

# Prelude and Finale

By Friedrich Engel

In memory of Dr. Klaus Lang (1938 – 2013)  
for his life's work, above all for his services  
to the heritage and memory of Wilhelm Furtwängler

The biographies of musicians of older generations usually discuss only briefly, if at all, the technical conditions under which recordings of their interpretations came into being; this certainly applies to Wilhelm Furtwängler. It is more than just a happy coincidence that he and "his" star orchestra, the Berlin Philharmonic, were the first to discover the qualities of the Magnetophon, a new process perfected at the end of 1940, and the new working conditions offered by it – and, conversely, that the Magnetophon was able to prove its merits as "equipment on test" by means of the best possible performances in December 1940.

From the 1930s to the 1950s, the disc was almost without exception the dominant recording medium in music recording studios – and one with serious limitations. Many performers saw recordings from their own, rather sceptical perspective: four and a half minutes of playing time on each side of a record meant that conductors and musicians had to find a break about every 270 seconds, stop, wait until the record cutting machines were ready to record again, and then, on command, start again immediately and precisely in tempo and pitch.<sup>1</sup> No wonder, then, that by the end of the 1930s Furtwängler had recorded hardly any longer works on disc.



Magnetophon K 4, complete system with loudspeaker (left), tape transport (middle) and amplifier, commercial version 1939, price about 3,600 RM

Since 1932, AEG Berlin had invested substantially in a new sound recording system called the "Magnetophon" for which it built players and amplifiers; at the same time, I.G. Farben in Ludwigshafen on the Rhine developed the "Magnetophonband Typ C" sound carrier from a flash of genius by Dresden inventor Fritz Pfelemer into a saleable product. In 1938, German Radio (Reichs-

Rundfunk-Gesellschaft, or RRG) ordered twenty portable Magnetophon devices for outside reporting and recordings, as well as a further twenty stationary units for the studio, known as the R 22 Magnetophon (RRG preferred the spelling "Magnetofon"), all of which were put into service in 1939. The first really successful model, the "Magnetophon K 4", marketed from autumn 1939, was intended for commercial application. However, despite all its advantages, recording quality was poor, and in particular there was a background noise "as if water were running into a bathtub behind a closed door".<sup>2</sup> The Magnetophon was thus excluded from the demanding requirements of radio plays and music production for broadcasting – and this was where the ambition of the RRG technicians, and above all that of Walter Weber, made itself felt.<sup>3</sup>



Magnetofon system R 122 (the RRG designation). Amplifiers and power supplies for the two R 22 drives are installed in the amplifier rack on the left in the picture.

In April 1940, Weber drew the right conclusion from a perceptive analysis of the malfunction of an experimental setup: the "main task" of magnetizing the audio tape should not be performed by the actual audio signal, but by a high-frequency alternating current. This auxiliary oscillation remains inaudible, but reduces noise to a third (10 dB). Skilful manipulation of the amplitude parameters allowed an additional extension of the dynamic range by a further 10 dB and, as a bonus, an extension of the pitch range by a full octave. With a dynamic range of 60 dB and a frequency range of 30 Hz to 10 kHz, the RRG took a decisive step forward with the modified Magnetophon in its search for the "ideal

sound recording method":<sup>4</sup> "Broadcasting as a bridge between spaces required an instrument to bridge time".<sup>5</sup>

Walter Weber and his supportive superior Hans Joachim von Braunmühl, scientific and technical director of the RRG laboratories, reported their discovery (patented as DRP 743 411 at the end of August 1940<sup>6</sup>) to AEG and made sure that their further patent applications became known among experts. And thus, from the turn of the year 1940/41, sensational rumours were circulating in record companies and film studios. The key word, however, was as unwieldy as it was inscrutable: thanks to high-frequency pre-magnetization ("Hochfrequenzvormagnetisierung"), the Magnetophon, which had so far been merely promising rather than outstanding in terms of quality, had become the best available medium for storing sound and clearly superior to all other systems of recording.

