



The Oscillator



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

THE OFFICIAL NEWSLETTER OF THE DVHRC

WINTER 2023

In Loving memory of Pete

It is with deep sadness that we mark the passing of Peter Grave who lost his long battle with cancer in early November, 2022. In facing his challenges, Pete never gave in and provided us all with a true profile in courage. Pete was known as a friend, husband, mentor, technician, auctioneer, storyteller, comedian, and a one-of-a-kind who will remain a large part of the personality of DVHRC. As an early and founding member of DVHRC, Pete was always involved, especially with the radio sales, auctions, and public events. Quick with his wit, Pete knew how to draw attention during an auction with funny quips and left us with hundreds of anecdotes to recall.



Pete's mom was a psychologist, his dad, a Pennsylvania Official who treated his son to a radio or two after Pete's constant angling and urgings- especially for the Hallicrafters SW sets of his youth.



As a teenager, he became the neighborhood expert fixing or adjusting early 50's Philco TV sets noted for their quirky tuners, working around his area to get them functioning at the wonderment of his friends and neighbors.

Pete was also passionate about the American automobile. According to the Packard Club's recent posting, "Pete's life with Packards started in the mid-1950s, when he was in high school, and he started working at a Packard dealership in Philadelphia. During the past several decades he and his wife, Jan, ran Ted Covington Sales, a towing service and junkyard in Ottsville. A feature of "The Grave Yard" was dozens of Packards, mostly postwar models and he also specialized and dealt in used police cruisers, emergency and other rare vehicles as well.

Pete leaves behind his wife Jan, many of their favorite dogs, and even more friends that he made over the years" Pete has told us as a buyer at auctions, he purchased vehicles just to store other items he had bid and won, packing them to the gills to be transported back to PA.

At Kutztown, Pete was always present both as a vendor and as master auctioneer on Friday nights. Pete was a genius yet very approachable and kind to others. We can only say that we've been privileged to know him and will remember his spirit throughout our radio collecting futures. We expect to recall many stories about Pete later this year at the Kutztown Spring Radio meet. We'll keep in touch with you via more instantaneous channels regarding any future memorial that may be planned. As a tribute to Pete, we'll include stories about automobile radio topics in this edition.





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.

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2023 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 August's Tailgate at Renningers.

[Feb 14](#)- Red Radios.

[Mar 14](#)- Have You Ever Seen This Before? Unusual radio items, possibly which you may even need explained.

[Apr 11](#)- Kutztown XLVII Planning, Theme: Clock Radios.

[May](#) – No Monthly Meeting.

[May 12 & 13](#)– Kutztown XLVII Antique Radio & Vintage Audio Show.

[Jun 13](#)- Adding a Bluetooth.

[Jul 11](#)- All Transoceanics.

[Aug Sat. Date TBD](#)- Tailgate Swap Meet under the pavilion at Renningers, Kutztown **10AM**.

[Sep](#)- No Monthly Meeting.

[Sep 15 & 16](#)– Kutztown XLVIII Antique Radio & Vintage Audio Show.

[Oct 10](#)- The 1930's.

[Nov 14](#)- My Favorite Console(s). Due to size and our aching backs, please bring flash drive with image(s), picture(s), or email them to JB. May also bring paper media and technical data. These may be displayed via projector at meeting.

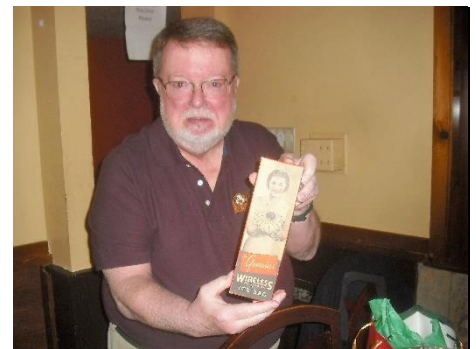
[Dec 12](#)- X-mas Party at Red Cedar Grille, Colmar.

2022 Christmas Party

DVHRC members celebrated friendship and good holiday tidings back on Dec. 13th at the Red Cedar Grill, Colmar. Thanks to Tom Spiegel for his organization of this party.



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



Meeting of October 11, 2022

The theme was *Antennas*. We saw examples of antennas, specialized antenna tuners and matching device and receivers using specialized antennas.



Above: Mike Koste demonstrated the Select-A-Tenna model 451, when placed in proximity of a loop or ferrite AM radio, will give a signal boost and possibly reduce other interference. Mike tuned in a weak station and the unit when tuned to resonance really did its work! "The Select-A-Tenna functions by concentrating the radio station signal energy in the near proximity of the 541. The Model 541 is a passive device that requires no wires, no batteries, no plugs, etc. It works by simply placing it next to your radio and tuning the knob to the same station frequency as your radio. This is the original Select-A-Tenna used for at least 28 years by hundreds of thousands of satisfied customers. The Model 541 produces a signal gain of +30 dB.



