



## Vintage radio item with little-known facts or lore.

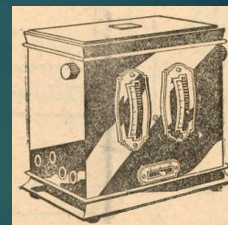
Category: 1920s European Broadcast Receiver



### 1929 Telefunken Arcolette Type 30W for AC Mains.

Presented by : Robert Lozier – KD4HSH

kd4hsh@carolina.rr.com --- December 2021



I acquired an example of this radio two months ago. It has been repaired to make it operational. But I have yet to power it up. What I do not like is that some repairs have been done in an expedient way. I am compelled to try and correct some of them.

Telefunken of Germany got its start, like Marconi in England, by providing ship to shore and soon, world –wide communications to their colonial interests, business, diplomatic and military uses. Its creation in 1903 was as a holding company to resolve patent conflicts between Adolph Slaby at the firm AEG and Ferdinand Braun at the firm Siemens & Halske. Until about 1933 all receiver manufacture was done at AEG and Siemens & Halske factories.



Broadcasting begins in October 1923 with private and club radio stations approaching some 20 stations by 1925. Consolidation under the **Reichs-Rundfunk-Gesellschaft mbH ( RRG )** with eventual creation of a network covering the nation with 29 stations by 1929. All, in part, financed by an annual radio operation license that, in the late 1920s was equal to about \$60 USD in 2021.

<https://de.wikipedia.org/>

[ 02 ]

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Radio "Siemens D-Zug", 1924 ★

Identical "D-Zug" radios have a Telefunken badge. D-Zug = Steam Train = Radio circuit modules connected together.

Classic TRF battery powered design of 1928.



Bild 5: Telefunken T 9A, 1928.



Telefunken 5 (2)  
Radiomuseum.org

Telefunken 5  
1928

(Den Empfangsbereich dieses frühen "Netzempfängers" kann man durch Einsetzen spez. Ansteckkoppler von 250-600 m auf LW erweitern)

Telefunken 5 of 1928. Their first AC mains powered radio. Apparently made in very low quantity. This advertising cut shows the receiver resting on its right side???



The first metal cased Arcolette of about 1926. A single band, 3 tube receiver using only R-C coupling. Made in very small quantities.



These are Telefunken branded radios from 1924 to 1928. The unit panel radios called D-Zug radios were made in small quantities on the heels of Germany's period of hyperinflation. Only a few of the very strange looking 3 tube Arcolette battery radios were made around 1926, the first to use R-C coupling providing enough gain to drive a loudspeaker. Broadcast receiver manufacturing rate increases considerably in 1927, producing some very nice TRF and Neutrodyne radios. The very odd-looking Telefunken 5 of 1928 becomes their very first AC powered broadcast receiver but production numbers were very low.

Battery version: The Arcolette 3 is on the market by late 1927. Same cabinet as 30G

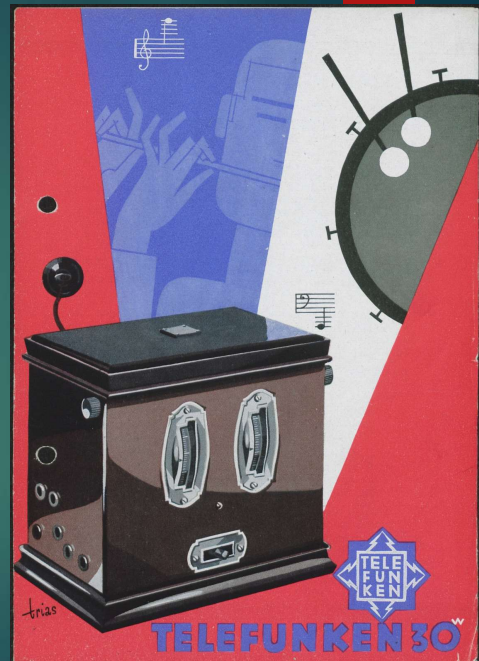


[ 04 ]

Dir. of Engineering George Graf von Arco.

Magnetic speaker - Arcophon, Dynamic speaker - Arcodyn, Crystal detector - Arconite, External grid tube - Arcotron, Radio/record player - Arcofar.

1928 Advertising folder for the Model 30. Their second mains powered broadcast receiver. First version for DC mains only the 30G. Followed in months by AC mains version the 30W.



