

CLASSIFICATION S-E-C-R-E-T

CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

REPORT

CD NO.

25X1

DATE DISTR. 15 August 1955

NO. OF PAGES 3

COUNTRY East Germany

SUBJECT Radar and Antenna Development at VEB Funkwerk Koepenick

NO. OF ENCLS. (LISTED BELOW)

25X1

PLACE ACQUIRED

DATE OF

SUPPLEMENT TO REPORT NO.

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THIS IS UNEVALUATED INFORMATION

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1. Development and construction of ~~an antenna with a length of 3.2 centimeter wavelength~~ (Schutzgeraet) on the 3.2 centimeter wavelength in VEB Funkwerk Koepenick started in January 1952. The development work was carried out by Department TEA which, in May 1955, was headed by Dipl. Ing. Scheill (fnu). At this time, the following persons worked on the completion of the development:

- Dipl. Ing. Hasse (fnu)
- Ing. Simmich (fnu)
- Ing. Lingenfelder (fnu)
- Ing. Arndt (fnu)
- Ing. Scheuer (fnu)

The completion date set for the development work was the last quarter of 1954; this date was met insofar as the development of the device was concerned. Testing of the device and construction of models, however, took longer than originally planned. At present, two models are under construction in Department TEA. By late May 1955, these two models were completed except for their sight devices. The final completion date for the two models was 1 June 1955 and tests were planned for late June 1955. One model is supposed to be tested near the island of Ruegen; the second model will be tested after having been mounted on a fast Sea Police boat. Engineers Scheuer, Simmich and Lingenfelder have been selected to be present during the final tests of the models. It was originally planned to further develop the radar device in 1955 after the results of these final tests are known. This plan of further development, however, was cancelled in May 1955 by order of the Ministry of the Interior because, after the defection of [redacted] (formerly in charge of the development) and a number of [redacted] there are not enough skilled technicians for further [redacted] to completing the two models mentioned, the personnel now engaged in the development and construction of the device are mainly engaged in completing the documentation of the device.

Chief contributor

2. The first laboratory sample of the device was tested several times in 1954. This sample was equipped with a parabolic mirror antenna with horn feed. This was the first type of antenna developed for the device. The following qualifications were required for this antenna:

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ARMY Ev	<input checked="" type="checkbox"/>	AIR	<input checked="" type="checkbox"/>	FBI							

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- a. Horizontal: Plus/minus 0.7 degrees
- b. Vertical: Plus/minus 5 degrees

Anpassung: [redacted]

Nebenzipfel: [redacted]

These specifications were met. However, during a test on September 1954, it turned out that the vertical [redacted] 5 degrees was just sufficient for a 3,000-ton [redacted] during stormy weather but too small for a fast Sea Police boat. The Ministry of the Interior, therefore, instructed the development team to develop a new antenna. On the strength of this instruction which was transmitted to the enterprise by a representative of the Ministry of the Interior named Matthes (fnu)-an official of the Sea Police, development of a new antenna was started. This antenna was of the cheese-box (Tortenschachtel) type, also equipped with a horn feed. Following were its technical specifications:

- a. Horizontal: Plus/minus 1 degree
- b. Vertical: Plus/minus 12 degrees

Anpassung: From the transmitter exit via an antenna rotation link to the antenna: 1.075. Antenna rotation link alone: 1.025.

Nebenzipfel: More than 21 db.

Construction of one model of this antenna type was completed on 16 May 1955. Testing of this model had satisfactory results with the exception that the Nebenzipfel were bigger than required. This was caused through [redacted] of the aluminum sheet used for the antenna, incurred on the occasion of its welding. A second model of this type of antenna is now under construction, in which the welding will be replaced by riveting. Galvanizing of the horn feed of the antenna was carried out by VEB Galvanoplast in Babelsberg. The antenna [redacted] at a rate of [redacted].

- 3. The impulse power required for the radar device was 40 kW; the completed model, however, was only about 35 kW. The impulse width of the completed model was 0.5 micro-seconds. The device has the following three ranges:
 - Range I - 150 meter to 1 nautical mile
 - Range II - 150 meter to 3 nautical miles
 - Range III - 150 meter to 15 nautical miles

- 4. Many difficulties were experienced with equipping the device with klystrons. In the oscillator of the completed device, a klystron type 723 AB was used. This klystron is an imitation of an American type with identical designation. It was constructed in VEB Werk für Hochfrequenztechnik at Berlin/Oberschoeneweide. The first 15 samples of the imitation required klystron power was 10 mW plus [redacted]. Testing of the 15 [redacted] tubes [redacted].