Above: The Select-A-Tenna 541-M is the

same as the original 541, but it featured a 3.5 mm "mini" jack on the front panel that allows the unit to be connected to an outside long wire and ground. This is handy for those trying to listen inside a concrete building or trailer." These units can really add to your AM DX listening experience. Mike noted that the Select-A Tenna is no longer produced but used ones pop up on eBay. You can make a similar tuner by winding about 15 loops of wire on a copier paper box lid and wired parallel to a 365 pF tuning capacitor. Al Klase of NJARC has an article on how to build one as well.

Below: Mike made the Emerson receive like a champ but the little trade show replica given to dealers at trade shows was not affected!



Below: In a similar vein, Jarret Brown showed McKay Dymek loop and powered antenna amplification DL-4 +DA9 duo. A frequency control permits precise selection of incoming signals while the sensitivity control provides optimum reception of distant stations. It is finished in real teak wood and textured black. See link for various DL-x loops configurations used with system.

https://www.radiomuseum.org/r/mckaydymek_amplified_loop_base_system_da_9.html



McKay-Dymek, of Pomona, CA was founded in the late 1970's by George McKay, W6WKG. It appears his overall intent was to make shortwave and AM radio equipment that was attractive enough to blend in with home audio gear, and also to bring hi-fi reception quality to AM and shortwave radio listening. The company produced many high end, elegant MW and SW receiving systems. This antenna operates from 120 VAC. Output is to a 50 ohm phono jack. More at: <https://antiqueradios.com/forums/viewtopic.php?p=3361199>



McKay Dymek DA5 Antenna

A shielded ferrite rod directional AM antenna with frequency and sensitivity controls

The DA 5 is a shielded ferrite rod directional antenna containing a FET two stage amplifier with frequency and sensitivity controls. The shielded ferrite rod can be rotated and tilted to null out undesirable signals. A frequency control permits precise selection of incoming signals while a sensitivity control provides optimum reception of distant stations.

The McKay Dymek DA 5 antenna is compact, weighs less than seven pounds, and is finished in real teak wood and textured black enamel making it an attractive addition to any audio system.

To truly appreciate high fidelity AM we recommend our AM 5 tuner for use with the DA 5 antenna. "You will hear AM as you've never heard it before."

This state of the art antenna is designed to eliminate interference and background noise commonly prevalent in AM reception, plus it will greatly enhance reception in areas where AM signals are marginal.

McKay Dymek Your AM Headquarters

Below: In the 60's& 70's, no home within the local UHF TV coverage was without these artfully designed antennas suitable for the living room.



Club News and Plans for 2023

The “Kutztown 101” FAQ Information has been updated: https://dvhrc.com/Kutztown_101.pdf Sometimes we are surprised of a question that comes up as we learn something new each event and this edition addresses everything you need to know. It is always a good refresher for all! Link appears on our homepage as **“KUTZTOWN FAQ’s”**

Also, accessible on our home page is a newly released **Antique Radio Podcast** with none other than our own Dave Abramson. Explore the adventures and life story of Dave as he travels from Rockford to Philadelphia to eventually lead the Phillies television broadcast team through a complex progression of video technology. Dave will relate his first exposures to electronics and his incredible journey. Link is: <https://anchor.fm/dvhrc>

Jarret as producer and editor of the podcast welcomes more club members to tell their story in the hobby and other electronics interests. This is our way to promote the hobby to others and preserve our story so join in!

You may remember Jarret’s presentation on Rave records and his goal to preserve the audio as a digital archive. This was a meeting topic back in October 2021 and appeared on pages 3- 5 within the spring 2022 Oscillator. Take a look back to review. What we have learned recently is that Jarret, who inherited the Rave recordings compilation reels from his good friend, Jolly Joe Timmer,

worked to record each record of the Rave catalog and reprocess the audio to its best possible condition. Jarret had pondered the value of the catalog and found a mutual archive opportunity in the Lehigh University Digital Archives. You may now access these recordings which include over 30 albums produced by Jolly Joe’s Rave Records in his compact upstairs studio. Again, a review of the previous story may help to set the stage. Direct Link: <https://digitalcollections.lib.lehigh.edu/islandora/object/digitalcollection/s%253Arave-records>

Alternatively, you may begin search under Lehigh University’s Digital Collections site and search for Rave Records following sequence below to reveal metadata of collection: <https://digitalcollections.lib.lehigh.edu/islandora/object/digitalcollection/s:root>

The screenshot shows the Lehigh University Digital Collections search results page. At the top, there are navigation links for 'Rare Books', 'Rave Records', and 'Speeches of Lee A. Iacocca'. Below these, there are three collection cards: 'Rare Books' with a star icon, 'Rave Records' with a photo of a man, and 'Speeches of Lee A. Iacocca' with a document icon. The 'Rave Records' collection is selected, showing its metadata: 'Collection info.fedora/digitalcollections:root'. Below the search results, there is a 'Results Per Page' dropdown set to 50, and a 'Rave Records' section with an 'Advanced Search' form. The search form includes a 'Field' dropdown set to 'Title' and a 'Search terms' input field containing 'info.fedora/digitalcolle'. There is also a 'Search' button and a 'Preserve Filters' checkbox.

