Wisconsin Antique Radio Club Inc.

www.warci.org

WARCI News

January 2015

Happy New Year!

Location for January 11 Meet

Best Western Plus Milwaukee Airport Hotel and Conference Center at 5105 S. Howell Avenue, at Edgerton Avenue. Exit the Airport Spur at Howell Avenue and go North to Edgerton Avenue.

The meet will be held in the Concourse Room. Buyers use lobby entrance. Follow the signs. Sellers use double doors just west of the lobby for unloading. Tables will be provided (a limit of two per seller).

Doors open for set up at 7:00AM, the meet is 8:00 — 11:00 AM.

Allen-Bradley of Milwaukee, Another Wisconsin Radio Company, see Dale Boyce's article on page 7

Next WARCI Meet:

	Sunday, January 11; 8:00 – 11:00 AM. Doors open 7:00 AM.
	Best Western Milwaukee Airport Hotel & Conference Center (see flyer, page 19) 5105 S. Howell Avenue at Edgerton Ave., Milwaukee, Near the Airport
	Features: 50-50 Raffle.

Inside This Issue…

WARCI, Inc.

The Wisconsin Antique Radio Club, Inc. exists to preserve the knowledge of radio, television, and other related technologies. We have a special interest in the history of radio in Wisconsin, Wisconsin radio companies, radio stations, etc. Our members' interests include radio, television, audio, microphones, jukeboxes, and antique phonographs.

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WARCI News Editor – Greg Hunolt

WARCI Website – Nick Tillich
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WARCI Information

WARCI is incorporated in the State of Wisconsin.

Annual membership dues are $15 for each calendar year, January – December. (Allowance is now made for new members joining in September or November.)

Seller's fee at Swap Meets is $7.00 for members, $10 for non-members.

The next Swap Meet will be held on January 11, at the Best Western Hotel & Conference Center (see pages 1 and 19).

The swap meet times are 8:00AM – 11:00 AM. Doors open at 7:00AM for set-up if we need to be inside.

WARCI News

This newsletter is the official publication of the Wisconsin Antique Radio Club, Inc. It is published four times per year, in January, May, July and September. The WARCI News is free to all paid-up club members.

Articles or material for the newsletter are most welcome and should be sent to Greg Hunolt, ghunolt@excel.net or N5412 State Hwy 57, Plymouth WI 53073. Include your name, address, phone, and email. PC format (e.g. MS Word) by email is preferred. JPEG for images is preferred. Please contact Greg Hunolt for assistance.

Classified ads up to ¼ page are free to WARCI members.

The cut-off date for all newsletter material is about the fifteenth of the month preceding publication of the next newsletter (e.g. April 15, 2015, for the May, 2015 issue).

WARCI Website

www.warci.org

The WARCI website features information about WARCI activities, Wisconsin radio, articles, etc. Contributions are most welcome! Contact our webmaster Nick Tillich, at webmaster@warci.org . Thank you, Nick, for your great work.

Voluntary Member Directory
There is a new feature on the website that lets you create a listing for yourself in a club member list. You can describe your interests in radio, etc., and provide contact information. This capability put in place by NARC has provided some good contacts for WARCI members who are also NARC members and have listed themselves on the NARC site. We encourage you to list yourself on our site - it is purely voluntary.

WARCI Headlines

September Meet Notes

The September meet at the Terminal was good, though turnout was held down by inclement weather. The club netted $38 from the 50-50 raffle.

The main event was WARCI's fourth annual auction. We had 29 people participate as buyers and/or sellers, compared to 27 in 2013 and 2012. Eight people consigned 24 lots, compared to 9 people consigning 23 lots in both 2013 and 2012. Ten consigned lots sold, 42%, compared to 14 consigned lots sold last year. We sold 10 donation lots this year, compared to 4 in 2012 and 6 in 2011.

The total price of all lots sold was just $821, compared to $1281 last year. We took in $21 in bidders' card fees, $160 in lot fees, and $116 in donation lot sales, for a total of $297.

Again this year we did not get bigger, and again we had a lot of no sales. But the auction 'process' went very very well, save for a hiccup with donated lots that we will fix.

We now know how run a good auction. For next year, we need to think of how we can attract more folks to consign and participate.

Any ideas on any aspect of this are most welcome!

November Meet Notes

This was our first November meet, and it was very good on a cold day. We had 16 sellers, but at one point we counted 48 cars in the lot and 74 people walking about looking at all of the radios, etc., for sale. The donation auction brought in $137 for the club, and the 50-50 raffle another $27. The general impression of the November meet was very favorable.

The WARCI board, after years of no progress on this, agreed on a logo for WARCI which appears here and on page 1 of the newsletter. Great thanks are due to Mike Krawczyk for coordinating the logo effort, with graphics help from Jay Volke. Mike has gone on to work with a vendor to produce some sample T-shirts and a hat with the new WARCI logo. These will be available for inspection at the January meet and your comments will be most welcome.

Membership Update

Continuing great news! We have finished 2014 with 75 paid members. This is up from 60 paid members in 2013. Looking back, we had 58 members in 2012 and just 44 members in 2011.

January Meet

The January meet will be held at the Best Western Milwaukee Airport Hotel & Conference Center as it was last January. We will have a 50-50 raffle, and an informal donation auction if there are items to auction. See page 19 for a copy of the January meet flyer.

The room we have is nice, but not huge, and we are asking that members limit themselves to two tables to give as many folks as possible an opportunity to set up. Tables are provided by the Best Western.

WARCI Meeting Dates for 2015

January 11, Best Western Hotel & Conference Center

March 29, The Terminal / Landmark

May 31, The Landmark

July 12, The Landmark

September 20 with Auction, The Terminal

November 8, The Terminal / Landmark

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2014 MPTV Apraisal Fair & MPM Collectors' Day, by Glenn Trischan

WARCI at the 2014 MPTV Appraisal Fair

Milwaukee Public Television hosted its annual fund raising antique/collectible Appraisal Fair on Saturday, Oct. 11, with 28 different specialist categories as well as general/unspecified items. For the first time in the fair's nine year history, Radios/ Telephones/Telegraph Equipment was included as a specialist category. Subject matter experts, were WARCI members Terry Hanney and Glenn Trischan.

The day started with set-up and breakfast at 7:00AM. Items from both Terry and Glenn were used to set up the radio display shown in the photo at right. Items included crystal and battery sets through deco and transistor radios, as well as tubes, magazines, and mounted display items. This was a great time to talk to other appraisers and hear their radio related stories.

Tickets for appraisals had been sold in advance and individuals were assigned entry times at 30 minute intervals beginning at 9:00 AM through 4:00 PM. After an initial triage, people were sent to the appropriate category or general area. Our first appraisal was a very nice, early Heathkit VOM in a small (~3" x 3" x 6") bakelite case that had been built by the individual's father. Not a high dollar item, but a good story and an interesting test device.

As the crowd ebbed and flowed throughout the day, of the folks that stopped by the Radio table, some people were curious about a set in the basement, some were seeking a missing tube or part, and others had a possible interest in the hobby. Information about WARCI, resources, and the upcoming November meet was given to interested parties.

