

Commission for the Inspection
of German Radio Stations Constructed
in this Country.

German Directional Antenna Installation in Kølby, west of Nibe

Visited by War Capt. Bahnsen and Professor Rybner 11/12 1945.

The station is located on a flat field southwest of Kølby. The antenna system extends 200 m in the direction north-south, and a section to the east, in front of the station barracks, including a transformer for supplying the station from the public electrical power grid.

The station and the antenna installation were not finished. Construction probably started shortly after the occupation, but was later abandoned. It is believed that it was intended to be used for transmitting guide beams for navigation by aircraft towards England.

The antenna system consists of a center antenna and, symmetrically positioned north and south of it, two times four antenna rows of 21 antennas each, arranged in circular arc segments of 60° around the center antenna

The antennas consist of vertical metal tubes, mounted on insulators over a grounding screen. Their heights are proportional to their distance from the center antenna, so that their tops appear higher than oneself, when standing at the base of the central antenna. The outermost antenna row has not been erected; only some large concrete foundations were poured, and the antenna tubes, which were split into two halves, lay on the ground.

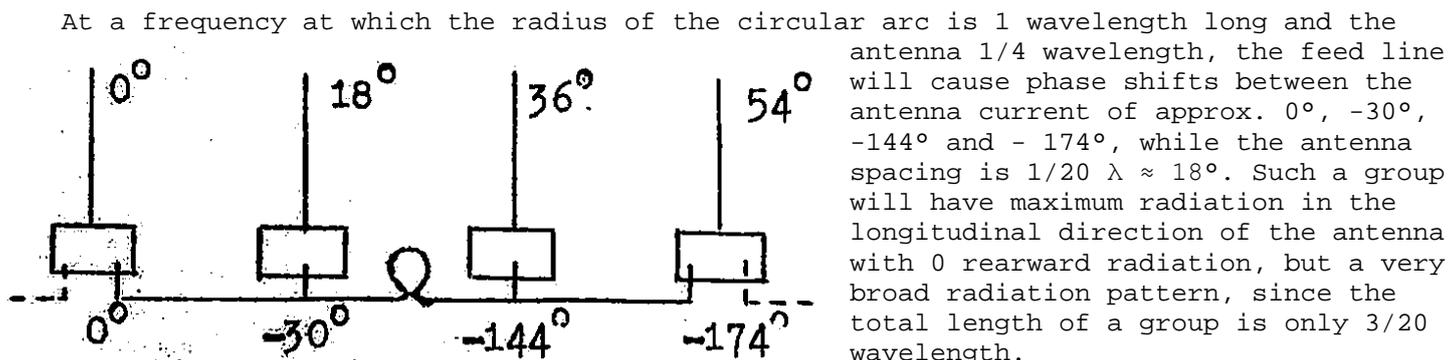
The center antenna consisted of a 12.5 m lower pipe, mounted on three heavy insulators, and supported a 5.0 m upper tube, isolated from the lower tube.

At the foot of each erected mast, except the outermost in each row, stood a distribution box, which led to a power cable, an inlet to the antenna, which had a piece on it, and furthermore a feed cable. Coupling and tuning elements were not fitted. The feed cable guide is shown in the figure for the next to last antenna row; each cable section connected 4 distributors, starting in one box, passing straight to the next where there was a split, and then forming a loop of several turns, then it passed behind the third box with a split to this, and then straight to the fourth box, where a new cable section started.

No feed lines were observed from the center antenna or the cable housing to the antenna rows. However, a cable trench from the transmitter barracks headed in the direction of the center antenna.

A sample of the feed cable was taken and examined. It was a concentric cable [FD: coax] with a massive inner conductor of 4.5 mm in a homogeneous rubbery insulating mass (polyvinyl chloride?) with an outer conductor of copper braid with an inner diameter of 22,5 mm. Capacity was measured at 800 Hz as 81.1 pF per meter, with a dielectric constant of approx. 2.32 and a phase speed 0,657 times the phase speed in air.