In collections

The screenshot shows two collection cards under the heading 'Library Digital Collections'. The first card is for 'Nice & Easy Polkas' (RLP201) by Timmer, Joe, with a red album cover. The second card is for 'Polka Dance Party' (RLP202) by Timmer, Joe, with a yellow album cover. Both cards show the creator, topic (Polkas), and collection ID (info.fedora/digitalcollections:rave-records).

In collections

The screenshot shows two recording cards under the heading 'Rave Records'. The first card is for '01. Two Timin' Baby Polka' by Timmer, Joe, with a microphone icon. The second card is for '02. Gaytimes Polka' by Timmer, Joe, also with a microphone icon. Both cards show the creator, topic (Polkas), and collection ID (info.fedora/digitalcollections:RLP201).

Click on the brown hyperlinks to listen to selections. Some of these happy sounds might be just what the world needs. Jarret worked over the past year to select final versions, repair tape splices, digitally process and record for this project, providing the final files to the collections archivist. As the keeper of university and Lehigh Valley/Bethlehem history and culture, Lehigh University was glad to participate. And so it is always our duty to preserve the history of radio, and related electronic media in any way we can!

Some Housekeeping Notes

Web references herein may need to be copied or manually entered into your browser. Please advise of edit corrections and features you would like to see in future editions. We are always looking for a good story and plan to work with other clubs to share articles in the future as well. You may forward a story or ideas to: gdottr@yahoo.com

Special Note: DVHRC member Terry Skelton has secured permission to re-publish the following story about the iconic Simpson 260 in Radio Guide Magazine. Great links included on following site include maritime, AM towers, repair and history of AM transmitters, the future of terrestrial radio among others and really worth saving as a favorite!
<https://www.engineeringradio.us/blog/2022/01/radio-guide-the-magazine/>

This is the second installment of the story. Refer also to Part 1 appearing in the Summer 2022 Oscillator.

Old Ain't Bad..Notes From The Workbench! (Part 2)

Rebuilding a Simpson 260 Meter

Radio Guide Nov-Dec 2016 * Tommy Gray CPBE CBNE



In our last issue, (*summer 2022 Osc.*) we started refurbishing an old Simpson 260 meter. This time we will continue the project. If you obtained a Simpson meter since last issue, or resurrected one out of the storage bin, you should have cleaned it up and removed any leftover corrosion from old

batteries, which is so common to these meters when left unattended for years.

GETTING STARTED: Last time, I showed pictures of a bluish residue and a white, looking substance that was left behind on the silver plated contacts from different types of cells, when they deteriorated overtime. The electrolyte bracket usually in a form of a paste, ammonium chloride, etc., that can be corrosive overtime bracket is what leaks out and causes damage.



Some of the deposits can be very hard and must be scraped or brushed away with something like a Dremel™ tool to remove them. Others can be removed with simply an old toothbrush or something similar. Once you have removed all the left over deposits and your contacts are clean, install a new set of good quality cells in your meter. I recommend good quality alkaline cells for your meters. These will last longer and some of them will last years without turning into a pile of corrosion. If you were fortunate enough to have had only terminal corrosion, you can clean up everything and then check your calibration, and you're good to go. If your meter has the residue from years of rotting carbon- zinc cells, you will not only have terminal corrosion, but will probably have a liquid like substance left behind that can eat up everything good inside the meter. If your meter has the gooey substance, you need to get something like a good contact cleaner, and attempt to remove it from the internals of the box. If it has done too much damage, then the only reasonable alternative is to scrap the meter and try another one.

CLEANING STUFF: I put my contacts in a bowl of Tarn-X™ brand silver cleaner and immediately the corrosion dissolved and left the contacts. It is a great cleaner for just about anything silver in your transmitters as well. I use it to clean tube socket finger stock and tuning sliders. Just remember to

wash it off with water to remove any residual cleaner left behind in order to stop the cleaning process. Once contacts were clean, I had to polish them with a little with the Dremel™ tool and a piece of fine Scotch Brite™ pad to bring them to a shiny clean state, so that the Cool-Amp™, silver plating compound, which stick to the parts. Instructions on how to use the powder can be found on the manufacturer's website at <http://www.coolamp.com>. I also purchased my powder there.

