



Annex to the reasons for the submission to the Milestone Program
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"Archiv für das Post- und Fernmeldewesen" (archive for post and telecommunications),
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Translation (Page 353)

The German broadcast

up to the commencement of the Copenhagen Frequency Plan

by Gerhart Goebel

Foreword

The author set himself the task to provide in this document a summary history of the technical and organizational development of the German broadcast from its primitive beginnings during an unforeseen period of prosperity to its "partial disassembly" by the Copenhagen Frequency Plan. (The German television broadcast is not considered here because its development went in parallel to the radio broadcasting and will be covered in a special work.)

The sources were primarily the original papers from surviving scattered technical literature, in particular the early issues of the "Archiv für Post und Telegraphie" and the "Telegraphen- und Fernsprechtechnik" (telegraphy and telephone engineering). Files, pictures, technical descriptions and other documents unfortunately got lost largely as a result of both time and the effects of war. As a result of this the author relied in many cases on personal recollections of involved parties. Where these recollections conflicted with well documented information the latter was preferred. Where the opinions of the involved parties diverged from one another the author tried to summarize the pieces of information in such a way that they are in accordance with the known circumstances. Where verifiable details could be discovered – in particular from the early days of broadcasting – which might be important in clarifying one question or another, these were included in the paper even at the risk of a skimming reader missing a "great line".

Many papers about broadcast have been written which include a great line but with few details so that the author believes he should take such a risk. "Il n'y a d'originalité et de vérité que dans les détails." (Stendhal)

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Outline

A. Previous history

Technical basics

Organizational preparations

B. The development of broadcasting technology in Germany

I. Transmission technology

a) High frequency technology

1. First construction period (0.25 kW)
2. Increase in efficiency
3. The Rheinlandsender (transmitter in Rhineland)
4. The Großrundfunksender (Large Broadcasting Transmitter)
5. The modified transmitter
6. The Deutschlandsender
7. Mobile transmitters
8. Short wave transmitters
9. Reconstruction after 1945
10. Very high frequency transmitters

b) Modulations methods

c) Power supplies

d) Emergency power supplies

e) Aerials

1. Quarter wave antennas
2. Antifading antennas
3. Short wave antennas
4. Earth nets

f) Transmitter buildings

II. Recording technology

a) Microphones

b) Microphone and gain measurement, level monitor

c) Recording rooms (studios)


d) Central control rooms

e) Broadcasting centres

f) Sound storage

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III. Transmission technology

- a) By wireless
- b) Via lines
 - 1. Open-wire lines
 - 2. Cables
 - aa) Telecommunications cable with one central and four core members
 - bb) Broadcasting wires
 - 3. Broadcasting line amplifiers and monitors
 - aa) Broadcasting line amplifier System 29
 - bb) Program exchange
 - cc) Broadcasting line amplifier System 34
 - dd) Carrier-frequency systems
 - ee) Monitoring equipment
 - ff) Broadcasting line amplifier System 48

IV. Receiver technology

- a) Previous history
- b) Single tuned circuit receivers
- c) Multi-tuned circuit receivers
- d) Improved components
- e) Quality receivers and Volksempfänger (people's receivers)
- f) Highest level of receiver technology
- g) Post-war development
- h) Loudspeakers

V. Common-frequency technology

- a) Dependent tuning fork control
- b) Independent tuning fork control

VI. Wired broadcasting technology

- a) Low-frequency wired broadcasting
- b) High-frequency wired broadcasting
 - 1. Within the high-voltage system
 - 2. Within the telephone network
 - 3. Within the low-voltage supply system

C. The broadcasting program

D. The development of the broadcast organisation in Germany

I. Post and transmitting companies

- a) Jurisdictional issues
- b) The transmitting companies
- c) The Reichs-Rundfunkgesellschaft (broadcasting company of the German Reich)
- d) The Rundfunk-Kommissar (broadcasting commissioner)
- e) Broadcasting organisation in the "Third Reich"
- f) Reconstruction of the German broadcasting organisation after 1945

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II. Radio licences and fees

III. Radio interference suppression

IV. The broadcast in the occupied areas 1919...1926

V. The German broadcast in the Second World War

VI. Frequency allocation

- a) Free choice of frequencies
- b) Geneva Frequency Plan
- c) Prague Frequency Plan
- d) Lucerne Frequency Plan
- e) Montreux Frequency Plan
- f) Copenhagen Frequency Plan

E. Postscript

(Page 359, left column, paragraph "Das durch die Demobilmachung...")

Radio equipment released at the demobilisation and not needed by the armed forces "Reichswehr" and police "Schutzpolizei" was used to construct a radio network in the German Reich to unburden the wired telegraphy ruined by the war. This inland radio network included the Main Radio Station Königs Wusterhausen (figure 2), 20 transmitting stations, and 76 receiving stations in major postal institutions.

