



The Oscillator



"All the Electrons that are Fit to Flow . . . "

THE OFFICIAL NEWSLETTER OF THE DVHRC

WINTER 2020

DVHRC Plans for 2020

In early January, the DVHRC board discussed plans and came up with the following initiatives:

- 1) DVHRC will continue to create video content to preserve radio knowledge and time tested wisdom of the art and science of vintage radio restoration such as Lewie Newhard's AA5 series.
- 2) DVHRC may consider another repair clinic, perhaps in the greater Philadelphia area given the successful NMIH Bethlehem event of July 2019. Other locations such as the Renninger's facility or any other suggested venue will help to spark interest in the hobby and show the use of testing and repair techniques.
- 3) DVHRC is planning for Kutztown events and although there are no milestone events in 2020, Kutztown Radio shows are what we are most known for! The club will continue to bring our best efforts and bolster the volunteer complement at the club table. We also thank you all for your help at auction so remember to cheerfully sign up for these jobs at our meetings preceding events. Ideas to more easily move heavy sets will be entertained as we would like to maintain our health! Communicating announcements from the club table will be made

more often and the delivery system will include improved PA audio capabilities. Auctions will always be closely managed since liquidation of estates will likely be a constant in our hobby.

- 4) Property management initiatives to maintain the trailers will continue and moving Ottsville storage inventory will likely be accomplished as soon as spring weather conditions will allow. Stay tuned for invitations to participate in work parties to assist the club.
- 5) Finally, we did speak to the promotion of our club through various advertising opportunities and even the distribution of business cards. This would be something you could give to friends who may have worked in allied fields or may have interest. The cards are a reminder of who we are, when we meet, etc. Keep them in your wallet and when you see Joe or Joanne buying some joe down at the Wawa, give him or her one. Although the board did not discuss field trips this time around we are always open to suggestions at meetings.

2020 Monthly Themes

The Board has proposed these themes for our Telford meetings. Access to these can also be found on our web page Events tab.

Images or associated documents from your flash drives can be projected on our big screen in lieu of dragging your items to meetings and physical pictures can be projected and audio played.

Meetings begin at 7:30 PM except July's Tailgate (7:00).

[Jan 14](#)- AA5 Part 2 with Lewie Newhard, Video Presentation now available at: <https://www.youtube.com/watch?v=AnW04WE6zvo>

[Feb 11](#)- What I Got for Christmas.

[Mar 10](#)- Drone Presentation. Jarret Brown explains licensing, FAA Part 107 rules and operation of drones.

[Apr 14](#)- Kutztown XLII Planning, Vintage Phonographs.

[May 12](#)- FM-only radios, Post Kutztown Discussion.

[Jun 9](#)- Vintage Books and Paper Brochures, printed materials.

[Jul 14](#)- Tailgate Auction at Telford Community Building Lot. **7:00 PM**

[Aug 11](#)- Atomic Age Radios, Articles and Designs.

[Sep 8](#)- Kutztown XLIII Planning, Theme: Early Wire and Tape Recorders.

[Oct 13](#)- Early/Vintage Audio.

[Nov 10](#)- Your Best Restoration. This is the one you're most proud of!

[Dec 8](#)- X-mas Party at Stove N' Tap.



Delaware Valley Historic Radio Club
PO Box 5053
New Britain, PA 18901
www.dvhrc.com

The Oscillator is the quarterly newsletter of the Delaware Valley Historic Radio Club.

Articles on radio and television history or collecting can be submitted by the 25th of month prior to quarterly issue dates of April, July, October and January to the editor at gdottor@yahoo.com.

Personal views, opinions and technical advice do not necessarily reflect those of members, officers or Board of Directors of the DVHRC, nor is the DVHRC responsible for any buying or selling transactions.

Dues are \$20 per year and can be paid at a meeting or mailed to the above address. Meetings held 2nd Tuesday of each month at Telford Community Center.

