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INFORMATION REPORT

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COUNTRY East Germany

REPORT

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SUBJECT Development and Construction of a 3kW and 10 kW Television Transmitter at VEB Werk fuer Fernmeldewesen WF

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This is UNEVALUATED Information

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

1. The following are the pertinent data on a 3 kW and 10 kW television transmitter developed at VEB Werk fuer Fernmeldewesen WF, Berlin-Oberschoenevide. Development was started in 1949 and is to be completed in 1955. This television transmitter normally operates with 10 kW power; if, however, the final stage fails to function, the transmitter can still be operated at 3 kW from the modulation stage. The transmitter can be set to operate on any frequency between 175 and 216 MHz. In setting the transmitter for a frequency of 200 MHz or over, it is necessary to change the coils of the control transmitter (Steuersender). Control of the transmitter is effected by an oscillator quartz or by self-excitation (Eigenerregung). The concentric line resonators (Topfkreise) used in the transmitter are so arranged that they extend over the entire range from 175 to 216 MHz. Except for the final stage, these resonators are so constructed that they can be calculated as  $\frac{1}{4}$ -wavelength coaxial circuits ( $\frac{1}{4}$  Wellenlaenge Koaxialkreise). The concentric line resonator of the final stage, however, is set up as a double shortened  $\frac{3}{4}$ -wavelength coaxial circuit. Except for the final stage, in-coupling of the individual stages is capacitive and out-coupling is inductive. The final stage has two Lecher wires and is coupled out capacitively at the second one. Frequency multiplication takes place in each individual stage. Total frequency multiplication for the transmitter amounts to 24 times.

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2. The transmitter is built into a series of cabinets, each of which is two meters high, 75 centimeters wide and 72 centimeters deep. The individual constructional components are arranged in the cabinets as follows:

- Cabinet 1 - Control transmitter, control transmitter pre-stage and control transmitter final stage
- Cabinet 2 - First exciter stage (Treiberstufe)
- Cabinet 3 - Second exciter stage
- Cabinet 4 - Modulator I
- Cabinet 5 - Modulator II
- Cabinet 6 - Modulation stage

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Cabinet 7 - Power supply and charge equalisation (Lastausgleich)  
 Cabinet 8 - Residual side-band filter (Restseitenbandfilter)  
 Cabinet 9 - Final stage 10 kW  
 Cabinet 10 - Power supply and charge equalisation  
 Cabinet 11 - Power supply  
 Cabinet 12 - Power supply  
 Cabinet 13 - Power supply  
 Cabinet 14 - Power supply  
 Control desk  
 Cabinet 15 - Sound transmitter  
 Cabinet 16 - Sound transmitter  
 Cabinet 17 - Sound transmitter

3. Tubes in the individual stages are changed as follows:
  - a. Control Transmitter Final Stage - tube is located down in the concentric line resonator and is removed and replaced by pushing up the outer conductor (Aussenleiter).
  - b. First and Second Exciter Stages - tubes can be reached from the top of the cabinet and are removed by loosening a castle nut.
  - c. Modulation Stage - tube is down in the concentric line resonator and is removed by tilting the split head of the concentric line resonator.
  - d. Final Stage - tube can be reached from the top of the cabinet and is removed by loosening a castle nut.
4. The tubes and oscillating circuits are switched in a grid basis circuit arrangement (Gitterbasisschaltung). The tubes are air-cooled. The band width of the transmitter in front of the residual side frequency filter is 12 MHz; in back of it the band width is 6 MHz.
5. Measuring of the alternating input current (Eingangswchselspannung) in front of each stage is carried out as follows:
  - a. In front of the first exciter stage - directly by means of crystal rectification
  - b. In front of the second exciter stage - directly by means of diode rectification
  - c. In front of the modulation stage - by means of diode rectification through a capacitative voltage divider

It is impossible to make any measurements immediately in front of the final stage. Type ED 704 crystal rectifier and Type SA 101 diodes are used.
6. Stage control with a reflectometer is effected as follows:
  - a. in back of the modulation stage
  - b. in front of the residual side-frequency filter
  - c. in back of the residual side-frequency filter
  - d. in back of the final stage.
7. The antenna protection switch (Antennenschutzschaltung) is in back of the final stage and is a quadruple measuring device (Vierfachmesskopf) composed of: a reflectometer; a high-frequency input voltage measurement device; a high-frequency demodulator for modulation control, and a high-frequency decoupling device (Auskoppelung) for the control desk. The quadruple measuring device is a piece of coaxial conductor into which the four component measuring devices are built. It can be plugged in and can serve to connect the antenna either to the final stage or to the modulation stage so that, if the final stage of the transmitter fails to function, the transmitter can still be operated from the modulation stage with 3 kW power. There are two charge-compensating stages (Lastausgleichstufen).