<https://technikmuseum.berlin>

By 1927 they had completely repackaged the design of the Arcolette. Still battery powered with a stage of tuned RF with regenerative feedback and two stages of resistance-capacitance coupled audio amplification. By 1928 they had a DC mains power version in the same cabinet modified by adding a perforated cage on the back of their battery set to enclose a large ballast lamp, line chokes and filter capacitors. Quite a toasty arrangement. Many makers wanted to assign a catchy brand name and the last name of the Telefunken Director of Engineering; George Graf von Arco seemed a natural to play upon. So, there was in addition to the Arcolette, the Arcophon, magnetic driver speaker, the Arcodyn dynamic speaker, a crystal detector called Arconite, a dubious value and short-lived external grid triode called the Arcotron and a Radio/record player called the Arcofar.

**Radio mit Feinregler!**

Der neue 3-Röhren-Stadt- und Land-Empfänger

**TELEFUNKEN 30w**

Ohne Batterien - Zum Anschluß an die Lichtleitung.  
Empfängt den Ortssender ohne Hochantenne -  
und out dem Land die größeren Fernsender  
Anschlüsse auch für Schallplatten-Wiedergabe

Tonumfang  $7\frac{1}{2}$  Oktaven

RM 194.-

Verlangen Sie Vorführung im nächsten Radiogeschäft  
für jeden Zweck, für jeden Geldbeutel

**TELEFUNKEN**  
DIE DEUTSCHE WELTMARKE

[ 05 ]

Radio with Fine Tuning! Boasting  $7\frac{1}{2}$  Octave tone range. Telefunken, the German world market brand.



<https://www.vintageradio.nl>



Dutch Advert.

I have both speakers shown. Had never opened Arcophone 3. Will have to take a look and give it a listen.

<https://elettronialtramoto.forumfree.it>



Philips 2016 cone.



[ 06 ]



Italian advert showing unusual Arcophon 3 with half-cylinder radiators joined at middle drive point. (Not picture of my spkr.)

This series of radios were exported. Here are advertisements in Dutch and Italian with line drawings showing appropriate loudspeakers. The diminutive Philips 2016 plain parchment cone was also available at some time with several chaotic color motifs. I kind-of wish I had one of them. I have had one of the boxy, plain Jane looking Arcophon 3 speakers shown on the right for 25 years but never researched it. Only this past week did I learn that it has a very unusual radiating structure consisting of two half cylinders of a parchment like paper joined along one edge and attached to the pin driver mechanism. I'll certainly want to see how this sounds.



Fine tune and fine regeneration control via small rubber wheel friction drive to main drums.

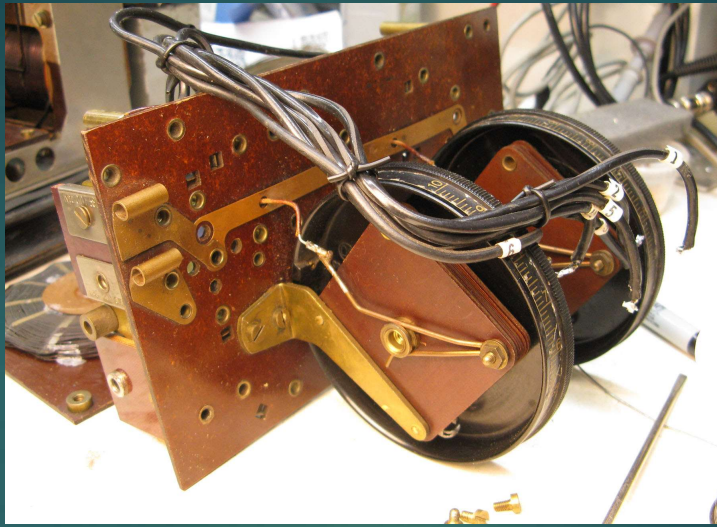
[ 07 ]



To turn ON, you had to lift the top lid and press the white button. (Black to turn OFF) No real shock hazard and these three tubes do not get dangerously hot.



So here is my new-found 30W.... Certainly nothing even remotely equivalent to American made radios of 1929 produced in any quantity at all. The large thumbwheel knobs on the front are for regeneration and tuning. Small shafts on either side of the cabinet provide friction drive for fine adjustments. A three-position slide switch on the front selects operating wave lengths from 200 to 2000 meters. To operate the set, you must lift the lid and press the white button. To turn off, you push the Black button. No real shock hazard and these three tubes do not get dangerously hot The power rectifier tube is enclosed in the metal box.



