



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

**Category: 1920s American made broadcast receiver.**

**Hi-Grade Wireless Instrument Co.  
Type HS-2  
Circa mid 1922**

**Presented by : Robert Lozier – KD4HSH**

**kd4hsh@carolina.rr.com --- November 2021**

- From Marconi's first demonstrations in 1897 to World War I (1914-1918 ) Practical communications used telegraph codes.
- Vacuum tube technology advanced greatly during the War years to make voice modulation of radio signals more than just a laboratory demonstration.
- As the wartime uses of radio began to wind down, what could be done with that capability? A rapidly growing cadre of radio amateurs and entrepreneurs had the idea to use this technology not only for messaging at sea and on the land but for audio entertainment for anyone that could tune-in on their own receiving apparatus.



About 22 years passed from a demonstration of Marconi apparatus to post office officials in 1897 to the 1919-1920 audio broadcasting demonstrations of Frank Conrad's station 8XK and others here and abroad.







1920 – 1923 More magazines appear with lots of radio related content.





Even general interest magazines of the same early 1920s time-frame were fueling interest in broadcast reception in your own home.

Our first name brand

“Made in North Carolina” Radio.

Appearing on the market about  
mid-1922 with various small  
advertisements in *The Asheville  
Citizen* newspaper.

Only two known survivors of this  
pioneer brand.





# Why Did Folks Come To Asheville?

- ▶ It's climate was recognized almost 200 years ago as offering vital benefits to anyone who could make the trip up the mountains from South Carolina, Georgia and other regional hot spots
- ▶ And so, the people made their way to town, first by stagecoach and then by railway, craving what doctors of the time said was best for their debilitating illnesses; rest in the quiet country air, good food and skilled nursing care, and, finally, a chance to unwind from the pressures of booming Gilded Age business. The Asheville plateau was heralded as "the great sanitorium of our eastern country,"
- ▶ Some of Asheville's most enduring names came to the city for health-related reasons – E.W. Grove with his "chill tonic" empire and George Willis Pack with his public-health-based civic philanthropy. Even George Vanderbilt supposedly decided to build his 250-room Biltmore estate here after a health visit with his mother. That's how Asheville as a wellness destination was born.
- ▶ One can speculate that although the population was not that great, there was seemingly a relatively large proportion of moneyed individuals coming into the area.

4280—Grove Park Inn, Asheville, N. C. "In the Land of the Sky."



Grove Park Inn



Boarding houses.

## Why Asheville ?



B.109. BATTERY PARK HOTEL, ASHEVILLE, N. C.

Battery Park Hotel



Highland Hospital (Sanitorium)

**Just some of the Health, Recouperation  
and Relaxation venues of the early 1920s.**



Retail location of Hi-Grade Wireless Instrument Co. at Room 25 (& 24) Asheville Citizen and Times Building.

This building was built in 1902 and the address is given as 16 Haywood St.

Photo taken just before demolition in 1939.

This side facing Haywood St. at intersection of Patton Avenue. (Streets since rerouted?)







## ANTICIPATING THE DEMAND

While analyzing the wants of the Radio Man, Radisco discovered the value of anticipating the demand for modern and efficient apparatus; knowing that the Radio Man would be quick to realize and appreciate such service. Under this incentive Radisco engineers have produced such justly famous instruments as Radisco Coils and "B" Batteries and we now take pleasure in announcing the new

## Radisco Variometer

Like all other Radisco products it has been produced to anticipate and supply the demand for a good short wave instrument, qualified to stand the acid tests of radio work, and built at a price consistent with the cost of manufacturing, which has always been a Radisco characteristic. For the radio man who desires an instrument of this character, our Variometer makes a distinct appeal. It is made in one size and of one quality, the best. The extreme dimensions are 4 1/2" high, 2" wide, 1 1/2" deep and the dial is of 1 1/2" bore, one side right and the other 20 degrees. Terminals are carefully insulated from thorough ground and adjustment screws are provided. The price is strictly an indication and should appeal to the most conservative.

Number 1 Variometer . . . \$7.00  
Number 1D Variometer with dial \$8.50

Shipping weight 3 pounds



The agents listed below carry all Radisco products and they will be glad to consult with you on the New Radisco Variometer

ALBANY, N. Y.  
Shotton Radio Mfg. Co.,  
8 Market St.

ASHEVILLE, N. C.  
Hi-Grade Wireless Instrument Co.

ATLANTIC CITY, N. J.  
Independent Radio Supply Co.,  
118 So. New Jersey Ave.

BALTIMORE, MD.  
Radio Engineering Co.,  
614 No. Calvert St.

BRINVILLE, QUEBEC, CAN.  
Canadian Radio Mfg. Co.

BOSTON, MASS.  
Atlantic Radio Co.,  
88 Broad Street.

BROOKLYN, N. Y.  
Kelly & Phillips,  
312 Flatbush Ave.

CHICAGO, ILL.  
Chicago Radio Laboratories,  
1316 Cermak Ave.

EUREKA, ILLINOIS  
Klaus Radio Co.,  
Branch, Peoria, Ill.

KANSAS CITY, MO.  
McCreeary Radio Supply,  
4th & Delaware Sts.

LOS ANGELES, CALIF.  
The Wireless Shop,  
511 W. Washington St.

McKEESPORT, PENN.  
K. & L. Electric Co.,  
427 Olive Street.

NEW ORLEANS, LA.  
Rose Radio Supply,  
604 Gravier St.

NEWARK, N. J.  
A. H. Corwin & Co.,  
4 West Park Street.

NEWCASTLE, PENN.  
Pennsylvania Wireless Mfg. Co.,  
507 Florence Ave.

OMAHA, NEBRASKA  
O. B. Radio Supply Co.,  
406 Brown Building.

PHILADELPHIA, PENN.  
Philadelphia School of Wireless  
Telegraphy,  
Broad and Cherry Streets.

PROVIDENCE, R. I.  
Rhode Island Elec. Equip. Co.,  
45 Washington Street.

PITTSBURG, PENN.  
Radio Electric Co.,  
3807 5th Ave.

PORTLAND, ME.  
Atlantic Radio Co.,  
15 Temple Street.

SEATTLE, WASH.  
Northwest Radio Service Co.,  
609 Fourth Ave.

SCRANTON, PENN.  
Shotton Radio Mfg. Co.,  
P. O. Box 3.

Branch & Kingsbury St.,  
Jamestown, N. Y.

ST. LOUIS, MO.  
The Benwood Specialty Co.,  
3424 Olive Street.

TORONTO, ONT., CAN.  
The Vimy Supply Co.,  
367 College Street.