Once I had them cleaned and all the surfaces on the contacts, silver plated, I reinstalled the contacts into the meter. Simply follow the instructions that come with the various products to get the best results. One thing I would recommend, is that you use very warm or hot water instead of room temperature water with the plating powder get the best results. It will save a lot of time too, as a pattern will transfer better when the water and metal are warm. On larger pieces, I use a cotton ball, dampened in the warm water. A soft rag would work well also. I pat the moistened ball (or rag) into the powder, then rub it into the metal surface until I have enough silver deposited on it to satisfy. It may take numerous applications to get a sufficient amount of silver deposited on the surface. Also, don't expect it to look like a piece of fine jewelry. It will have a satin light finish, but will be plated. Once you are done. If you desire and have left enough silver on the part, you can shine it up, but it takes a little elbow, grease and a lot of patience, along with a soft rag. Rub until it is a shiny as you like. You can make a lot of new parts to replace hard-to-find stuff in older transmitters, with a little bit of copper and some Cool-Amp™. I have used it to make IPA plate straps in some older FM transmitters to replace worn out ones. I cut the new parts out of some good copper scrap, play them with Cool-Amp™ and they work as well as a factory piece.

MOVING RIGHT ALONG: I gave my meter a good cleaning inside with a non-corrosive contact cleaner and used a soft paint brush to get rid of any

remaining dust, etc. One word of caution - you should probably not spray contact cleaner into the carbon potentiometers as they may be damaged and render your meter dead or plagued with intermittent connections, until you replace them.

CALIBRATION: Once you have everything reassembled and ready to use, it is time to verify the calibration. This will require you to use a good set of calibration instructions to help you figure out which controls do work. To do my basic calibration, I simply take a meter of known accuracy and adjust the meter to read the same thing. Usually this is sufficient. One note here is that, regardless of what version your meter may say on the meter face, its construction may vary slightly from what the pictorials and schematic say yours is. The version number is printed on the front of the meter face itself. Apparently when Simpson made these meters they did not control versions very well, or their documentation is a little mixed. My version 5 meter has a battery layout that is shown in the pictorial diagrams for an older version, and it also has the circuit board that is shown for a newer version – go figure? Regardless, of which one you have, it is easy to figure out which one to use when calibrating the meter, as the pictorials and schematics will help you know which controls do what. I would suggest doing some AC and DC voltage comparisons with a good meter of known accuracy, along with some resistance measurements, etc., with your good meter, and adjust as necessary for a starting point. A quick search on the Internet will help you find a myriad of schematics, operator manuals, and some service manuals. There are also a few sites devoted solely to the Simpson that are a gold mine of valuable information. I have found a very comprehensive array of documentation for most Simpsons is: <http://www.simpson260.com>. If you look at the backside of the circuit board, using my meter as an example, you will see the controls used to perform calibration on the meter. I will share a bit of wisdom with you here. Don't just start cranking on

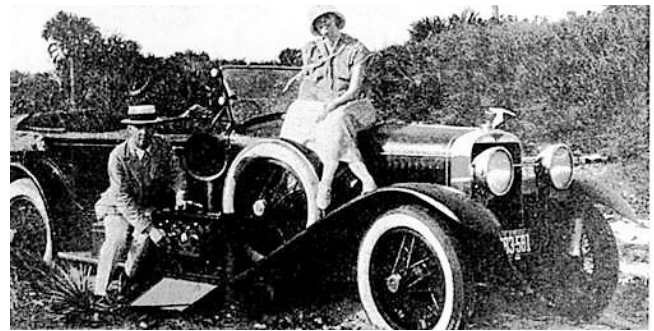
the controls. I have found that for the most part nearly every one of these meters that I have refurbish was so close in calibration already, that all it took was a very minor tweak on only a couple of controls to bring it within serviceable specs and have it ready for use. If it takes a lot of adjustment, you might have damaged components that need to be replaced. The wet looking shiny spot you may notice on the board near component leads is from the lacquer like coating that was sprayed on the front side of the board at the factory. It's soaked through the holes as you can see. These boards are single sided PC boards that are good quality. The inner solder side of the board is much nicer looking in the back, and contains some very good solder joints. I have never had to redo a factory solder joint on one of these meters as they are usually first rate to start with.