[ 08 ]

The SK that had this set liked to get sets in operating condition. I was worried about how careful he might have been in making repairs. Ugh! He had rewired the set with 18 Gauge Vinyl insulated wire made by splitting a scrap AC line cord. A.k.a. Zip Cord. That will never do in any set I have.

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There are a hundred or more pictures of this little radio on the Web but Google search shows no ORIGINAL wiring. I begin queries to everyone I know, after three weeks of search, no luck.

Or do the wires have different colored insulation?



[ 09 ]

There are a hundred or more pictures of this little radio on the Web, but Google searches show no ORIGINAL wiring. I begin queries to everyone I know, after three weeks of search, no luck.

**Success !**

Radio-Bastler-Forum (RBF) - Historical devices and technology in general - Historical radio receivers up to 1945, detectors and accessories, historical antenna technology. **Telefunken 30W What wiring is correct?**

Telefunken 30W What wiring is correct?

My first posting here ... My T-30W radio has modern plastic insulated wiring installed by a previous owner. I would like to correct the wiring using authentic looking wire and insulation. I have not been able to find any pictures of this radio before repairs were made. (Only pictures after repairs were made.) The only wiring in question are the six wires between the radio chassis and the power supply.

Thanks for any pictures that will guide me to correct preservation of this fascinating little radio so delightfully different than contemporary American manufacturing practice. Thanks, Robert

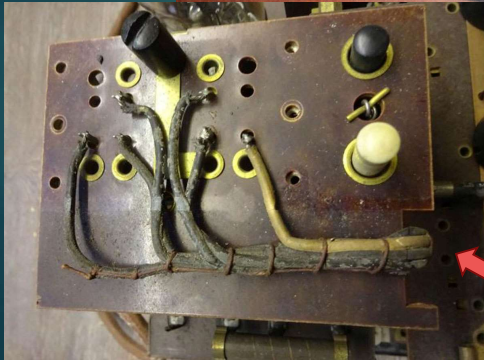
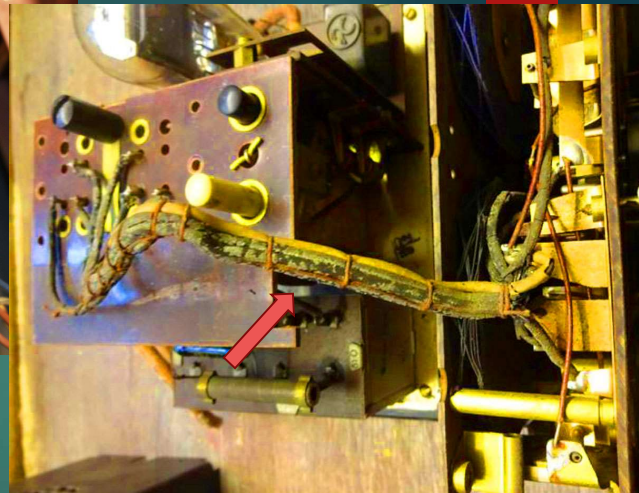
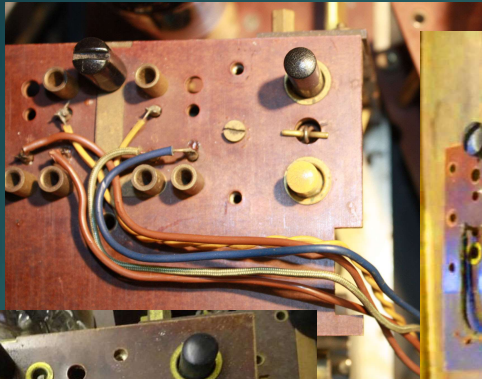
Google Translate has me searching in German  
I find a site like Antique Radio Forums (ARF)

Radiomuseum.org is a site I visit often, but no help on seeing original T 30W wiring.

I visit radiomuseum.org often but they did not have my illusive pictures on their site. With the aid of Google Translate, I make queries in German and come across Radio-Bastler-Forum (RBF) i.e. Radio Hobbyist Forum. It is easy to join, and I had my answer in less than a day!... My only comment if you have not used translating tools like Google Translate before is to make your sentences grammatically correct, simple, precise, short and polite. Take the German translation and have Google translate back to English. You may find you need to choose different English words to get the correct meaning.