DVHRC Board of Directors

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WWII Radios Presentation at NMIH Bethlehem, 11.10.2019

Mike Lobus, on Veterans day weekend, presented a thorough history of radio technological advances in applications used during wartime at Bethlehem's National Museum of Industrial History. This included a history of radio's development, highlighting research and discoveries of various circuits spanning from Hertz to Edwin Armstrong and their application to the rapid development of encrypted communication and radar during those tumultuous war times. Allied forces worked hard to be one step ahead of German radar technology, a deciding factor in fending off attacks against England.

Another theme included the relationship of radio amateurs and their contribution to the state of the art in the 1920's. The talk was well attended with a fully occupied meeting room. Those attending were also treated to the *100 Years of Radio* exhibit in adjoining rooms. **An audio record of the presentation was made and this editor will attempt to obtain the fine PowerPoint presentation and highlight as a future *Oscillator* story or make available online.**

Below: Part of the display of military radios at NIMH Radio at War presentation.

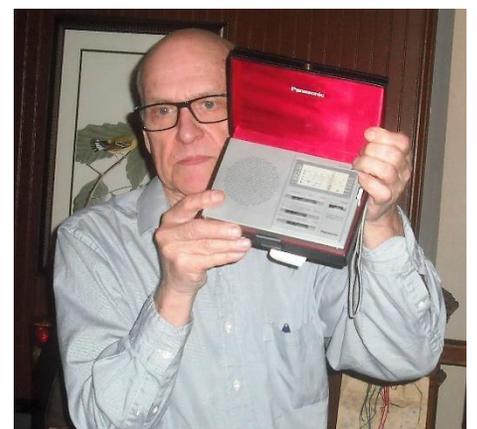
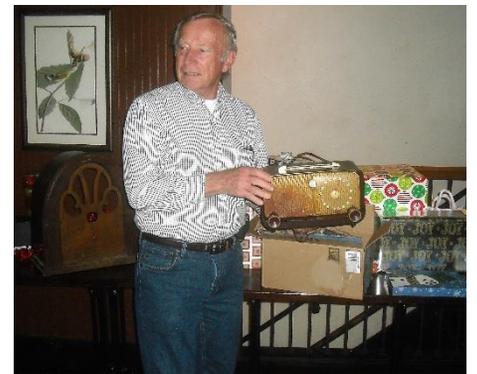


2019 Christmas Party

DVHRC members and friends broke bread and exchanged many nice gifts at Lansdale's Stove N' Tap location, December 10th, 2019. Jarret thanked all for their efforts for a great year including landmark events including Kutztown 40, assisting with NIMH's *100 years of Radio* exhibit and the associated repair clinic. Thanks to Tom Spiegel for his organization of this party.



Above and Below: Lots of fellowship and great gifts were exchanged. Fred and Frank say it's good to participate and share our treasures!



Meeting of February 11, 2020

The theme was *What You Got for Christmas*. Here are some of the presents given us or which we procured.



Above: Mark Thierbach did not get this 1925 RCA model 100 speaker as a present but he's had 4 of them in the past. This time he set out to restore one for Christmas. Mark had to rewire one of the windings with #42 wire and matched the resistance of the other functional coil.

Below: Although the original paper cone was reused, new foam surround was replaced using a widely available kit found on the internet. Since there is seldom an exact match, trimming to match diameter and regluing was necessary- buy bigger and trim. The design predates the modern voice coil and works via two coils working push-pull against a wire to the point of the cone.



Top Next Column: The magnet was cleaned and reassembled, and other metal cleaned and repainted. The result was a functional high impedance speaker that requires a few watts to drive since somewhat inefficient. Note that Mark's model 100 is made of steel and superior to the similar 100A using weaker Pot metal which can suffer from minor to severe distortion so care must be taken when working on those. When reinstalling the 100A grille cloth frame, you may find it hard to line up the screw holes due shrinkage of the speaker housing.