WICHITA, KAN.  
The Conradio Co.,  
1723 Fairmount Ave.

Responsible Dealers: Write for interesting sales proposition on Radisco apparatus

If none of the above agencies are in your vicinity, or do not give you the desired information on Radisco Apparatus, communicate with

RADIO DISTRIBUTING COMPANY : : Newark, New Jersey

Hi-Grade seems to have operated for over a year before trying to build their own branded radio.

## RADISCO AGENCIES

ALBANY, N. Y.  
Shotton Radio Mfg. Co.  
8 Market St.

ASHEVILLE, N. C.  
Hi-Grade Wireless Instrument Co.

ATLANTIC CITY, N. J.  
Paramount Radio Supply,  
Arkansas & Pacific Aves.

BOSTON, MASS.  
Atlantic Radio Co.  
727 Boylston St.

BROOKLYN, N. Y.  
Kelly & Phillips  
312 Flatbush Ave.

EUREKA, ILL.  
Klaus Radio Co.

KANSAS CITY, MO.  
McCreeary Radio Supply  
4th and Delaware Sts.

McKEESPORT, PA.  
K & L Electric Co.  
427 Olive St.

NEWARK, N. J.  
A. H. Corwin & Co.  
4 West Park St.

NEW ORLEANS, LA.  
Rose Radio Supply  
604 Gravier St.

OMAHA, NEBRASKA  
O. B. Radio Supply Co.  
406 Brown Building

NEW BRUNSWICK, N. J.  
Geo. N DeLaplaine  
306 George St. and  
8th and Magnolia Sts.

Small cut from two-page advertisement in December 1921 issue of *Radio News* showing Hi-Grade to still be a sales agent for RADISCO Radio parts.

First mention of Hi-Grade Wireless Instrument Co. I've found in a national publication: *Everyday Engineering* for October 1920.



Who ran this Hi-Grade enterprise?  
Apparently, one of two men,

- Mr. James Rumbough at 49 Zillicoa Street. (House still standing.)  
Department of Commerce records for 1921 through 1923 show Hi-Grade to be the owner of four radio station licenses. 4AF, 4HY, 4KQ and 4KR. All giving the address of "47-49 Zillicoa St."
- 47 Zillicoa St. was the residence of his associate, George Stevens, "Designing and constructing engineer". (This plot is now vacant.)
- The late Lew Elias – W4DBT of Winston-Salem, NC once commented that a Thomas Freck had worked for Mr. Stevens building these Hi-Grade brand radios.



49 Zillicoa Street, Asheville, NC – Residence of: James E. Rumbough first and only mayor of the autonomous village of Montford eventually absorbed by the city of Asheville. (Photo date 2014)



ORIGIN <i>CW</i>			RADIO- POSTALGRAM	Date Received <i>192</i>
VIA <i>5</i>	VIA <i>✓</i>	CHECK <i>—</i>		Time Received <i>by Mr M.</i>
TO: <i>8ARK</i> <i>Ostentill N.C.</i> <i>U &amp; Sigs had to fine O on what</i> <i>U got if U charged me let me</i> <i>know thanks</i> <i>73°5</i> <i>Mr Tom Freck</i> <i>11 Cherry ST</i> <i>Asheville N.C.</i> <i>4K̄ By T. Freck</i> Received at Radio Station				

Tom Freck was an employee of Hi-Grade. He became a radio amateur in March of 1922. This is one of his earliest QSL cards that he mailed May 1<sup>st</sup>. 1922 to 8ARK in Fredonia, NY

Picture from 1955. Saying that Tom displayed the HiGrade (sic) radio in his radio and appliance store in Asheville. This is almost certainly the set now donated to the Asheville Radio Museum from the collection of Robert Lozier.



**PIONEER RADIO SET** made by the HiGrade Wireless Instrument Company of Zillicoa Street, Asheville, is shown above with Thomas Freck, one of the four men employed by George A. Stevens, owner of the company, in the manufacturing enterprise. The radio is now on display at the Freck Radio and Appliance Company.

Asheville Citizen - Times  
25 September - 1955

Umm.... North Carolina was no 'hot bed'  
of radio manufacture in the 1920s.

Probably only two others:



Jewell Master Model Radio  
Made in Henderson, NC – 1923 ???  
Owner unknown. Also made a 1925 model.




**National** Mfd. by Mills Radio Corporation  
Made in Raleigh, NC – Late 1923 ???  
Only 1 known. – Collection of Robert Lozier



## **We still need genealogy sleuths to identify various people associated with early radio in the Asheville area.**

- **James E. Rumbough** - Living at 49 Zillicoa St. (House still standing.) Identified as a “capitalist” in 1922 city directory.
- **George I. Stevens**, “designing and constructing radio engineer.” Residence given as 47 Zillicoa St. (now vacant plot). Identified as “Wireless” and elsewhere as Hi-Grade Wireless Instrument Co. in 1922 city directory. Also, as operator of “Citizen Radiophone Broadcasting Station”.
- **G. O. Shepherd**, “well known Asheville advertising man and pioneer in the realm of radio...” Wrote articles for the Asheville Citizen.
- **‘Dolph’ Blankenship** located on Brevard Road. West Asheville... Made the Hi-Grade radio cabinets.
- **Tennyson, Hilton and Tom Freck** all claimed to have worked for the manufacturer Geo. Stevens.
- **Bill Alliston**, living in a nearby township, is mentioned as having worked for Rumbough.
- **E. H. Jackson Jr. - E. Arthur Jackson - James Lorick** - All associated with a radio station license WABC granted to the Asheville Battery Company about 1925.

- 
- The majority of radio manufacturers were not allowed to purchase a license to use the Armstrong **regenerative** receiver patent controlled by the **Radio Corporation of America** (RCA)
  - Only 13 licenses issued before management concluded that they could get away with a monopolistic strategy.
  - In the late 1920s the Corporation eventually lost Federal anti-trust suits forcing major reorganizations by 1933 that opened licensing to most makers at affordable rates.



