

Vintage radio item with little-known facts or lore.

Category: Broadcast Receiver Amplifiers

**S. G. Brown Ltd. – London
“Microphone Amplifiers” for Crystal Sets
and One Valve Receivers circa 1922-1926.**

**Presented by : Robert Lozier – KD4HSH
For the Mid-Atlantic Antique Radio Club
MAARC Brown Talk 2025-Rev2-1**

kd4hsh@carolina.rr.com --- January 2025



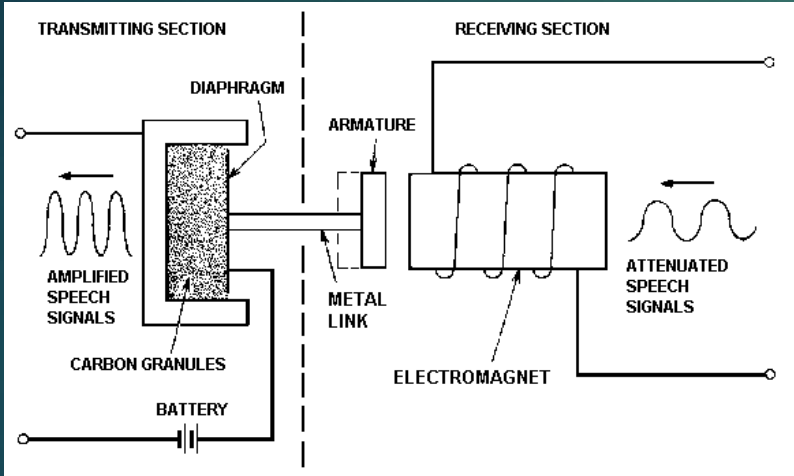
[01a]



A technology for early home broadcast reception never successfully employed commercially anywhere else.

This may be the first demonstration of **all three** variations of these amplifiers for broadcast receivers in almost 100 years.

In 1904, H. E. Shreeve developed a mechanical variable resistance device for the Bell Telephone system. A weakened signal was connected to a solenoid coil that attracts a steel plunger. The plunger alternately applies pressure to a loose pile of carbon granules alternately varying the current in a battery energized secondary circuit. This power gain can be considerable.

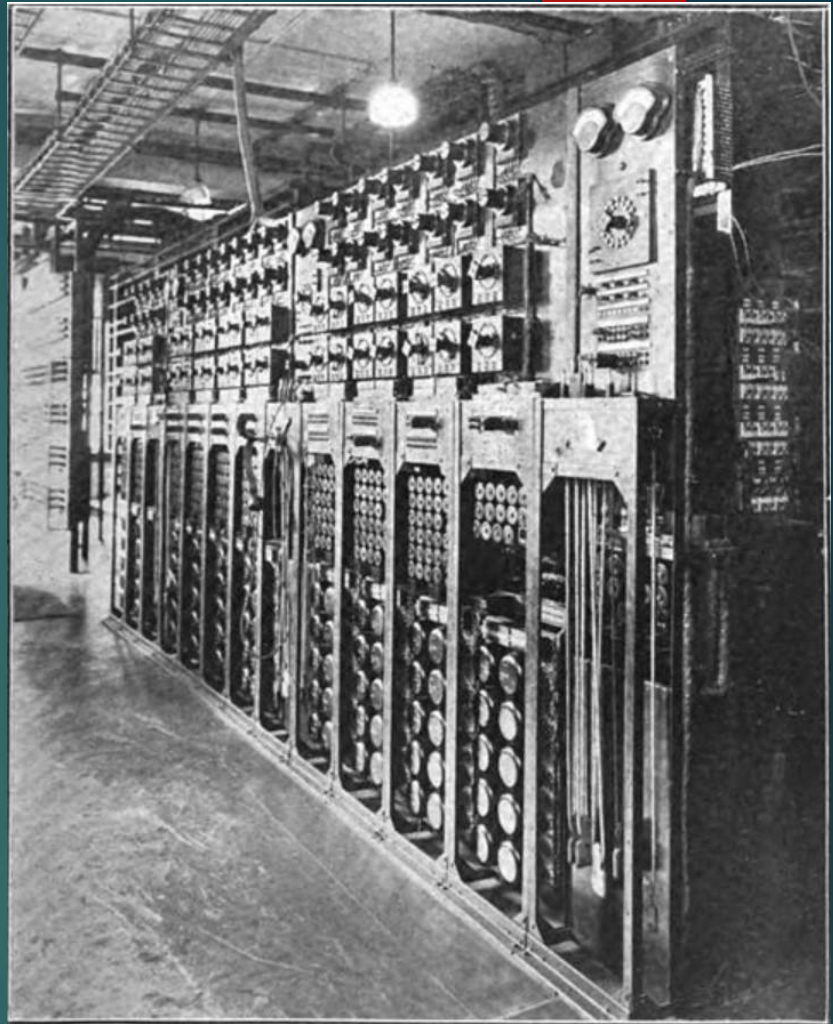
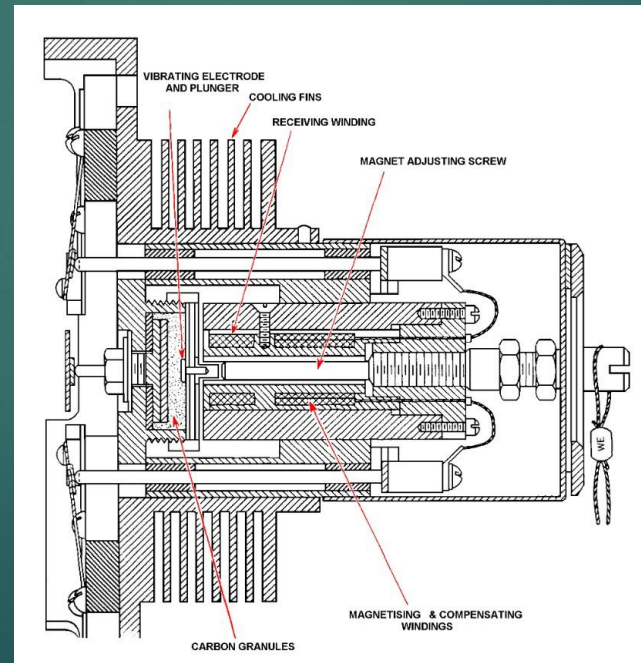


Basic amplifier concept.



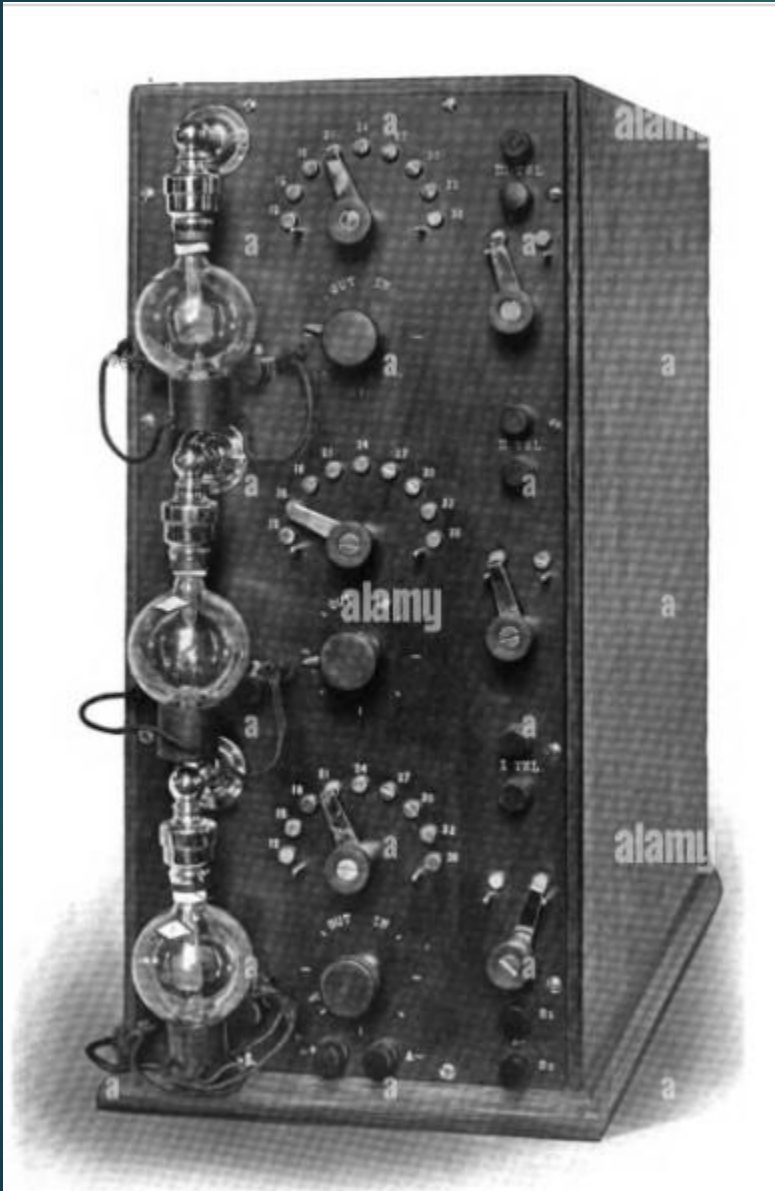
Repeaters required precision machined parts with ability to hold very delicate adjustment.