10 June 1941:

The "high-frequency" Magnetophon in the UFA Palace at the Zoo, Berlin

Of course, such a revolutionary innovation as high-frequency bias had not only a technical dimension but also showed considerable economic potential in the area of licenses and markets. Although many trading relations had been cut off since the beginning of the war, lucrative export opportunities were still emerging, and for the time being the domestic market was also flourishing. Above all, German feature film production showed a lively interest in at least gradually replacing the technically somewhat limited optical sound with the qualitatively superior magnetic sound; the record companies followed later. The UFA and the Filmtechnische Zentralstelle (FTZ), which was responsible for the standardization of production technology in German film studios, followed developments particularly closely. Heinz Orlich, for many years a leading UFA sound specialist, prompted FTZ director Richard Schmidt to make contact with AEG director Hans Heyne, who immediately responded positively.<sup>7</sup>

Orlich specifically proposed a joint event by the AEG and the UFA as a first step, in order to present the new system to the public, i.e. decision-makers from authorities, politics and business as well as other potentially interested parties. The AEG seems to have been worried that its previous work could be underestimated, while the RRG was intended by the AEG and UFA to have little more than a minor role, and thus to play down the discoveries of Braunmühl and Weber. However, it was not possible to ignore the RRG completely; they always saw their importance as being in competition with film production (i.e. the UFA) and felt somewhat superior to this medium. It goes without saying that it was out of the question for the broadcasting man-

**AEG**

Die

**Allgemeine Elektrizitäts-Gesellschaft**

gibt sich die Ehre

zu der am Dienstag, dem 10. Juni, vorm. 11<sup>30</sup> Uhr, im

**Ufa-Palast am Zoo**

Hardenbergstraße 29

vor kleinem Kreis stattfindenden ersten Vorführung ihres neuen Tonaufzeichnungs-Verfahrens einzuladen.

Das neue Magnetton-Verfahren wurde für besonders störgeräuscharme und hochqualitative Tonaufnahme und Wiedergabe entwickelt.

**Vortragsfolge**

- |  |   |
|--|---|
| 1. Begrüßung . . . . .   | Direktor Dr.-Ing. Heyne AEG                         |
| 2. „Les Préludes“ von Franz Liszt<br>(gespielt vom Orchester der Städtischen Oper, Charlottenburg)<br>Dirigent Staatskapellmeister Lütze |   |
| 3. Technische Einführung . . . . .   | Dr.-Ing. Schepelmann AEG                            |
| 4. Aus „Dorfschwalben aus Osterreid“ von Joh. Strauß<br>Aus der Arie aus „Linda di Chamounix“ von Donizetti<br>(gesungen von Erna Sack)  |   |
| 5. Anekdote von Heinrich v. Kleist<br>(gesprochen von Heinrich George)   |   |
| 6. Über Anwendungsmöglichkeiten des Verfahrens im Tonfilm . . . . .  | Dr. Richard Schmidt<br>Filmtechnische Zentralstelle |
| 7. Aus dem „Forellenquintett“ von Franz Schubert<br>(gespielt vom Fehse-Quartett, Berlin, am Flügel F. Leitner)                          |   |
| 8. „Mondscheinsonate“, letzter Satz, von L. v. Beethoven<br>(gespielt von Ferdinand Leitner)   |   |
| 9. Aus der 1. Sinfonie, 4. Satz, von Joh. Brahms<br>(gespielt vom Philharmon. Orchester, Berlin)<br>Dirigent Wilhelm Furtwängler         |   |

Wiedergabe der Darbietungen mit dem neuen AEG-Magnetophon-Gerät

Durch langjährige enge Zusammenarbeit zwischen AEG und RRG ist es gelungen, die magnetische Tonaufzeichnung zum heutigen Spitzenverfahren auszubauen.

In seiner Grundform ist dieses Verfahren bereits seit einiger Zeit bei Reichssendern und Propagandakompanien im Betriebe eingeführt und hat sich bestens bewährt.