More on the 100A and typical grille cloth designs:

https://www.radiolaguy.com/info/Radiola_100A-GrilleInst.htm

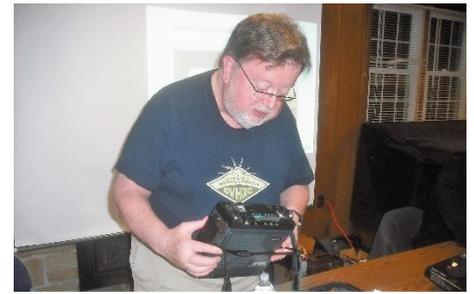
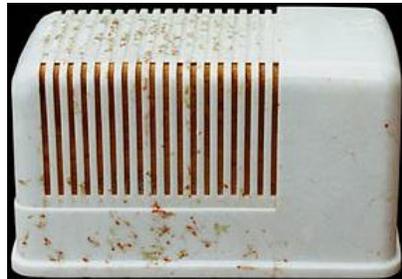


Below: Pete and Jan are eyeing the eye candy with a cute Temple G-419 4-tuber from 1948 and two novelty "car radios" from the late Joe Cro's collection including the finned 59 Caddy.

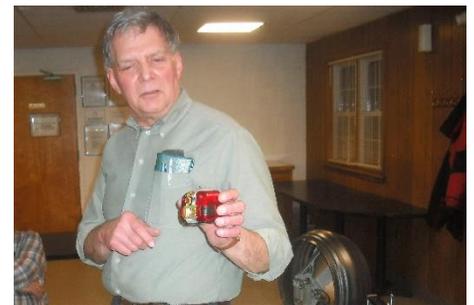


Above and Below: Also in the Christmas spirit, Jarret Brown showed off [this](http://www.antiqueradio.com/Commentator_4-96.html) Silvertone "Candy Cane" by Noblitt-Sparks (Arvin) for Sears. Jarret was fortunate to find a crack-free Mdl 7008 in beetle plastic. See story on this set's series:

http://www.antiqueradio.com/Commentator_4-96.html



Above and Below: Dave Snelman added to his Sony collection with this rugged model ICF-8650 3 bander AM, FM, Aircraft radio from 1980. The set is powered by 8 D cells. The AC power supply is almost the size of the unit.



Above and Below: Al Simmons demonstrates his Hallmark NPPR (North Pole Public Radio) Christmas Tree ornament radio with amusing on-demand pre-recorded public announcements and segue music interludes just like the real NPR included at no extra cost! This is the third in a series of radio ornaments by Hallmark including the 2006 Cathedral and 2012 25-day countdown radio. These keepsakes will live on each Christmas so store them with care.



AA5 Part Two

At our January 14th meeting, Lewie Newhard delivered Part Two part of his series on the All American Five (AA5) circuit and radio tips. Lewie wants all with any questions to “brave it out” and ask those questions while those with the knowledge can pass it on. There is no question too simple so let’s make sure, as a club, we avail ourselves to the experienced folks of DVHRC that we are fortunate to have around us. Then we must invest time in restoration projects to get some reps on the things we learn by both failure and success.



Above: Lewie shows the digital wattmeter, a modern tool for checking power consumption.

Below: Lewie shows the infamous “curtain burner”, a flawed design in early radios and the cause of problems for radio owners and their livelihoods.



Both AA5 presentations may be found on DVHRC Facebook page or via the following YouTube links:

Lewie’s AA5 Part 1:

<https://www.youtube.com/watch?v=6KoO3DJa6u4>

Lewie’s AA5 Part 2:

<https://www.youtube.com/watch?v=AnWO4WE6zvo>

ALL ABOUT BATTERIES

The following synopsis comes from: <https://www.allaboutcircuits.com/textbook/direct-current/chpt-11/battery-ratings/> Automotive batteries are used here only as an illustration of principles; radio hobbies generally use mA ranges.

Battery Ratings

Because batteries create current flow in a circuit by exchanging electrons in ionic chemical reactions, and there is a limited number of molecules in any charged battery available to react, there must be a limited amount of total charge that any battery can motivate through a circuit before its energy reserves are exhausted. Battery capacity could be measured in terms of a total number of electrons, but this would be a huge number. A new unit, the amp-hour, was made for this purpose. Since 1 amp is actually a flow rate of 1 coulomb of electrons per second, and there are 3600 seconds in an hour, we can state a direct proportion between coulombs and amp-hours: 1 amp-hour = 3600 coulombs.