To gain practical experiences in the field of wireless broadcast of both news and performances the post "Deutsche Reichspost" (DRP) first introduced in early 1919 a telegraphic press broadcast service using the existing receiving stations and a Poulsen transmitter in Königs Wusterhausen. The Wolff Telegraph Agency was the first institution to broadcast the parliament's reports in part this way during the session of the National Assembly ("Nationalversammlung") in Weimar. News received by the postal institutions was forwarded to the press by telephone or carriers. The regular press broadcast service which was started on 01 November 1919 and was later joined by the Dutch Nieuwsbureau had to be discontinued initially because of Article 197 of the Treaty of Versailles. It was allowed to continue in May 1920 following the involvement of the Telegraphen-Union.

In June 1920 the foreign trade body of the Foreign Office participated in this radio press service, followed later by the "Eildienst für amtliche und private Handelsnachrichten G.m.b.H." (express service for official and private commercial news).

The three press agencies ceased their radio service in early 1921 so that the telegraphic commercial broadcast service was undertaken by the Eildienst G.m.b.H. as the only news company performing this service. A general wireless broadcast of news could be made possible only by the introduction of wireless telephony, as Hans Bredow explained to the appropriations committee of the National Assembly on 3rd October 1919. On behalf of the DRP he organized a lecture about "radio telegraphy and press" by which firstly music and sometime later city names and numbers were able to be transmitted by a tube transmitter

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manufactured by the TRA (Telegrafentechnisches Reichsamt), and made audible in the conference room by nine telephones. On this occasion Bredow explained the possibility of a "broadcast to all" for the first time. H. Dominik noted about this: "Although the presenter remained fact-based and down to earth he could occasionally imagine future applications with an audacity of Jules Verne. For instance a future political speaker could give his speech via the wireless receiver so that it can be heard simultaneously in a thousand different rooms by a million people."

In early 1920 wireless transmission tests of voices initiated by Bredow were not only made by the TRA but also from the Main Radio Station Königs Wusterhausen using alternatively a machine transmitter and a 5 kW arc transmitter (wavelengths 3500 m and 2700 m) for each half an hour per day (figure 3). A normal telephone capsule mounted in a wall socket in the transmitting room was used as microphone. From June 1920 the Main Radio Station transmitted gramophone music in between test messages with the microphone placed directly in front of the horn. On 22 December 1920 E. Schwarzkopf and other civil servants of the Main Radio Station arranged the first wireless instrumental concert (violin, harmonium and choral singing). The reception was acknowledged by numerous German radio stations operated by Post and Reichswehr and also by many commercial and amateur radio stations in Europe. Here are some examples.

Radio message:

Karlsborg, 25-02-1920 (700 km). We heard you very well with each word clear, please respond. Your telephony tests were brilliant!

Radio message:

Moscow, 02-02-1920 (1700 km). The spoken German and Russian texts were clearly audible during the today's telephony test. The words ... were particularly well audible. The whistling was also easily audible.

Radio message:

Karlsborg, 17-09-1920 (700 km). Good morning! The Minister and the General Manager of the Swedish Telegraph Administration sincerely thank you for the excellent demonstration.

(Page 360, left column)

Luxembourg, 23-12-1920 (600 km). Many thanks for your free Christmas concert yesterday to which I invited the editor of the Luxembourger Zeitung (Luxembourg newspaper), and whose report you can read in the attached extract. Signed by A. Robert, Professor at the Institute E. Metz.

Radio message:

Kiel, 22-12-1920 radio station (300 km). Music tiptop . A cheer for you. Merry Christmas!

Telegram:

Königsberg, 23-12-1920 (530 km). Your farewell concert marvellously heard in Königsberg. It caused me Christmas spirit to enjoy such a success as a born Berliner and former trainee of the company C. Lorenz!

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Radio message:

Sarajewo, 22-12-1920 radio station (1500 km). Your telephony concert today was excellent, just like the singing of a cock. Congratulate on your success, greetings.

Letter:

Cirgglestone-Wakefield, England, 31-12-1920 (1200 km). I have here a wireless experimental station and receive your telephony every day between 12.15 and 1.00 pm. Your telephony is very loud and can be heard all over the room by using normal telephones and a quadruple amplifier. The distance from here to your station is about 1200 km. Signed by H. H. T. Bu.

Letter:

Veendam, 23-12-1920, Holland (850 km). I am pleased to have a reason to tell you that I have been listening for some days to your excellent telephony demonstrations with great pleasure. I receive by using three American "Lateral-coils" arranged in parallel, and I note in doing so that the tuning is easy and find that the loudness of the telephony and music given by you is "strong", marvellously modulated without background noise, and the voice of the spokesman sounds clearly and well articulated.

I am looking forward to future performances (not forgetting the nice music) I send greetings to you and you wish splendid success. Signed by O. H.

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