## Hi-Grade Wireless Instrument Co radio.

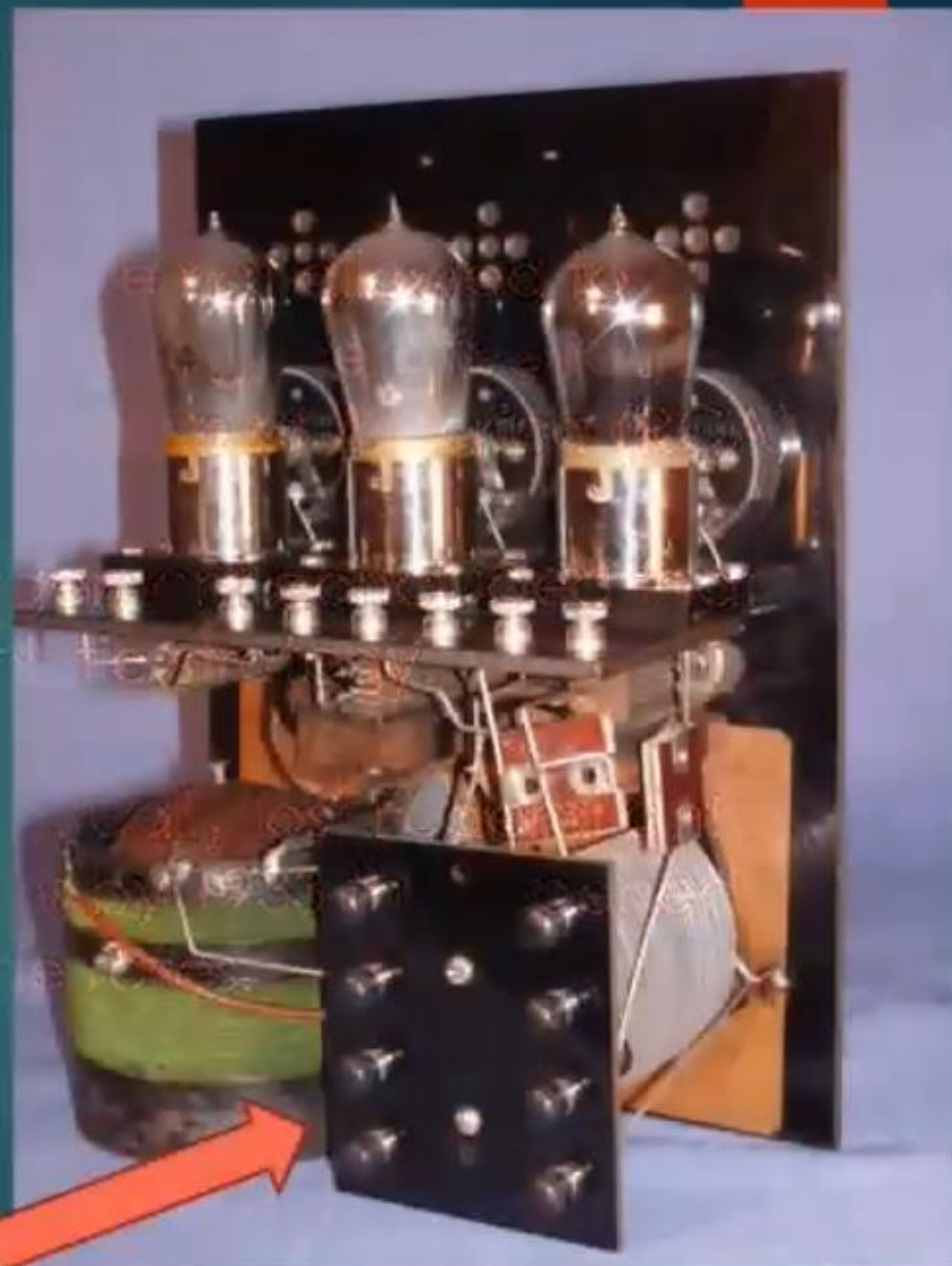
The chassis construction tells a little known but not unique story.

Note the eight-point terminal board behind the tuning capacitor.

With one jumper factory connected, the receiver was a **legal** straight detector/2-step audio amplifier outfit.

But all the customer had to do was replace this jumper with two others across the board to make it a much better performing, **unlicensed** regenerative detector.

How 'convenient'



Today, **Atwater Kent** is probably the best-known maker of the day to make it 'convenient' to convert their sets to **unlicensed** regenerators.


Simply drop-in it's **Mounted Variometer** that, 'presto' made these better performing **unlicensed** regenerative receivers.

Historian, Alan Douglas, notes that AK was very careful **not to mention regeneration** in any of its published documents.


Radio News for February, 1923 1905

# ATWATER KENT


## RADIO RECEIVING SETS




The two instruments shown above comprise an excellent and complete receiving set. The Coupled Circuit Tuner and Detector 1-Stage Amplifier on the mahogany mounting board, present a beautiful appearance.  
Complete Outfit, as above, with . . . \$52.00



The above set, consisting of Coupled Circuit Tuner and Detector 2-Stage Amplifier, is an ideal set for either phone or loud speaker use. Note that this set includes two stages of audio frequency amplification.  
Complete Outfit, as above, with . . . \$55.50



The Coupled Circuit Tuner and Detector Unit only, comprise a complete receiving set. Later, if desired, the 2-Stage Amplifier can be added for two stages of audio frequency amplification as shown above.  
Complete Outfit, as above, with . . . \$37.00  
Complete Outfit, as above (without Amplifier), with . . . \$33.50



The Mounted Variometer carries through the standard quality of ATWATER KENT products. For an open set it supplies a finished instrument unsurpassed in appearance and performance.  
Mounted Variometer . . . \$10.00

An Excellent Merchandising Proposition

ATWATER KENT MANUFACTURING COMPANY  
4943 SEASIDE AVENUE Radio Dept. PHILADELPHIA, PA.