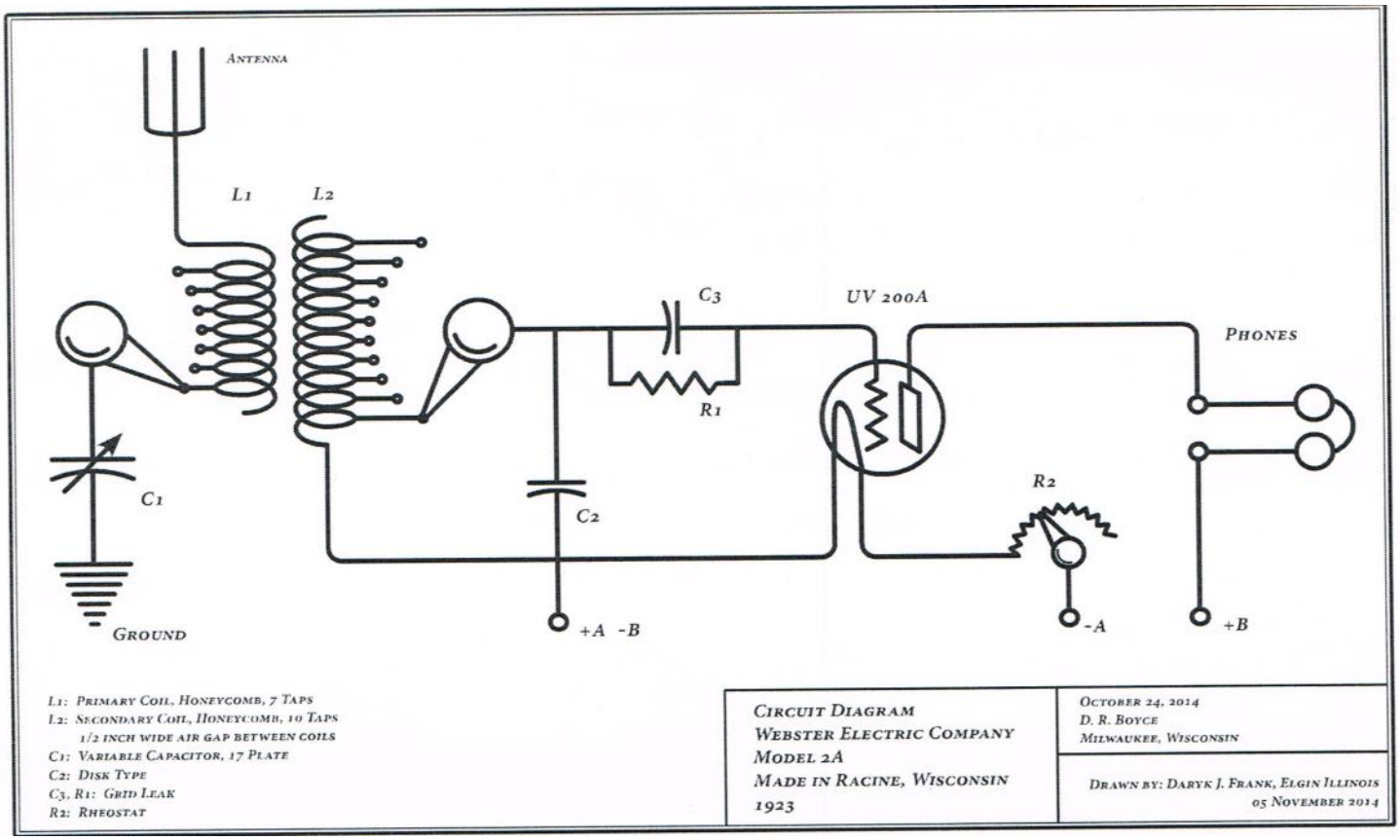
As the day went on, we were confronted by a variety of items, not necessarily directly related to radios, including a Regina music box and a 50's camera. The high point was an early 40's Rickenbacker guitar amplifier having a deco appearance in excellent condition. This had been a parent's possession. The customer only had pictures, due to the weight of the unit. No model, serial number, or tube list was available, but one tube clearly was a number 47 that could well have been original. With thanks to Bill Engaas for some phone-a-friend help, we were able to appraise the item in the $400 - $900 range, pending some further identifying information.

At the end of the day, we did not discover any Zenith Stratospheres or Sparton Nocturnes hiding in anyone's attic, but it was a good time. We both concluded that come 2015, we would do it again.

MPM Collector's Day Radio Exhibit

The Milwaukee Public Museum held its 11th annual Collector's Day on Saturday, November 8. Set-up started at 8:00 AM, late by radio meet standards, with the general public admission starting at 9:00 AM. More than 20 collectors exhibited items ranging from bottle caps, bicycles, Milwaukee and Titanic memorabilia, to playing cards and atomic age (Civil Defense) items. The radio collecting hobby was represented by Glenn and Edna Trischan for the first time (see below). Display items included battery sets from the 1920's, cathedral and transistor sets, as well as a slide show and an abbreviated vacuum tube history, all on an 8ft table. While the youngsters were puzzled by vacuum tubes, the older crowd reminisced about favorite radios or radio programs. The time passed by quickly and enjoyably with a steady stream of visitors. By the 4:00 PM end of the show, over 1200 visitors had passed through the doors.

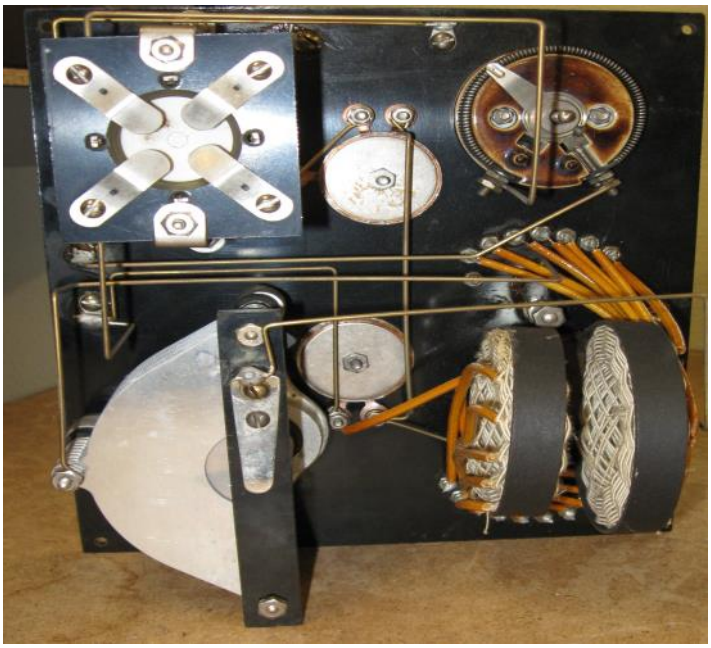
Follow-Up on the Webster 2A Receiver - Greg Hunolt



Schematic of Dale Boyce's Webster 2A, rendered by Daryk Frank

My article on Webster Electric (WARCI News, September 2014) included a schematic of a Webster model 2A receiver that appeared in an Antique Radio Classified article by Frank White. That schematic suggested that the 2A receiver was regenerative, and thus in violation of RCA's patent (Webster appeared to not have a license that would have permitted them to use a regenerative circuit) and this could have been discovered by RCA who might have forced Webster out of the radio set business, perhaps explaining why Webster stopped producing radio sets almost as soon as they started, in 1922-23.

But Frank's schematic looked odd, and I asked Dale Boyce who also owns a 2A to draw a schematic from his set, and WARCI member Daryk Frank kindly produced the schematic shown above from Dale's hand drawing. This schematic shows a straightforward non-regenerative circuit, which Webster would have been free to use. This is also consistent with Webster's advertising the set as non-regenerative, and I note that the author of the contemporaneous narrative cited in the article made no mention of any patent conflict with RCA, saying only that Webster quit the radio set business because the company decided they had entered the market too late (unlikely as that may seem).



Chassis of Dale Boyce's 2A

My conclusion is that especially given the pristine condition of Dale's 2A (see the photo above) Dale's schematic is correct and that the set was non-regenerative, as advertised. (I did ask Frank to have a look at his 2A and Dale's schematic but he was unable to do so.)

Editor's Note:

The WARCI News is your newsletter.

Your comments and suggestions for the newsletter are most welcome.

Your contributions of articles or other material are urgently needed. Your help is needed to make the WARCI News a success and to ensure that it covers the full scope of the interests of WARCI members.