Amp-Hour Application to Measure the Battery’s Capacity

A battery with a capacity of 1 amp-hour should be able to continuously

supply current of 1 amp to a load for exactly 1 hour, or 2 amps for 1/2 hour, etc., before becoming discharged. In an ideal battery, this relationship between continuous current and discharge time is stable and absolute, but real batteries don’t behave exactly as this simple linear formula would indicate. Therefore, when amp-hour capacity is given for a battery, it is specified at either a given current, given time, or assumed to be rated for a time period of 8 hours.

For example, an average automotive battery might have a capacity of about 70 amp-hours, specified at a current of 3.5 amps. This means that the amount of time this battery could continuously supply current of 3.5 amps to a load would be 20 hours (70 amp-hours / 3.5 amps).

Conversely, if a very light load (1 mA) were to be connected to the battery, our equation would tell us that the battery should provide power for 70,000 hours, or just under 8 years (70 amp-hours / 1 milliamp), but the odds are that much of the chemical energy in a real battery would have been drained due to other factors (evaporation of electrolyte, deterioration of electrodes, leakage current within battery) long before 8 years had elapsed. Therefore, we must take the amp-hour relationship as being an ideal approximation of battery life.

Approximate amp-hour capacities of some common batteries:

Typical automotive battery: 70 amp-hours @ 3.5 A (secondary cell)

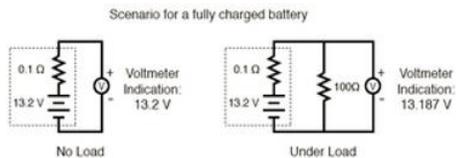
D-size carbon-zinc battery: 4.5 amp-hours @ 100 mA (primary cell)

9 volt carbon-zinc battery: 400 milliamp-hrs @ 8 mA (primary cell)

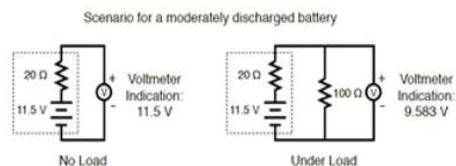
How to Check the Condition of the Battery - With and Without Load?

As a battery discharges, not only does it diminish its internal store of energy, but its internal resistance also increases (as the electrolyte becomes less and less conductive), and its open-circuit cell voltage decreases (as the chemicals become more and more dilute). The most deceptive change that a discharging battery exhibits is increased resistance. The best check for a battery's condition is a voltage measurement under load *while* the battery is supplying a substantial current through a circuit. Otherwise, a simple voltmeter check across the terminals may falsely indicate a healthy battery (adequate voltage) even though the internal resistance has increased considerably. What constitutes a "substantial current" is determined by the battery's design parameters. A voltmeter check to reveal too low of a voltage, of course, would positively indicate a discharged battery:

Fully Charged Battery:



Moderately Discharged Battery:



Notice how much better the battery's true condition is revealed when its voltage is checked under load as opposed to without a load. Does this mean that it's pointless to check a battery with just a voltmeter (no load)? Well, no. If a simple voltmeter check reveals only 7.5 volts for a

13.2-volt battery, then you know without a doubt that it's dead. However, if the voltmeter were to indicate 12.5 volts, it may be near full charge or somewhat depleted—you couldn't tell without a load check.



Above: *Inexpensive cheapo meters rely on voltage measurement and will only tell you when battery is really dead but do not appraise under load sometimes leading to false "goods".* **Below:** *Dave Dean's Simpson 260 and load test appliance truly measures batteries under load. The 260 measures on a scale of 1 -50. More sophisticated Military multimeters are among the most accurate and rugged units.*



Review

The amp-hour is a unit of battery energy capacity, equal to the amount of continuous current multiplied by the discharge time that a battery supply before exhausting its internal store of chemical energy.

$$\text{Continuous current (in Amps)} = \frac{\text{Amp-hour rating}}{\text{Charge/discharge time (in Hours)}}$$

$$\text{Charge/discharge time (in Hours)} = \frac{\text{Amp-hour rating}}{\text{Continuous current (in Amps)}}$$

An amp-hour battery rating is only an approximation of the battery's charge capacity and should be trusted only at the current level or time specified by the manufacturer. Such a rating cannot be extrapolated for very high currents or very long times with any accuracy. Discharged batteries lose voltage and increase in resistance. The best check for a dead battery is a voltage test under load.