**Radio News**  
February 1923



## Hi-Grade Type HS-2 - Construction features.

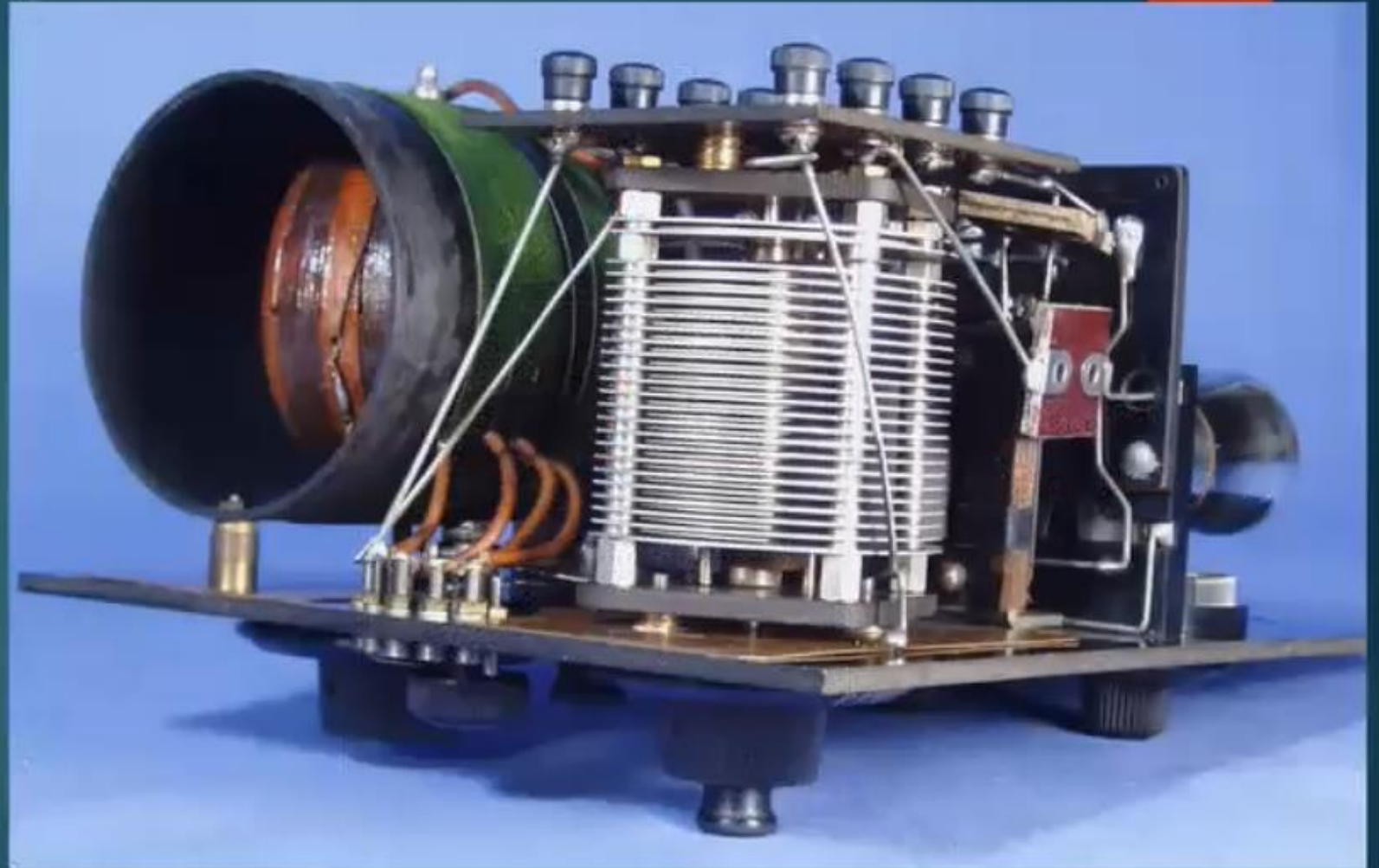
The tuning capacitor is a 1,000 pF. unit. Typical broadcast receivers had 400 pF. units.

A 5<sup>th</sup> rotary switch tap connects to one of the binding posts on the back panel.

This is allowing for the insertion of an **external** loading coil so the receiver could be used to bring-in time signals from NAA in Arlington, Virginia on 113 kHz. (2650 meter) and other commercial and military traffic.

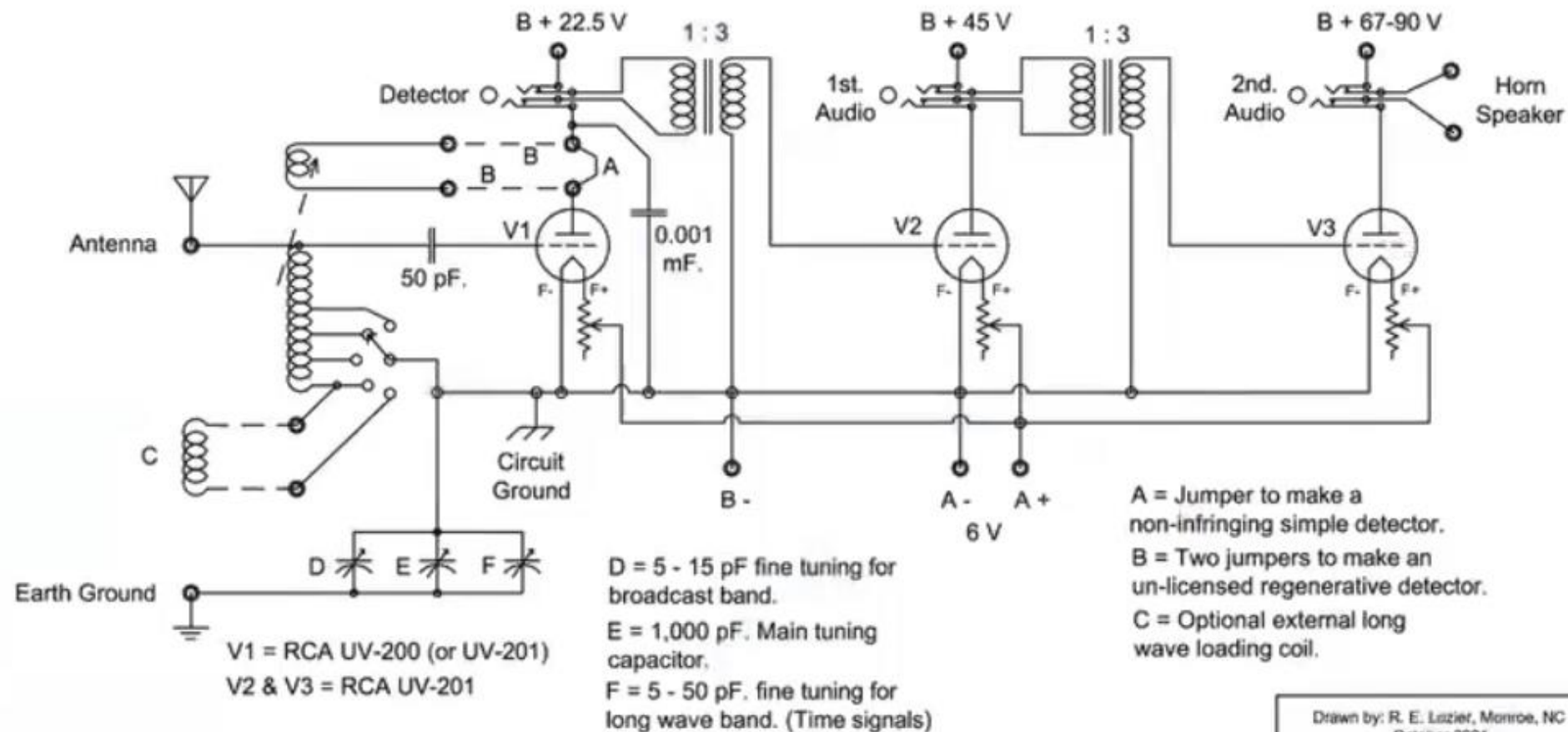
There are **TWO** vernier rotary capacitor vanes shunting this big tuning cap. One approx. 5-15 pF and the other 5-50 pF.