Die Direktion der AEG veranstaltet am 10. Juni 1941 eine erste allgemeine Vorführung des neuen Magnetofons. Wir erlauben uns, Ihnen anliegend hierzu eine Einladung zu übersenden.

**Reichs-Rundfunk-Gesellschaft**

Invitation to the event in the UFA-Palast on 10 June 1941. Below is the supplementary note by the Reichs-Rundfunk-Gesellschaft

agement to simply let this spectacular innovation be taken out of their hands. As can be read from the hints of those involved, a tangled game of intrigue must have begun, in which the RRG apparently could not assert all its interests. Even the elaborately printed invitation was so displeasing to the Technical Director Hans Hubmann that he had a clarification by the RRG attached to his own statements.<sup>8</sup>

At the end of March and beginning of April 1941, during weeks of preparations, 10 June 1941 was finally agreed upon as the date. The extent to which I.G. Farben, the tape supplier, was involved can no longer be determined. Von Braunmühl would have preferred the Gloria-Palast "for technical and social reasons",<sup>9</sup> but Richard Schmidt and UFA attached importance to bringing the event to their renowned "UFA-Palast am Zoo", the premiere venue of such famous films as DER LETZTE MANN (December 23, 1924), METROPOLIS (January 10, 1927), and, many hard years later, MÜNCHHAUSEN (March 5, 1943), although the loudspeaker system in the acoustically muffled auditorium was no longer state of the art.<sup>10</sup>

It was decidedly unusual for a company presentation "in front of a small circle",<sup>11</sup> namely a good 2000 "representatives of the Party, the Wehrmacht, the sound film industry, radio"<sup>12</sup> and more than 80 journalists,<sup>13</sup> to take place in the largest cinema in the country<sup>14</sup> with the curtain in front of the screen remaining closed. On this occasion, lectures and demonstrations followed one another in quick succession. The audio demonstrations for the official premiere of the "new magnetic sound process ... for outstandingly low-noise and high-quality sound recording and reproduction"<sup>15</sup> were mainly provided by the studios of the Telefunken record company (which transferred from Siemens to AEG shortly afterwards). Richard Schmidt reported "On the possible applications of the process in sound film",<sup>16</sup> where it "could mainly be used for the production of the "master tapes" ... The highest quality of the master tapes and the operational advantages of the magnetic sound process would facilitate the recording work in the film studio".<sup>17</sup> Schmidt hoped above all that magnetic tape and high-frequency bias would eliminate "sound problems with the use of colour film",<sup>18</sup> which had hindered the production of the first German colour feature films. Hans Schepelmann, the AEG sales engineer, made a further contribution, enhanced by an impressive demonstration: he interrupted his presentation and after a short pause his last sentences could be heard from tape over loudspeakers – to the astonishment of the audience there was no difference between original and reproduction.<sup>19</sup>

At first, however, the audience seemed to be most impressed by a "particularly vivid" recitation by Heinrich George of Kleist's "Anecdote

from the Last Prussian War", which was particularly topical after the recent French campaign. The musical examples were technically more demanding: "Les Préludes" by Franz Liszt, vocal recordings by Erna Sack, piano solos, and the variation movement from Schubert's Trout Quintet with Ferdinand Leitner on piano and the famous Fehse Quartet. This was not necessarily the most crucial item, but ultimately it showed, as we can still appreciate today, that the leap to a previously unattainable level of quality had been successful.<sup>20</sup>

The Reichs-Rundfunk-Gesellschaft provided the most convincing proof of the capabilities of the HF Magnetophon in its own field with the almost 17-minute-long fourth movement from Johannes Brahms' First Symphony in C minor, op. 68, played by the Berlin Philharmonic under Wilhelm Furtwängler in the Alte Philharmonie – and "without dynamic regulation", i.e. the compression which had previously been technically necessary. The recording of course played without interruption, which for record listeners at the time was completely unexpected; if the movement had been divided up on shellac records, their short playing time would have necessitated four or five interruptions for side and record changes (and usually also a change of playing needle).<sup>21</sup>

The Magnetophon had thus publicly proved at a stroke that it was free of the most annoying weaknesses of record technology: it offered appreciably greater dynamics, significantly less background noise, a running time of a good 21 minutes per tape (1000 m at a tape speed of 77 cm/s), and no crackling. The recording could be listened to immediately after recording and as often as desired without loss of sound quality, and, last but not least, corrections by means of tape editing and splicing opened up completely new production conditions.