If you're not seeing articles on topics you are interested in, ***write one.***

You may submit complete articles, but information from which an article can be developed is also welcome.

Don't agonize over format, etc., as I will have to adapt your submission to the newsletter anyhow. Simple text is best. PC format (e.g. MS Word, separate jpegs by email) is preferred, but hardcopy text and photos are accepted.

In this issue we have a feature article by Dale Boyce (actually part one of a two part series) on the Allen-Bradley company of Milwaukee, two reports by Glenn Trischan on his participation in public outreach events for MPTV and the Milwaukee Public Museum, and an update on Webster Electric.

We will also cover tube audio and television and other member interests – but we need your contributions of articles or information for articles.

Thank you, and I look forward to seeing you at the January 11 meet,

- Greg Hunolt, Editor, WARCI News

No meet photos were available for this issue of the WARCI News.

Odd Bits

Send in your odd story about strange doings in the world of radio collecting, or weird items from old radio magazines.

Bob Paquette's Microphone Museum

WARCI member Bob Paquette's Microphone Museum features his collection of well over 1,000 different makes and models of microphones as well as related pieces of equipment. The emphasis is on historically important microphones made between 1876 and 1950, and early radios, telephones, and many other communications devices, including an assortment of military gear. Check out Bob's website, http://www.sssmilwaukee.com/Microphone%20Museum.html

Bob always enjoys visitors and will be happy to give a guided tour to individuals or groups. You can call Bob at Select Sound (414) 645-1672 to arrange for your visit. Just ask for Bob Senior. The museum is located on the second floor of Select Sound, 107 E. National Avenue in Milwaukee. Enjoy your visit and allow yourself plenty of time.

Allen-Bradley Company of Milwaukee

by Dale Boyce

This article is another installment in our continuing series on Wisconsin radio companies and their products. Allen-Bradley (A-B) of Milwaukee was a nationally prominent manufacturer of radio parts in the 1920s, a producer and distributor of a line of three tube amplifiers, and even dipped a corporate toe into the water of radio set production in 1927. Founding WARCI member Dale Boyce has collected A-B radio devices for many years and has researched the company's history to produce a two part article for the WARCI News. In this issue part 1 will feature the A-B company history and the three tube A-B amplifiers, and part 2 in the next issue will discuss A-B radio devices in detail and the A-B TRF receiver of 1927.

My first visit to Allen-Bradley Company was in 1971-72. I was a senior electrical engineering student and I was invited to their Milwaukee, Wisconsin, headquarters for a job interview. That was a long distance from NDSU (North Dakota State University) in Fargo, ND. Details about that visit are vague. My career took me in other directions. My second visit was in 2002 after I had purchased an Allen-Bradley 3-tube amplifier with the original box and instructions at the 2001 Dr. Ralph Muchow Estate Auction in Elgin, IL. I had a wonderful tour. Other life changing events put my documentation of Allen-Bradley Company on hold. Now that I am retired it is time to finish this project.

This article will describe a brief chronology of the early Allen-Bradley Company, its' predecessors and founders. It will also identify the present ownership and a few of the iconic landmark buildings in Milwaukee that are associated with Allen-Bradley Co. The main purpose of this two-part article is to document some of the radio components and radio devices that were made by the Allen-Bradley company in Milwaukee during the 1920's.

Allen-Bradley History

Born in 1878, Lynde (pronounced "Lined") Bradley became an electrical experimenter. When he was 14 years old, he built an adjustable compression type carbon pile resistor device to control the speed of a motorized toy lathe.

In 1899, after Lynde dropped out of high school, he started the first X-Ray laboratory in Milwaukee. Dr. Stanton Allen of Milwaukee became aware of this X-Ray Laboratory. He became a friend and father-figure to Lynde and an investor in the facility. This venture lasted a couple of years.

In 1901, Lynde went to work for a motor, dynamo and motor control manufacturer in Milwaukee. This company was named Milwaukee Electric. It is not to be confused with an electric and gas utility company with a similar name. While Lynde worked for Milwaukee Electric he became familiar with the types of devices which were used for controlling motors. Since he believed that he could build better motor controls, he left Milwaukee Electric to start his own motor control business.

In 1903, with Dr. Allen as his investor/partner, Lynde started the Compression Rheostat Company in Milwaukee. They worked in a small local machine shop facility. When they outgrew this facility, they partnered with a Chicago based electrical device manufacturer, American Electric Fuse (AEF), to manufacture and sell Allen-Bradley motor controls.

A manufacturing facility was opened in Muskegon, Michigan, to manufacture the carbon-disc type Allen-Bradley motor controls. In 1904, Lynde's younger brother, Harry, joined the company.

In 1909/1910, after some differences developed between the Bradleys and AEF, Dr. Allen and the Bradleys started the Allen-Bradley Company in Milwaukee.

Lynde and Harry made significant improvements in the designs of their Allen-Bradley motor controls. They changed the main component of their motor control rheostats from carbon discs to graphite discs which were more durable and more suitable for industrial applications.

In 1912, due to irregularities, AEF went out of business. Allen-Bradley acquired the patents and other AEF assets.

Wyeth Allen, son of company founder, Dr. Stanton Allen, joined Allen-Bradley in 1915 and became the first plant manager. In 1919 he left and moved on to significant positions at Briggs & Stratton, Globe-Union and other organizations. His possible

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Allen-Bradley, continued from Page 7

connection to "radio" development at these prominent Milwaukee based companies is a potential topic for research and a future article.

During the pre-WWI years when major electrical equipment manufacturers such as General Electric, Westinghouse and Cutler Hammer were not able to keep up with the demand for industrial motor controls, the US Government contracted with small companies including Allen-Bradley to manufacture motor controls for use in factories which were manufacturing equipment and armaments. During WWI, Allen-Bradley grew from approximately 30 to 200 employees.

After WWI, Allen-Bradley pursued other electrical control device markets in addition to motor controls. A dashboard–mounted compression rheostat was developed to manually control battery charging current in motorized vehicles. A customer reportedly applied one of these rheostats to control filament current in his home built radios. It worked better than other devices. This caught on and the "Radiostat" was a success.

As the radio market boomed in the early 1920's, a variety of variable resistance compression rheostats were developed for use in radio transmitters and receivers. Sales of 15,000 units per week were reported.

During the 1920s Allen-Bradley manufactured a variety of radio devices and components including variable resistance devices, fixed resistors, a fine-tuning vernier dial, variable condensers, switches, and adapter tube sockets (to be discussed in detail in part 2) which were nationally advertised and sold. Allen-Bradley also manufactured a line of three tube resistance coupled amplifiers (to be discussed below) and experimented with a TRF receiver (see part 2).

Allen-Bradley produced radio components through World War II (including some specially "ruggedized" for military use) and on into the 1970s.

In January 1985, Rockwell International acquired the privately-held Allen-Bradley company for approximately $1.65 billion. Present day (2015) Rockwell Automation is a global concern with employees and facilities throughout the world. Since their beginnings in 1903 and continuing today, Allen-Bradley Motor Control devices, hardware, software and related products and services have been and still are the best available. The company grew from a couple of employees in a small machine shop to thousands of employees occupying approximately 1.8 million square feet of factory and office space. Their facilities covered approximately 4 city blocks in Milwaukee.

In approximately 2003, materials from the in-house Allen-Bradley Company Museum were dispersed to other institutions. Some items are now on display in the Allen-Bradley Company exhibit in "The Streets of Old Milwaukee" exhibit at the Milwaukee Public Museum. Some items are at the Milwaukee County Historical Society.

ALLEN-BRADLEY "PERFECT AUDIO AMPLIFIER"

The battery-powered Allen-Bradley audio frequency amplifier was intended to be used as an add-on to a crystal radio or one-tube radio, or as an add-on to replace the audio frequency amplifier stages of, for example, a typical "three dialer" with two transformer coupled AF stages. See the Bradley-Amplifier instruction sheet on pages 13 and 14 below. An Allen-Bradley ad proclaimed "Slip a Bradley Amplifier into your set and experience a new thrill in radio reproduction." See examples of Allen-Bradley ads on pages 12 and 15.