- 3 samples had 13 to 14 mW
- 5 samples had about 10 mW
- 7 samples had 6 to 7 mW

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The seven samples with less than 10 mW were returned as unusable. Klystron difficulties cannot yet be considered as overcome. In the diode mix-stage detector type 1 N 23 was originally used. This American-type detector was replaced in December 1954 by detector type KD 1 which was constructed at VEB Werk fuer Bauelemente der Nachrichtentechnik (former Dralowid) in Teltow. Type KD 1 is an imitation of the American type 1 N 23 and has the same electrical values. The Dralowid imitation detector, however, is not shake-proof (schuettelfest) and the samples so far constructed are not interchangeable because of too great variations in their values. Of 50 imitation detectors delivered by Dralowid in early 1955, only 8 samples could be used for the 3.2 centimeter wave length. Cutting off the antenna from the transmitter or from the receiver is carried out by means of nullodes. The required Durchlass-daempfung² of the diodes was 0.7 db or less at a 3.2 centimeter wave length. In early 1955, VEB Werk fuer ~~Formaldehyde~~ delivered the first 15 samples of nullodes. Their testing at 3.2 centimeters had the following results:

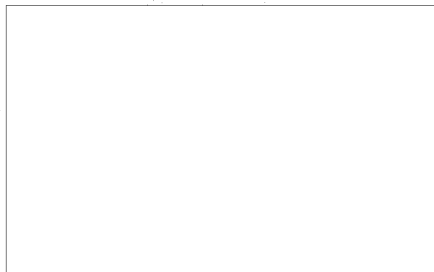
- 4 samples had 0.5 db
- 6 samples had 1 db.
- The remainder had more than 1 db. Those with more than 1 db were returned as unusable.

5. From early 1955 to late May 1955, the two enterprises mentioned, in Oberschoeneweide and Teltow, have tried to improve the accessory devices needed for smooth functioning of the radar device according to specifications. While the originally planned further development of the device in essential respects (i.e. different frequency, reduction of size and weight, etc.) was not considered possible as of May 1955, the Ministry of the Interior has ordered that the following changes of the device be carried out after the testing of the two models now under construction gives satisfactory results:

- a. The near distance range of the device is to be reduced from 150 m to 20 m. This means that the intermediate frequency amplifier presently used (60 MHz frequency; 5 MHz band width; 0.5 micro-seconds impulse width) is to be changed to 60 MHz frequency; 20 MHz band width; and 0.1 micro-seconds impulse width.
- b. In view of the fact that the Oberschoeneweide enterprise will probably not be able to deliver the high quality nullodes required, the antenna is to be of the Doppeltortenschachtel³ type with separate transmitter antenna and receiving antenna.

- 1. [Redacted] Comment: TEA-Te [Redacted] Antenne.
- 2. [Redacted] Comment: Lite [Redacted]
- 3. [Redacted] Comment: Dou [Redacted]

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1. Development and construction of an anticollision radar device (Kollisions-schutzgeraet) on the 3.2 centimeter wave length in VEB Funkwerk Koeppenick started in January 1952. The development work was carried out by Department TEA which, in May 1955, was headed by Dipl. Ing. Schedll (fnu). At this time, the following persons worked on the completion of the development:

- Dipl. Ing. Hasse (fnu)
- Ing. Simmich (fnu)
- Ing. Lingenfelder (fnu)
- Ing. Arndt (fnu)
- Ing. Scheuer (fnu)

The completion date set for the development work was the last quarter of 1954; this date was not insofar as the development of the device was concerned. Testing of the device and construction of models, however, took longer than originally planned. At present, two models are under construction in Department TEA. By late May 1955, these two models were completed except for their sight devices. The final completion date for the two models was 1 June 1955 and tests were planned for late June 1955. One model is supposed to be tested near the island of Ruegen; the second model will be tested after having been mounted on a fast Sea Police boat. Engineers Scheuer, Simmich and Lingenfelder have been selected to be present during the final tests of the models. It was originally planned to further develop the radar device in 1955 after the results of these final tests are known. This plan of further development, however, was cancelled in May 1955 by order of the Ministry of the Interior because after the defection of Ing. R. Manthey (originally in charge of the development) and a number of his chief coworkers, there are not enough skilled technicians for further development. In addition to completing the two models mentioned, the personnel now engaged in the development and construction of the device are mainly engaged in completing the documentation of the device.