Someone sent this pix. But I thought it was not faithful to the original....

[ 11 ]



Use Photoshop to push color saturation. Conclusion: All dark color wires are probably just BLACK.

Over three weeks to find two pictures of original wiring. Courtesy of "Mendefreund" on Radio-Bastler-Forum (RBF)

Odd that you make specific requests and people send you pictures of obvious modern plastic insulated wire. Thankfully though, one person responded as requested.... I use Photoshop to boost the color saturation as high as possible. Sometimes that will show some of the original tint. In this case, it appears that all five dark colored wires are simply black rubber covered stranded wire of about 20 AWG. One wire is natural white rubber. They assembled a cable with likely waxed linen cord. Easy to replicate.

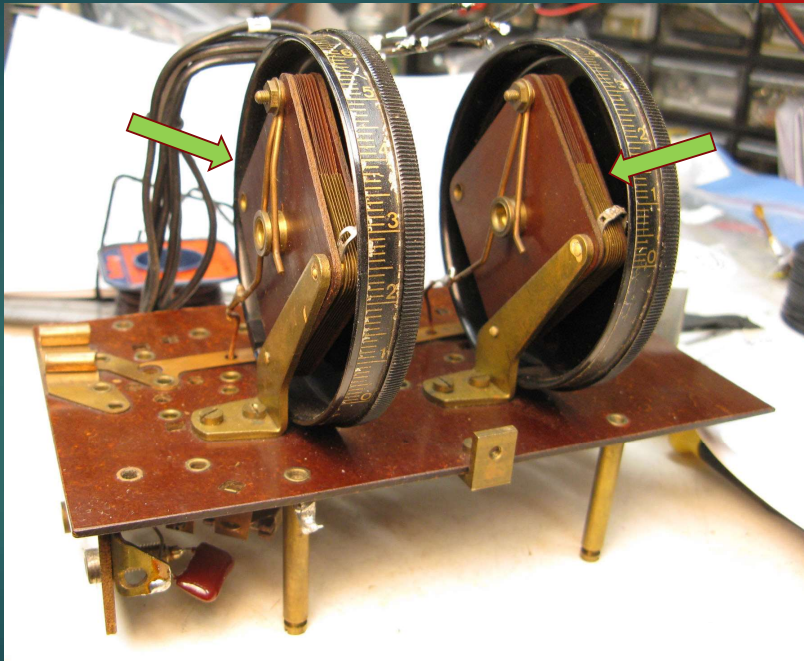


My way to duplicate vintage rubber covered wire is to use UL3132 soft silicone rubber wire available on e-Bay. Increase the diameter by using 3/32" diameter 2:1 shrink ratio thin-wall heat-shrink polyolefin tubing. This tubing is available in various colors and can be stained with aniline wood dyes such as Mohawk Ultra Penetrating Stain to make the wiring look aged.



Regeneration  
(Volume)

Compact adjustable capacitors are common in late 20s German radios. Instead of air dielectric, thin sheets of phenolic impregnated paper are used. Can get away with it because dials are not calibrated.



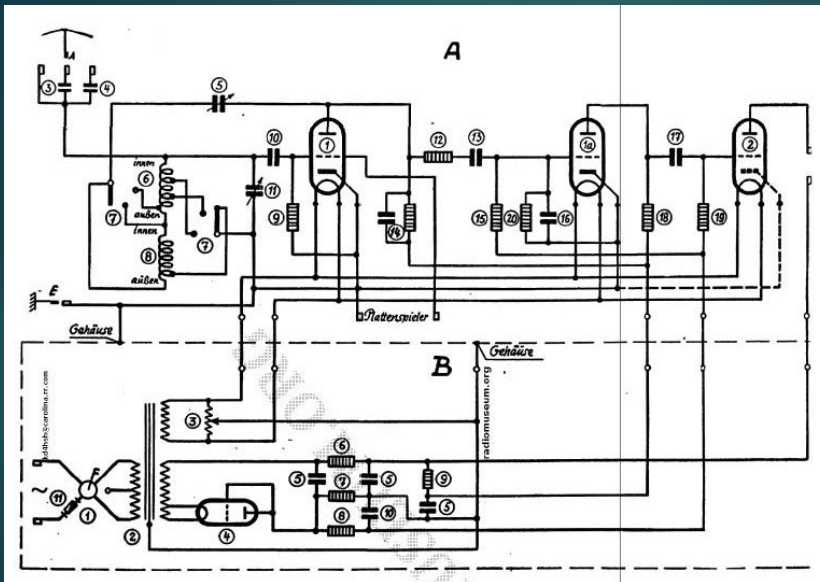
[ 12 ]

Tuning

These Compact adjustable capacitors are common in late 20s German radios. Instead of air dielectric, they use thin sheets of phenolic impregnated paper. Not rotationally precise but they could get away with it because dials are not calibrated.