Type 3A repeater circa 1914



Circa 1919 – Repeater racks on Boston to Washington trunk lines. Three racks of equipment to service just 21 lines.

The Bell System knew they needed something better.



Lee De Forest's three element vacuum tube, he called the Audion, could amplify at audio frequencies. In 1912-13 he negotiated with AT&T to license the device. It would be the end of 1914 before their engineers had built a repeater amplifier good enough to install on a long lines circuit. By 1920, The Bell System began decommissioning all their carbon amplifier repeater hardware.

← The type of amplifier submitted to AT&T for evaluation. Not at all ready for telephone service.



S. G. Brown began to turn his interest to wireless communications by 1910. He designed an especially sensitive earphone with a vibrating reed actuator that was readily adopted by Marconi and favored by the British Military. The design of the earphones could later be adapted to make a very efficient loudspeaker.



... DEPENDABILITY
is Essential

Reception conditions range from excellent to very poor, signal strength from strong to very weak, and to cope successfully with all such conditions you need a pair of highly sensitive and dependable headphones.

For maximum reception results insist that your local dealer supplies you with a pair of the rightly famous **S. G. BROWN** Type "A" (Adjustable Reed Movement) headphones. Sea, land and air W/T operators, servicemen, experimenters and radio amateurs all vouch for their dependability.

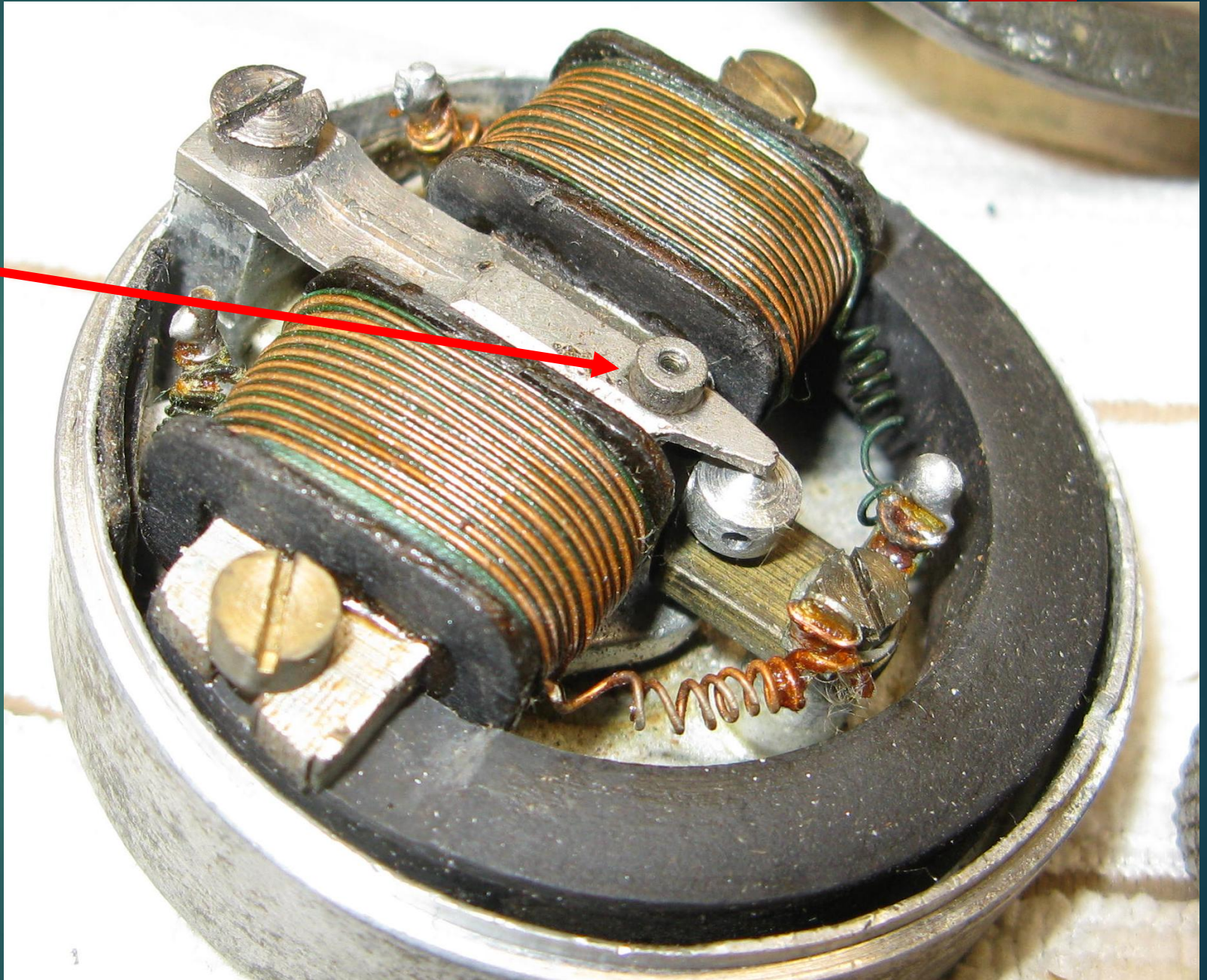
PRICE 63/- PER PAIR

For details of other S. G. Brown Headphones (prices from 30/-) write for illustrated Brochure "V.K."

S. G. Brown, Ltd.
SHAKESPEARE STREET, WATFORD, HERTS
Telephone: Watford 7241

Type "A"