Thus the RRG had the satisfaction of presenting an unmistakably trend-setting musical contribution – not to mention that the HF Magnetophon conquered music studios from the turn of the year 1941/1942, though despite promising beginnings, magnetic sound technology only came to be used in film studios towards the end of the 1940s, mainly due to the circumstances of the time.

That the press reported the event enthusiastically and in considerable detail was not due only to the "Gleichschaltung", the binding guidelines from the Goebbels' Reichs Propaganda Ministry. The event was presented as a brilliant success and was regarded as "the most important demonstration of its kind in the last 6 or 10 years",<sup>22</sup> praised by articles in trade journals such as the renowned "Akustische Zeitschrift"<sup>23</sup> and the daily press as "a new peak technique in electrical sound recording [...] which will result in a complete revolution in sound recording..."<sup>24</sup> About four

dozen reports can be found, from the "Völkischer Beobachter" to the capital city's press to provincial newspapers. Magnetophon technology was therefore by no means a state secret, as was alleged after 1945, when for example it was said that Hitler had ordered the invention so that the Allies could not establish his whereabouts during his (in fact quite rare) wartime radio speeches; the Nazis could not have achieved much more than initial steps. Otherwise, it would appear that new possibilities were to be expected only after the end of the war, which proved correct: the shellac record dominated until the beginning of the 1950s, when the LP gradually replaced it – but without the Magnetophon, there would be no LP!

How and when the news about high-frequency premagnetisation reached the tape manufacturers at Ludwigshafen and how it was received there is unknown, as is whether any of the employees responsible for tape production took part in the UFA Palace demonstration.<sup>25</sup> It is remarkable, incidentally, that the NS journals "Frankenthaler Zeitung" and "NSZ-Westmark" covering Ludwigshafen did not mention the Berlin event.<sup>26</sup> In 1943, when the full significance of high-frequency biasing was obvious, I.G. Farben Director Karl Pflaumer made the suggestion – hopefully also implemented – that von Braunmühl and Weber should receive a "one-off recognition bonus".<sup>27</sup>

The fact that Franz Liszt's "Les Préludes" was used indicates that the 10 June 1941 presentation could not be considered an entirely apolitical event. Goebbels himself had the main theme of the "Siegesfanfare" (Fanfare of Victory) arranged during just this period, soon to be heard again and again as a martial leitmotif to introduce special announcements by the "Großdeutscher Rundfunk" ("Greater German Radio") and the weekly newsreels. As the "Russia Fanfare", it was part of the propaganda arsenal for the long-planned war against Russia, which was to begin barely fourteen days later.<sup>28</sup>

## Wilhelm Furtwängler encounters the Magnetophon

Furtwängler had programmed Brahms' First Symphony for the three concerts of 15, 16 and 17 December 1940, together with the first performance of a "Rondino giocoso" by Theodor Berger (1905-1992) and Bach's Fifth Brandenburg Concerto, in which he took the piano part.<sup>29</sup> The RRG transmitted the first repeat concert on 16 December 1940, technically supervised by the RRG sound engineer Friedrich Schnapp,<sup>30</sup> who was soon to become Furtwängler's lifelong friend, and recorded at least part of it with a prototype high-frequency "Magnetofon" in the Funkhaus on Masurenallee.<sup>31</sup> Hardly nine months had passed between Walter Weber's first memorandum and this ambitious practical application.

It is not too much to say that with the concert of 16 December 1940, something like a new ep-

och began (if one disregards the Beecham concert recording of 19 November 1936 in Ludwigshafen because of its inadequate technical quality).