USING THE METER: Once you have the calibration to your liking, operation is straight-forward and details can be found in the operators manuals on the website mentioned above. For voltage and current, etc., just set the meter switch on the center left to AC, DC+ or DC-, as needed. To make resistance measurements, set the meter to DC+, then short the leads. Adjust the "Zero Ohms" knob to make the pointer read full scale and exactly on the "0" line. When you change ranges, you will need to re-zero each time, but it is an easy process. To test a rectifier, connect to it and switch between DC+ and DC- to see front to back ratio. Remember, when, using these meters that they are NOT auto-ranging like most of the digitals meters used to. To prevent damage to the meter, always start with a higher scale for your particular purpose (Volts, resistance, etc.) and then work your way down, to put the reading within a usable range. Also, they are not very high, impedance meters, and should not be used in digital circuits, etc., due to the loading. **Have fun with your old meter!**

Tommy Gray has been President/CEO of "Broadcast Engineering & Technology LLC", a Consulting and Contract Engineering Firm with offices in the Houston, TX area, and North LA area. www.BEandT.com

Edwin Howard Armstrong was a gear head! **(Auto enthusiast) By Bob Bennett**

Funny how when we're young, certain things tickle your fancy. Edwin Armstrong had plenty of tickling feathers at his disposal. His incredible passion for how early electronics can work, no fear of heights and "the need for speed" are just a few examples. While attending college, he commuted on an Indian motorcycle. This was likely to be an early V-twin, capable of not just getting around, but rapidly! This may have been the spark that later on (after inventing the regenerative circuit, super heterodyne circuit and super regenerative circuit) left him enough resources to buy a Hispano Suiza automobile.



Above: Edwin and his wife Marion on their new 1923 Hispano Suiza, just before they were married.

So you may be asking, "What's the big deal?" Well, after having the privilege of restoring a car radio in Tucker #48 a couple of years ago, I got schooled about those cars and how innovative (and fast) for 1948 they really were! The Hispano Suiza came out in 1919 and at that time was the car of the future. The car was named Model H6. As an early automobile company, they could be purchased with different "coach" types to fit one's needs. These were made to compete with Rolls Royce with quality mechanicals, performance and luxury. Like the Tucker afterwards, with its 6 cylinder engines that were originally used in helicopters, the H6 used a V-8 engine that was originally used in World War One aircraft. That motor was then halved, then a pair of cylinders was added to make a six cylinder! The block was made of aluminum with nitrated steel liners threaded in for durability (not too different from today's gasoline cars). The pistons

were aluminum with tubular connecting rods, along with inline vertical valves that were gear driven in the front of the motor. There were 2 spark plugs per cylinder and utilized a twin ignition system. All of these expensive pre-1920 speed goodies netted an overall horsepower of 37.2.



Above: A Hispano Suiza H6. Possibly Limo Coachwork.

The thing that got me, was when you have big car and big car performance, how do you stop it? Well, the H6 had that covered as well. The brakes were finned aluminum drums (maybe that's how Buick got that idea) on all 4 wheels, and a pedal under the instrument panel called the "Servobrake" operated them. This patented system used a hollow gear driven cross-shaft with a brake drum rotating about 1/64th of the engine speed.

Expanding shoes would expand to the drum at the same time the brakes were activated. All in all, this was an early hot rod, and I'm sure the Major put it to the test! The H6 was made between 1919 and 1934 with a total of 2,614 cars made. I think I can say with confidence that if the Major was still around today, he not only would have enjoyed our club, but would have arrived in a Ferrari or a Challenger Hellcat! [Thanks to Bob and NJARC for sharing!](#)

As we approach Valentine's Day: It all started with a woman's suggestion! - Fact or Fiction?

One evening, in 1929, two young men named William Lear and Elmer Wavering drove their girlfriends to a lookout point high above the Mississippi River town of Quincy, Illinois, to watch the sunset. It was a romantic night to be sure, but one of the women observed that it would be even nicer if they could listen to music in the car.

Lear and Wavering liked the idea. Both men had tinkered with radios (Lear served as a radio operator in the U.S. Navy during World War I) and it wasn't long before they were taking apart a home radio and trying to get it to work in a car. But it wasn't easy: automobiles have ignition switches, generators, spark plugs, and other electrical equipment that generate noisy static interference, making it nearly impossible to listen to the radio when the engine was running.

One by one, Lear and Wavering identified and eliminated each source of electrical interference. When they finally got their radio to work, they took it to a radio convention in Chicago. There they met Paul Galvin, owner of Galvin Manufacturing Corporation. He made a product called a "battery eliminator", a device that allowed battery-powered radios to run on household AC current. But as more homes were wired for electricity, more radio manufacturers made AC-powered radios. Galvin needed a new product to manufacture. When he met Lear and Wavering at the radio convention, he found it. He believed that mass-produced, affordable car radios had the potential to become a huge business. Lear and Wavering set up shop in Galvin's factory, and when they perfected their first radio, they installed it in his Studebaker. Then Galvin went to a local banker to apply for a loan. Thinking it might sweeten the deal, he had his men install a radio in the banker's Packard. Good idea, but it didn't work. Half an hour after the installation, the banker's Packard caught on fire. (They didn't get the loan.)

