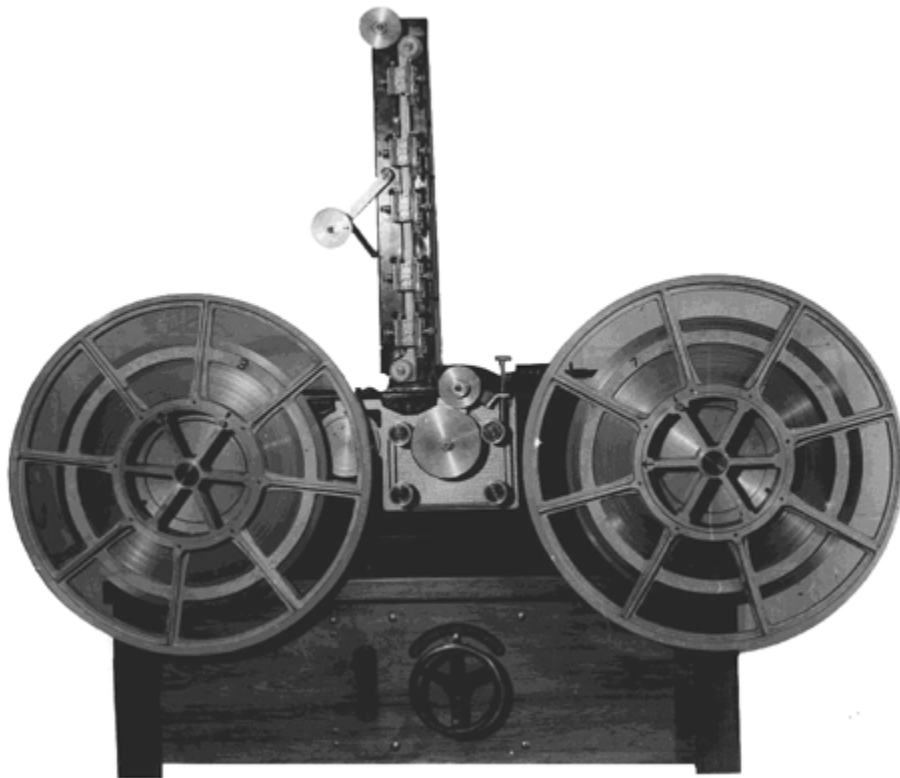


Recording on Wire and Steel Ribbon : The Blattner, Stille and Marconi-Stille Magnetic Audio Recorders

At the end of the last century, **Valdemar Poulsen**, one of radio's earliest pioneers, discovered that a magnetic impression could be made on a moving length of wire which remained on the wire even after it had been rolled up. He used his machine the **Telegraphone** to record Morse code only, that is, magnetism "on" magnetism "off".

In 1924 **Dr. Curt Stille** made a machine which could record 'sounds'. The B.B.C. sent two engineers to Berlin, and after a demonstration they offered to buy the machine, but in the end they returned to England empty-handed.

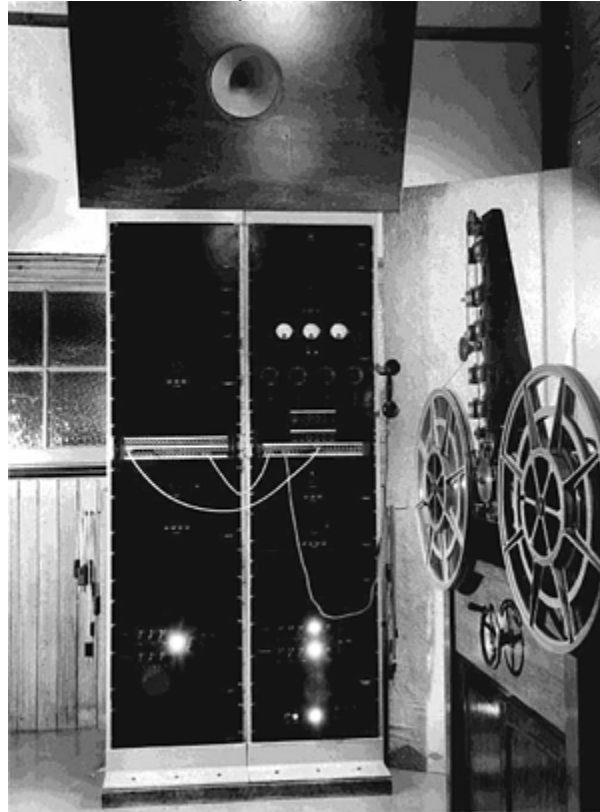
In 1931 **Mr. Louis Blattner** managed to buy a machine and bring it to England. He called it the **Blattnerphone**. By this time Dr. Stille had replaced Poulsen's wire with a flat steel tape 6 mm wide. Each reel of tape could only accommodate 20 minutes of recording. There was however, a constant and heavy background hiss, due to the inherent quality of the steel tape itself.