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Each charge-compensating stage has the same type of tube as the stage to which it is parallel, so that if an impulse results in a high anode current, the current of the charge-compensating tube is closed or reversed. Thus, the sum of the anode currents of the power tube and the charge-compensating tube remains constant and the same amount of current is always flowing through the anode mains set (Anodennetzgeraet). Therefore, a drop in voltage as a result of impulses cannot occur.



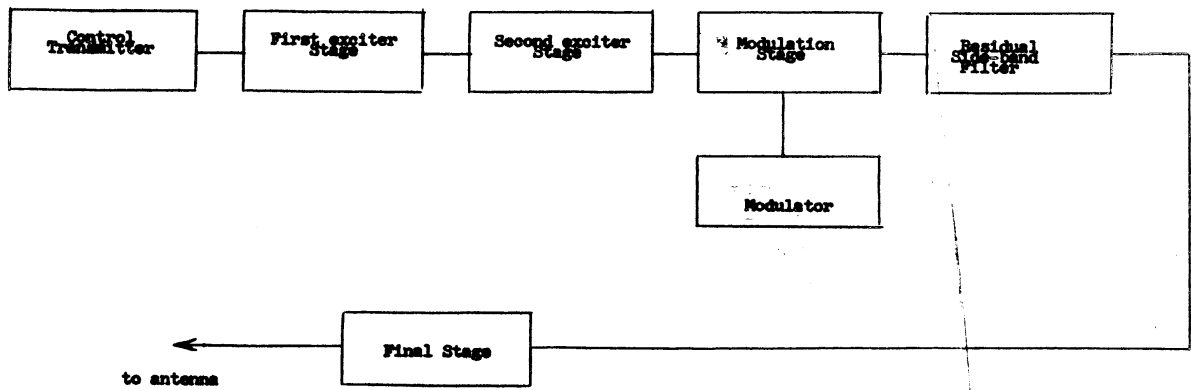
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Block diagram of 30W and 10KW television transmitter