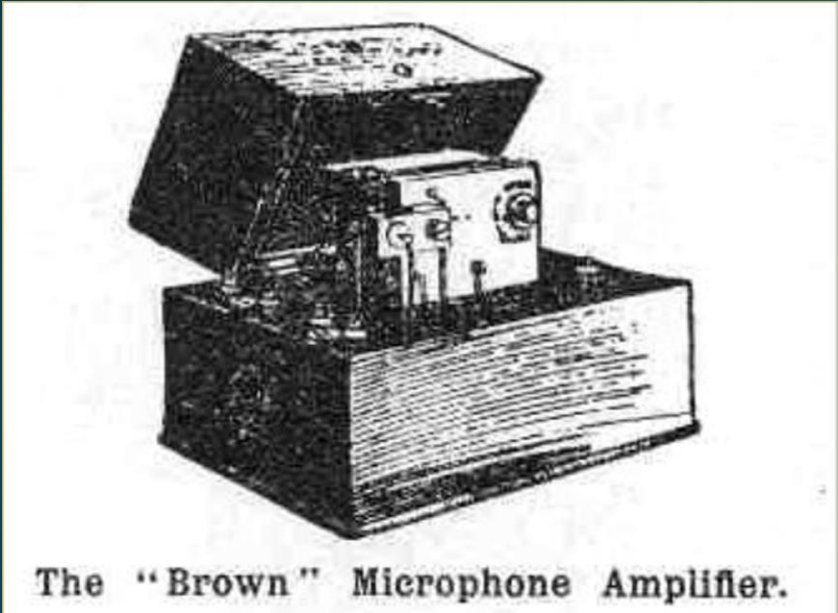




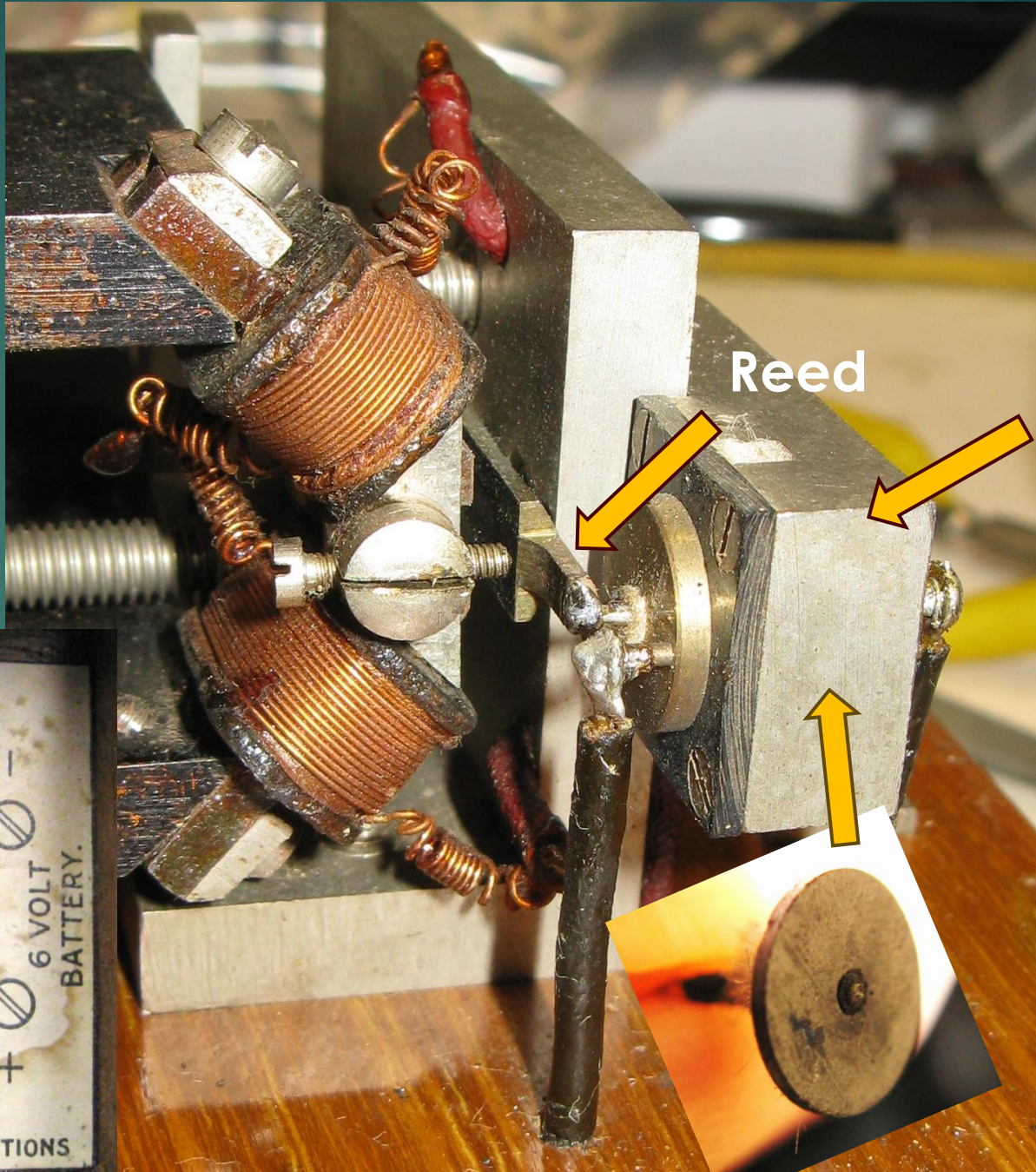
Bobbins were wound for 60,
1,000 or 2,000 Ohm
resistance (not impedance)
Wire gauges not specified.



[06a]



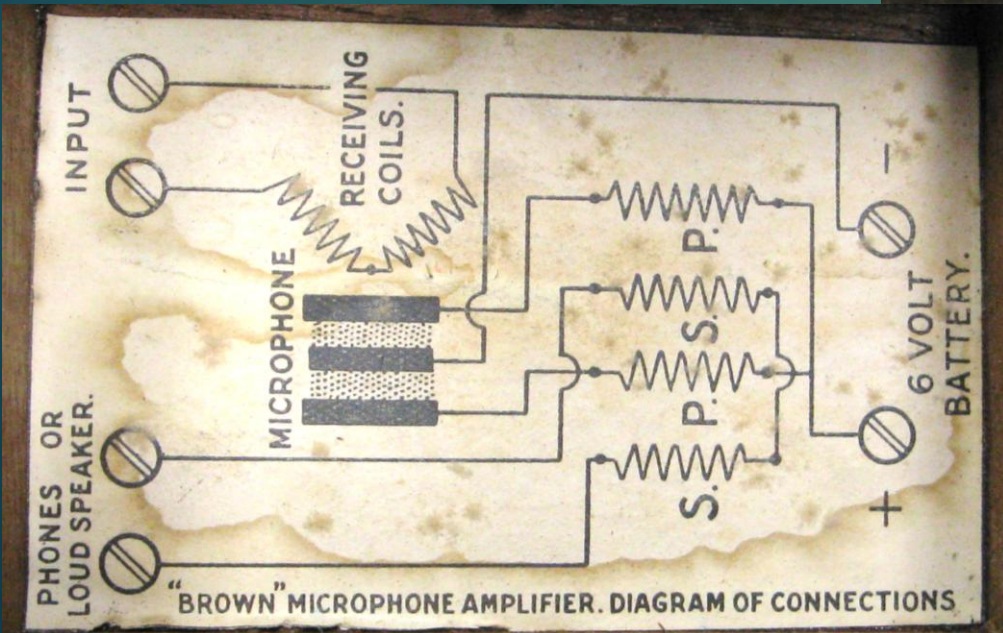
The "Brown" Microphone Amplifier.

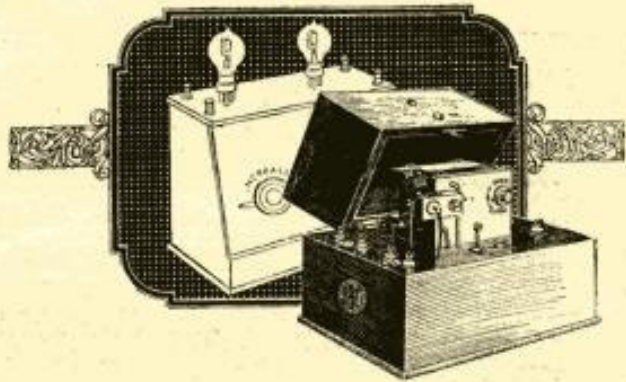


Reed

Microphone Housing

Center Carbon Electrode attached to Reed





Better and cheaper than any 2-Valve Amplifier

If your Receiving Set gives good results in the Headphones, and you want to use a Loud Speaker, there are two alternatives open to you.

You can add a 2-Valve Low-Frequency Amplifier, or you can use a **Brown Microphone Amplifier**.

The first method means the purchase and upkeep expenses of 2 Valves with a further drain upon your accumulator, together with the distortion and noise which are inseparable from the use of L.F. transformers.

The **Brown Microphone Amplifier**, on the other hand, gives a pure and undistorted volume of sound greater even than two Valves, and the only running cost is a small 6 volt dry battery which lasts for months without replacement.

Small wonder then that an increasing number of wireless enthusiasts are being converted to the use of this wonderful Valve-less Amplifier which gives such remarkable results.

Its operation is simplicity itself. Merely connect the input terminals

to the telephone terminals of your set, add the small battery and attach leads to your Loud Speaker.

A vernier magnetic tuning adjustment in the lid of the cabinet corrects the volume, and ensures perfect purity of reception under all conditions.

If you would appreciate a really good volume of pure and undistorted sound then you must use a **Brown Microphone Amplifier**.

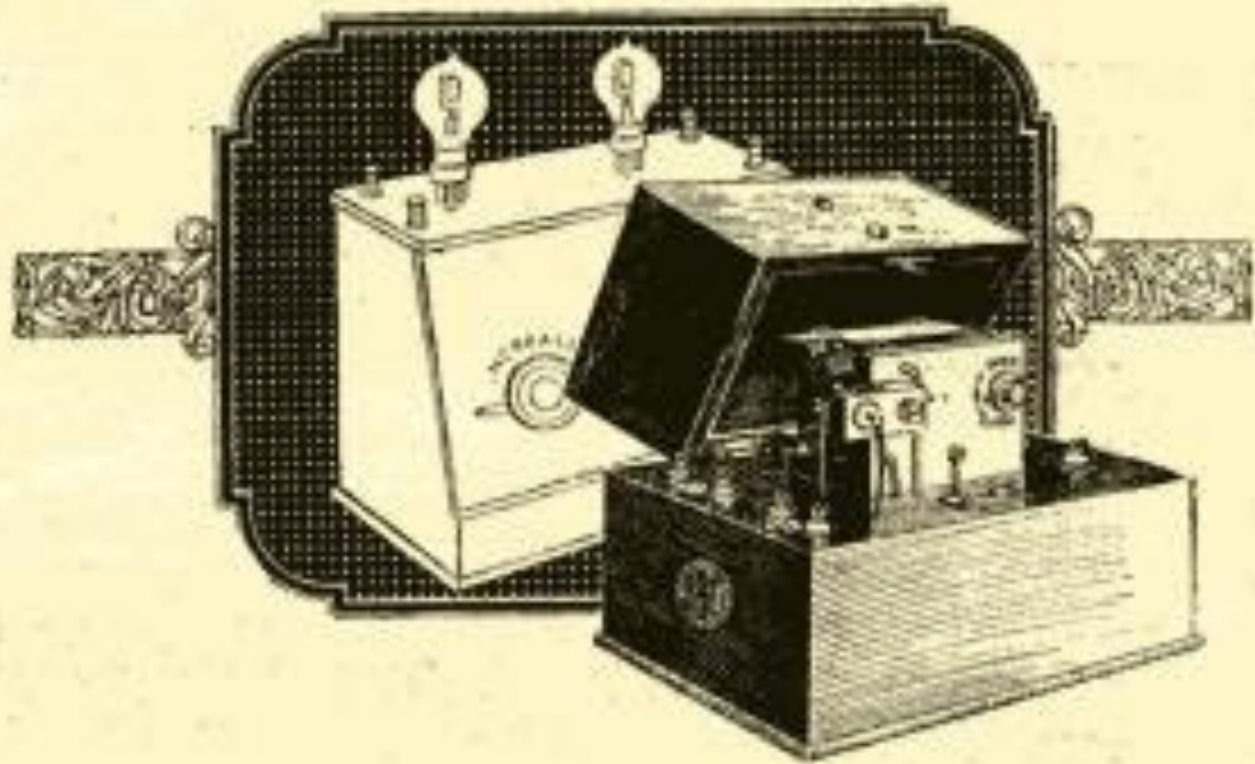
Prices:

Brown MICROPHONE AMPLIFIER.