[ 13 ]



Radiomuseum.org

- Single parallel tuned circuit with capacitive feedback for regeneration. Not a problem for city dwellers where there is only one near-by station in your native language.
- High impedance magnetic phonograph input provision.
- Two stages of resistance/capacitance coupled amplification with a claimed fidelity of 50 to 8,000 Hz. Tube types were changed over the two-year production run.

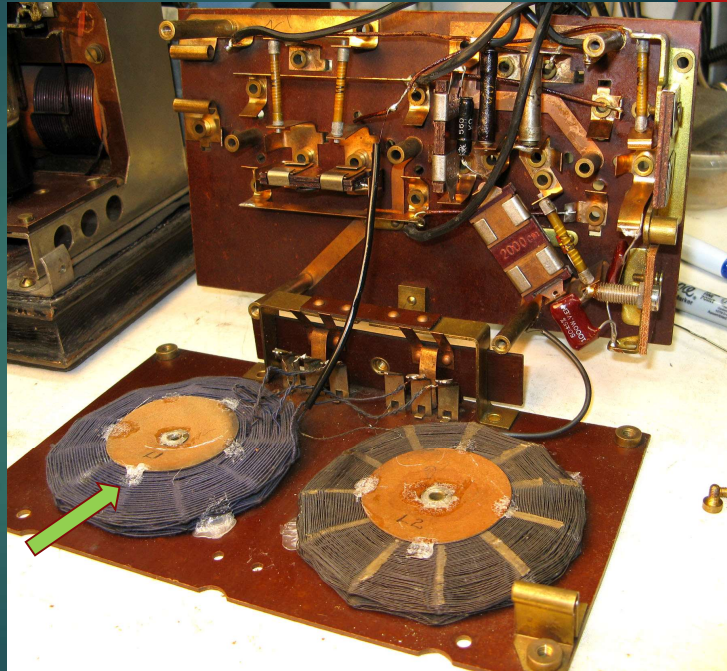
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A circa 1928 German design.

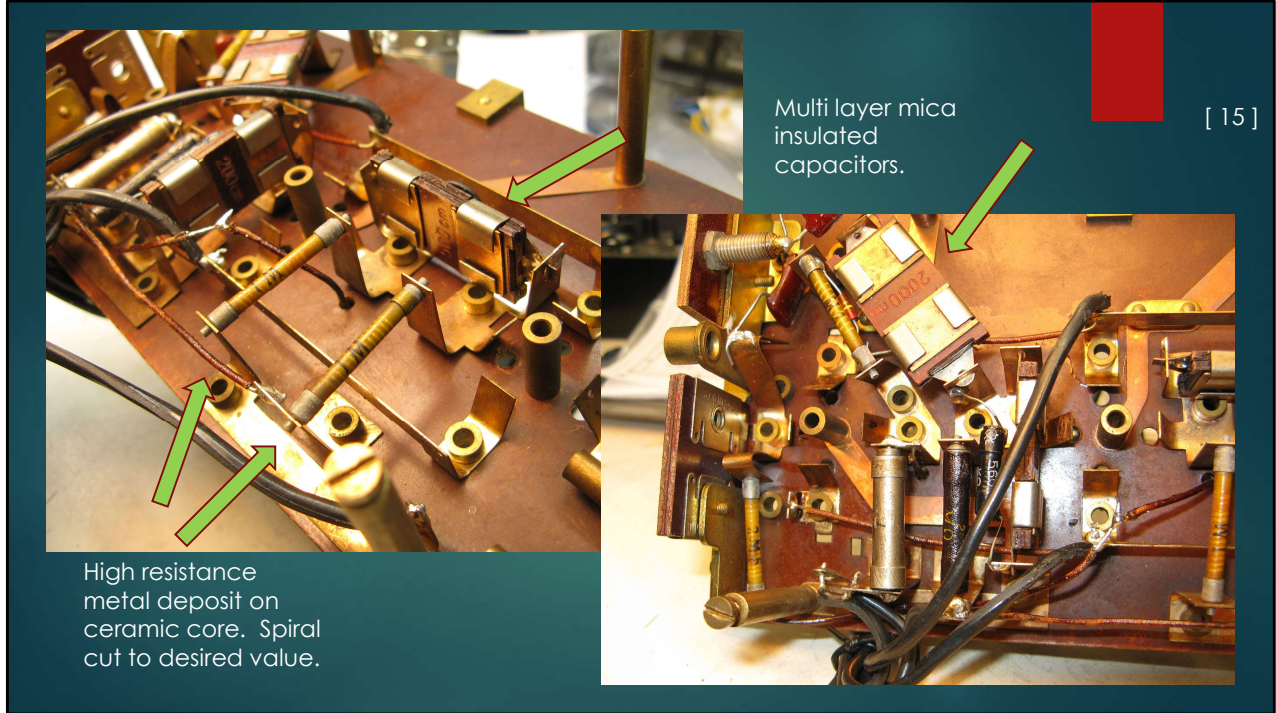
Heck! To American eyes, this radio could have been built on Mars!