In his article on the Bradley Amplifier published in the December 1995 (Volume 20 Number 12) issue of MAARC's Radio Age, Buford Chidester noted that "Allen-Bradley saw the need to retrofit many of the existing (battery) receivers with an amplifier that could drive the new loudspeakers while allowing the existing receiver and power source to be used, thus eliminating the need for purchasing a new improved receiver, which was very expensive in those days." The Allen-Bradley amplifier was a 3-tube resistance coupled amplifier, with fixed resistors replacing the audio frequency transformers used in conventional AF stages. Resistance coupling sacrificed signal voltage step-up characteristic of transformer (inductive) coupling, necessitating three stages of amplification to provide the gain equivalent to two transformer coupled stages, but provided higher quality audio (better frequency response) to the user's speaker. Buford notes that "By the time World War II ac/dc sets came along, resistance coupled audio amplifiers became standard practice, but in the early 1920s, audio transformers were still king and resistance coupling was looked upon as a promising new technology."

The Allen-Bradley amplifier was produced in at least 4 different Black Bakelite housings. It appears that major and minor changes were made during production. The amplifiers are usually found with 6

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Allen-Bradley - continued from Page 8

fixed resistors and 4 fixed capacitors/condensers. The terminals are nickel-plated and "captive" type. Bakelite base dimensions are 9.2 inches long by 1.25 inches high by 3.125 inches deep (front to back), and the overall height with tube sockets is 2.5inches. The nickel-plated metal tube sockets have a vertical slot for insertion of the tube alignment side-pin. There is no locking position for the tube alignment side-pin. The brass fittings in the base hold the tube pins in position by side friction. There are raised elements which were cast or machined into the underside of the base and used to align components for assembly and soldering. The following information is cast into the top of the Bakelite base and results in "raised lettering" of "Bradley Amplifier. Resistance Coupled. Perfect Audio Amplifier. Allen-Bradley Co. Milwaukee Wisconsin" and the (octagonal) A-B logo. All terminals are also identified by "raised lettering"; refer to specific amplifier versions for specific terminals. The Bakelite housing has two mounting holes located at the upper left and lower right corners as viewed from the top. The amplifiers were packaged in an Orange/ Black checkerboard box, dimensions 9.25 inches long by 2.75 inches high x 3.375 inches deep (front to back). See figure 1 below.

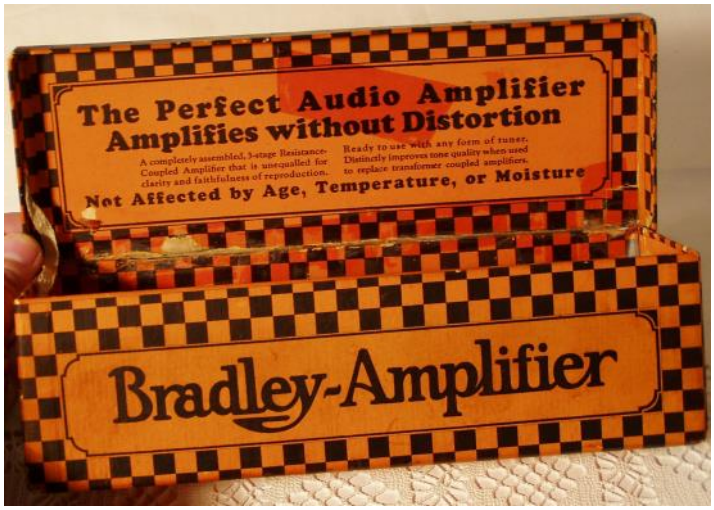

Figure 1—Bradley Amplifier Box

The amplifier package included a 2-sided original instruction sheet, shown on pages 13 and 14.

There were at least four versions of the three-tube amplifier.

Version 1: The distinctive A-B Co. octagon logo is located in the upper-left corner. This version appears in advertisements through November 1924. This version was manufactured with 9 terminals. Terminals include: A, +A, -B, +B1, +B2, LOUDSPEAKER (2 terminals), DET PLATE, unmarked terminal. This version does not have a "–C" terminal or a molded 'boss' for such a terminal. The DET/PLATE terminal and the unmarked terminal are secured to the Type 601 grid leak capacitor. In general, the Bakelite top is thicker near each terminal. A raised circular "boss" is molded into the Bakelite around the small holes thru which the terminals are installed. There are 3 sets of 4 pin holes in the base that line up with the 4-pin holes in the bottom of each tube socket. The pinholes allow the pins in tubes to be inserted thru the bottom of the tube sockets and make contact with the fittings under the base. There are no large holes in the base. This example amplifier has two metal-shell, 4-pin tube sockets and one 5-pin Bakelite tube socket. The metal sockets are riveted to the base. The 5-pin socket is fastened to the base with 5 small bolts. The 5-pin socket appears to be an after-factory user modification. The surface of the underside of the Bakelite housing shows markings that are distinctive to "engine turning milling machine" finishing. There is no mold/cast mark on the top or bottom of the Bakelite. Some of the resistors and capacitors have been removed from this example. This example is from the Greg Hunolt collection.

Figures 2, 3, and 4 below and next page show the Version 1 amplifier, a top view, a zoom in on the left side of the top to show the logo information, and a bottom view of the chassis.

Figure 2—Bradley Amplifier Version 1 Top View

Figure 3—Bradley Amplifier Version 1 Top View Logo

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Figure 4—Bradley Amplifier Version 1 Chassis View

Version 2: The A-B Co. octagon logo position is centered along the top of the Bakelite housing between the –B and +B1 terminals. This version appears in advertisements starting in December 1924. It has three 4-pin metal shell tube sockets. All sockets are riveted to the housing. The three metal sockets are centered on three 1 inch diameter holes in the base. It is manufactured for 10 terminals. Terminals include: -C, -A, +A, -B, +B1, +B2, LOUDSPEAKER (2 terminals), DET PLATE, unmarked terminal. The DET PLATE and unmarked terminals secure the Type 601 capacitor to the base. In this example of Version 2, the thickened "boss" at the DET PLATE terminal and unidentified terminal is not circular but ovoid in shape. The underside of the Bakelite housing is filled with open bus wiring and components. Paper-labeled fixed resistors include three BRADLEYUNIT 100R (100,000 ohms) and three BRADLEYUNIT 500R (500,000 ohm). There are three Dublier Micadon Type 640, 0.01MFD and one Dublier Micadon Type 601, 0.005 MFD grid leak type capacitors. All resistors and capacitors are soldered in place and appear to be "done in the factory". In one corner on the bottom side, the Bakelite housing has a very small mold/cast mark with the words "BELDEN CHICAGO". This example was acquired on November 10, 2007 at an Estes Auction from the Estate of Dick Bury.

Figures 5 and 6 below show a Version 2 amplifier, a top view and a chassis view showing the capacitors and paper label resistors.