Hans Schießler, then head of the laboratory at AEG, recalled: "Furtwängler was amazed by the quality of the recording, and had it played over and over again. He had never previously been able to listen to a recording immediately after it was made, and one of such high quality."<sup>32</sup> Schießler thus addresses another weakness of the recording technology of the time: the centimeter-thick wax master discs could only be played back twice for assessment, otherwise they could not be used to make records. Corrections of small errors were out of the question; where there was any doubt, a four-minute section simply had to be re-recorded.

Furtwängler instinctively recognized the advantages of the Magnetophon during his first encounter with it. With his agreement to presentation of the Brahms recording in the UFA-Palast, he confirmed the practical maturity of the new procedure, as it were, which carried all the more weight due to the artistic power and reputation of the performers.<sup>33</sup>

The tape from December 1940, which is valuable not least in terms of technical history, was long considered lost. However, thorough connoisseurs of Furtwängler's wartime recordings know of a recording of the fourth movement of Brahms' First Symphony, which, according to tradition, was dated January 23, 1945 – Furtwängler's last concert in Berlin before the end of the war. However, no evidence has been found to date according to which there was any recording or radio broadcast of this event at all. Rather, a dense chain of circumstantial evidence suggests that it is in fact the four-year older recording. It has been preserved only as a magnetic tape copy from the 1960s; the original tape and archive box have probably been scrapped. Thus, the most important pieces of identification are missing, especially since no contemporary entry can be found in the official archives of the RRG. The provenance of this Brahms torso, which has been published several times, can therefore only be clarified by means of a lucky find of documents.

The fact that Furtwängler's other magnetic tape concert recordings only began in 1942 is due to his skiing accident in spring 1941, the consequences of which prevented him from performing for months.<sup>34</sup> Significantly, the RRG for its part had to wait until late 1941 for the first four series HF Magnetofon recorders for its studios, because the production line of the AEG was largely blocked by Wehrmacht orders for the "Tonschreiber".<sup>35</sup>

About 40 RRG recordings on magnetic tape by Furtwängler from the war years 1942 to 1945 (some with the Berlin Philharmonic, others with the Vienna Philharmonic) still exist today.<sup>36</sup> Some are available on CD, notably the recordings of the

Berlin orchestra in the comprehensive new publication "The Radio Recordings – 1939 - 1945". A comparison of this collection with a discography of Furtwängler's recordings between 1942 and 1945 shows that a considerable proportion of these recordings can ultimately be traced back to the magnetic tape recordings (see below for more details).<sup>37</sup>

Other tape recordings seem to be lost. Telefunken recorded the Adagio from Bruckner's Seventh Symphony (April 1, 1942) as well as Gluck's overture to the opera *Alceste* (October 28, 1942) on magnetic tape in its former recording studio, the concert hall of the Berlin Singakademie.<sup>38</sup> The Adagio was issued on no less than six sides.

This recording is also very likely a premiere, as it is probably the first commercially produced record using the Magnetophon. However, it remained Furtwängler's only studio recording before the end of the war, which may have to do with the fact that they still had to work under the conditions of the 78 rpm shellac record. The *Adagio* was thus divided into six separate sections, and in order to avoid awkward breaks, small changes were even made to the musical text.<sup>39</sup> This then-standard method of recording can of course only be demonstrated using the original shellac records. Accordingly, a corresponding partial magnetic tape recording had to be made for each segment. Since the Telefunken company had only rented one magnetic tape recorder, they could not make tape copies, so it is very unlikely that exact copies of the "original tape" would have circulated. When the long-playing record allowed symphonic movements as long as the *Adagio* to be transferred without gaps on a single side, skilful sound engineers used tape copies, either to remove the transitional elements or to conceal them, thus creating a "continuous" version. The 22'50"-long version we know today is also available in various CD productions.<sup>40</sup> – The magnetic tape master for the Telefunken discs is lost; it cannot now be established whether it was taken with the entire pressing stock to a mine tunnel shortly before the end of the war or destroyed in the fire at the Singakademie Berlin at the end of November 1943.<sup>41</sup>