That is why the study of foreign sets before 1970 can be so interesting.

Phooey! Seemingly indestructible modern glue.

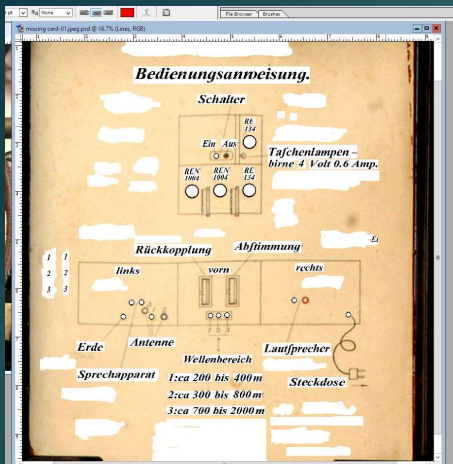


You can easily see that this radio construction method bears no resemblance whatever to American practice of the day... That is why I am delighted to have it in my collection. The previous owner has used some sort of modern resin to hold the coils in place. I'd like to replace it, but I have used everything from alcohol, to Toluene, to MEK, Generic lacquer thinner, Goof-Off, CA adhesive remover, 1-1-1 Trichloroethane nothing has worked.... I'm out of ideas as to the proper chemical key to open this resin lock so to speak...



Interesting in that the high value resistors are almost always good. While American made resistors of the day are almost always bad. They just snap into place. The mica capacitors have tails that snap into slots in the same type of brass strips. Unfortunately, a couple of original capacitors and one resistor are missing. The guy replaced them with modern parts.

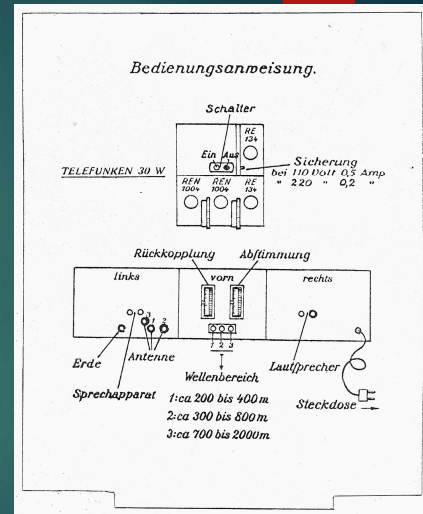




Only had a poor picture of warped card. No font in Photoshop matched exactly, so combined font features and modified a few characters to come very close. And THEN...



I needed this hook-up card.



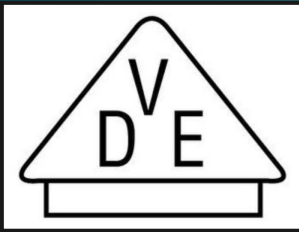
Michael Roggisch in Munich finds this very good scan. Problem solved!