At the final antenna row, where the antenna spacing is 293 m, the length of the feed cable between the two middle antennas in each group was 11,5 m.



If two antenna groups of 4 masters, symmetrically positioned around the central antenna, are fed in the same phase, the radiation is reduced to $41,4^\circ$ displacement from the longitudinal direction of the antenna groups, but with strong side "lobes". If the center antenna also participates in the radiation, these side lobes can be reduced, but then the center beam becomes even wider.

Using two or more antenna groups from each antenna row, e.g. 7 or 10 antennas, etc., the radiation pattern becomes narrower, but quite wide for the AN method.

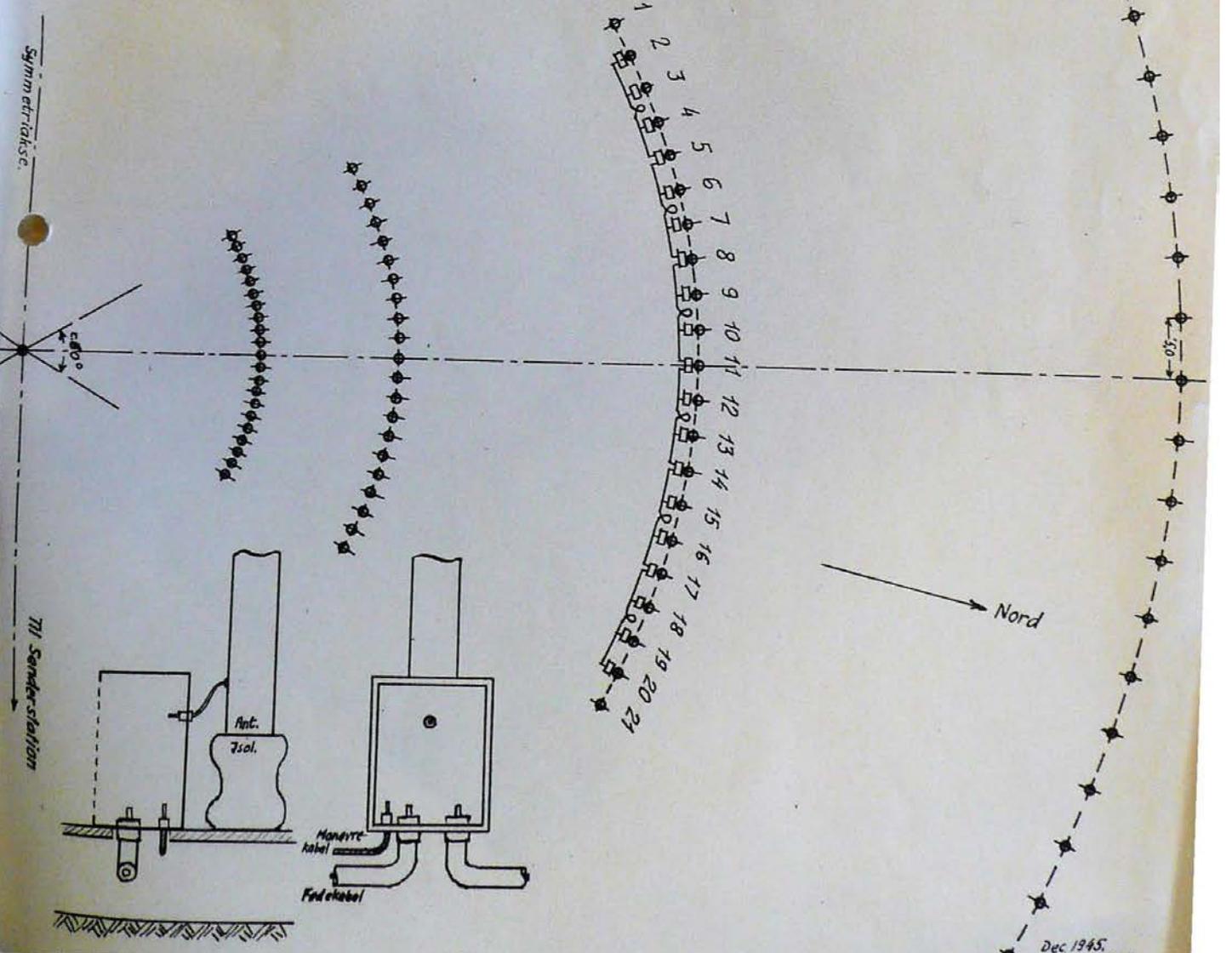
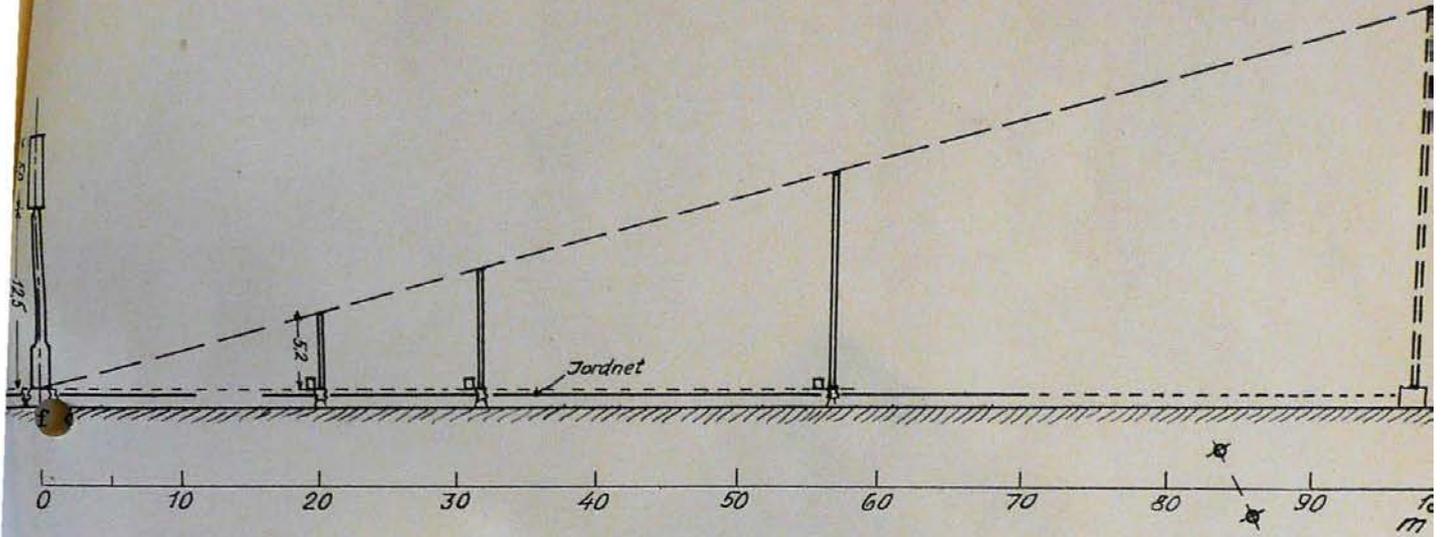
It is, therefore, difficult to guess the antenna's mode of operation. If it is thought that the antenna installation transmitted a rotating guide beam, this stems from the fact that the outer tangents to each of the circular arc sections formed by the antenna rows point towards Northern Scotland and Central England, respectively.

Two officers from the RAF, whom I asked about the facility, knew it well, but did not want to comment on it. They suggested, however, that in England they could deflect the beams sent out by the Germans, so that the bombers flew in the wrong direction; I guess this happened by receiving and re-broadcasting the directional signals.

Jørgen Rybner

Translated from the Danish original on 23 March 2020 by F. Dörenberg ©2020. Correctness of translation is not guaranteed.

Tysk Retningsantenneanlæg
i Kølby Vest for Nibe.



Dec 1945.
 Jørgen Rybner.