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VISIT TO SYLT (4.7.45)

1. Interrogation of Obergefreiter Cova

(1) Wasserman

Wasserman on ~~Sylt~~ is ~~Mark II~~ M.II. Serial No:- 1266. The Wasserman at Römö is a ~~Mark I~~ M I - having a fixed frequency band.

The ~~Mark III and Mark IV~~ M III & M IV are later versions, and he belives give more accurate height finding.

The cylindrical ~~mast~~ mast type is a very early version and is obsolete.

The ~~Mark II is~~ M.II comprises a wide-band system fitted with improved height-finding system, (Wellenshieber), which does not introduce the loss of the original Compensator used in the ~~Mark I~~ M.I.

Frequency coverage of the ~~Sylt one~~ equipment is 119 - 156 Mc/s although they normally work on 152 - 153 Mc/s, only changing from this frequency if jamming is experienced (on their own initiative). Over this frequency range operation appears perfectly satisfactory, although a column showing the normal amplitude of a standard P.E. is added to the columns of dial readings against frequency. (This figure varies from 8 to 42 over the range 120 - 150 Mc/s). This may merely be frequency sensitivity of the P.E. and does probably not indicate, variation of sensitivity of the equipment.

When changing frequency it is merely necessary to reset four controls, (one Tx, one on Rx and two on Simulton), to the readings shown on the table. Markers are fitted to the scales so that 3 or 4 ~~spot~~ frequencies can be selected rapidly without reference to the table. Frequency can be changed within about 1 minute. Change of frequency, results in the necessity for correcting the measured elevation, and a height conversion chart is used to find true heights when operating on different frequencies. Normally a height accuracy of not better than 500 m can be obtained.

Aerial System

The aerial system is of similar size to the Wasserman I and comprises 24 H.P. dipoles high by 8 wide. 3" diameter radiators are used. The array is divided into two halves vertically - fed from an azimuth split motor. The main feeders to the two halves are taken to two "Wellerschicbers" (ganged mechanically).

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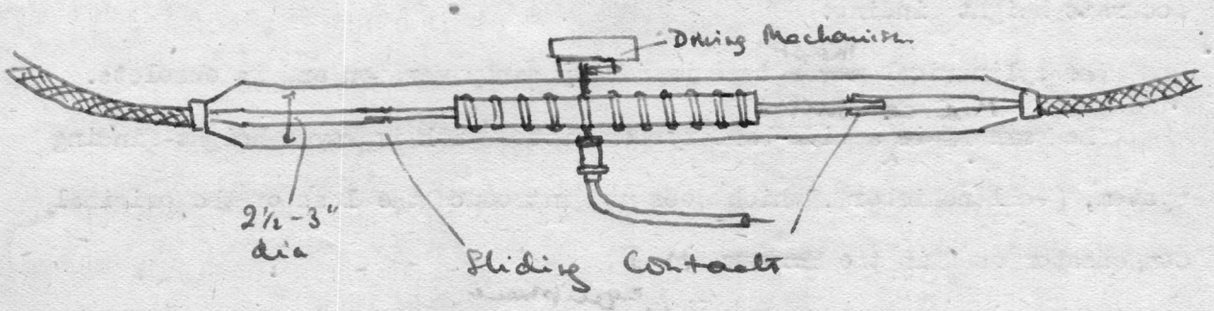
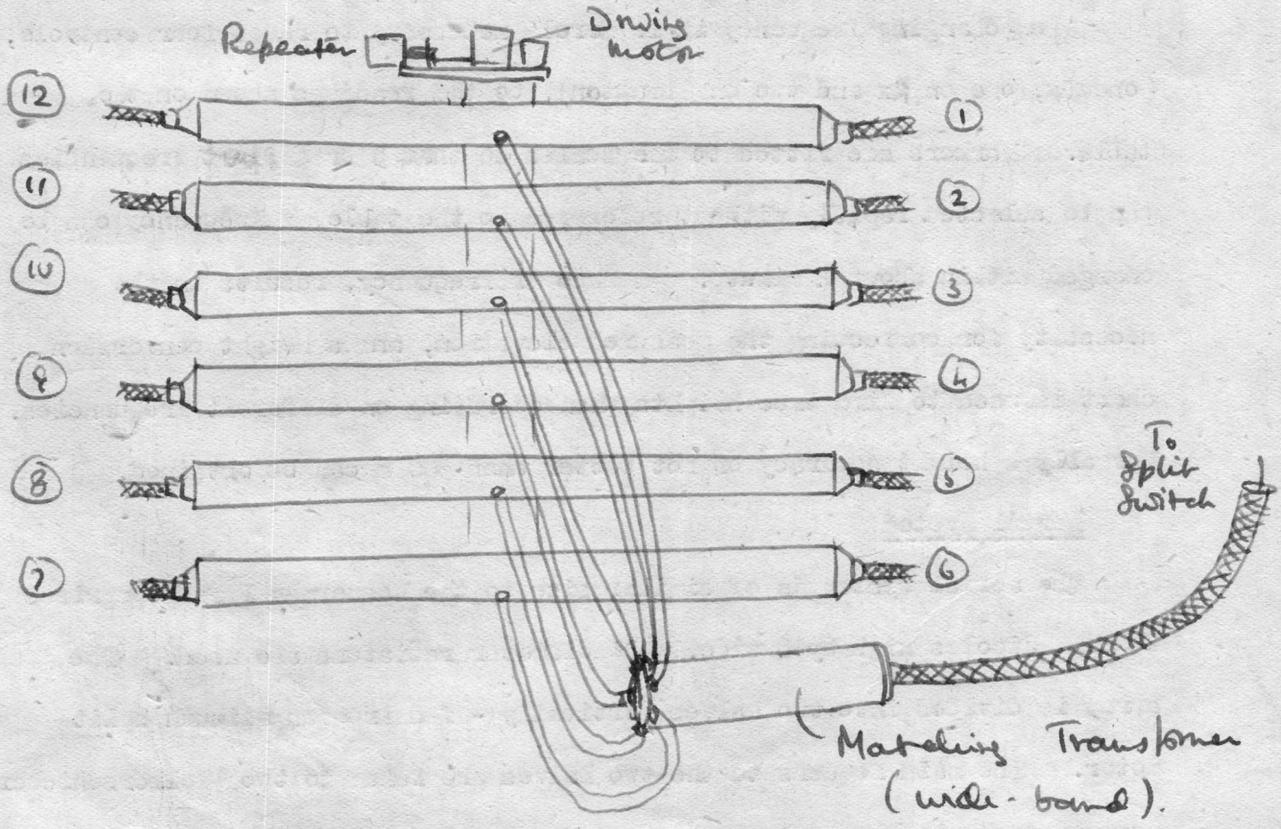
These comprise six phase-shifters consisting of a spiralled conductor mounted on an insulated shaft which can be rotated and screwed along, and connections being made by means of sliding concentric connections to the 70W aerial feeders. The power is fed in via a fixed spring-loaded silver brush at the centre of the main tube. This system has the great advantage that the system can be matched throughout, (i.e. high-impedance phasing line is not used) and thus wide-band operation becomes possible.