Surprisingly, the recordings of the Stockholm concerts of 25 November 1942, 12 May and 8 December 1943 might also have been made on the high-frequency version of the K 4 Magnetophon - Sveriges Radiotjänst (Swedish Radio) had received some ten of these machines in exchange for deliveries to Germany, but only with very limited initial provision of magnetic tapes.<sup>42</sup>

If the monophonic transmission technology could be compared to a "hole in the wall", stereophonic productions promised, so to speak, to "open a window" to the concert hall. Although record technology had already achieved promis-

ing results in the 1930s, the transfer to magnetic tape technology from 1942 was a pioneering achievement of RRG technology (by Walter Weber, Helmut Krüger and Ludwig Heck) and AEG. The few surviving recordings are technically astounding and musically impressive; all the more regrettable that the vast majority of the approximately 250 RRG stereo recordings have been lost.

At the end of May 1943, Herbert Dominik, Technical Director of the RRG, had presented Goebbels with a "revolutionary innovation in the field of sound reproduction",<sup>43</sup> and this choice of words could have meant that the "new Magnetophon amplifier" was in fact a stereo device. How highly this procedure was rated, despite the critical situation, is shown by the little-known fact that RRG was able to build a stereophonic Outside Broadcast (OB) vehicle especially for such tasks.

Recordings from the 1944 Bayreuth Festival, in which Wilhelm Furtwängler conducted several performances of the specially performed Wagner opera "Die Meistersinger von Nürnberg", are lost. The RRG not only recorded them in full with the stereo OB truck, but had also presented excerpts of these recordings to Furtwängler.<sup>44</sup> Witnessing this encounter with stereo music – the first for most of the participants – was none other than Wolfgang Wagner, one of the composer's two grandchildren, who also testified to Furtwängler's fascination with it, despite his usual scepticism about technical matters.<sup>45</sup>

There may be a connection between this stereo OB truck and Furtwängler's five "Magnetophonkonzerte" (recordings made specially for archival purposes) of June, October and December 1944, about whose origin and purpose no reliable information can be found; it has been rumoured that Goebbels ordered the radio station in Vienna to record these performances. It is not known whether the stereo OB truck remained in the southern German-Austrian area, and undertook this or other tasks for such special purposes. The original tapes of the "Magnetophon concerts" seem to be untraceable; whether they were stereo recordings can no longer be determined from the copies reduced to one combined channel.

## The broadcast of the Reich Sender Hamburg from 1 May 1945

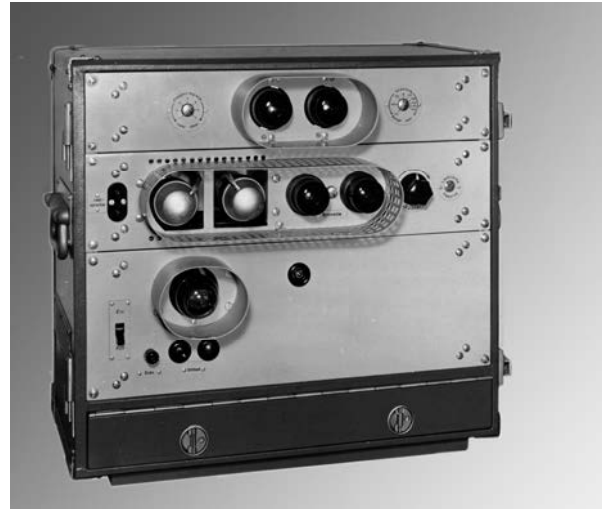
Writings about Anton Bruckner's Seventh Symphony seldom omit to say that its second movement, *Adagio (Sehr feierlich und sehr langsam – "very solemn and very slow")*, was used in the programme accompanying the news of Hitler's suicide on 30th April 1945, which was kept back by one day, on the already largely shattered "Großdeutscher Rundfunk". The course of the broadcast on May 1, 1945, according to the usual later accounts, was roughly as follows: Reading