Input: 120 ohms	.....	£ 25 10 0
Output: 120 ohms	.....	£ 25 10 0
Input: 2,000 ohms	.....	£ 25 10 0
Output: 120 ohms	.....	£ 25 10 0
Input: 2,000 ohms	.....	£ 25 10 0
Output: 2,000 ohms	.....	£ 25 10 0

Brown

S.G. BROWN LTD. RETAIL: 19 NOTTINGHAM STREET, W.1. WHOLESALE: VICTORIA ROAD, N. ACTON, W.2.



[08b]

Three models:

Input 120 Ohm – Output 120 Ohm

Input 2000 Ohm – 120 Ohm

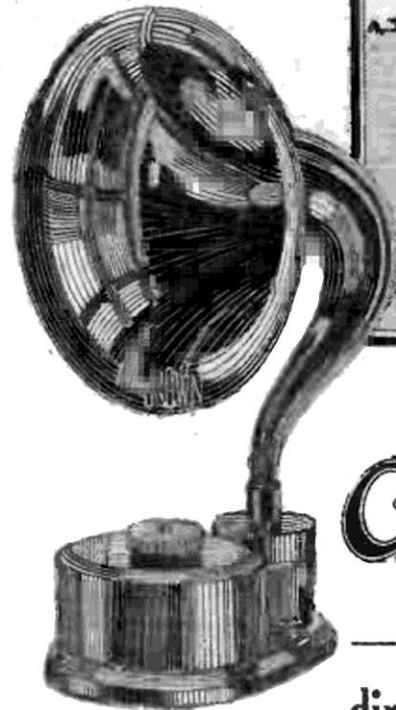
Input 2000 Ohm – 2000 Ohm

Prices:

Brown MICROPHONE AMPLIFIER.

Input: 120 ohms	.....	£ 25 10 0
Output: 120 ohms	.....	£ 25 10 0
Input: 2,000 ohms	.....	£ 25 10 0
Output: 120 ohms	.....	£ 25 10 0
Input: 2,000 ohms	.....	£ 25 10 0
Output: 2,000 ohms	.....	£ 25 10 0

Q This Map shows the effective working areas of the Crystavox—the only Loud Speaker in the world capable of operating direct from a Crystal Receiver. If you live within any of the circles—and if your Crystal Set will respond to the simple test described below—you can use a Crystavox Loud Speaker.



CRYSTAVOX

—the only Loud Speaker working direct from a Crystal Receiver

Exhibited at our Stand at the Albert Hall Exhibition.

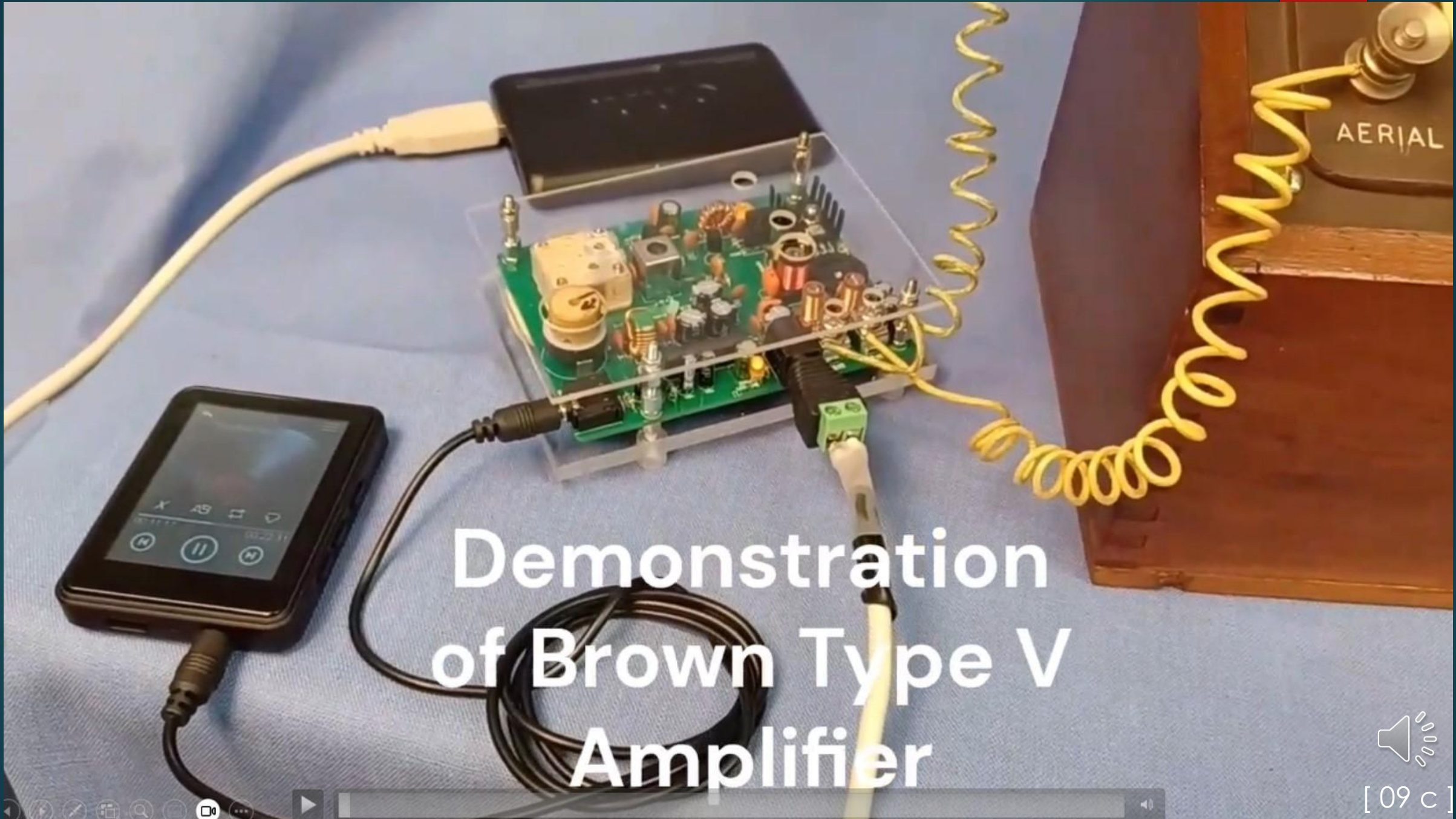
Advertisements in various magazines invited you to see if you were within 10 to 25 miles of the various BBC medium wave stations. Or within 125 miles of the Chelmsford long wave station.

If the program were loud enough for you to hear with your earphones laying on a table in a quiet room, the Brown Amplifiers would likely be able to power various Brown loudspeakers to adequate volume.

