

CENTRAL INTELLIGENCE AGENCY

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High and Highest Frequency Research at
Heinrich Hertz Institute

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THIS IS UNEVALUATED INFORMATION

1. Two departments of the Heinrich-Hertz-Institute for Oscillation Research, Berlin-Adlershof, 1/ are engaged in high-frequency and highest frequency research:

- a) department II, High-Frequency Technology and Wave Propagation, headed by Prof. Richard Schachenmeier;
- b) department III, Highest Frequency Technology, headed by Dr. Helmut Jung.

2. Department II is engaged in high-frequency technology only in so far as it is required to carry out research projects assigned to it. The department constructs the high-frequency equipment needed for its research; it does not engage in research on high-frequency problems as such. The main assignment of the department is the study of wave propagation and related problems.

- a) Study of ultra-short-wave propagation in the one to ten meter range: During the past months, the department has worked on a project calling for the establishment of a measurement installation (Messtrecke) for the study of the propagation of ultra-short waves in the above-mentioned range and its dependency on atmospheric conditions. The measurement line will lead from the Heinrich-Hertz-Institute via Lindenberg to a place between Guben and Beeskow. The receiving end has not been selected definitely, but will be situated between these two places. The line will traverse the Lindenberg area because the Lindenberg Meteorological Institute will provide the Heinrich-Hertz-Institute with data on temperature, humidity and pressure gradients. These data, needed for the study of the influence of atmospheric conditions on the propagation of ultra-short waves, are obtained by the Lindenberg Institute by balloon ascents. 2/ Department II has completed the construction of a transmitter and a receiver for this purpose. The transmitter has a power of 200 watts; it will operate in the four

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25X1 1/ [] Comment. An institute of the German Academy of Sciences. It is headed by Prof. Otto Hachenberg.

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25X1 3/ [] Comment. With the exception of this co-operation, there is no connection between the Heinrich-Hertz-Institute and the Lindenberg Institute.

25X1 4/ [] Comment. So far, the East German Postal Service has not released any other wave length for the Heinrich-Hertz transmissions.

25X1 []
25X1 6/ [] Comment. The East German Post has several telecommunication lines in operation, among them lines to Moscow, Peking and Bucharest.

25X1 7/ [] Comment. Director Prof. Walter Grotrian.

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meter range. ^{4/} It is expected that the line will be operating at the end of June 1953 at the latest.

- b) Ionosphere study: department II has completed construction of an ionosphere transmitter which was begun about a year ago. ^{5/} The instrument has an impulse power of ten kW; it operates in the 4 MHz range. The study is concerned with the measurement of wave reflections upon the E-layer through determination of the echo transmission time and the returning field strength; furthermore with the determination of the absorption occurring twice when the waves pass through the E-layer on their way to and return from the E-layer. The department has been engaged in the theoretical aspects of this study for more than a year, but actual transmissions with the ionosphere transmitter on a regular basis were begun about two months ago. The transmitter is now operating with a provisional antenna; an improved antenna allowing more accurate measurements is under development. The practical aim of this study is to accumulate data for the Postal Service. The department now collects data on a daily basis, computes monthly and yearly averages, and acts as a consulting service for the Post. ^{6/} It is the duty of the department to inform the Post about the most favorable frequencies to be used in telecommunications. The ionosphere transmitter is scheduled to be ultimately located in Neustrelitz where the Heinrich-Hertz-Institute has a branch office (Aussenstelle); the date of its transfer there is not yet definitely set.
- c) The Neustrelitz Aussenstelle has a crew of six technicians who are engaged on a permanent basis in receiving transmissions from the four standard transmitters (5, 10, 15 and 20 MHz) of the US Bureau of Standards. Twenty-four hours a day, the arriving field strength of each of the US transmitters is measured every two hours.
- d) In connection with its consulting service for the Postal authorities on ultra-short-wave telecommunications, the department has taken up solar observation, mainly the observation of solar protuberances, and solar radio-astronomy. In May 1953, the department will have completed the construction of a telescope with a mirror diameter of 8 meters. Work on solar observation and on solar radio-astronomy is performed in co-operation with the Academy Observatory in Potsdam-Babelsberg ^{7/}; the two institutes keep each other informed on the results obtained, and the personnel concerned convene in regular meetings to discuss results. Department II is now engaged in a study of the Moeguel-Dellinger effect (hammering or annihilation of telecommunication through **overly heavy ionization caused by overly strong solar radiation**) and of the emission of radio waves by the sun (solar noise) and their influence on predictions for ultra-short-wave telecommunication.

3. Department III is engaged in:

- a) Molecular spectroscopy in the twenty to one cm range. The work in progress aims at the spectroscopy of large organic molecules, but it is in its very initial stage. No organic molecule has been investigated yet. Dr. H. Jung and Dipl. Ing. Siebert Koepp are now engaged in studies of the nitrogen molecule on the basis of papers published in the USA.
- b) As a sideline, this department is also engaged in energy measurement in the cm range according to the ponderomotoric method; also in the study of crystal diode detectors. No results not known to experts in these fields have been obtained.

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