[ 16 ]

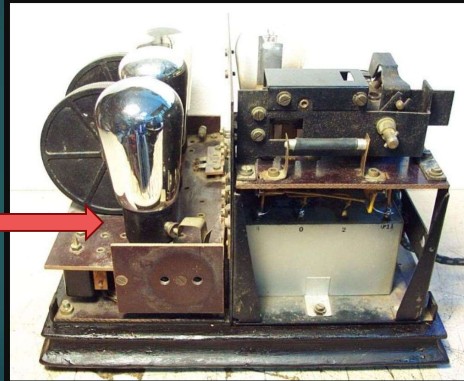
The top lid has an instruction card glued inside. I only had a poor picture of a warped card. No font in Photoshop matched exactly, so I combined font features and modified a few characters to come very close. I spent hours on the task and then a Michael Roggisch in Munich comes to the rescue with this graphic that was very easy to replicate. You have to be careful in selecting what card to use, there are variations Especially regarding operating voltage selection, fusing and tube types used.



The German equivalent of Underwriters Laboratories was/is VDE and for the late 1920s was more cautious for consumer electrical devices than here in the USA, You see precautions like this where opening a lid disconnects any circuits you could touch with a “standard finger probe” There had to be a fusible device inside the radio. In this case, it is a resettable thermal fuse. The brass tube has a ceramic bead with a spring-loaded brass pin with a piston like head inside. The spring is surrounded by hard wax. If the area gets hot enough, the pin will withdraw inside the cylinder and break the line circuit. The service man could heat the fuse gently and push the pin back out from the other end and allow to cool until the wax hardened thus resetting the fuse.



New, more stringent, safety rules adopted in 1930 requiring Telefunken to redesign. The new model is the 31W.



Pentode with side contact.



Lid is locked unless key switch is OFF. Won't turn ON unless lid is closed.

<https://www.leradiodisophie.it/>



[ 18 ]

But sometime in 1930 the safety standards were made even more stringent. You could no longer allow the user to open a door, lid or panel with the mains cord connected or without a key. Telefunken designed the T-31W to meet these new requirements by adding a key operated switch.... The Lid is locked unless key switch is OFF. Won't turn ON unless lid is closed.

At the same time, the audio output power was considerably boosted by use of a Pentode tube.



[ 19 ]

**Oh NO !** The ARCI Zoom time is here and I'm not finished !!!....  
I thought I would have plenty of bench time by now.... I can't  
report on how my rewiring and performance checks turned out.  
Maybe you guys will let me do that some other time...

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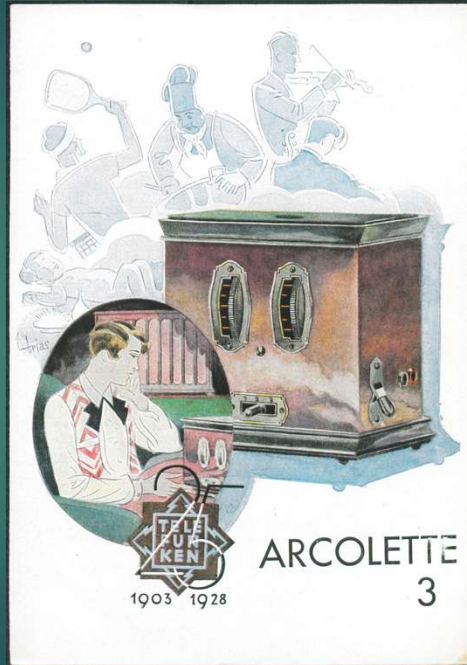
My thanks to:

Michael Roggisch – Munich  
<https://www.leradiodisophie.it/>  
Anders Widell – Lund, SE  
Radiomuseum.org  
Radio-Bastler-Forum - DE  
Brian Harrison – KN4R  
Wikipedia  
<https://www.gfgf.org/>  
Deutsches Technikmuseum  
<https://www.cdvandt.org/25-jahre-telefonen.htm>  
Antique Wireless Museum of the AWA

## *The End*

Presented by : Robert Lozier – KD4HSH

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[ 20 ]

Photo of heat shrink.... Whine about bad info saying multi-color spent \$60 to get 10ft. Of each color.

Use aniline wood dye to add look of age to polyolefin tubing. Add coat of amber varnish.

1mm brown waxed linen beading cord from craft stores can sub for waxed linen wire lacing cord. It is cheaper as far as I can tell. Modern cord is synthetic and looks just plain wrong for pre-WW-II vintage equipment.

There are component value errors on some circulating schematics.

Not uncommon to have wood beetle larvae infestation in European radios. Place dry cabinet parts in plastic bag and place in bottom of deep freezer at 0 F for 4 days or more. Or in an oven held above 120 F at core temperature for more than a half hour. Some attics get to 140 F., but the humidity needs to stay very low. (Like desert conditions.)