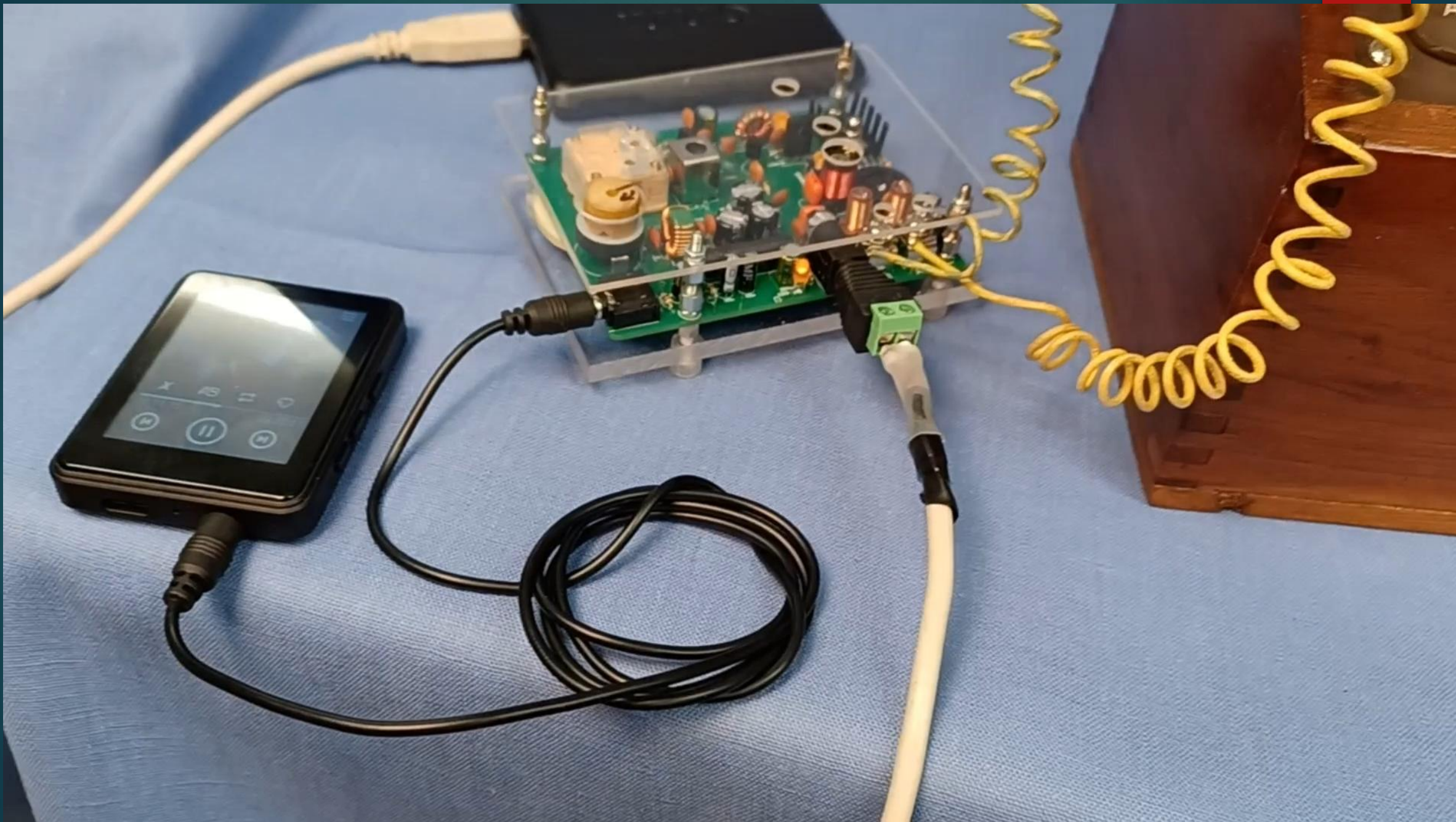


[09b]

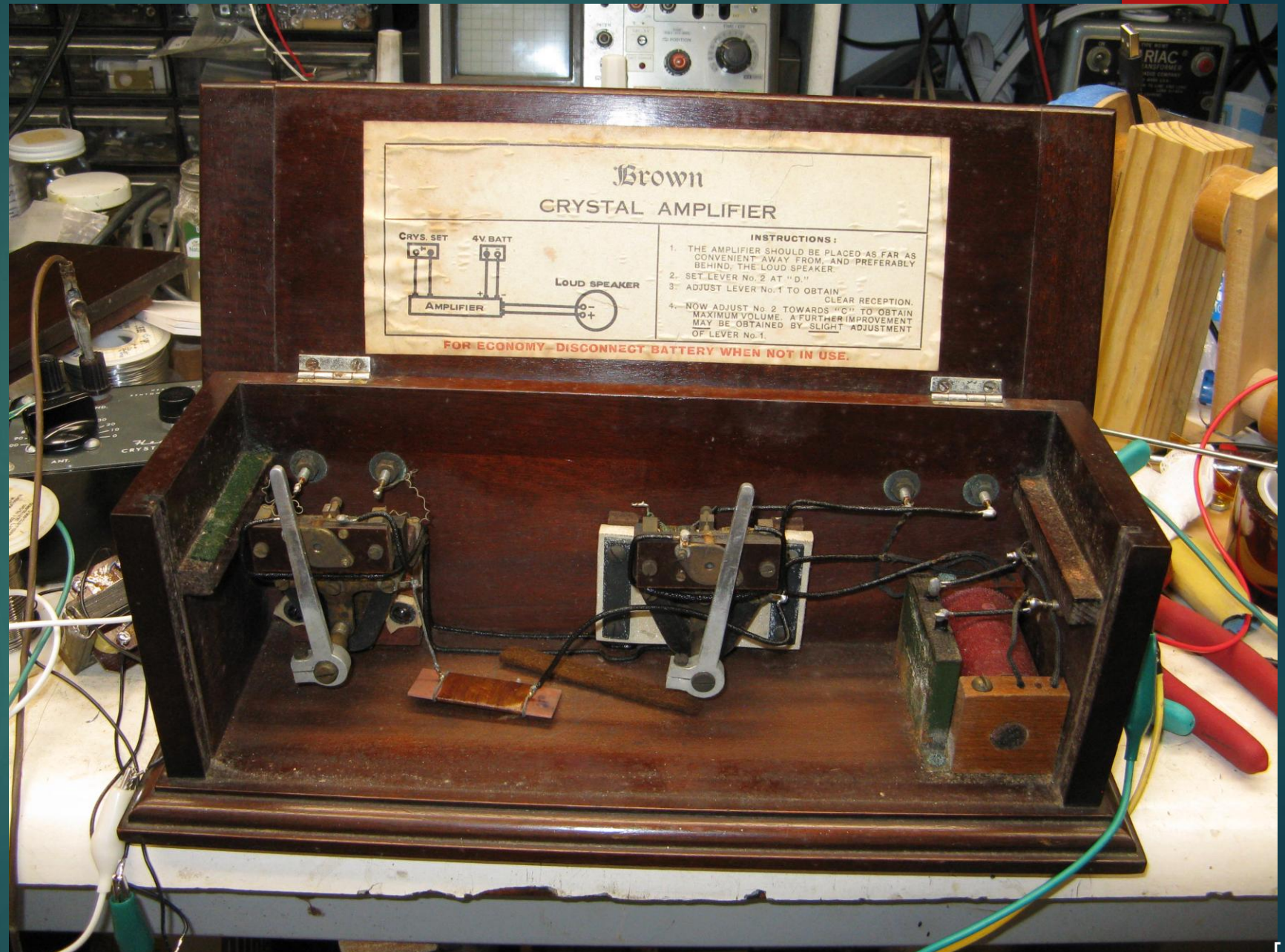
Demonstration of Brown Type V Amplifier



[09 c]



Crystal Amplifier of 1926.... Two stages of amplification to accept crystal set output and drive a high impedance loudspeaker of 2,000 to 4,000 Ohms.



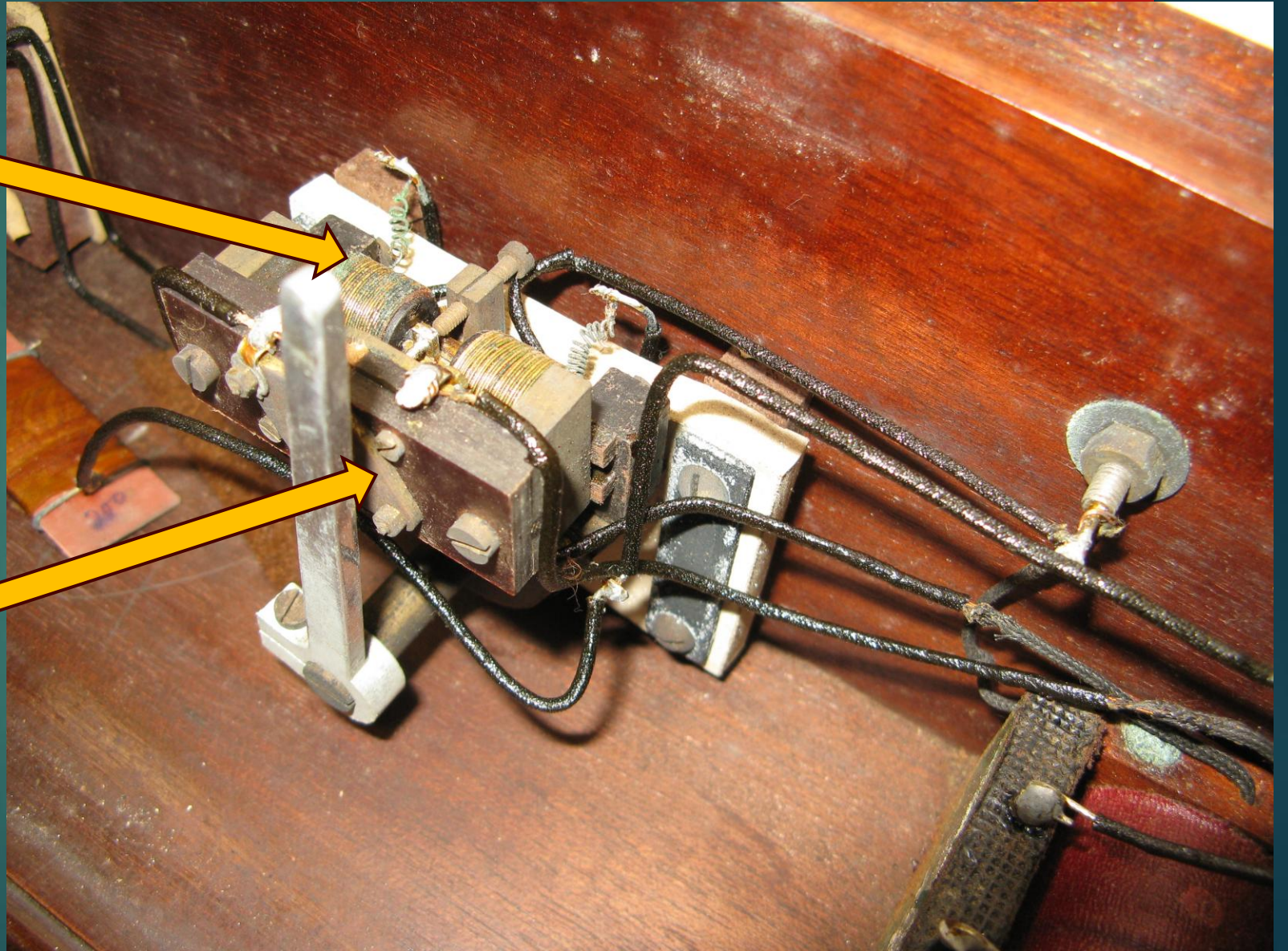
2,000 Ohm receiving coils.