Marconi-Stille, ABC Radio, Melbourne, c.1950

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Stille Inventions Ltd. joined forces with Marconi's Wireless Telegraph Co. Ltd. to produce, with the close cooperation of the B.B.C. Research Department, the **Marconi-Stille** machine which was put into use in 1932.



Marconi-Stille, ABC Radio, Melbourne, c.1950

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The tape width was reduced to 3 mm and the thickness to only 0.08 of a millimetre. In order to secure the reproduction of the higher audio frequencies it was found necessary to run the tape at a rate of 90 metres per minute past the recording and reproducing heads. This meant that the length of tape required for a half-hour programme was nearly 3 kilometres!

Source: <http://www.rose.com/~caps/apnindex.htm>

...and by courtesy (to the original source) of Mr Bill Pratt of Antique Phonograph News, a condensed version of a speech given by CBC Corporate Archivist, Ernie Dick, and CBC Radio Archivist Gail Donald at a 1993 meeting of the Canadian Antique Phonograph Society (CAPS)...

The first recording technology, used systematically by radio, was the **Blattnerphone**. This was an erasable magnetic sound recording technology developed by **Louis Blattner** in Britain in the late 1920s and early 1930s.

The 33 minutes continuous recording capacity of the Blattnerphone represented a significant technological advancement for broadcasters, over the four minute recording/playback capacity of the discs of the period. The tape speed was 1.5 metres per second with single channel recording possible in either direction on metal tape of 3mm width.

Only 2000 metal tapes were manufactured by a Swedish company with CBC (Canadian Broadcasting Corporation) purchasing 12 reels (as far as we know). Each reel contained some three kilometres of metal tape, measuring 60.5 cm in diameter, and weighed 15 kilos.

The 12 reels had no labels or identifiable markings and we had no way of knowing whether they contained any sound or not. Recently, I learned that Telecom Australia had restored a Blattnerphone and as I was travelling to Australia this past September, I proposed to Telecom Australia that we attempt to play back the CBC reels. They were perfectly willing and the results were most gratifying.

The recordings on the Blattnerphone had been transmitted from Britain via shortwave and appeared to date from late 1943. Quality varied throughout because of the vagaries of the original CBC field or studio recordings and of the shortwave transmissions. We already held samples in CBC Radio Archives of most of the programs, although we are still sorting out the uniqueness of a speech by Charles de Gaulle.

The last reel proved to be particularly stubborn because it was no longer perfectly circular and would not fit on the machine. However my Australian colleagues persisted in sanding it until it would fit. We heard the BBC originated broadcast of the 1935 Silver Jubilee of King George V. Even the BBC did not hold this recording and the Corporation was delighted to receive it from Canada.

Mr Bill Pratt, Ernie Dick, and Gail Donald

also...

a mail sequence on a user group...

Source: <http://palimpsest.stanford.edu/byform/mailling-lists/av/1999/06/msg00033.html>

Source: <http://palimpsest.stanford.edu/byform/mailling-lists/av/1999/06/msg00045.html>

which mentions...

If you need further information on the Blattnerphone please contact me directly.

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In the early 1920's German inventor and entrepreneur **Dr. Curt Stille** (1873 - 1957) modified **Valdemar Poulsen's Telegraphone** to use electronic amplification and marketed the patent rights to the device, a wire recorder, to German and British companies.

Around 1927 or 1928, a British motion picture production company, Ludwig (Louis ? ed.) Blattner Picture Corporation, took a license to manufacture Stille technology. The firm unsuccessfully tried to make and distribute movies with a synchronized soundtrack on wire. Later machines, modified by Blattner, use steel tape instead of Stille's wire. He dubbed it the **Blattnerphone**.