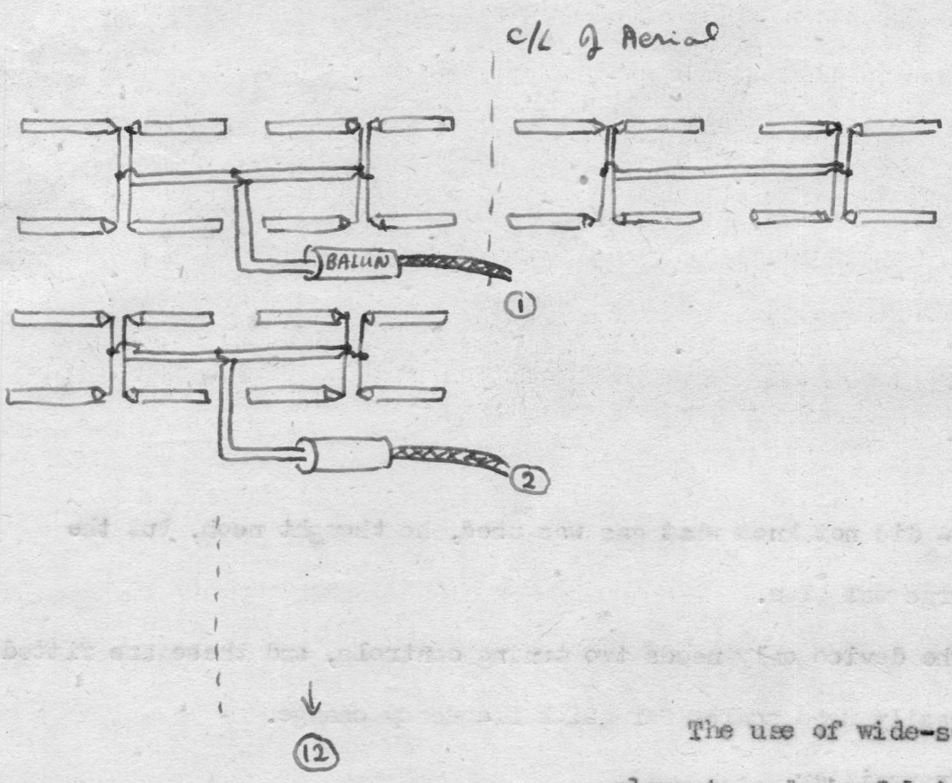


Unlike the Mammut, the phasing is done in only 12 bays (two sets of dipoles being fed in phase), but this should be quite adequate for the small degree of phasing necessary for elevation.