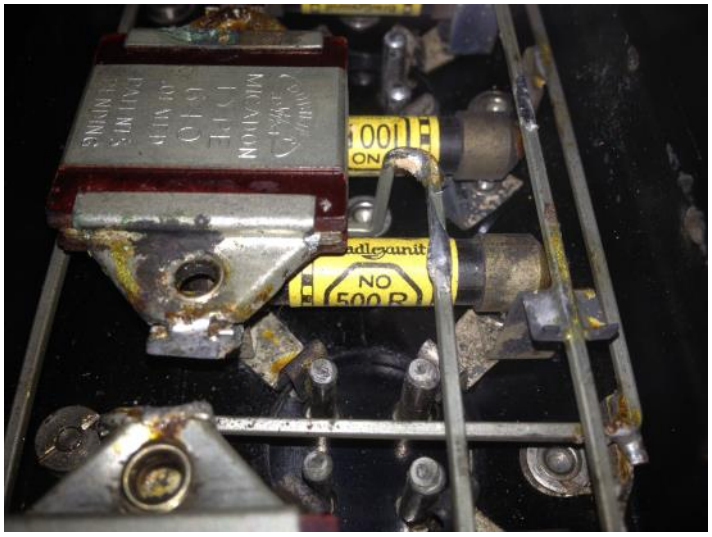

Figure 6—Bradley Amplifier Version 2 Chassis View

Version 3: Version 3 is similar to Version 2 except that the fixed resistors are dark body type and do not have the BRADLEYUNIT paper labels. The resistors are ink stamped on one silver end cap with a black letter "C" or "L". The author understands these to be equivalent to the 100R and 500R Bradleyunits. This example has three each of the 100R and 500R resistors. The four condensers in this unit are identical to the condensers in Version 2. This example and the original box and instructions were acquired Sunday August 5, 2001 at the Estes auction from the estate of Dr. Ralph Muchow.

Figure 5—Bradley Amplifier Version 2 Top View

Allen-Bradley - continued on Page 11

Allen-Bradley - continued from Page 10

Figures 7 and 8 below show a top view and a bottom chassis view of the Version 3 amplifier. Note in the chassis view the solid black "C" and "L" resistors.

Figure 7—Bradley Amplifier Version 3 Top View

Figure 8—Bradley Amplifier Version 3 Chassis View

Version 4: Version 4 is similar to Version 3 except the resistors end caps are ink stamped around the circumference with very small font numbers to indicate resistance values. These resistors are only ¼ inch in diameter. Two resistors are 100,000 ohm, one is 250,000 ohm and three are 500,000 ohm. The four condensers in this unit are identical to the condensers in Version 2. This example appears to be factory soldered. Of the six amplifiers examined in preparation of this article, this example is the only one with a 250,000 ohm resistor. This example was photographed at Bob Paquette's Microphone Museum in Milwaukee on December 6, 2014.

Figure 9 below shows a Version 4 amplifier chassis. Note the ink stamping on the resistors.

Figure 9—Bradley Amplifier Version 4 Chassis View

The original amplifier instructions (see pages 13 and 14) include schematics for connecting the amplifier to the following circuit variations: crystal radio; 1-tube, 3 circuit tuner; 1-tube four circuit Cockaday; 4-tube untuned RF, 4-tube Neutrodyne tuned RF; 6-tube superheterodyne. The instructions also include recommended battery voltages for use with the following tubes: UV-199, UX-199, UV-200, UX-200, UV-201-A, UX-201-A, WD-11, WD-12, WX-12, UX-112, UX-120, UX-210. Also included are an internal wiring diagram and two diagrams for proper connections to battery sources.

At the time that these amplifiers were being sold, other national companies including Daven, DeJur, Muter, Infradyne, and Sonatron, were also selling similar compact add-on type 3-stage amplifiers. Adding an amplifier was often less expensive than buying a new radio. Most of these other amps were only resistance coupled. Capacitors/condensers had to be added into the circuits. Sonatron and Daven did include condensers similar to the Allen-Bradley. Companies such as Globe Electric (Milwaukee), Klitzen (Racine), Monroe McKillup, Grebe, Crosley, Magnavox, Radiola (RCA), Western Electric, Kennedy, Paragon, Zenith and many others manufactured transformer coupled amplifiers in larger wooden box type cabinets to match the cabinet styles of their radio detectors and receivers.

To Be Continued...

Part 2 of the article will appear in the next issue of WARCI News. It will describe the Allen-Bradley radio devices and components in detail, and the TRF radio set made by Allen-Bradley in 1927.

REFERENCES

Refer to Antique Wireless Association (AWA) Old Timers Bulletin Vol. 18. No 2, Sept 1977, for "A Short History of Allen Bradley Company".

"The Bradley Amplifier", Buford Chidester, MAARC *Radio Age,* Volume 64, Number 56, December 1995 .

Rockwell website www.RockwellAutomation.com provides extensive company history and some information on Radio Devices. The 1925 color radio Device brochure is worth viewing.

CREDITS

Chris Boyce, for patience, understanding, assistance, proofreading, and collaborating in our 31 year search for old radios things.

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Allen-Bradley- continued from Page 11

"The Bradley Legacy" by John Gurda 1992

Personal collection of Radio Devices, radio publications from the 1920's with product advertisements, radio supply catalogs, and memorabilia.

Greg Hunolt for copies of radio magazine advertisements, a gift of several Radio devices, and the loan of the Version 1 Allen-Bradley amplifier.

Julie Gonzo for Allen Bradley Company information.

Bob Paquette, Sr., for permission to photograph Version 4 Allen-Bradley Amplifier.

Glenn Trichan for permission to photograph Bradleydenser, Bradleydenser Box, Bradleyneir, Bradleyneir Box.

Jay Volke for information on Bradleyunit devices.

James Jerschefsky, Allen-Bradley, for 2002 AB tour.

Greg Hunolt, WARCI President and Newsletter Editor and his wife Jean Ann Blanke for editing the drafts.

THANKS TO

Chris Boyce, Greg Hunolt; Julie B. Gonzo; James Jerschefske, CBC; Glenn Trischan; Steve Schaffer; Paul Dorobialski; Bob Paquette, Sr.; Joe Halser; Jay Volke; the late Dr. Ralph Muchow; the late Dick Bury.

THE SEARCH GOES ON…

The author is interested in comments from readers. Please contact me at www.radioman@wi.rr.com

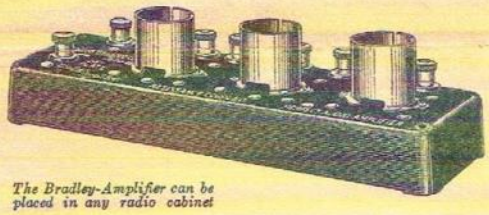
Allen-Bradley - continued on Page 13

Allen-Bradley - continued from Page 12

Read This Instruction Sheet — Follow Instructions Closely

Bradley-Amplifier

Resistance-Coupled
PERFECT AUDIO AMPLIFIER

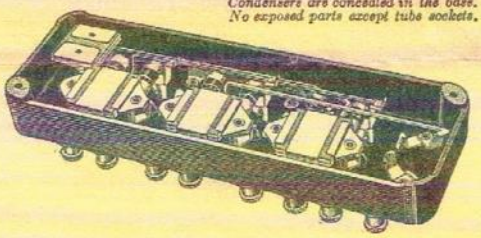


The Bradley-Amplifier can be placed in any radio cabinet

AMPLIFIES without DISTORTION

Does not change or deteriorate with age or service

Note how neatly the Bradleyunits and Condensers are concealed in the base. No exposed parts except tube sockets.

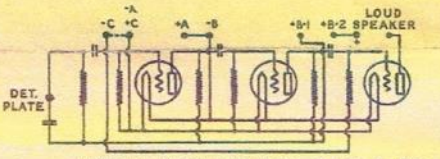


THE Bradley-Amplifier is a complete audio amplifier unit, which can be connected with any type of standard tuner. The amplifier tubes are interconnected with Bradleyunit resistors, instead of ordinary audio-frequency transformers, with the result that all tones are amplified equally. A purely resistance coupled amplifier has no selective properties, but amplifies both low and high tones with equal efficiency and faithfulness — none of the harmonics are missing, none are added. The violin sounds like a violin and not like a cornet. The timbre or tone color is faithfully passed on from tube to tube, and if a good loudspeaker is used the resulting music in the instrument is as pure and undistorted as though the artist were right in the room. Howling, so often present when high ratio iron core transformers are used, is eliminated, and music can be reproduced as pleasing to the critical ear of artist or layman alike as would be the original rendition in the studio itself.