This is to make fine tuning easier on each band.



Schematic created from the only believed complete and original artifact surviving.

Hi-Grade Wireless Instrument Co.  
Type HS-2  
Asheville, NC - circa mid 1922



The detector has only 22 Volts applied to the plate and was most likely a UV-200 "soft detector" and did not need a high value resistor shunting the 50 pf. Capacitor.

[ 17 ]

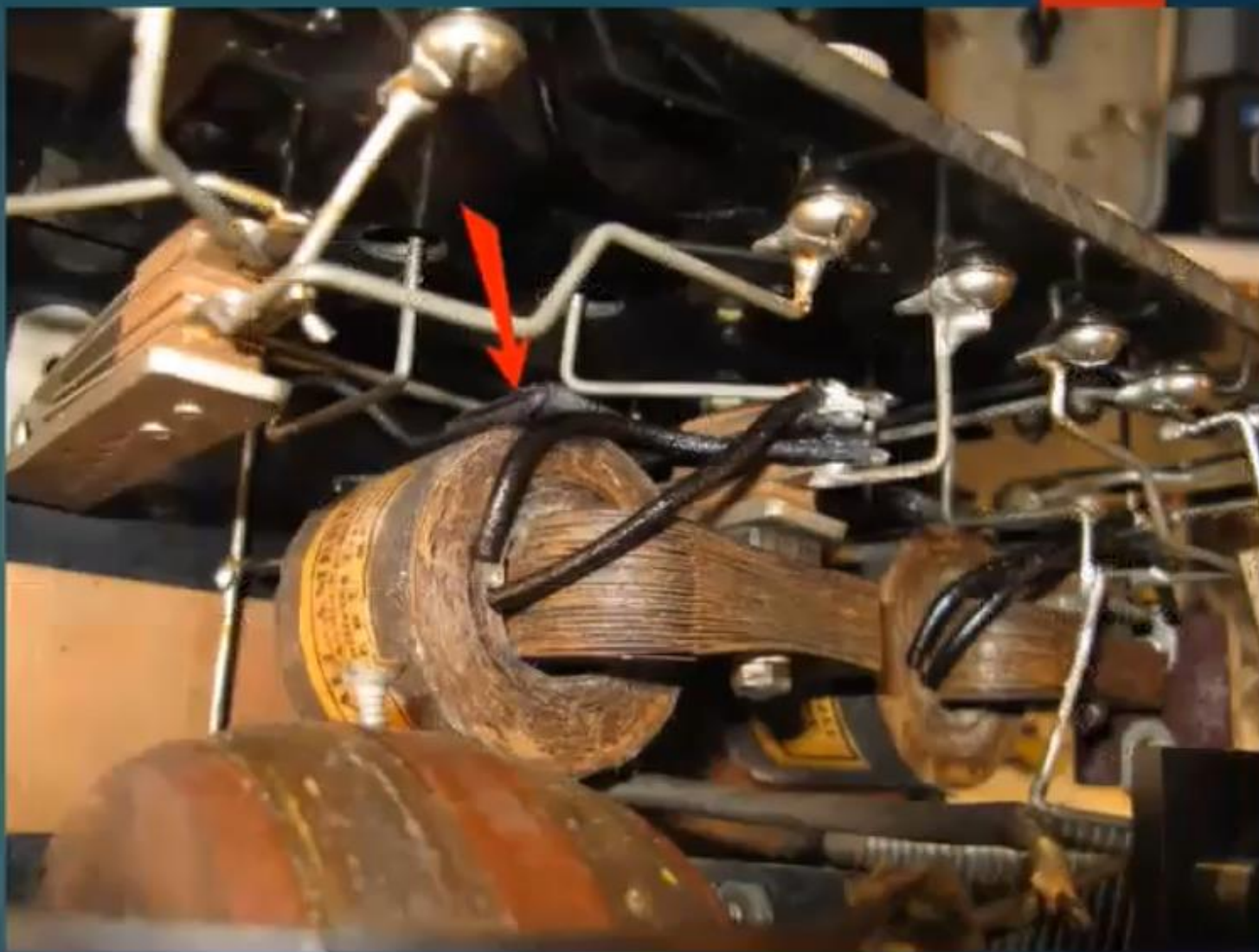
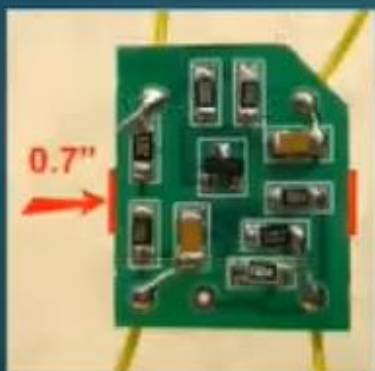
Most collectors are not used to seeing a receiver with a single, **series resonant** circuit. It can work because the **Earth Ground** is different from the **Circuit Ground**.

There is **no power switch**, you must turn each of the three filament rheostats to their zero (open) position.



Museum docents sometimes like to demonstrate radios. Both original audio transformers have open primaries. I **WILL NOT** replace the original transformers!