The general arrangement of the Wellerschiebe is shewn below, showing the arrangement of the repeating mechanism which is described later. This, together with the split switch is mounted in the base of the aerial mast, thus involving only one RF connection to the tower (apart from I.F.F.)



Each bank is presumably driven at a progressively slower speed.



The use of wide-sound aerial elements and careful impedance transformation, together with the matched phasing lines, has resulted in a system which requires no adjustment over the range 119 - 156 Mc/s.

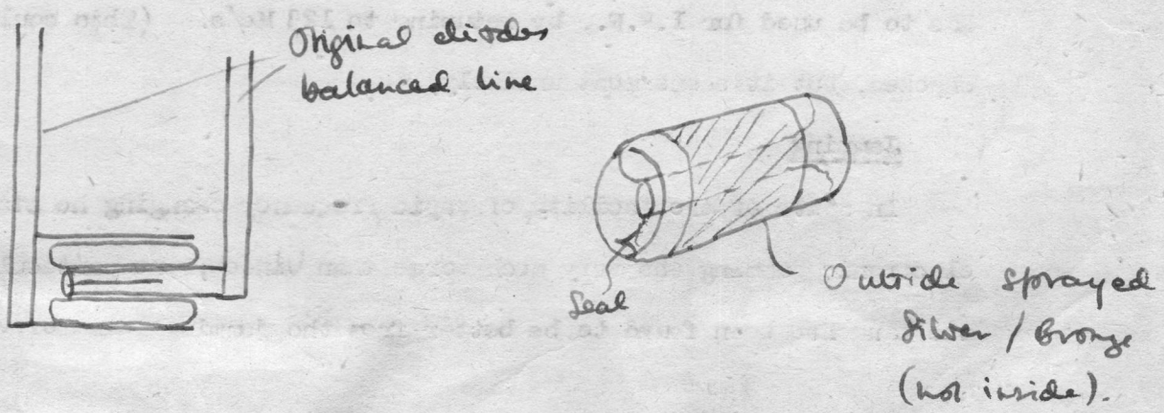
Simultan Gerät

The Wasserman Simultan originally used diodes, but these gave trouble when they got old, as the impedance did not remain sufficiently low, with the result that receiver protection became poor.

With the development of the Nullode, the protection was just as good, and the life more or less indefinite. On this equipment the Nullode systems only became available in March 1945.

The equipment was obviously modified, with the original diode holders in position and with a meter for the diode filaments.

The exact layout of the Simultan circuit was not familiar to him and it was not possible to examine it without taking the station off the air, but details of the Nullode itself are shewn in the diagram below:-



He did not know what gas was used, he thought neon, but the discharge was blue.

The device only needs two tuning controls, and these are fitted with easily read scales for quick frequency change.

Transmitter

The transmitter is contained in the standard Freya container, but the chassis is entirely different. The same valves are used, (TS41) but in a circuit capable of single-knob ~~tuning~~ tuning over the band. Grid, anode and aerial circuits are made identical and ganged. Fixed cathode chokes are used.

Anode modulation is used, instead of the usual grid modulation and the pulse (of 22,000 volts, instead of 8,000) is obtained from ~~these~~ three paralleled TS41's feeding a pulse transformer. (8000v HT). The grids of the three TS41's are driven via another pulse transformer, from a fourth TS41 which is driven from the original Freya modulator. The system therefore consists of the original Freya modulator/transmitter assembly, with another box containing the two additional modulator stages. He did not know the peak transmitter power, except that it was greater than 40 kw.

I.F.F.

According to Cova, although a separate I.F.F. receiver is fitted, (fed from the normal I.F.F. aerial at the top of the tower), the main transmitter has to be used for I.F.F., by retuning to 125 Mc/s. (This could not be checked, but it seems most unlikely).

Jamming

In spite of the facility of rapid frequency changing he stated that electronic jamming was very much worse than window; no particular part of the band had been found to be better from the jamming point of view, but

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they usually moved from the normal frequency of 152 Mc/s down to about 120 Mc/s. In general charging frequency did not help very much as the jamming used to come back again.

During ~~Mandrel~~ part of Exercise 5, the equipment was observed and the jamming was not at all effective, being generally only 2/3 X noise. (Note:- This is presumably due to working frequency being above the normal Mandrel barrage, ~~which~~ while it may well have been overlooked by Mandrel III operators).

Remote indicator of Wellerschieber

Details of the remote system used for height indication were also discussed ~~elsewhere~~ in connection with Elephant and Wasserman azimuth indication and Askania. The conclusion on these systems are dealt with elsewhere.