The Resistance Coupled Bradley-Amplifier eliminates the distortion ordinarily caused by the use of audio-frequency transformers, and with a good loudspeaker, the original tone qualities transmitted by the broadcasting station are faithfully amplified and reproduced. The Bradley-Amplifier is the Perfect Audio Amplifier.

A three-stage resistance coupled amplifier produces the same amplification as the ordinary two stage transformer coupled amplifier, but the tone quality is far superior. The use of the Bradley-Amplifier will not ordinarily increase the volume of your set, if you use a two-stage amplifier, but a marked improvement in clarity and tone quality will be noticed immediately.

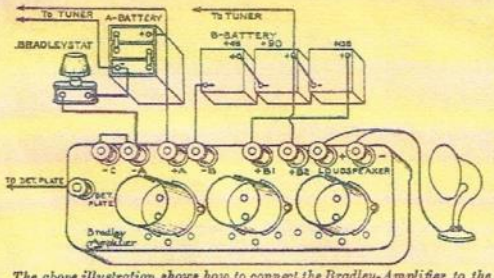
The small size of the Bradley-Amplifier permits it to be installed in practically any radio set without disturbing the existing wiring of the set. Merely remove the audio-frequency tubes and the audio frequency transformers and place the Bradley-Amplifier in the space formerly occupied by these devices, taking care that no short circuit occurs between the metal parts of the Bradley-Amplifier and the receiver. The wiring from the set to the Bradley-Amplifier is extremely simple and requires no technical knowledge. All binding posts are clearly marked.



INTERNAL WIRING DIAGRAM OF Bradley-Amplifier

The Bradley-Amplifier is no more difficult to install in your set than connecting up a group of B batteries. ***The same A and B batteries may be used for the Bradley-Amplifier as are used for the balance of the receiving set.***

The Bradley-Amplifier may be mounted anywhere within the set cabinet, if desired. If a detector jack is provided on the set, a plug connection can be made to the Bradley-Amplifier by running a cord from the plate side of the detector jack to the input terminal of the Bradley Amplifier. The output terminals are then connected to the loudspeaker, and the battery wires attached as indicated in the diagrams.



The above illustration shows how to connect the Bradley-Amplifier to the tuner and to the A and B batteries when no other battery is used. The B battery connection to the tuner plate circuit may be 90 volts or less depending upon the tubes used. When no C battery is used, the -C terminal is connected with a short wire to the -A terminal. Other batteries used with the UX tubes or other equivalents are shown in the table on opposite page.

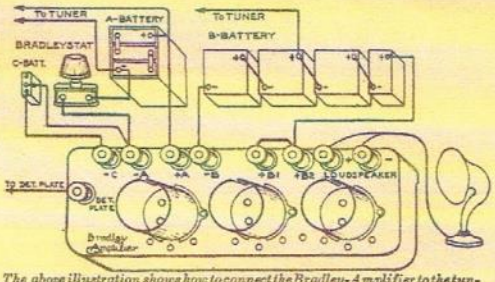
For further information regarding the Bradley-Amplifier ask your dealer or write us direct. Our radio engineers are glad to help you solve your problems.

Allen-Bradley Co.

Electric Controlling Apparatus

286 Greenfield Avenue — Milwaukee, Wis.

Mfrs. of the Bradleystat and other Perfect Radio Devices.



The above illustration shows how to connect the Bradley-Amplifier to the tuner and to the A, B and C batteries. The B battery connection to the tuner plate circuit may be 90 volts or less depending upon the tubes used. When UX tubes are used, especially in the last stage, the C battery is essential and is connected as shown in the above illustration between the -A and the -C terminals. The C battery voltage is given in the table on the opposite side.

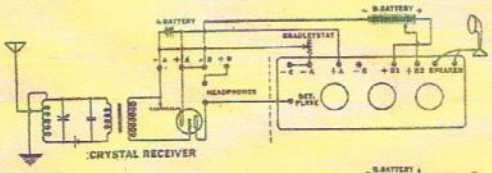
(OVER)

Allen-Bradley - continued on Page 14

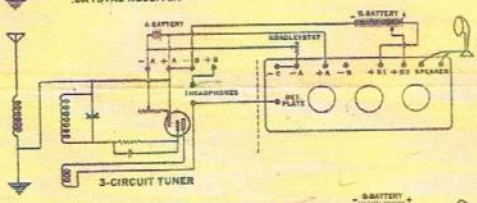
Allen-Bradley - continued from Page 13

Connection Diagrams and General Instructions

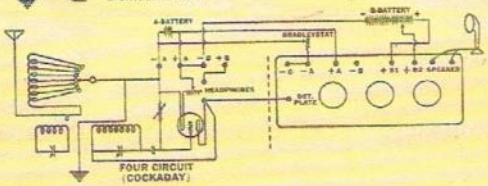
for using the Bradley-Amplifier with various Types of Standard Receivers



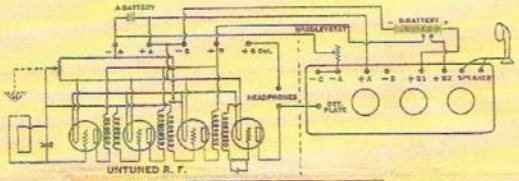
CRYSTAL RECEIVER



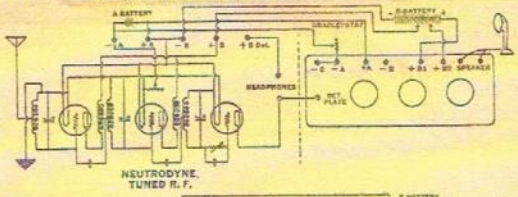
3-CIRCUIT TUNER



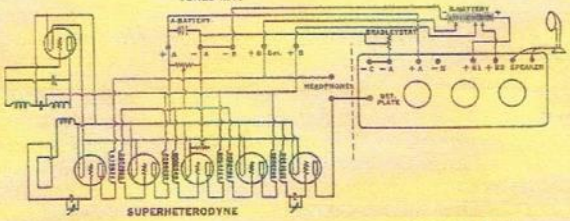
FOUR CIRCUIT (COCKADAY)



UNTUNED R. F.



NEUTRODYNE, TUNED R. F.



SUPERHETERODYNE

How To Use The C-Battery With The Bradley-Amplifier

The Bradley-Amplifier is provided with sockets that will take the standard UV-201A tubes or tubes with similar bases. UV-199 tubes and other tubes with similar small bases are used with adapters. The new UX tubes can be used in the Bradley-Amplifier without adapters, both dry cell and storage battery types.

When the UX tubes are used, either in all three stages or only in the last stage of the Bradley-Amplifier, it is essential to use a C battery to prevent unnecessary drain on the B battery. The C battery terminal is shown in the illustrations on the opposite page. When no C battery is used, the C terminal is connected to the A terminal with a short wire. When a C battery is used, the negative C battery terminal is connected to the C binding post of the Bradley-Amplifier and the positive C battery terminal is connected to the A terminal in the Bradley-Amplifier. The correct amount of C battery voltage is given in the table in adjacent column on this page.

For further information, consult your dealer or write the Allen-Bradley Co., 286 Greenfield Avenue, Milwaukee, Wisconsin. If properly connected, the Bradley-Amplifier produces amplification without distortion.

— IMPORTANT —

1—The A and B batteries must be tested to determine if they are delivering their rated voltage. The same A and B batteries may be used for tuner and Bradley-Amplifier.

2—Practically any amplifying tube with proper batteries will produce satisfactory results in the Bradley-Amplifier. The sockets of the Bradley-Amplifier will accommodate the UV-201-A tube and other tubes with the same type of base. UV-199 or C-299 tubes, or tubes with similar bases, cannot be used in the Bradley-Amplifier without an adapter. The new UX series of tubes, either dry cell or storage battery types, can be used without adapters.