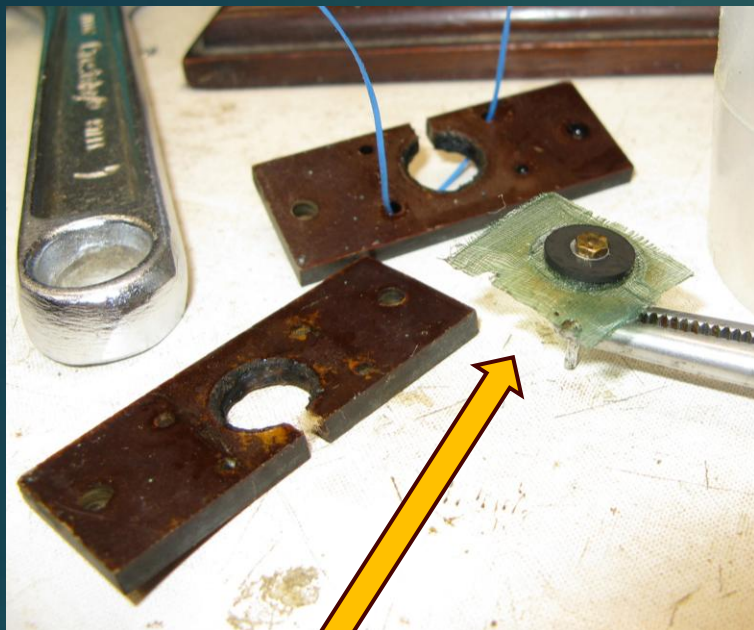
Output of double button microphone capsule drives 120 Ohm receiving coil of second amplifier.



The receiving coils are wound for about 120 Ohm total.

The double button of the second stage is different from the first.

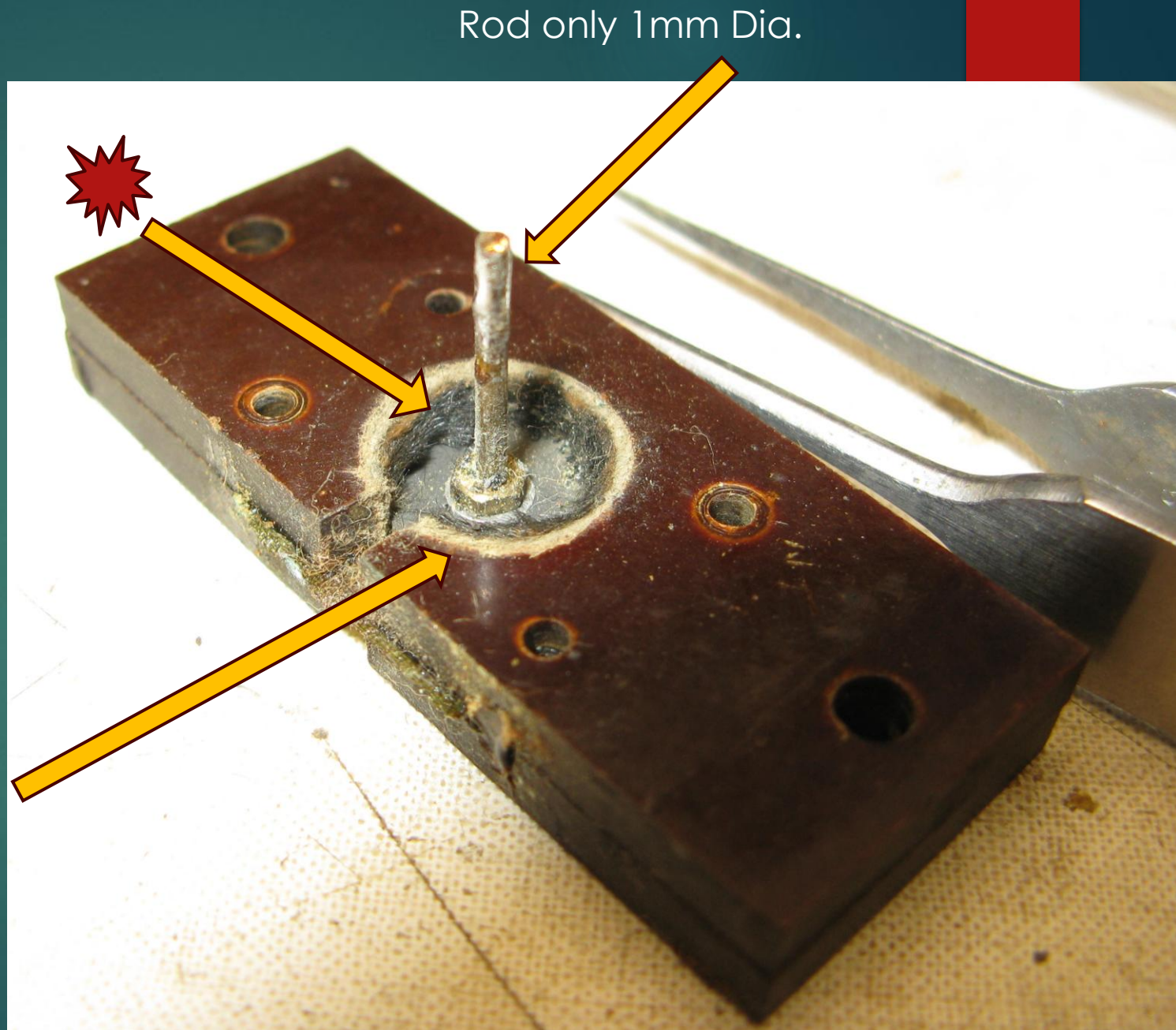




Center electrode is two impossibly thin washers of carbon capturing a sheet of ultra fine silk cloth.

Phenolic plate holes are lined with soft wool felt.

Unfortunately, the carbon granules get hot enough to carbonize the felt thus immobilizing the carbon washers.







S.G. Brown Crystavox
1923-26
First seen in
the AWA Academy
museum 40 years
ago.

Takes phone output
of a crystal set and
uses built-in carbon
amplifier to drive tiny
horn speaker.

Fascinating and
extremely rare. I
asked if I could
restore it.
Was I sober at the
time???



[16a]





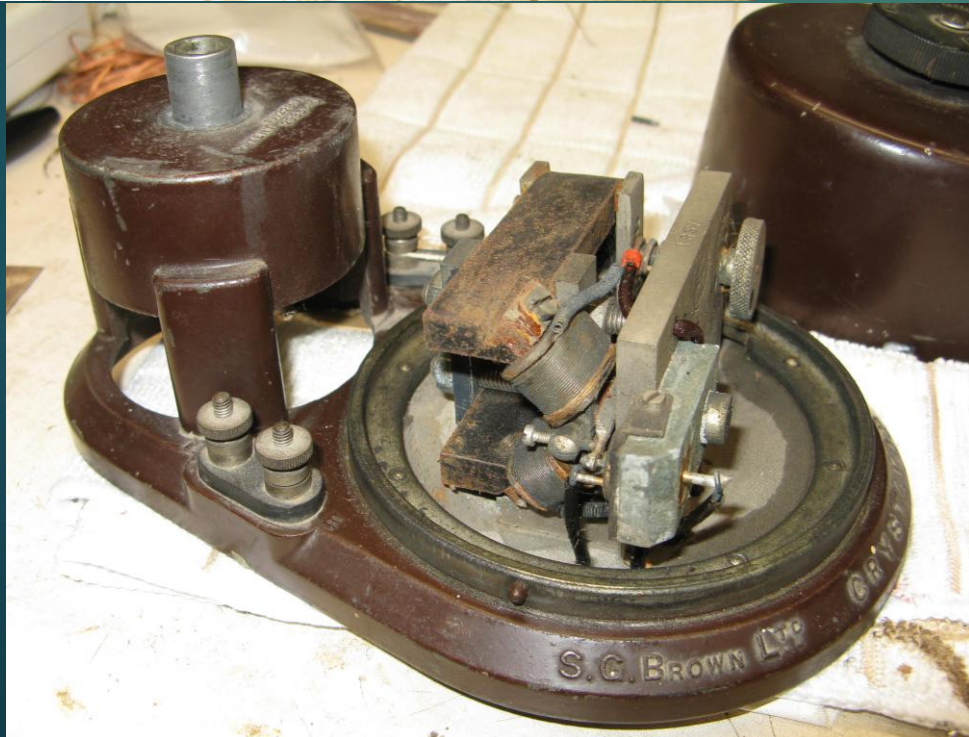
Watch maker scale mechanism.

Cover of amplifier frozen in place.