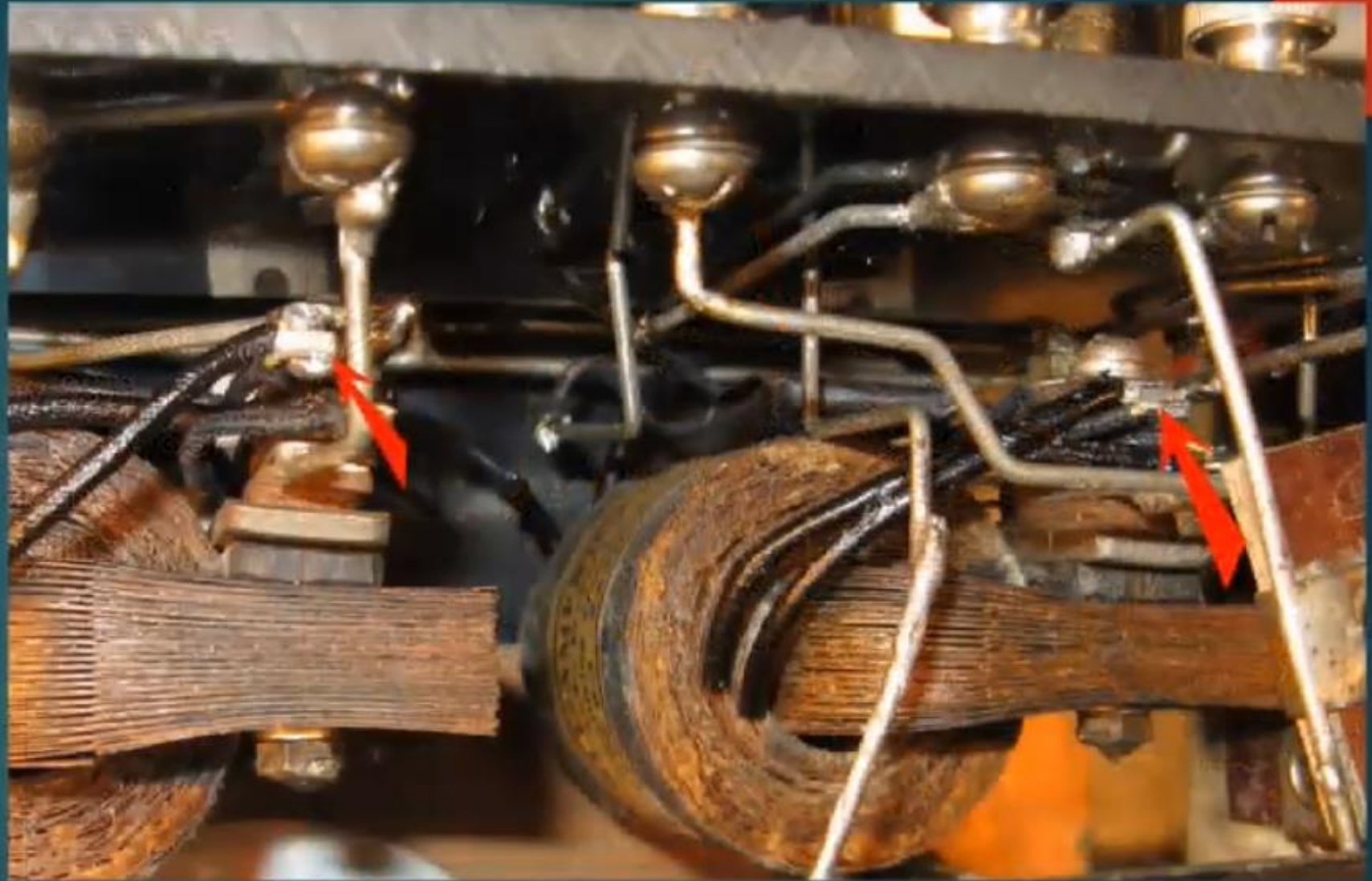
My solution is to hide, in slips of black paper, two of my SST1D transformer emulators. They can be set to provide the same voltage gain as the original transformers.



The radio performs as original. The SST1Ds are **virtually invisible**. The original wiring is still in place. Only disconnected by less than 0.1"



Tiny little Chicklets of double-side PCB is flow soldered to the active circuit. In this case phone jacks terminals. The disconnected defective circuit is 'parked' by tack-soldering to the other side. The old wire moves less than 0.1". A dot of gray paint makes the change virtually disappear.



For whatever reason, this solution is completely reversible. This radio can remain a historically accurate reference to the components originally employed.



## A pet peeve of mine: To find various bright shiny solder joints after a radio cleaning job.

For restoration work, all these soldered nuts had to come off.

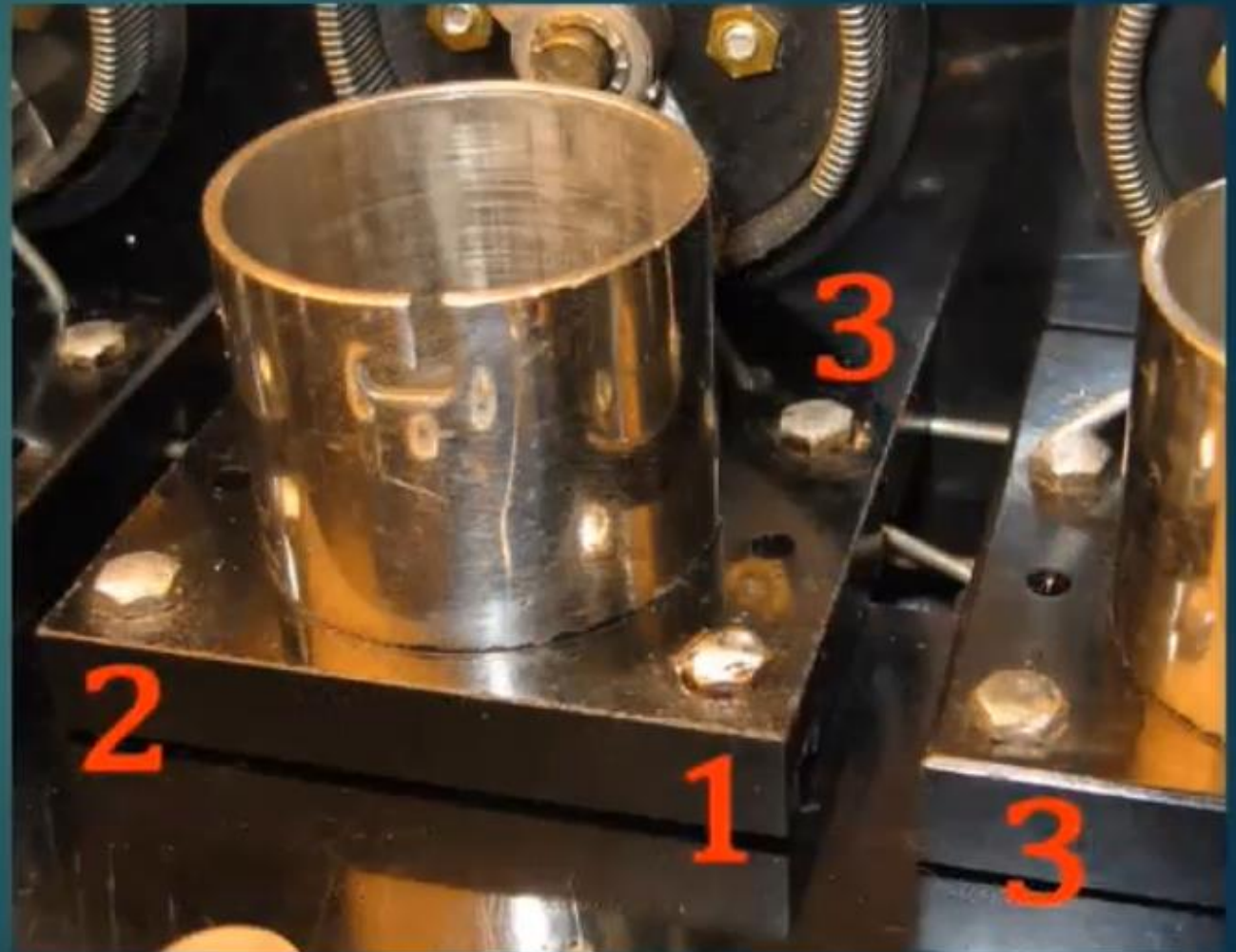
#1 - Shows a fresh shiny joint. Electrically excellent but **distracting**.