3—Be sure that all tube prongs are clean and bright and make good contact in the sockets.

4—Caution: Connect the minus B Battery to your receiver only and not to both receiver and amplifier. One connection either to the receiver or to the Bradley-Amplifier is sufficient, and you are then protected from short-circuiting your A Battery in case the minus A and minus B terminals of your receiver are connected together.

5—A filament rheostat, preferably a Bradleystat to obtain best results, should be connected between the minus A Battery and the minus A terminal of the amplifier unit. See diagrams in adjacent column and also illustrations at bottom of opposite page.

6—Use a 90-volt B Battery for the +B2 terminal, and 135-volts for +B1. The 90 volts can be used for both terminals, but less amplification results. For the UX series of tubes, still higher B Battery voltages may be advantageous, as shown in tabulation below. For information about C battery read paragraph "How to use the C battery" at bottom of this page.

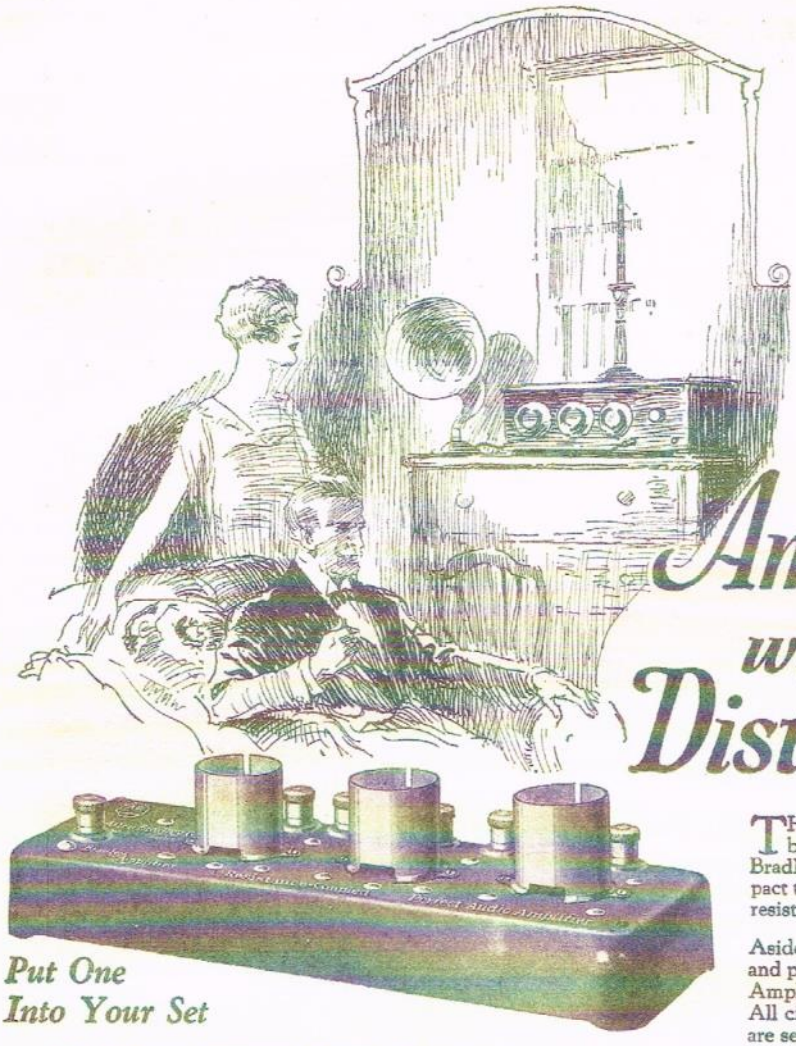
7—To reduce the volume, do not turn down the amplifier filaments, but reduce the energy input to the Bradley-Amplifier by reducing the output of the tuner. This may be accomplished by reducing the number of turns in the antenna circuit or by changing the setting of the variocoupler if the latter is used. Reducing the amplifier filament usually produces distortion unless the change is quite small.

8—Distortion in amplified signals usually may be traced to the loudspeaker. If the tubes in the Bradley-Amplifier are not poor or overloaded, it is practically impossible to cause distortion in the amplifier unit. Avoid placing the loudspeaker too close to the set, since mechanical vibration of the tubes may produce a steady hum in the loudspeaker.

MODEL	USE	"A" BATTERY VOLTS (SUPPLY)	FILAMENT TERMINAL VOLTS	"A" BATTERY CURRENT AMPERES	"B" BATTERY VOLTS DETECTOR	"B" BATTERY VOLTS AMPLIFIER	NEGATIVE "C" BATTERY VOLTS
RADIOTRON UV-199	Detector Amplifier	4.5	3.0	.06	45	90	4.5
RADIOTRON UX-199	Detector Amplifier	4.5	3.0	.06	45	90	4.5
RADIOTRON UV-200	Detector Only	6	5	1.0	16 to 22½	—	—
RADIOTRON UX-200	Detector Only	6	5	1.0	16 to 22½	—	—
RADIOTRON UV-201-A	Detector Amplifier	6	5	.25	45	90 135	4.5 9.0
RADIOTRON UX-201-A	Detector Amplifier	6	5	.25	45	90 135	4.5 9.0
RADIOTRON WD-11	Detector Amplifier	1.5	1.1	.25	22½	90	4.5
RADIOTRON WD-12	Detector Amplifier	1.5	1.1	.25	22½	90	4.5
RADIOTRON WX-12	Detector Amplifier	1.5	1.1	2.5	22½	90	4.5
RADIOTRON UX-112	Detector Amplifier	6	5	0.5	22½ to 45	157.5 90-135 112.5 90	10.5 9 7.5 6
RADIOTRON UX-120	Audio Amplifier Last Stage Only	4.5	3.0	.125	—	135	22.5
RADIOTRON UX-210	Amplifier Oscillator	8	7.5	1.25		450 270< 180	25 22 16
		6	6.	1.1		157.5 135 112.5 90	10.5 9 7.5 6

Allen-Bradley - continued on Page 15

Allen-Bradley — *continued from Page 14*



Amplifies without Distortion

THE latest Allen-Bradley contribution to better radio is the new Bradley-Amplifier, a marvelously compact three-tube audio amplifier of the resistance coupled type.

Aside from its faultless tone quality and perfect reproduction, the Bradley-Amplifier is amazingly small in size. All circuits, resistors, and condensers are securely soldered within the base, leaving no exposed parts.

Another outstanding feature is the use of Bradleyunits (Molded Resistors) which do not deteriorate with age nor are they affected by temperature and moisture. The Bradley-Amplifier requires no attention or adjustment.

Put One Into Your Set

HAVE you been troubled with distortion, due to faulty audio-frequency transformers? If so, slip a Bradley-Amplifier into your set and experience a new thrill in radio reproduction. No special wiring is necessary, because the Bradley-Amplifier is wired, ready for instant use. Send for new booklet "Amplifies without Distortion" today! It explains, fully, the principles of audio frequency amplification and how to improve tone quality.

ALLEN-BRADLEY CO., 287 Greenfield Ave., Milwaukee, Wis.

Bradley-Amplifier

Resistance-Coupled

PERFECT AUDIO AMPLIFIER

PRINTED BY GILES PRINTING CO., LONG ISLAND CITY

News from the Neighboring Clubs

MARC

Michigan Antique Radio Club
www.michiganantiqueradio.org

Extravaganza 2015

MARC's Fall Newsletter announced that MARC's 2015 Extravaganza will be held in a new location, the Kalamazoo Michigan Expo Center. "We will be able to hold the entire event INSIDE the same air-conditioned space. No longer will weather, be it rain or extreme heat, be a concern. The space offers amenities such as high quality food service, multiple rest rooms, and Wi-Fi access." There are several hotels within two miles of the Expo Center and, "for the hardy", campsites on the Expo grounds.