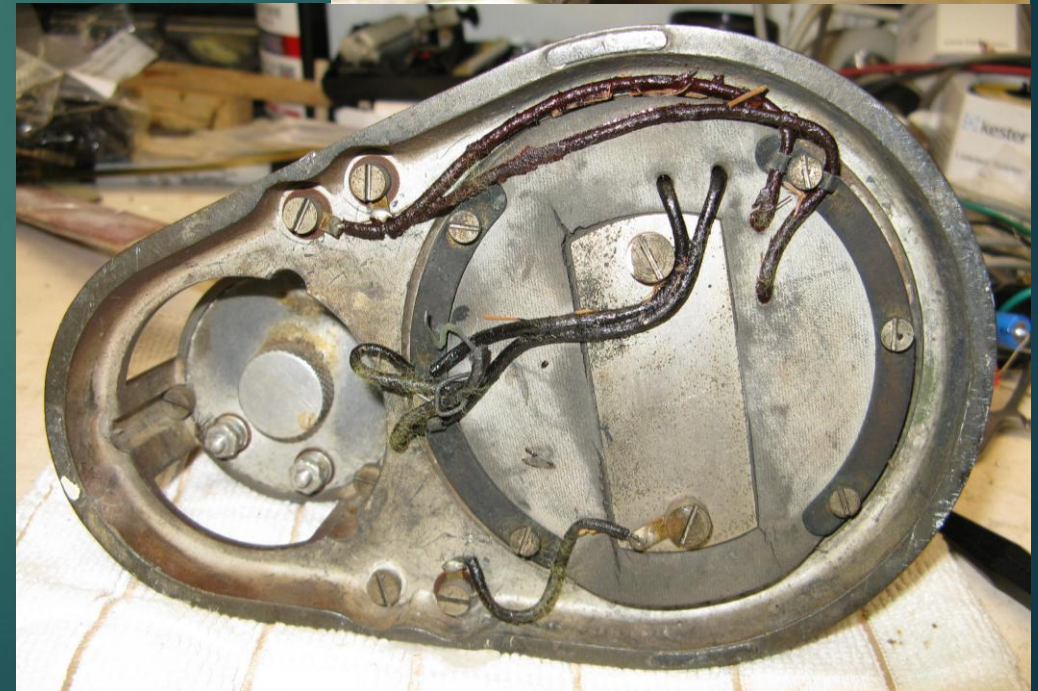
Heavy rusting.

Wire insulation turned to goo.

Distorted rubber suspension plate
now as rigid as plaster.

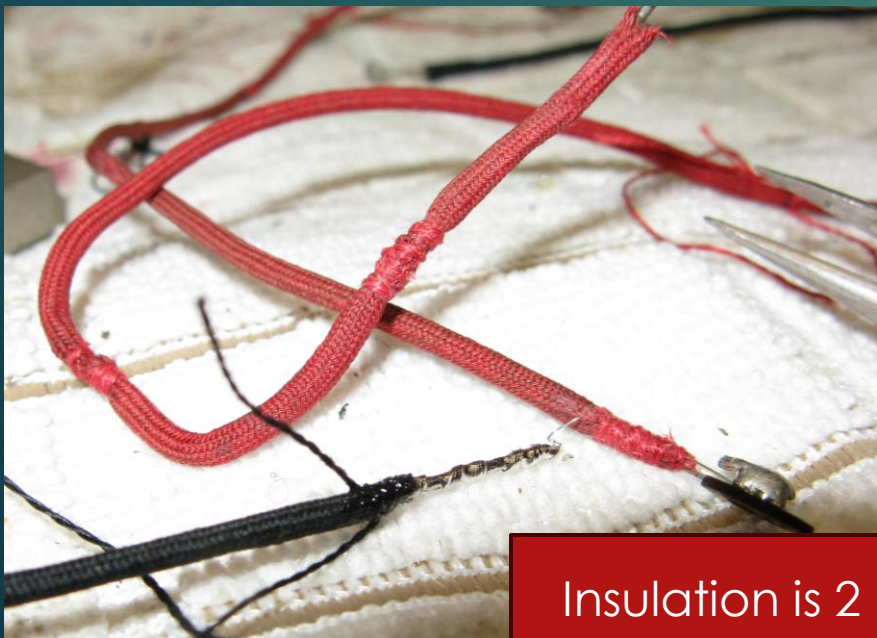


A
challenge
indeed!





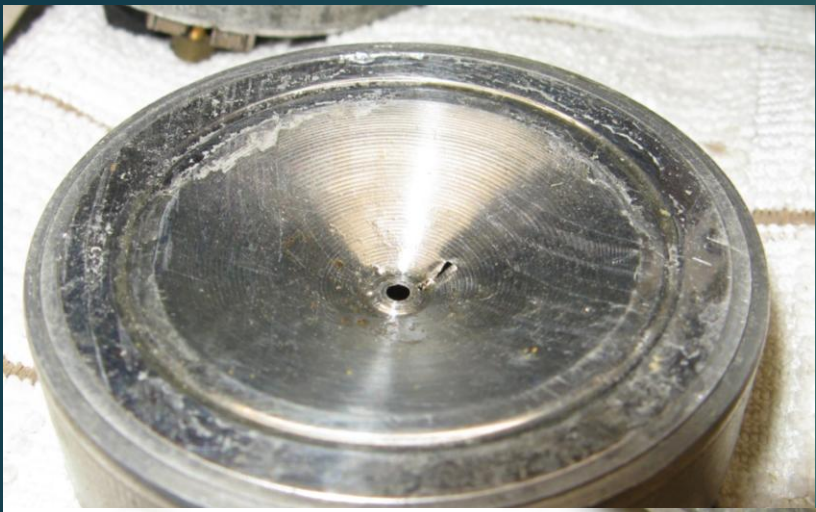
100-year-old 3/16" Rubber sheet suspension now is rigid as plaster. McMaster-Carr had an EXACT match to the embossed non-skid surface; only now in Neoprene.



Insulation is 2 mm braided silk. Un-obtainium!



[18a]



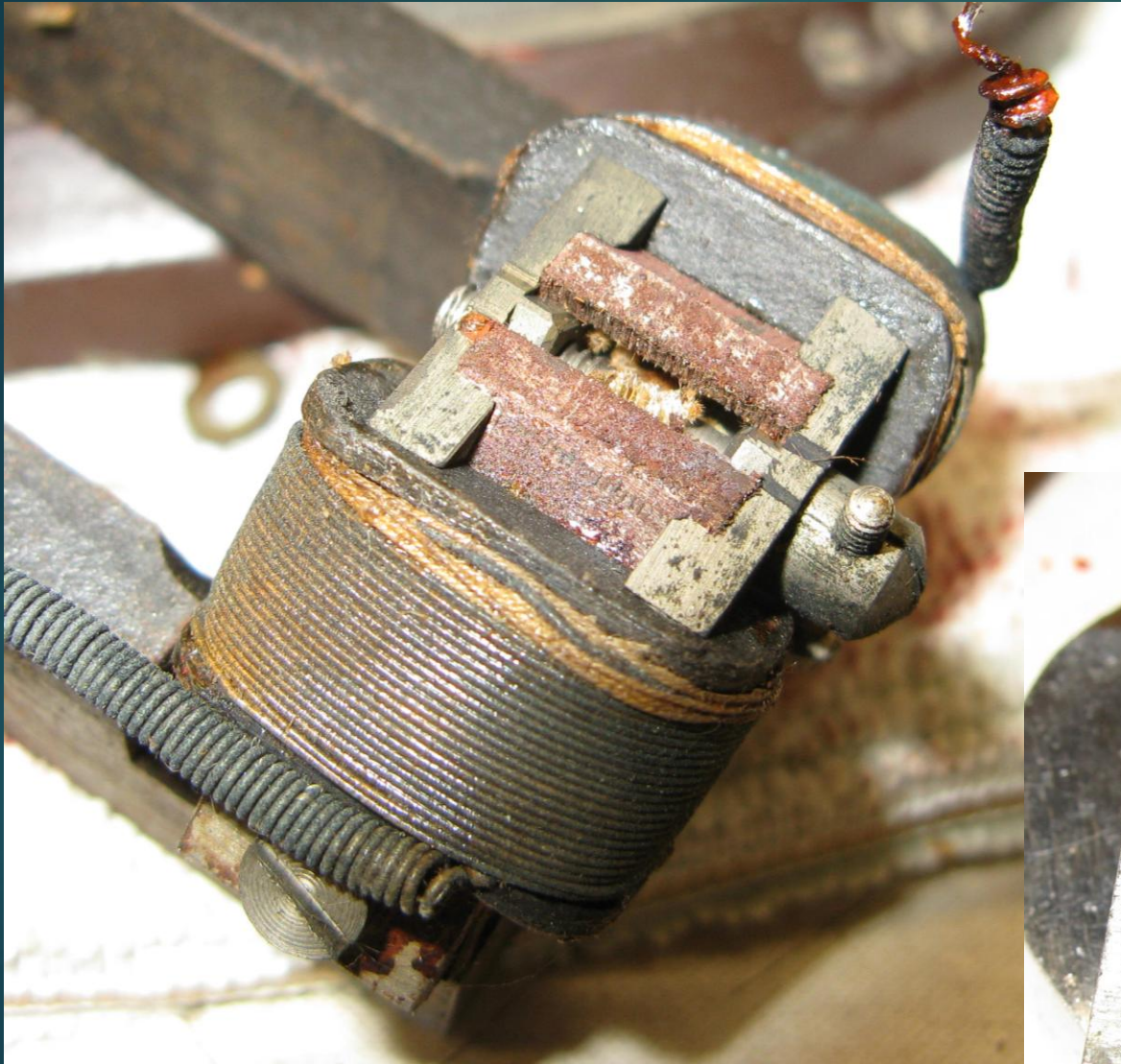
Crystavox driver is variant of the Brown Type A steel reed earphone.