The playback device Magnetophon K 5, drive. The mechanics are largely the same as those of the Magnetophon K 4. The small shielding housing (centre front) covers the playback head. The accompanying documents refer to this instrument as the "Führergerät".

of the message – speech by Dönitz (Hitler's successor for ten days) – Bruckner: *Adagio* – which would have become official funeral music, so to speak. It is not uncommon for it to be claimed that this was Furtwängler's 1942 recording, and thus a basis of known facts has already been abandoned.<sup>46</sup> Not to mention the implications that seem to rewrite a non-event at Furtwängler's expense, in view of the problematic relationship between regime and conductor. The fame and artistic value of his interpretation do not in themselves permit blind attributions. Such false and misleading statements could have been avoided with a manageable effort of research.

With a probability bordering on certainty it can be ruled out that Wilhelm Furtwängler, of all people, contributed to the sonic backdrop of one of the most macabre RRG programmes. The proof is provided by a British newspaper report dated 2 May 1945, which published a minute-by-minute breakdown of the one-and-a-half hour broadcast from the Reichsradio station in Hamburg (not Berlin!).<sup>47</sup> After that the *Adagio* was broadcast between 21:57 and the ensuing main message at 22:25, so it took about 28 minutes with announcements at the beginning and after the end. Furtwängler's 1942 production only lasts 22'50", so it would have been about four minutes too short. The most likely candidate was Karl Böhm's recording with the Vienna Philharmonic on 4 and 5 June 1943 – he took 27'30", thus conducting the *Adagio* "very slowly and solemnly", just as Bruckner prescribed.



A set of amplifiers for the Magnetophon K 5. Top: the playback amplifier; centre: the loudspeaker amplifier; bottom: the power supply unit. The picture of the corresponding loudspeaker cannot be found any more.

## Odyssey and homecoming

Surprisingly, a small (and not precisely defined) circle of people could already hear music from their own tape recorder during the war years. The AEG had simplified the K 4 into the pure playback device Magnetophon K 5,<sup>48</sup> which was made available to celebrities, and Hitler, of course, came first.

Witness to this is Joseph Goebbels, who shortly after Hitler's birthday in 1942 wrote in his diary that the Führer had received a Magnetophon system as a gift and used it extensively. An American post-war report notes that the device was at the Führer's headquarters near Winniza in the summer of 1942, and the Führer even had further recordings flown in on the daily courier plane.<sup>49</sup>

This Magnetophon K 5 even made it back to Obersalzberg.<sup>50</sup> Goebbels noted in his diary entry of 21 April 1944 that he had given Hitler a magnetic tape recording by Furtwängler of Anton Bruckner's Fourth Symphony for his birthday, with which he was very pleased.<sup>51</sup> However, it was probably Bruckner's Fifth Symphony in B flat major, which was on the concert programme in the Alte Philharmonie in Berlin on 25, 26, 27 and 28 October 1942. The 69-minute recording, based on the transfer of the four original tapes, is available on CD.<sup>52</sup>

The story of Furtwängler's approximately 40 RRG recordings reflects both wartime and post-war history. At the end of the war, the tapes were in all probability still stored in a recording archive of the Funkhaus in Masurenallee, which was back on the air on 13 May 1945, now as "Berliner Rundfunk", under Russian direction. Around 1947/1948, a Russian officer collected at least 1500 or so recordings from the sound archive and shipped them to Moscow, where

they were kept like a state secret.<sup>53</sup> When the devastated and gutted Funkhaus was handed over to Sender Freies Berlin (SFB) in July 1956, the archive, which had been well stocked in 1946, was empty.<sup>54</sup> It was a happy coincidence that in 1983 the SFB's music editor, Klaus Lang, came across Furtwängler records produced in Russia during a private visit to what was then Lenin-grad, including recordings that were thought to be lost in the West, but could only come from RRG tapes.<sup>55</sup>