Galvin didn't give up. He drove his Studebaker nearly 800 miles to Atlantic City to show off the radio at the 1930 Radio Manufacturers Association convention. Too broke to afford a booth, he parked the car outside the convention hall and cranked up the radio so that passing conventioners could hear it. That idea worked -- He got enough orders to put the radio into production.

WHAT'S IN A NAME? That first production model was called the 5T71. Galvin decided he needed to come up with something a little catchier. In those days many companies in the phonograph and radio businesses used the suffix "ola" for their names -Radiola, Columbiola, and Victrola were three of the biggest. Galvin decided to do the same thing, and since his radio was intended for use in a motor vehicle, he decided to call it

the Motorola. But even with the name change, the radio still had problems: When Motorola went on sale in 1930, it cost about \$110 uninstalled, at a time when you could buy a brand-new car for \$650, and the country was sliding into the Great Depression. (By that measure, a radio for a new car would cost about \$3,000 today.) In 1930, it took two men several days to put in a car radio. The dashboard had to be taken apart so that the receiver and a single speaker could be installed, and the ceiling had to be cut open to install the antenna. These early radios ran on their own batteries, not on the car battery, so holes had to be cut into the floorboard to accommodate them.

The installation manual had eight complete diagrams and 28 pages of instructions. Selling complicated car radios that cost 20 percent of the price of a brand-new car wouldn't have been easy in the best of times, let alone during the Great Depression? Galvin lost money in 1930 and struggled for a couple of years after that. But things picked up in 1933 when Ford began offering Motorola's pre-installed at the factory.

In 1934 they got another boost when Galvin struck a deal with B.F. Goodrich Tire Company to sell and install them in its chain of tire stores. By then the price of the radio, with installation included, had dropped to \$55. The Motorola car radio was off and running. (The name of the company would be officially changed from Galvin Manufacturing to "Motorola" in 1947.)

In the meantime, Galvin continued to develop new uses for car radios. In 1936, the same year that it introduced push-button tuning, it also introduced the Motorola Police Cruiser, a standard car radio that was factory preset to a single frequency to pick up police broadcasts. In 1940 he developed the first handheld two-way radio-the Handy-Talkie for the U. S. Army. <https://en.wikipedia.org/wiki/SCR-300>.

A lot of the communications technologies that we take for granted today were born in Motorola labs in the years that followed World War II. In 1947 they came out with the first television for under \$200. In 1956 the company introduced the world's first pager; in 1969 came the radio and television equipment that was used to televise Neil Armstrong's first steps on the Moon. In 1973 it invented the world's first handheld cellular phone.

And it all started with the car radio!

Whatever happened to the two men who installed the first radio in Paul Galvin's car? Elmer Wavering and William Lear ended up taking very different paths in life. Wavering stayed with Motorola. In the 1950's he helped change the automobile experience again when he developed the first automotive alternator, replacing inefficient and unreliable generators. The invention led to such luxuries as power windows, power seats, and, eventually, air-conditioning. Lear also continued inventing. He holds more than 150 patents. Remember eight-track tape players? Lear invented that. But what he's really famous for are his contributions to the field of aviation. He invented radio direction finders for planes, aided in the invention of the autopilot, designed the first fully automatic aircraft landing system, and in 1963, introduced his most famous invention of all, the Lear Jet, the world's first mass-produced, affordable business jet. Not bad for a guy who dropped out of school after the eighth grade!

Romantic or revised?

<https://www.truthorfiction.com/history-car-radio/>

A better source may be Ernst Erb's excellent contribution on the subject. *"The very first broadcast receivers and early radios, that is to say sets of the early 1920s, almost always consisted of a box for the radio, one for the speaker and several batteries, sometimes in the form of accumulators containing liquid acids. Also required was a wire antenna of substantial length. Altogether, the components weighed a loaded suitcase. Nevertheless, one soon packed all into a wooden "suitcase" in order to be mobile."*

In the article, we learn of other early brands such as Transitone and get a glimpse into countries' foray into mobile radio yielding dates, pictures, and descriptions- allowing more clarity about who was first or how that is defined. Ernst is an officer of *RadioMuseum*, of which we all should be a member given the value of its accumulated information. See these three essays below for more:

https://www.radiomuseum.org/forum/first_car_radios_history_and_development_of_early_car_radios.html

<https://www.hagerty.com/media/automotive-history/history-of-early-radio/>

<https://philcoradio.com/library/index.php/philco-history/philco-auto-radios/>

A Basic Progression of the Automobile Radio Antenna

by Eli Laurens and others

In his day, the brilliant -- some say, mad -- scientist Nikola Tesla had a vision: to fill the entire world with energy, so that powering anything was as simple as reaching out with a metal pole and pulling electricity out of thin air. While Tesla's idea might seem a little crazy now, in a very real way we're living in exactly the energy-filled world he imagined. No matter where you go, the air is absolutely brimming with electrical energy in the form of radio waves, and catching them isn't much more difficult than our mad genius proposed way back in 1892.