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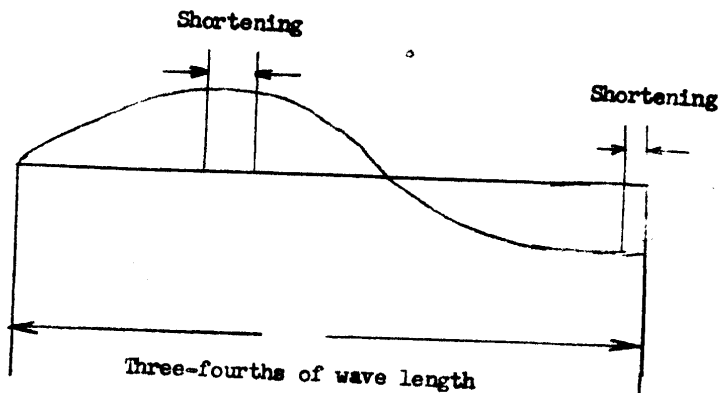
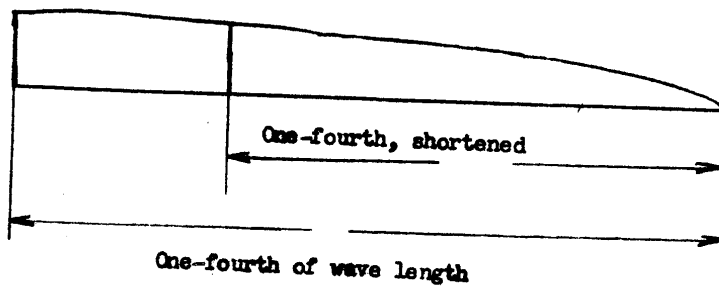
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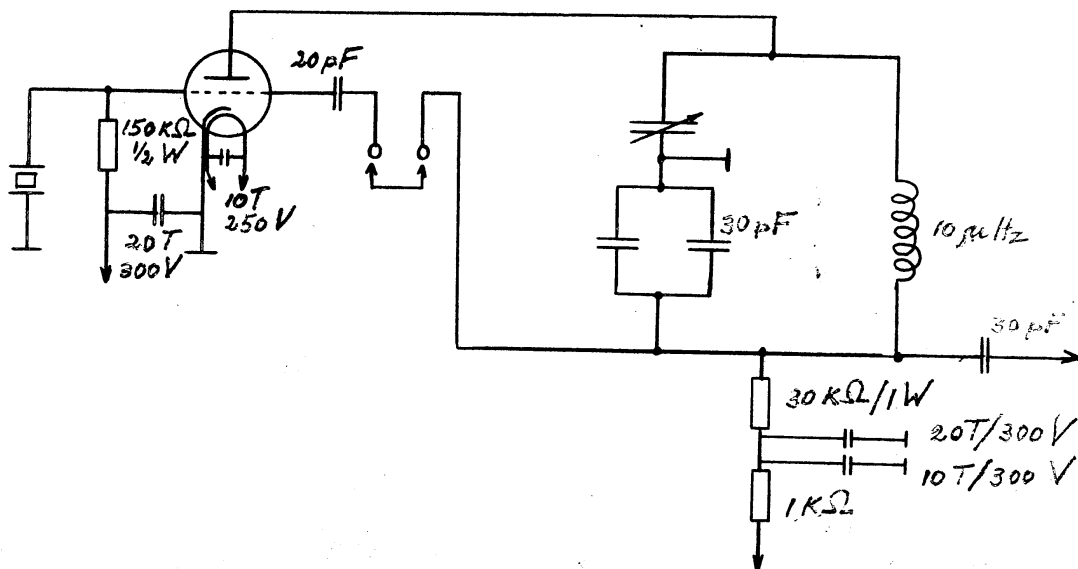
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FIGURE 2

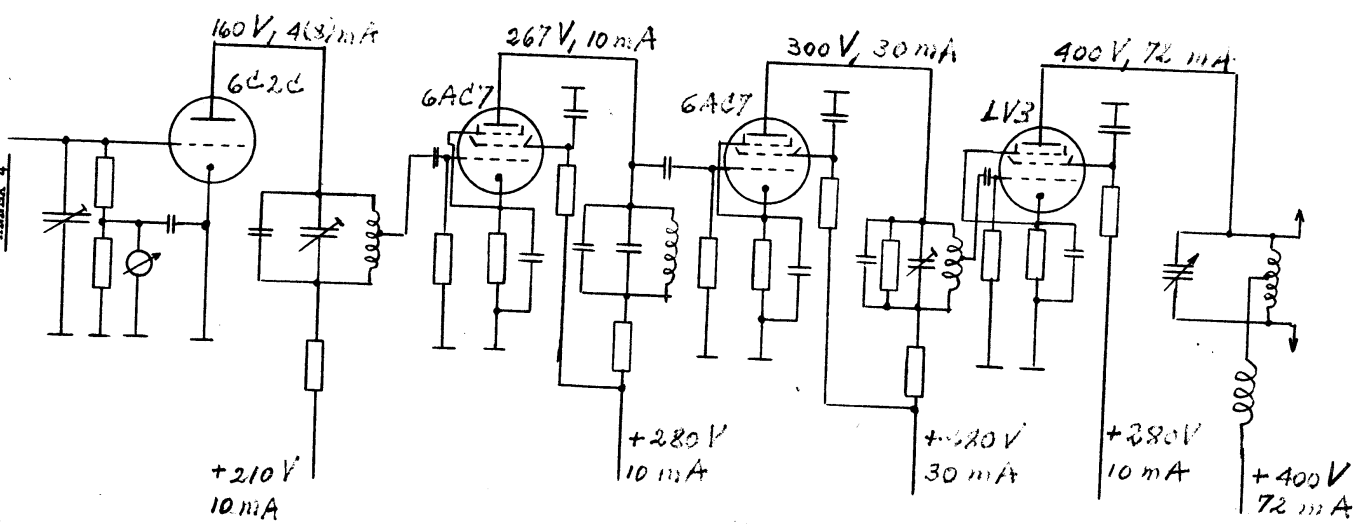


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ANNEX 3



Control stage (quartz stage)