MARC has held meets at the Expo Center and has always been happy with the site.

The Extravaganza dates will be July 9-11, with event schedule, etc., to be announced soon.

ARCI

Antique Radio Club of Illinois

www.antique-radios.org

Congratulations!

Congratulations to John Stone, newly elected president of ARCI.

In door Swap Meet

Sunday, February 8, 2015; 7AM-11AM (Many sellers arrive by 6AM.) 9AM Officers' Meeting

Admission is free, sellers must be an ARCI member ($20.00 ARCI annual membership).

There is a $7.00 per space seller's table fee. A Donation auction is held at every outdoor meet.

Boy Scout Pancake Breakfast, free coffee, juice and cookies.

American Legion Hall, 570 S. Gary Avenue, Carol Stream, IL (See ARCI website for directions and map.)

MRAC & MAARS Mid-Winter Interclub Indoor SwapFest

February 14, 2015

12560 West Townsend Street
Brookfield, WI 53005

Radios, Computers, Electronics, Ham Gear

Swapfest runs 8am to 12 noon.
Grounds open 6am to 1pm.

Free parking with $5 Admission. Six foot table $10 in advance, $12 day of event, electricity $5.

Website: www.w9rh.org

West Allis Radio Amateur Club Midwinter Swapfest

January 10, 2015

Waukesha County Expo Arena
1000 Northview Rd (Cty Trunk T)
Waukesha, WI 53188

Ham Radio, Computers, Electronics

Swapfest runs 8am to 11 pm.

Free parking with $6 Admission.
Eight foot table $24 day of event.

For more in formation, call Phil W9NAW, 414.425.3649 or visit www.warac.org

WARCI Radio Services

We now have a list of WARCI members who would be willing to provide repair / restoration services, advice or research for folks who contact WARCI looking for help. If you would like to be added to the list, please let me (Greg) or one of the Board members know.

Name	Email	Telephone	Service Available
Dwight Church	(none)	414-545-6972	Radio repair – electronics only.
Bill Engaas	CraftyradioBK@yahoo.com	262-786-8183	Speaker Repair.
Ralph Larsen	radioralph@hotmail.com	414-278-7981	Repair, including Television.
Mike Lewis	deepheart@att.net	608-835-7193	Repair, restoration, training.
Ben Bensaid	Ben@badgerconsignment.com	262-581-5453	Repair and restoration.
Greg Hunolt	ghunolt@excel.net	920-893-0422	Research, especially on 1920's radios.

Classified Ads

***WANTED*: by Dale Boyce, Email: radioman@wi.rr.com , 414-840-4146**

1. Briggs & Stratton Corporation, Milwaukee, WI (BASCO) Radio Equipment from 1922-1937. Catalogs, Complete or incomplete crystal radios, tube type radios, radio frequency transformers, earphones, tube sockets, crystal detectors, vernier rheostats, fixed resistors, multi-plate variable condensers, fixed capacitors, literature, advertising, parts boxes, Battery Eliminators (Radio Power Units types "A", "B", "A+B"), push-button tuners, promotional items, etc. Please check your boxes of radio parts and your literature files. Also wanted: radios such as Globe Electric, Monroe McKillip and others which utilize BASCO radio parts.
2. 1920's tube type radios, amplifiers and radio parts, parts boxes, advertising, promotional items, etc. made by Allen Bradley Co., Milwaukee, WI.
3. 1920's Crystal radios, tube type radios, advertising and promotional items made by Sunlite Radio, Milwaukee, WI.
4. 1920's Julius Andrae and Sons Co (JASCO) Crystal radios, Radio Catalogs, Radio Equipment and promotional items made by ANDRAE Electric, Milwaukee, WI.
5. 1920's Horn and Cone type Radio Speakers made by Milwaukee companies including: G&G Radio Co, GEMCO, Granolite Art Products, Yahr-Lange, and others.
6. Individual and boxed sets of 1920's Brightson Blue Radio tubes distributed by Yahr-Lange, Milwaukee, WI.

Classified Ads

WANTED: Old comics. Send lists to Dan Giddings, P.O. Box 3961, Glendale CA, 91221-3961

WANTED: All things Hallicrafters! Receivers, transmitters, accessories, television sets, test equipment, signs, books, etc. Also Silver-Marshall (1933-34) and Echophone.
Stan Broome, 108 East Main Street, Sun Prairie, WI 53590, 608-520-6290.

HELP NEEDED: Would like to contact owners of 1920's battery sets, literature, and equipment made by Globe Electric Company of Milwaukee, WI, to survey existing model types and variations for development of a company history. All responses will be kept confidential. Thanks.
Glenn Trischan, P.O. Box 240022, Milwaukee, WI 53224. E-mail: gnets142@att.net.

WANTED: Any set made in Plymouth, WI, by the Plymouth Radio and Phonograph Co., and Arlington, Alkire, or other sets made by the Wells Manufacturing Co. of Fond du Lac, WI. Greg Hunolt, N5412 State Hwy 57, Plymouth, WI 53073, Email ghunolt@excel.net or 920-893-0422.

TRAINING & SERVICE: Michael Lewis -- Radio Restoration Education & Consultation

I'm available to refurbish (90 day guarantee) or fully restore (1 year guarantee) your antique radios. Estimates can usually be provided in 2-3 weeks from the time you drop off your set at my shop in rural Oregon, WI (a bit SW of Madison). The cost for an estimate is $25, which can be applied towards a final bill if you hire me to work on your radio. Full restoration includes testing all tubes, capacitors, and resistors, with replacement as needed. Power supplies are modified to operate safely at 120 VAC. Chassis are dusted off, variable capacitors are flushed with residueless cleaner, and switches & pots are treated with contact cleaner. Moving parts are lubricated. Sets are aligned with digital RF generators, tested for proper operation, and "burned in" to reveal any intermittent problems.

I have over 30 years' experience in electronically restoring antique radios (I don't restore radio cabinets). For most of this time I've also taught others how to do radio restoration. I can be hired for 4- or 8-hr. blocks of bench time. You will have access to DMMs, digital audio and RF generators, capacitor and inductor analyzers, power supplies, and much other test equipment. I stock 1/4, 1/2, 1, 2, 5, and 10W resistors. Capacitor stock includes 75 values of mylars; micas & ceramics; electrolytics from 25 WVDC to 450 WVDC. Tubes are available to my students, as well as technical literature including Rider, Beitman, and Gernsback manuals, factory manuals, and Sams Photofacts. Whether you've never soldered before, or regularly restore radios & are stuck on a "tough dog," chances are I can help.

Michael Lewis, 6070 County Road D, Oregon, WI 53575, Phone: 608-835-7193, Email: deepheart@att.net

WANTED: DeForest Plug-In Butterfly Coils – Terry Hanney, 414-545-6425

Remember that classified ads up to about ¼ page are free to WARCI members.

The cut-off date April 15, 2015 for the May, 2015 issue). Send ads by email or letter to Greg Hunolt, WARCI News, at ghunolt@excel.net or N5412 State Hwy 57, Plymouth WI, 53073.

A Great Way to Start 2015

the Wisconsin Antique Radio Club

Winter Swapmeet

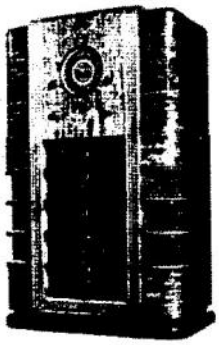
Sunday January 11, 8-11 am

at the

Best Western Plus Milwaukee Airport Hotel
& Conference Center, Concourse Room.
5105 S Howell Avenue at Edgerton Ave.

Please use lobby entrance. Follow the signs.

www.warci.org



www.warci.org or check out Wisconsin Antique Radio Club on Facebook