#2  
I use a jeweler's scratch brush to lightly scuff the surface.

#3

Then use a Q-Tip to apply JAX brand Iron, Steel & Nickel Blackener. (Used in the jewelry and art metal trades.) In 90 seconds, you will have it looking about 90 years old. (But won't get worse.)

**Viewers will not be distracted by whatever you needed to do to make it presentable.**







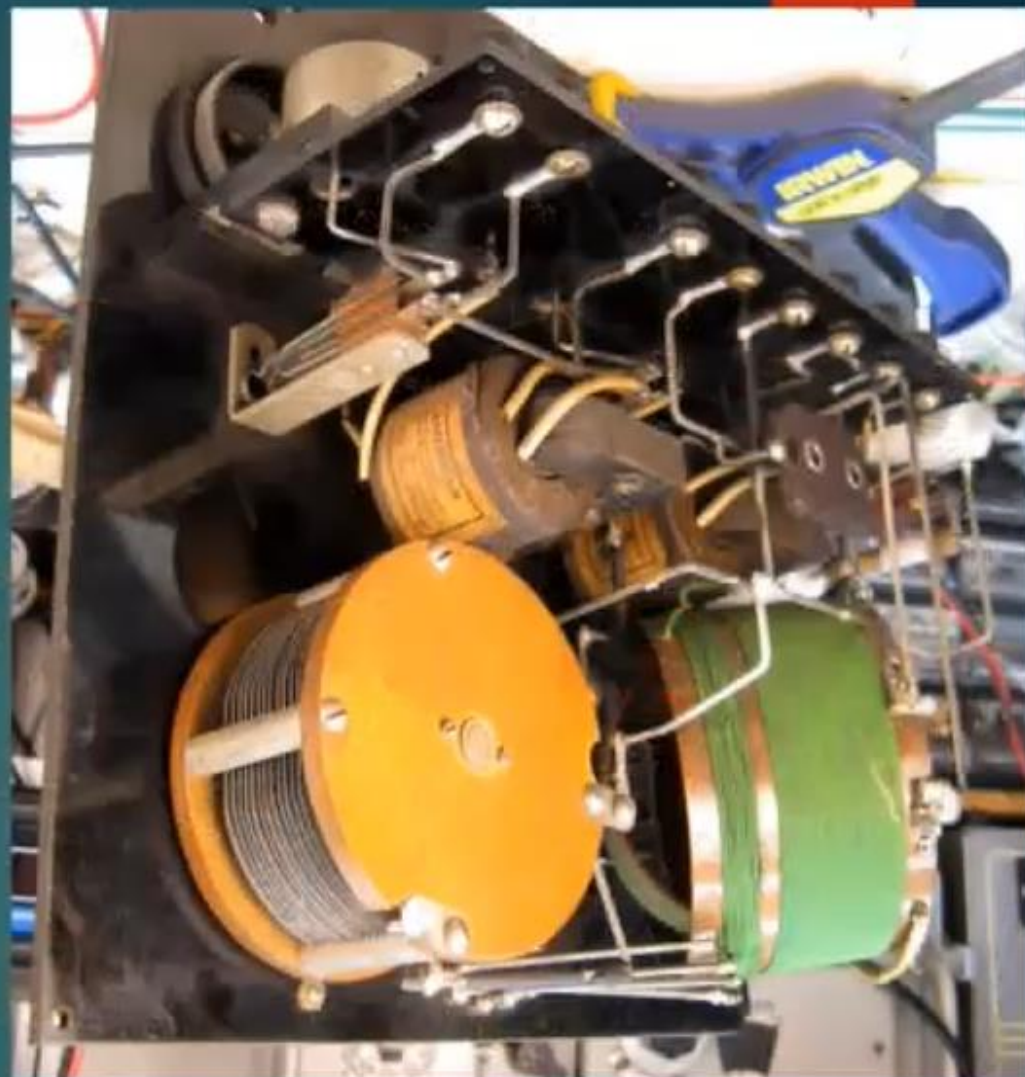
Muchow estate.

There are two of these sets with the same **Hi-Grade** Type HS-2 tag.

The Muchow estate radio, looks nice until the knobs come off. Radical panel rework to make other parts fit.



Maybe a salvage job by a 60s or 70s collector?



Completely different tuner parts. Spliced buss wires... No 'cheater board' or long wave. But the tube deck verifies that audios are the same.



Broadcasting continues  
into at least March 1923.

[illegible]



G. I. Stevens, designing and constructing radio engineer, who was the first manufacturer of radio instruments in the South and who began the study of radio and its mysteries in 909, has supervised the installation of the station and will have charge of its operation. When Mr. Stevens located in Asheville there was only one radio receiving set in the city and since that time a large number of receiving sets have been erected and purchased but today will mark the first complete concerts to be broadcasted from Asheville. In his work of installing The Citizen Radiophone Broadcasting Station Mr. Stevens has had the hearty cooperation and support of Dr. McLean, of the staff at Kenilworth Hospital, Dr. McLean realizing the benefit to be derived for his patients.

**We still need some local genealogy sleuths to identify various people associated with early radio in the area.**

"G. I. Stevens, designing and constructing radio engineer, who was the first manufacturer of radio instruments in the South and who began study of radio and its mysteries in 909 (sic), has supervised the installation of the station and will have charge of its operation. When Mr. Stevens located in Asheville there was only one radio receiving set in the city and since that time a large number of receiving sets have been erected and purchased but today will mark the first complete concerts to be broadcasted (sic) from Asheville. In his work of installing The Citizen Radiophone Broadcasting Station Mr. Stevens has had the hearty cooperation and support of Dr. McLean, of the staff at Kenilworth Hospital, Dr. McLean realizing the benefit to be derived for his patients."