In the 1930s, car antennas were incorporated into the radio body, as most stations were in the AM band. The lack of bandwidth competition and general radio noise in the 1930s (except that produced by the vehicle) meant that stations might be picked up for a long distance without external antenna hardware. The receivers were pretty primitive tube designs, not very efficient. The model 5T71 Motorola as the first "practical" car radio (previous story above) doesn't mean its installation was easy. It was reportedly a two-day job. A 28-page manual reportedly required disassembly of the dashboard and holes cut in the floor for the radio's batteries (which, at that time, were separate from the car's battery in order to eliminate noise). The last of the basic noise problems, allowing the radio to be powered directly from the car battery, were solved by about 1935, greatly simplifying installation. Car radios were typically AM, with some European

models having 80-meter shortwave and refinements in the design included the space charge electron tubes. These tubes worked on something called the "space charge" principle, which basically used the first grid after the cathode to accelerate electrons toward the weakly-charged plate, which was now working at 12V instead of 180V. The same principle was applied to other types of multi-grid tubes such as pentodes.

In order to "catch" a particular wavelength of radio energy from the air, an antenna works best if it's exactly as tall as the wavelength is long. Or, if that's not an option, then half or a quarter as tall. Car antennas are usually calibrated to "quarter-length" for the frequencies they're designed to pick up. Too long usually doesn't hurt, but too short can seriously affect radio reception. Antennas were really long, because that was more efficient than trying to improve the receiver. In some of the older European cars, you'll see antenna whips out to seven feet, most being around four feet fully extended.



Above: This 56 Packard came from factory with dual antennas. 55-56 Caribbeans had them and since it balanced the appearance, they put them on other Packard models. Both antennas are powered but only the one on the right side was connected to the radio originally.

By the mid-60s, transistor radios replaced vacuum tube technology, and the discriminatory qualities of

the receiver improved dramatically. Antenna lengths hovered around three feet, and retractable antennas started to be a thing - which often worked reasonably well fully collapsed. For AM BCB reception, longer is better, because the antenna is electrically short (length small compared to wavelength) so that making it longer makes it more efficient. A longer antenna is more efficient when electrically short in two ways: it couples a higher potential to the radio from a given field intensity, and it lowers the output impedance of the whip antenna making it a better match to the coax cable and the radio's input impedance.

By the 70s, FM was in ascendance, and multi-path rejection technologies were required, and the receivers improved again. In that time period, you started to see "invisible antennas" formed into the glass of the windshield. The path length was still fairly long, on the order of five feet or so, but zero of that stuck up away from the car.

The first advanced technology radios started showing up in 2004 when the first HD radios were sold. By this point, discrete component receivers were sacked in favor of digital signal processing to sort and decode the signals. Satellite radio started appearing around the same time, with super-small antennas, typically coils with the pack being a couple of inches across. GPS figured into that time frame as well, a completely different kind of radio signal.

Most **shark fin** "antennas" on modern vehicles are actually modules: they contain several antennas inside a single housing. Common features include AM/FM,

4G LTE, GPS navigation, and Satellite Radio elements.



The unit is designed this way to provide an aesthetically pleasing look while cost-effectively combining several functions. Due to the size of the unit and the number of antennas inside, the antennas themselves are less than ideal performers. However, there are some key tradeoffs that make these a good idea: The roof is the best place on the car for an antenna. There is less signal blockage and better line-of-sight than any other location. Modern automotive electronics and the receivers built into them, go a long way towards compensating for the smaller antennas. Car manufacturers have been making these compromises for many years now, and have focused on improving the tuners. Factory-installed shark fin antennas usually operate at frequencies near 1 GHz and higher. Because the wavelengths at these frequencies are relatively short, the antenna elements are usually etched into the circuit boards. Here is an example from a VW car:



The circuit board that is standing up is the antenna for CarNet, a driver assistance service offered by VW that is similar to GM's OnStar. The rectangular structures are antennas for GPS and satellite radio. The antennas are not simple dipoles. Instead, various ingenious designs are used so that the antennas can be made small in comparison to the wavelengths of interest.

Now getting back to the receivers, there's a fascinating symmetry between the early radios and the design of modern complex car audio systems in that both the very old and very new systems have their components spread throughout the car. This is in contrast to much of the trajectory of car audio from the 1950s through the early 1980s where everything except the speaker was contained in a single box. With the advent of power amplifiers and subwoofers in the 1980s and CD changers in the 1990s, the electronics again became distributed throughout the car, and a new term arrived to describe the portion that you actually laid your hands on—the "head unit." With this in mind, the Motorola 5T71 may have been the first production car audio system with a "head unit"—a tuner that was bolted to the steering column!