Source: <http://ftp.bbc.co.uk/radio4/drama/techie.html> - no longer active

During 1931, **Louis Blattner** sells an experimental steel tape recorder to the BBC but goes bankrupt the same year. Meanwhile, the British Marconi Wireless Telegraph Company purchases the U.K. rights to the Stille patents. The BBC and Marconi jointly produce several steel tape recorders (tape specs: width 3mm, thickness: 80 cm, speed: 1.5 m/s (60 ips), mass of a full reel: 25 kg;) and introduce them to BBC Empire service by 1932.

Similar steel tape recorders are used in radio service in Canada, Australia, France, Egypt, Sweden, and Poland. Because the machines depend on a special steel tape made in Sweden, supplies are threatened when World War II begins.

Source: <http://www.rci.rutgers.edu/~dmorton/mrchrono.html>

Update

In late 1999 and following on from an eMail about the BBC site link failing (above) - I revisited the topic of Blattner and Marconi-Stille machines as presented on the Internet and below, post the results of my search.

Please note that there may be (1), some duplication to the above and (2), that the items are in no particular date or subject order. At some time in the future, I will put this all the following into order but at present, time to do this is simply not available to me. The data however is current as of this date. Thankyou

Scientific American, Nov 98

100 Years of Magnetic Memories
James D. Livingston

A U.S. patent examiner ridiculed the first magnetic device for information storage as "contrary to all known laws of magnetism." Poor understanding of recording further stalled the technology's rise for decades. Yet hard drives and other magnetic media became indispensable.

75th Anniversary Site CBO

<http://www.radio.cbc.ca/regional/ottawa/75th/photos.html>

<http://www.radio.cbc.ca/regional/ottawa/75th/tech10ao.html>

<http://www.radio.cbc.ca/regional/ottawa/75th/tech04ao.html>

1927

W.CHARLSON und G.CARPENTER erreichen eine Verbesserung durch Vormagnetisierung mit Wechselstrom. Die Frequenz beträgt 10 kHz. Der Deutsche Dr. KURT STILLE baut eine Maschine mit einem 0,2 mm starken Stahldraht. Die Laufgeschwindigkeit beträgt zunächst 1,2 m/s, wird aber später auf 2 m/s erhöht. Für Musikaufnahmen reicht das jedoch nicht aus. Als Diktiergerät unter dem Namen "DAILYGRAPH" erfreut es sich aber großer Beliebtheit.

1930 verkauft Stille seine Rechte an L.BLATTNER, der zusammen mit einem englischen Konzern ein Gerät zur Tonfilmsynchronisierung entwickelt. Dieses "Blattnerphone" besitzt ein dünnes Stahlband auf Spulen mit einem Durchmesser von 30 cm. Es hat bereits einen Röhrenverstärker. Später verkauft Blattner seine Rechte an die MARCONI TELEGRAPH and CO LTD in London. Diese baut aus dem Blattnerphone ein Aufnahmegerät für die BBC-London.

Dabei kommt ein 3 mm breites Stahlband zur Anwendung. Die Geschwindigkeit beträgt 150 cm/s. Die Spule enthält ca. 2700m Band, hat also eine Laufzeit von ca. 30 Minuten. Der Röhrenverstärker kann Aufnahme und Wiedergabe schon richtig korregieren. Er erreicht einen Frequenzgang von 100 bis 5000 Hz +-2db. Das Gerät kostet ca. 25.000 DM (zum Vergleich: Das Tonbandgerät N 4418 von Philips, Baujahr 1970, hat einen Frequenzgang von 40 - 16 000 Hz bei einer Bandgeschwindigkeit von 19 cm/s mit einer Dämpfung von maximal 3 db und kostet 1972 ca. 10 000 S).

1929

Ludwig Blattner Picture Corp. Ltd. of London joins with Kurt Stille's Telegraphie-Patent-Syndicat to produce the Blattnerphone, which magnetically records motion picture sound on steel tape. Widely used to record radio broadcasts.

1933

Kurt Stille develops a vastly improved magnetic recorder using better steel wire and vacuum tube amplifiers. This machine, called a Textophone, was widely used by the Gestapo during WWII.

Source: <http://members.get.at/tbm/geschichte.htm>

and specifically <http://www2.nlc-bnc.ca/gramophone/src/chrntec.htm>

Canadian Antique Phonograph Society Journal: Antique Phonograph News Blattnerphone, May-June 1993, 12

<http://www.rose.com/~caps/subs.htm>

Historical note on the Marconi-Stille steel tape recording machine.