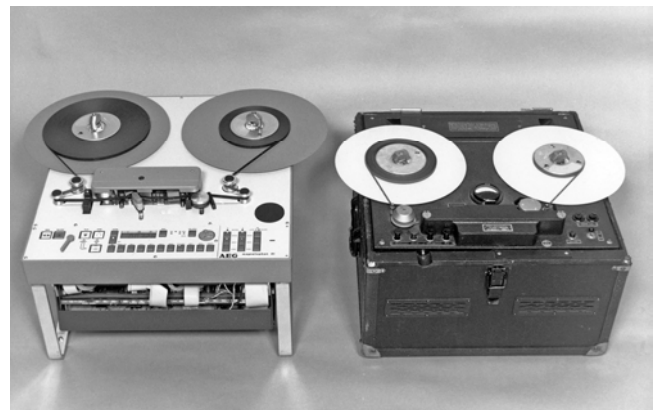
It is greatly to Klaus Lang's credit that with perseverance and remarkable skill he located a large RRG tape collection and secured its return to Berlin. A first "return delivery" in 1987 included processed magnetic tape copies; only in 1991 did 1482 carefully packed RRG originals return to the Funkhaus in Masurenallee.<sup>56</sup> The technical backup of the tape contents brought together the successors of the protagonists of 1941, though more than five decades and a generation separated them from the protagonists of that time. The magnetic tape division of BASF AG, successor to I.G. Farben's magnetic tape production, had suggested in 1987 at AEG Olympia in Konstanz the adaptation of a modern mag- s of the RRG, firstly in order to be able to transfer the older holdings of the company's own magnetic tape archive (and to be able to use the recording of the Beecham concert of November 1936), but above all to have a suitable playback device at hand if and when the largely lost stereo recordings of the RRG should reappear – a hope that has not been fulfilled to this day. This machine from the series of the last AEG model Magnetophon M 20 was brought to the SFB, which through lengthy work transferred the entire old stock to a digital medium (DAT) that is already outdated today – in the meantime the recordings have been transferred to future-proof carriers and comprehensively re-issued in 2019.<sup>57</sup> So it could be said that these historic Furtwängler recordings were to be found at both the beginning and the end of the five decades-long heyday of the magnetic sound epoch.

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*Friedrich Engel, born in 1941, worked for BASF Aktiengesellschaft as a magnetic tape applications engineer for most of his career. In 1984, the organization of an exhibition entitled "50 Years of Magnetic Tape" brought him into contact with the history of this storage medium for the first time. Several publications on the history of magnetic recording technology followed over the next few years. After researching the corporate archives of BASF SE, the Deutsches Technikmuseum Berlin, the company archives in Wolfen, etc, he produced the publication ZEITSCHICHTEN in 2008, in which he focused on the historical development of magnetic storage technology and magnetic tapes.*

*An essential postscript: The author attaches great importance to not favouring any trivialization or vulgarisation of history. This applies in particular to the contrasts and contradictions characteristic of the twelve dark years between the highest artistic and technical achievements and the criminality of irresponsible politics and acts of shameful inhumanity. A considerable part of our more recent cultural heritage is held on media whose decisive development phase occurred during this time.*



Nearly 50 years of Magnetophon equipment development: on the right the K 4 drive from 1939, on the left the Magnetophon M 20, the last and most highly developed magnetic tape recorder of the AEG, 1985. The set adapted to RRG standards, with which the RRG tapes returned from Moscow to Berlin were transferred after 1991, also comes from this series.



- <sup>1</sup> Kier, Herfried, *Der fixierte Klang: Zum Dokumentarcharakter von Musikaufnahmen mit Interpretieren Klassischer Musik*, dohr köln 2006; ISBN-13: 978-3936655315
- <sup>2</sup> N. N. (Menard, James Z.?), *German Sound Recording*, Technical Liaison Division, Headquarters, Theater Service Forces, European Theater, PB-3565, SIG INTEL SRM-1, 1945-11-25
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