Of the three North Carolina radio manufacturers of the 1920s I have found only **Hi-Grade** listed in any national publication. Not an advertisement, but in an industry trade publication.

78	MANUFACTURERS, SECTION I
<b>SETS COMPLETE, V. T. (Cont.)</b>	<b>SETS COMPLETE, V. T. (Cont.)</b>
✓ †Herschfield Electric Supply Co., 78 Warren	†Medford Radio Engineering Co., 312 Main St., Medford, Mass.
✓ †Hi-Grade Wireless Instrument Co., 47-49 Zillieon St., Asheville, N. C.	†Mercury Radio Corp., 53 Park Pl., N. Y. C.
†Holloway Elec. Supply Co., 238-3rd Ave., New York, N. Y.	†Mercury Radio Pro. Co., Little Falls, N. J.
†Horne Mfg. Co., Mercer & Colgate Streets, Jersey City, N. J.	†Metropolitan Elec. Mfg. Co., Long Island City, N. Y.
Hughes Peters Elec. Co., Columbus, Ohio	†Mich. Paper Tube & Can Co., 2536 Grand River Avenue, Detroit, Mich.
†Hungerford Brass & Copper Co., 80 Lafayette St., N. Y. C.	†Midwest Radio Co., 3423 Dury Ave., Cincinnati, Ohio.
†Hutchison Radio Co., 342 Madison Avenue, N. Y. C.	†Mignon System Mfg. Co., Buafflo, N. Y.

- This November 1922 edition has Hi-Grade **listed in three categories**. Crystal sets, Sets Complete, V.T. and Amplifiers & Loudspeakers.
- The RCA legal department likely used such listings to identify potentially infringing equipment manufacture.
- After investigation, a cease-and-desist letter was often enough to make small business withdraw their product.

# Radio Red Book



## RADIO TRADE DIRECTORY and BUYERS GUIDE

VOLUME I. No. 2

November, 1922

DONALD W. KNAGGS  
Editor and Publisher

JOHN C. LINEHAN  
Adv. Mgr.

EARL D. BECKWITH  
Middle Western Rep.  
Tribune Bldg.  
CHICAGO, ILL.

SINGLE COPIES ONE DOLLAR

To insure receiving every copy of the Radio Red Book  
enter your subscription for \$3.50 per year NOW.

PUBLISHED QUARTERLY BY

The Radio Red Book Publishing Co.  
406 West 31st Street New York, N. Y.



**RADIO**

**Radio Sets**  
**XMAS Special for This Week Only**

Overhead Long Range High Powered Radio Sets, included in your home all ready for you to "listen in" on all the best broadcasting stations.

**\$95.00 Complete**

Small Radio Sets only for 1922 complete complete with all equipment.

**Priced \$11.50**

Asheville Electrical Dept. Room.

**Piedmont ELECTRIC CO.**

225 Patton Ave. Phone 218. Opp. P. O.

12-December-1922

And Hi-Grade Wireless Instrument Co. at their **Citizen Radio Shop** had quite a bit of competition according to these **Asheville Citizen** advertisements.



ALL THE BEST KINDS OF RADIO SETS  
 Now In

**Goode's Drug Store**  
**Carolina Radio Co.**

Come in and look over Goode's Radio Department

CITIZEN WANT ADS BRING RESULTS

3-January-1923

**RADIO MAGNAVOX**

THE RADIO TALKER

With a Magnavox, every one in the room can hear just as if you were listening to a phonograph. It reproduces the human voice and the musical notes audible and correctly. No wireless is complete without it.

Price . . . . . \$45.00



Radiotron Tubes, No. 200 . . . \$5.00  
 Radiotron Tubes, No. 201 . . . \$6.50

**BROWN HARDWARE CO.**

25 BROADWAY • PHONES 2586 AND 2587

17-January-1923



**RADIO**

Listen and Hear the wonderful lectures, music, stock reports, market news, and other marvelous entertainments that are broadcast miles and miles away but that are brought to you on the vibrations of the invisible ether. Buy your apparatus of us. We guarantee everything we sell to be reliable and of the best for the money. The art is new, but we are experts.

**Asheville Battery Co.,**  
 College and Market Streets.  
 Asheville, N. C.

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12-September-1922



## 1920 to 1923 was an exciting time of possibilities for radio broadcasting in America.

- At the time, some newspapers like the **Asheville Citizen** enthusiastically reported on radio advancement and carried advertisements of where to buy sets and parts. Others like the highly politically influential **News & Observer** of Raleigh refused virtually any mention of radio or carrying any sort of advertising or classifieds; regarding radio as competition. And, in the case of the **N&O**, probably not wanting to bring-in new ideas to counter the overt white supremacy doctrine of the newspaper ownership under Josephus Daniels.
- The federal rules for operating radio broadcasting were, at the time, under the Department of Commerce and were ever evolving because this was a completely new enterprise.
- The methods of financing a radio broadcast station were still under development. It is said that the first paid commercial on an American radio station was in August 1922 over WEAJ in NYC. Other nations financed their broadcasting through annual licenses to operate radios.
- It was not until **1926** and later that broadcasting in the Carolinas could begin to generate adequate income for station owners.
- So, the 1927 launch of **WWNC** as **Asheville's first successful radio station** is significant and lasting. But the aspirations and activities by Asheville residents as much as five years earlier is, as **The History Guy** on YouTube says, "**Is History that deserves to be remembered**"



## But that's not all...

There was another licensed station, almost completely forgotten, before **WWNC** had its debut in Asheville.

- The Asheville Battery Company had been selling radio receivers since at least January 1923. Between July 1924 and June 1925, a Department of Commerce publication records the assignment of call letters **WABC** with the owner listed as the Asheville Battery Co. The transmitter power is given as only 10 Watts. One year later the power is given as 20 Watts.
- At some point in 1926 the Chamber of Commerce had an interest in the station but quickly divested itself from the venture.

No microfilm research of newspapers beyond mid 1923 has been done by this author to determine if this station was ever used for broadcasting. It could have been just a placeholder for a venture that never got off the ground.



September 22, 1927 - The Atwater Kent Radio dealership, the Asheville Battery Co. showing the setup to "Broadcast" the Dempsey – Tunney Heavyweight fight to crowds on Battery Park Place. This is a sound truck with radio receiver and some six loudspeakers on the roof.





# *The End*

**Hi-Grade Wireless Instrument Co.  
Model HS-2  
Mid 1922**

**Presented by : Robert Lozier – KD4HSH**

**kd4hsh@carolina.rr.com --- November 2021**