First to have a cone shaped diaphragm. Coils are 45 Ohms each.



[19a]

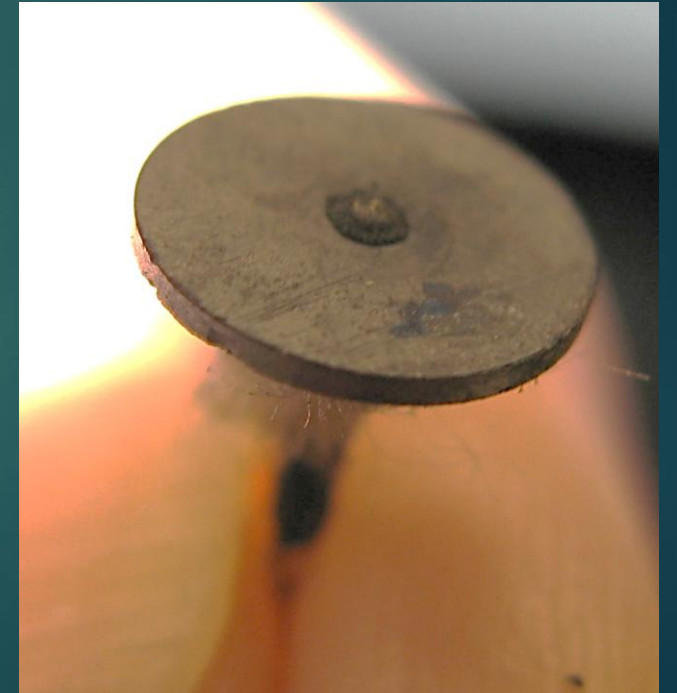
Working gap on steel reed – 0.0005 to 0.003 “

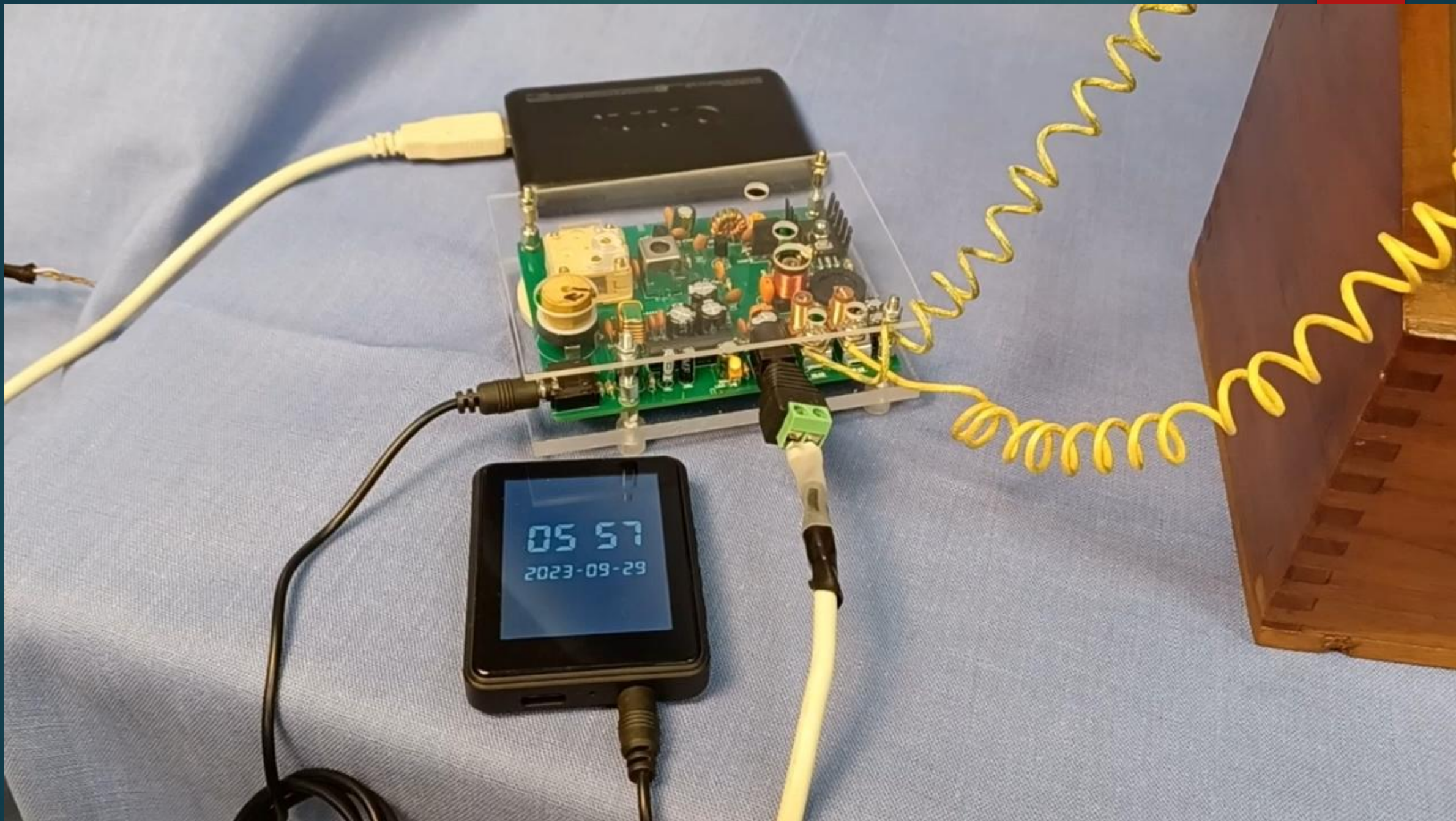


EACH receiving bobbin is 2,000 Ohms. Probably 7,000 turns of #44 wire.

Total load resistance seen by the crystal set is 4,000 Ohms. Minimizes loading of the crystal set.

Center carbon electrode is only 9 mm dia. and is swaged onto the disc! Machinist Witchcraft!







Epilog

S. G. Brown was ready to introduce these amplifiers to British broadcast listeners at about the time the BBC began official transmissions in late 1922.

By that time, here in the USA over 500 organizations had filed for broadcast licenses. And by mid 1923 were being permitted to occupy multiple channels between about 500 and 1500 kHz. It was becoming evident that crystal sets were simply unable to separate multiple **strong local stations**. A situation not experienced in many other parts of the world where there would be only one strong local station in an area.

In my opinion these carbon microphonic amplifiers for crystal sets would have not found even minimal acceptance here in the USA. Listeners here were simply needing more selective and sensitive receivers.

Also, the relative consumer cost of radio parts in the UK at that time was higher than here in the USA. And there was a general prohibition of foreign made radio apparatus into the USA.

Special thanks to:

Mike Molnar, For loan of his Brown Crystal Amplifier to evaluate and restore.

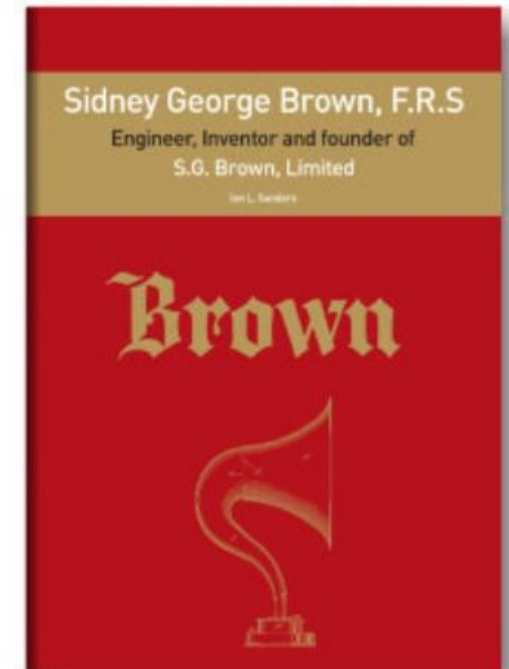
Lynn Bisha, Curator of AWA Communications Technology Museum for his authorization to restore their Brown Crystavox artifact.

Ian Sanders, Author of ***Sidney George Brown (S. G. Brown Ltd.)*** A highly recommended chronicle of S. G. Brown, his company and its products produced over several decades. The book presented with many high-quality monochrome and color images.



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[22a]

S. G. Brown Ltd. – London
“Microphone Amplifiers” for Crystal Sets and One Valve Receivers circa
1922-1926.

The End

Robert Lozier – KD4HSH
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