Why Do Batteries Leak?

Chris Raymond, Consumer Reports



What causes batteries to leak that crusty, white mess? To start, it helps to think of a battery as a tiny fuel tank built to house a chemical reaction. As the elements in that tank interact, generating power through use or self-discharge, the liquid electrolyte breaks down, releasing hydrogen gas. And gas—as we all know—creates pressure. "It's like water expanding," says Prashant Kumta, Ph.D., a chemical and materials engineering professor at the University of Pittsburgh. "It can rupture the seals and cause a leak."

Once the insulating seals at the ends of the battery have been breached (in

some cases, the outer steel canister might rust and corrode as well), the hydrogen escapes without notice. But the liquid electrolyte—in this case, potassium hydroxide—exits with it. Beware: Potassium hydroxide can cause eye, skin, and respiratory irritation. If you come in contact with it, rinse well and consult with a doctor to see whether you need medical care.

In general, though, the potassium hydroxide reaches the open air and reacts with carbon dioxide to form potassium carbonate—that white powder that cakes on the battery’s shell. “That’s one of the most stable compounds in the world,” says Venkat Viswanathan, Ph.D., an assistant professor of mechanical engineering at Carnegie Mellon University. “It’s essentially like rock salt.” To be safe, you should still wear gloves when you handle the powder and refrain from breathing it in or eating it.

As you’ve probably noticed, the potassium carbonate also has an adverse effect on the performance of your device. To clean a gadget caked with the aftermath of a leaking battery, dip a cotton swab in an acid such as lemon juice or distilled white vinegar and dab it on the potassium carbonate—that neutralizes it. Go slowly. You don’t want the acid to wreak havoc on the device’s other components. The liquid will start to fizzle as it interacts with the potassium carbonate. Once the white powder softens, you can gently rub it away with a cloth or toothbrush.

When you’ve finally restored your prized possession to working order, consider using lithium batteries in place of alkaline. They’re more expensive but far less prone to leaking and less likely to self-discharge, too.

Be Smart and Stay Safe

These tips will help your batteries last longer, and make sure you stay safe. Alkaline and lithium batteries are relatively benign household items. But they do present some dangers if they’re used or disposed of incorrectly.

Store batteries in a cool, dry place.

Some of DVHRC’s war stories on leakage may be due to variations or extremes in storage temperature and humidity. Refrigerated storage does not improve life.

Each time you put in new batteries, **clean the contact surfaces and battery compartments** by rubbing them with a clean pencil eraser or rough cloth.

Remove batteries when you don’t expect to use a device for a few months. Open your meter annually to inspect internal batteries!

When more than one battery is needed in a device, always **use batteries of the same type, brand, and age.** Do not mix old and new batteries. Doing so will reduce overall performance and may cause battery leakage or rupture. We recommend replacing all batteries within a device. A partially used battery will drain energy from a new one, reducing the total amount of battery power available.

If a battery leaks, and its fluids make contact with your skin or get into your eye, rinse well with plenty of cold water and seek medical attention. Used batteries should be disposed of ASAP and kept out of reach of children. For information about throwing out or recycling batteries, check out call2recycle.org or earth911.com.

Don’t carry or store loose batteries along with metal objects- say, in a change-filled pocket. This could short-circuit the batteries. Tote your spare batteries in a small ziplock bag. If a battery feels hot, changes color or shape, gives off an odd smell, or seems abnormal in any way while in use or in storage—don’t use it!