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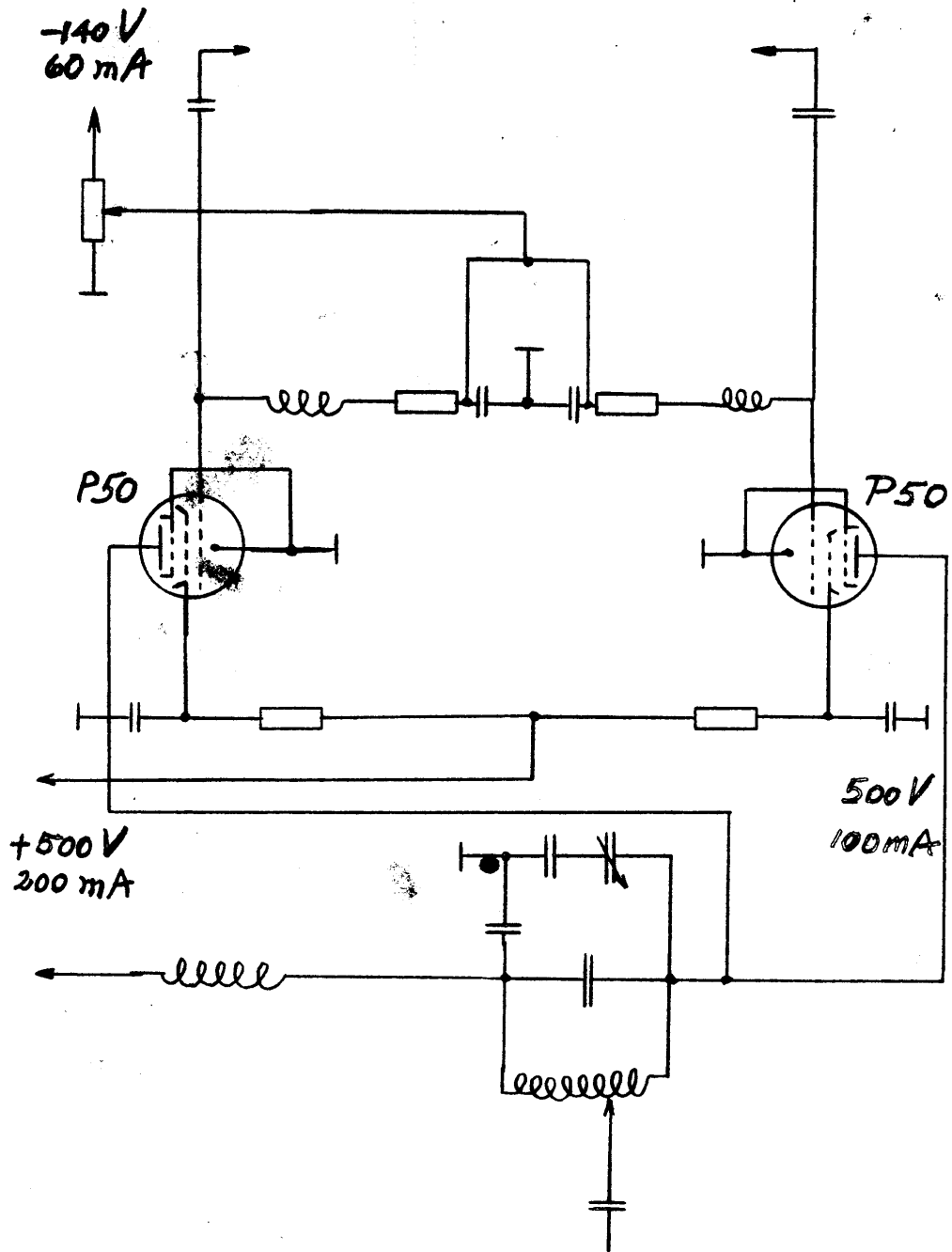


Circuit diagram of 3W and 10KW television transmitter

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Control Transmitter - Final Stage