At the beginning of the century Professor Poulsen, one of radio's earliest pioneers, discovered that a magnetic impression could be made on a moving length of wire which remained on the wire even after it had been rolled up. He used his machine to record the Morse code only, that is magnetism 'on' and 'off'. In 1924 Dr. Stille in Germany made a machine which could record sounds. The B.B.C. sent two engineers to Berlin, and after a demonstration they offered to buy the machine, but in the end they returned to England empty-handed.

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minutes of recording. There was a constant and heavy background hiss, due to the inherent quality of the steel tape itself.

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Source: <http://ofcn.org/cyber.serv/resource/bookshelf/radio10/chapter09.html>

Magnetic Recordings During World War II

By John Ward

Michael Woolf wrote:

"It is my understanding that magnetic recording techniques were indeed known to the Allies before the Second World War. During the 1930s the BBC in London was using a high-speed magnetic strip recorder called the Blattnerphone.

This is true; indeed the first magnetic recordings were made by Valdemar Poulsen around 1900. Pre WW2 machines all suffered from high distortion and noise, and could never equal the quality of a disc recording. The Germans stumbled on the use of high-frequency bias, which when added to the recorded signal greatly improved the fidelity of the machines; so much so that it was impossible to discern any difference between a live or recorded broadcast. Disc recordings could be spotted by the surface noise of the record, but the German tape recorders had the allies fooled for a time.

After the war, captured Magnetophons were analyzed, and the cat was out of the bag. The first Ampex machines were patterned on these, and were some of the first post-war tape machines capable of really high quality recordings."

Source: <http://mmd.foxtail.com/Archives/Digests/199909/1999.09.12.07.html>

1930: The German based Marconi-Stille Company builds the first steel band recorders for the BBC. The material specifications are as follows: 1/8" wide, 3 x 10 mm thick, 60 ips (1.5 m/s) record speed, and weighed 55 lbs. These machines were fairly dangerous to use, as operators risked deep gashes.

Source: <http://www.nagra.com/nagra/history.htm>

A History of Radio Broadcast Recordings

by Michael Biel, Ph.D.

eMail: mbiel@kih.net

which says in part...

"...Marvin Camras was developing the wire recorder during the late 30s and early 40s in Chicago. But there earlier had been a steel tape recorder originally called the Blatnerphone which was used by some radio stations as early as 1929. It was improved around 1932 as the Marconi-Stille.

There is one known machine in working condition in Melbourne, Australia, and 5 years ago a friend of mine from the CBC shipped the 12 reels that the CBC have down to Australia to be played at the time that he would be in Australia for the International Association of Sound Archives conference that I also attended. I have a videotape of the machine in operation. All but one of the steel tapes were wartime programs with interviews of British children evacuated to Canada"

Michael Biel is professor of Radio-TV at Morehead State University in Kentucky and author of The Making and Use of Recordings in Broadcasting before 1936.

Source: <http://www.kcmetro.cc.mo.us/pennvalley/Biology/lewis/crosby/transcrib.htm>

True to tape

New Scientist

Archive: 20 March 1999

I was intrigued by Kate Charlesworth's potted history of the hi-fi ("Life, the Universe and (almost) everything", 27 February, p 57). Did paper tape coated with iron powder really come into being in 1922? Up to the 1940s, the BBC made its everyday recordings on half-inch steel-tape Marconi-Stille machines. This afforded about 15

minutes per 12-inch reel, and the operators needed muscles. The quality was good enough but music programmes were always recorded on film. This was cut mechanically but replayed optically.

A German machine captured in the 1944 was sent back from the front and arrived in our lab for evaluation. Everyone was astonished that it used a quarter-inch paper tape coated with a magnetic medium and provided an unheard-of playing time per small-sized reel. One interesting feature was that the replay head could be rotated against the direction of tape transport. This enabled a recording to be played back slowly without lowering the frequency of the voice (although it sounded like a bathroom echo). Presumably, it was intended for use by translators working on enemy radio traffic.

Ken Green
Tintagel, Cornwall

Ken Green is right to question whether paper tape coated with steel powder was invented as early as 1922. In fact, the idea was patented by Fritz Pfeleumer, a German chemist, only in 1928. The German manufacturer AEG bought the rights to this patent in 1932 and by 1935 had developed the "Magnetophon" tape recorder.

Editor