Don’t try to recharge non-rechargeable batteries. They can explode. It’s also a bad idea to install them backwards, get them wet, expose them to fire or heat, pierce them, or strike them with a heavy object.

Always replace the battery or batteries in your equipment with the size and type specified by the manufacturer. Alkaline batteries are often recommended for best performance because **zinc carbon batteries have inferior life spans** and equipment may not operate properly if zinc carbon batteries are used.



KDKA will be celebrating the 100th anniversary of the first commercial broadcast in the U.S. On Nov. 2, 1920 KDKA broadcast the presidential election results of the Harding-Cox election, making them the first commercial broadcast station.

Another tour of the KDKA facilities, which was so successful in 2017, is being planned, as well as several other historic activities. RCA is working in conjunction with a number of other organizations to make this a “don’t miss” event. Pittsburgh hotels and

restaurants are less expensive than NYC, so this is another reason to plan now to attend our Technical Symposium and Banquet on Friday November 20th. The KDKA special events are planned to be on Saturday, November 21st.

In the meantime, you may be interested in several historical links about KDKA:

https://www.youtube.com/watch?v=At_WXK-UXAg

<http://jeff560.tripod.com/kdka.html>

Hear the recreated audio of the first commercial radio broadcast, the Harding Cox Election results, voiced by Leo Rosenberg, radio's first announcer: "This is KDKA".

<https://pittsburgh.cbslocal.com/2012/03/08/kdkas-historic-broadcast/>



Frank Conrad of Wilkesburg was Assistant Chief Engineer of Westinghouse Electric. An inventor who was fascinated with technology, Conrad built a transmitter, which he housed on the second floor of his Wilkesburg garage. This experimental station was licensed 8-X-K and was the forerunner of KDKA Radio.

The U.S. Department of Commerce, Bureau of Navigation, which served as the radio licensing agency of the day, issued the first radio license ever to KDKA, on Oct. 27, 1920. Many people ask if "KDKA" stands for

anything — and the simple answer is: no. The call letters "KDKA" were assigned from a roster maintained to provide identification for ships and marine shore stations, these being the only regular services then in operation under formal license by the Federal Government. "KDKA" was simply the next set of call letters available on the roster.

Plans were finalized with the Pittsburgh Post morning newspaper to acquire election returns by telephone. The election night broadcast, which began at 6 p.m. on Tuesday, Nov. 2, 1920, originated in a tiny, makeshift shack, atop one of the Westinghouse Electric buildings in East Pittsburgh.

Four men basically manned that first broadcast: Engineer William Thomas; telephone line operator John Frazier; R.S. McClelland, a standby and Leo Rosenberg, radio's first announcer.

The election results were relayed to about 1,000 listeners, who learned through this incredible new medium, that Warren Harding beat James Cox in the race for the Oval Office.

Upcoming Regional Events

Following are some excellent programs and a reason to have multiple club memberships in our region's clubs! Paste links into your browser to load. Even more hamfest events can be viewed via this website when updated: [n2lvi delaware valley area hamfests](http://n2lvi.delawarevalleyarea.com)

NJARC Spring Swapmeet Saturday, March 28, 2020 8 am to 12 pm.

Check contacts below. Vendor setup at 7:15AM. \$5 entrance fee. \$30 vendor fee (\$25 for members). Additional table \$20 reserved. \$25 day of event subject to availability. Where: Parsippany PAL, 33 Baldwin

Rd, Parsippany, NJ 07054.

president@njarc.org
www.njarc.org/directions.html#swapmeets

Hamfest-Warminster Amateur Radio Club (WARC) including EPA Section Convention Sunday, 05.03.20, 7am, vendors setup 6AM rain or shine.

Where: Bucks County Community College's Lower Bucks campus, 1304 Veterans Hwy (Rte. 413) Bristol, PA. 19007. *Prior website to be updated:* <http://www.k3dn.org/hamfest/>

Kutztown Radio Show XLII (42)

Friday, 05.08.20 through Saturday, 05.09.20 opens 7AM on those days; Vendor setup starts 12 noon

Thursday. **Early buyers will not be permitted on Thursday without a dealer tag. Free parking and free admission for shoppers.** Where: Renningers Farmer's Market, 740 Noble St., Kutztown, PA 19530. Antique radios, parts, and related items. Audio and Ham welcome. Tables, electric available. Dealer spaces 10' x 10' incl table \$45.