From the editor's standpoint, regarding the shark fin, it is certainly not an optimum AM

antenna within the fin. Daytime reception more than 60 miles out (NYC received in Lehigh Valley) may have a level of hiss as compared to my former analog car radio with a 3 foot antenna. But stronger night signals seem to be OK. The new infotainment and satellite channels do impress. I guess even dinosaurs move on.

Please reference the following link for an excellent presentation made at 2022 AWA Annual Conference, Entitled: *The Future of Car Audio - Not your father's AM-FM-stereo-8-Track*. Car Audio has come a long way since the car radio first appeared in the 1920s, and the pace of car audio innovation is increasing every year. It won't take long for the state of the art audio systems in today's concept cars to be standard equipment in base models of the future, and the audio systems have really become indistinguishable from the navigation and instrumentation systems. With convergence came new players to the car audio business, and Garmin is one of those players. Join Garmin engineer Tim Place as he explores the future of car audio.

<https://m.youtube.com/watch?v=mrO993du8Ho>

Tuners: next generation (The Future!)

- Multi-zone tuners (Personalized Experience for each seat)
- Hybrid Radio
 - Combines traditional broadcast radio with an IP data stream
 - Provides enhanced metadata on ANY band
 - Metadata used in station lists and landing pages
- IP Service Following
 - Find a stronger signal or stream from 5G network
 - Seamlessly adjust delays, crossfade and time-stretch for seamless experience

If you enjoy this video, consider becoming a member of the Antique Wireless Association at:

<https://antiquewireless.org/homepage/>

Subscribe to the Antique Wireless Museum channel and you'll receive news of our latest video uploads!

Upcoming Regional Events

The following is an abbreviated list at this early date in 2023; Load club websites to keep current. Following are some excellent programs and a reason to have club memberships in our region's clubs too!

NJARC Repair Clinic Saturday, Feb. 4, 2023 9 am to 4 pm.

InfoAge Science and History Museums, 2201 Marconi Rd, Wall Township, NJ 07719- Building 9032A. Contact Rich Lee for reservation. (Contact information available on www.njarc.org)

JD's Antique & Vintage Radio Electronics Auction Saturday, March 11, 2023 Preview at 8 am, Auction starts 9. Jackson Mills Vol Fire Company Banquet Hall 465 N County line Rd Jackson NJ 08527. Over 250 lots, pix posted soon, see: <https://jdauctionsllc.com/default.aspx?JDAuctionServices&p=1>

NJARC Spring Swap meets TBA- Check link often for future plans of scheduled events. www.njarc.org/directions.html#swapmeets.

2023 York Hamfest Saturday, Apr. 29 2023 8 am to 1 pm. Elicker's Grove Park, 511Roth Church Road, Spring Grove, PA. Tailgate setup 6 AM Sat. morning: \$5 per 10' space (outside) or table (pavilion), plus admission. Contact information available at: <https://www.yorkhamfest.org/wp-content/uploads/2022/12/2023-York-Hamfest.pdf>

Kutztown Radio and Audio Show XLVII (47) Friday, 05.12.23 through Saturday, 05.13.23 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. Auction is Friday 5.12 at 5:30 in white room, Preview at 4:30. 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 \$50, extra tables \$10. **Exhibitor reservation advised: Phone M-Th 570.385.0104; F-S 610.683.6848.** See links at: www.dvhrc.org and see updated **FAQ listing below.** https://www.dvhrc.com/Kutztown_101.pdf

RadioActivity 2023 Thursday, 06.01.23 6PM through Saturday, 06.03.23 4PM. To be held at venue within the greater Washington/Baltimore region TBA. The theme is: Electronics originating in the Virginia, Maryland, Delaware, and DC area, the heart of the Mid-Atlantic region. More detail will follow in the club's March *RadioAge* and at: <https://maarc.org/events/>

2023 AWA Annual Conference Tuesday, September 27 to Saturday September 30, 2023. AWA will be held at the RIT Inn and Conference Center, 5257 W Henrietta Rd, Henrietta, NY 14467. **The theme will be "The Broadcast Boom Years of The 1920s"**. Sub themes associated with design, marketing, early broadcasting, Roaring 1920s, big changes in culture, licensing issues, US Manufacturers in the 1920s, personalities, inventors. Registration via AWA website: <https://www.antiquewireless.org/homepage/annual-conference/>

Tube News from DVHRC



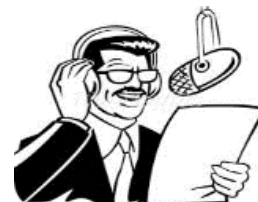
DVHRC is in the progress of streamlining inventory of obsolete or seldom-used tube stock. Until then we always welcome donations of:

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



So why did God make the Radio?

<https://www.youtube.com/watch?v=VAmk-Wk2pNA&list=RDMM&index=8>