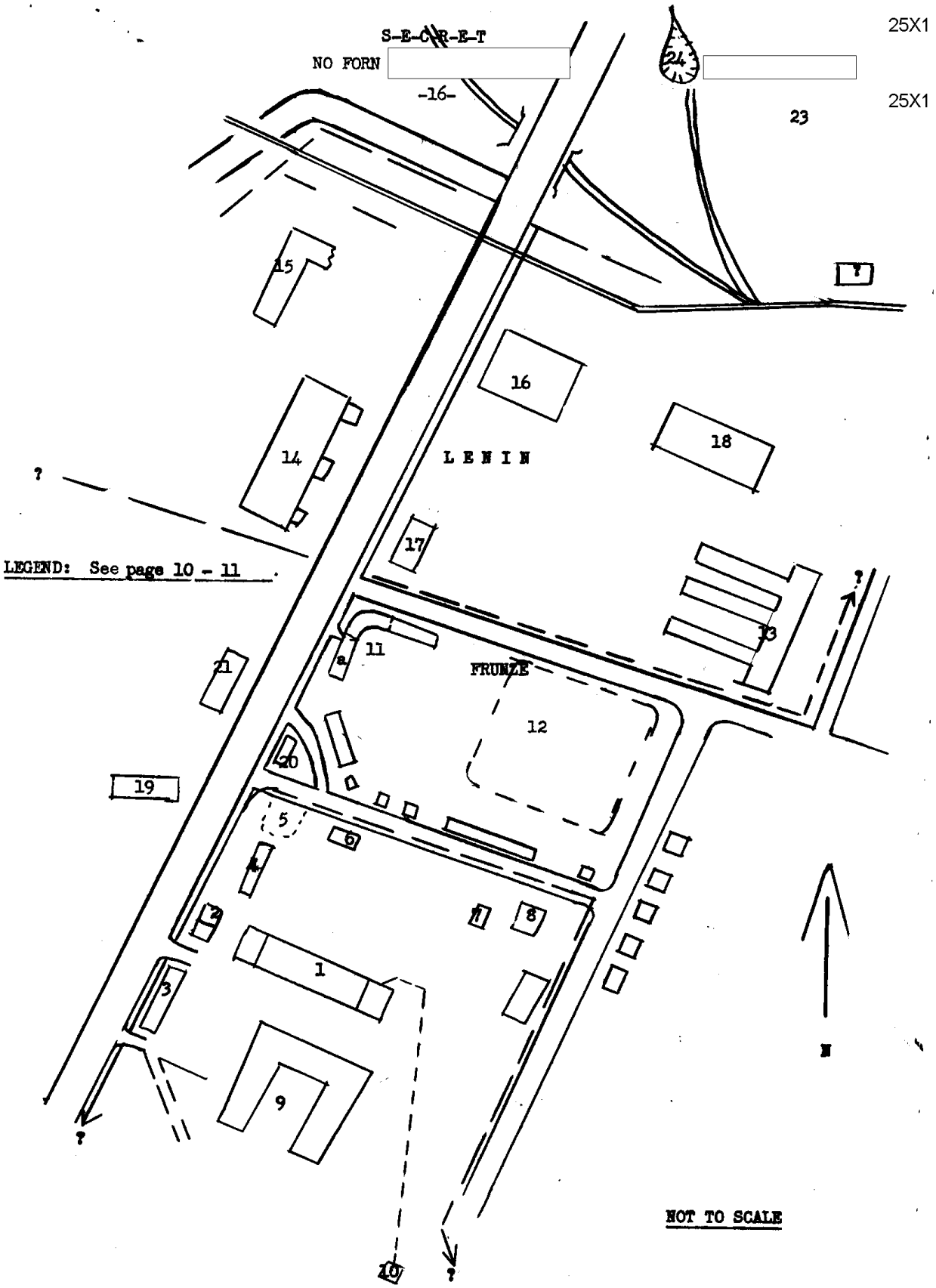

LAYOUT SKETCH OF FRUNZE AND LENIN PLANTS

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