2. The first laboratory sample of the device was tested several times in 1954. This sample was equipped with a parabolic mirror antenna with horn feed. This was the first type of antenna developed for the device. The following specifications were adopted for this antenna:

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Halbwertbreite: (half width)

- a. Horizontal: Plus/minus 0.7 degrees
- b. Vertical: Plus/minus 5 degrees

Anpassung: (matching) 1:1Nebenzinfall: (stray of side radiations) 20 db. or more

These specifications were met. However, during a test trip to Riga in September 1954, it turned out that the vertical Halbwertbreite of plus/minus 5 degrees was just sufficient for a 3,000-ton freighter during stormy weather but too small for a fast Sea Police boat. The Ministry of the Interior, therefore, instructed the development team to develop a new antenna. On the strength of this instruction which was transmitted to the enterprise by a representative of the Ministry of the Interior named Matthes (fnu -an official of the Sea Police), development of a new antenna was started. This antenna was of the cheese-box (Tortenschachtel) type, also equipped with a horn feed. Following were its technical specifications:

Halbwertbreite:

- a. Horizontal: Plus/minus 1 degree
- b. Vertical: Plus/minus 12 degrees

Anpassung: From the transmitter exit via an antenna rotation link to the antenna: 1.075. Antenna rotation link alone: 1.025.Nebenzinfall: More than 21 db.

Construction of one model of this antenna type was completed on 16 May 1955. Testing of this model had satisfactory results with the exception that the Nebenzinfall were bigger than required. This was caused through distortion of the aluminum sheet used for the antenna, incurred on the occasion of its welding. A second model of this type of antenna is now under construction, in which the welding will be replaced by riveting. Galvanizing of the horn feed of the antenna was carried out by VEB Galvanoplast in Babelsberg. The antenna rotates at a rate of 20 rpm.

3. The impulse power required for the radar device was 40 kW; the completed model, however, had only about 35 kW. The impulse width of the completed model was 0.5 micro-seconds. The device has the following three ranges:
 - Range I - 150 meter to 1 nautical mile
 - Range II - 150 meter to 3 nautical miles
 - Range III - 150 meter to 15 nautical miles
4. Many difficulties were experienced with equipping the device with klystrons. In the oscillator of the completed device, a klystron type 723 AB was used. This klystron is an imitation of an American type with identical designation. It was constructed in VEB Werk fuer Fernmeldewesen at Berlin/Oberschoeneweide under the supervision of Dr. I. Ladurner. The first 15 samples of the imitation were delivered in March 1955. The required klystron power was 10 mW plus at a wave length of 3.2 centimeters. Testing of the 15 tubes showed:
 - 3 samples had 13 to 14 mW
 - 5 samples had about 10 mW
 - 7 samples had 6 to 7 mW

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The seven samples with less than 10 mW were returned as unusable. Klystron difficulties cannot yet be considered as overcome. In the diode mix-stage detector type 1 N 23 was originally used. This American-type detector was replaced in December 1954 by detector type KD 1 which was constructed at VEB Werk fuer Bauelemente der Nachrichtentechnik (former Dralowid) in Teltow. Type KD 1 is an imitation of the American type 1 N 23 and has the same electrical values. The Dralowid imitation detector, however, is not shake-proof (schuettelfest) and the samples so far constructed are not interchangeable because of too great variations in their values. Of 50 imitation detectors delivered by Dralowid in early 1955, only 8 samples could be used for the 3.2 centimeter wave length. Cutting-off the antenna from the transmitter or from the receiver is carried out by means of nullodes. The required Durchlassdämpfung of the diodes was 0.7 db or less at a 3.2 centimeter wave length. In early 1955, VEB Werk fuer Fernmeldewesen delivered the first 15 samples of nullodes. Their testing at 3.2 centimeters had the following results:




4 samples had 0.5 db or less

6 samples had 1 db.

The remainder had more than 1 db. Those with more than 1 db were returned as unusable.

5. From early 1955 to late May 1955, the two enterprises mentioned, in Oberschoeneweide and Teltow, have tried to improve the accessory devices needed for smooth functioning of the radar device according to specifications. While the originally planned further development of the device in essential respects (i.e. different frequency, reduction of size and weight, etc.) was not considered possible as of May 1955, the Ministry of the Interior has ordered that the following changes of the device be carried out after the testing of the two models now under construction gives satisfactory results:

- a. The near distance range of the device is to be reduced from 150 m to 20 m. This means that the intermediate frequency amplifier presently used (60 MHz frequency; 5 MHz band width; 0.5 micro-seconds impulse width) is to be changed to 60 MHz frequency; 20 MHz band width; and 0.1 micro-seconds impulse width.
- b. In view of the fact that the Oberschoeneweide enterprise will probably not be able to deliver the high quality nullodes required, the antenna is to be of the Doppeltortenachachtel type with separate transmitter antenna and receiving antenna.

1.  Comment: TEA-Technical Development Antennas.
2.  Comment: Literally, pass attenuation.
3.  Comment: Double cheesebox (literally, cakebox) antenna.

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