Auction 6 PM Fri. 05.08. Exhibitor reservation advised: Phone M-Th 570.385.0104; F-S 610.683.6848. See links at: www.dvhrc.org to download or facebook.com/renningerskutztown

RadioActivity 2020 Thursday, 06.04.20 4PM through Saturday, 06.06.20. *RadioActivity* will be held at the Sheraton College Park North Hotel in College Park, MD. ***The theme will be the 100th anniversary of licensed commercial broadcasting.***

The Sheraton College Park North Hotel is off of Exit 29B (Rt. 212) of I-95 between Washington and Baltimore, at 4095 Powder Mill Road, Beltsville, Maryland, 20705. *Continued next page:* The hotel is on the southwest corner

of the interchange. Subcategories and info on website:
http://www.maarc.org/index.php?option=com_content&view=article&id=277:radioactivity-2020-old-equipment-contest-categories-and-rules&catid=9&Itemid=101.

2020 AWA Annual Conference

Tuesday, August 11 to Saturday August 15, 2020. AWA will be held at the RIT Inn and Conference Center, 5257 W Henrietta Rd, Henrietta, NY 14467.

This year's theme will be "The Evolution of Amateur Radio".

Interest has been expressed in presenting session topics including:

- 124 Years of Amateur Radio Innovation
- The History of the Amateur Novice Class
- Hiram Percy Maxim
- Amplitude Modulation at the ARRL HQ
- Tales from a Heathkit ham Collector
- Sounds of the Telegraph
- AWA Ham Radio Activity
- Westinghouse Broadcasting On The 100th Anniversary of KDKA
- Philadelphia Radio
- Organist Rosa "Queen of the Soaps" Rio
- Audio Pioneer McIntosh
- AWA History
- Moonlight Restorations
- Membership meeting & FabLab (STEM) update

Contact Info at:
<http://www.antiquewireless.org/annual-convention.html>

Tubes Needed for DVHRC Kutztown Inventory



Dave Dean has some types of tubes in very short supply. Be generous and clean up some of your old stuff by donating to DVHRC's tube program. Here are the tubes the club is looking for.

- Any and all Globe tubes,
- Any high end audio tubes ,
- Any "unusual" transmitting tubes.

5751	10
5842	12A7
6AQ8	2A3
6AZ8	45
6BD8	6Q7G
6DC8	6U7G
6BK8	85
396A	12AX7
417A	83
6072A	6SN7GT
EL37	1L6
6A3	50A1
6F5	6L6GC
6F6	6L6GAY
6L6GA	6L6GB

Update on FCC Digital-Only AM Proposal Forward As Part Of Revitalization NPRM

Here is the introductory paragraph of this FCC NPRM adopted 11.22.2019. There are many

issues to study including DAB protocol, nighttime operations, radio listenership and financial burden among others in this lengthy proposal. No slam dunk.

<https://www.fcc.gov/document/fcc-proposes-authorizing-voluntary-all-digital-am-broadcasting>

In this Notice of Proposed Rulemaking (NPRM), we propose to allow AM broadcasters to broadcast an all-digital signal using the HD Radio in-band on-channel (IBOC) mode known as MA3. We tentatively conclude that a voluntary transition to all-digital broadcasting has the potential to benefit AM stations and provide improved AM service to the listening public. We seek comment on proposed operating standards for all-digital stations and the impact of such operations on existing analog stations and listeners. This proceeding was initiated by a petition for rule-making (Petition) filed on March 25, 2019, by Bryan Broadcasting Corporation (Bryan). This proceeding continues the Commission's efforts to improve and update the AM radio service to provide a better listening experience for consumers and enhanced service offerings, as part of our continuing effort to revitalize AM broadcasting.



Dude, did someone say digital? What's that?